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DEPARTMENT OF STUDIES AND RESEARCH IN MANAGEMENT

M.B.A I Semester

Course – 2

MANAGERIAL ECONOMICS

BLOCK

1

INTRODUCTION TO MANAGERIAL ECONOMICS

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BLOCK – 1 : INTRODUCTION TO MANAGERIAL ECONOMICS

The block 1 contains 5 units (unit-1 to unit-5) where the unit-1 includes information relating to importance, scope and significance of Managerial Economics, fundamental economic concepts, objectives of the firm etc further unit-2 encompasses information relating to demand analysis, law of demand, individual demand and market demand, factors influencing market demand etc next unit, unit-3 includes information relating to price elasticity of demand, income elasticity of demand, cross elasticity of demand, applications of elasticity of demand concept etc further unit- 4 includes information relating to demand estimation and forecasting, short term demand estimation, objectives and long term demand forecasting, steps in demand estimation etc and finally unit-5 includes information relating to supply analysis, determinants of supply, supply function, law of supply, elasticity of supply, factors determining elasticity of supply, market equilibrium etc.

UNIT - 1 : INTRODUCTION TO MANAGERIAL ECONOMICS

STRUCTURE:

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Importance of Economics
- 1.3 Scope of Economics
- 1.4 Significance of Managerial Economics
- 1.5 Scope of Managerial Economics
- 1.6 Fundamental Economic Concepts
- 1.7 Relationship to the Functional areas of business Administration
- 1.8 Objectives of Firm
- 1.9 Summary
- 1.10 Key Words
- 1.11 Questions for Self-Study
- 1.12 References

1.0 OBJECTIVES

After studying this Unit, you will be able to ;

- Understand the meaning and importance of managerial economics
- Identify the role and responsibilities of a managerial economist
- Discuss the scope of managerial economics
- Know the salient economic concepts
- Understand the various objectives of a firm
- Highlight the importance of economics in relation to other disciplines

1.1 INTRODUCTION

Economics is the study of how societies choose to use scarce productive resources having alternate uses, to satisfy unlimited wants of people. As a social science, economics studies human behaviour as a relationship between numerous wants and scarce means with alternative uses. Scarcity is the source of an economic problem. Scarcity is a relative term. It can be defined as excess demand, that is, demand more than the supply. For example, inflation occurs due to scarcity of goods and unemployment is due to scarcity of jobs. Scarcity of resources forces people to choose among alternatives. Making a choice is not easy as resources are limited which can be put to alternative uses. Economics therefore is the art of rational decision making. The study of economics is very significant to modern day businesses as taking right decisions at the right time is necessary for the success of the business.

Managerial economics is the study of allocation of resources available to a business firm. It is fundamentally concerned with the art of economizing, making rational choices that would yield maximum returns out of minimum resources and efforts. It is the selecting the best alternative among alternative courses of action.

Managerial economics is a specialized discipline of management studies which deals with application of economic theory and techniques to business management. It is evolved by the integration of economic theory and tools and techniques of analysis (decision sciences) along with business management theory and practice. It is the application of economic concepts, methods and tools of analysis to business decision making process.

Business decision making is a complicated process as businesses have multiple goals and there is no certainty in business due to their dynamic nature. As a result, economic

theory does not provide clear solutions to business problems. However, economic theory helps in arriving at better decisions. Many gaps exist between theory and actual business in practice. In economic theory, a firm identifies profit maximizing output by equating marginal revenue and marginal cost. But, in actual practice, this may not be possible due to resource constraints. Managerial economics attempts to bridge the gap between analytical problems of economic theory and decision problems faced in real business.

1.2 IMPORTANCE OF ECONOMICS

The study of Economics is important for the following reasons:

1. It helps to understand how to satisfy human wants with scarce resources.
2. Economics is all about choice and therefore affects everyone. It therefore impacts decision-making. Individuals, businesses and governments are all faced with making choices in situations where resources are scarce. It is applicable to a wide range of fields, including business, finance, administration, law, local and national government and in many aspects of everyday life. It helps in the optimum utilization of resources. The amount of natural resources available to us is limited. Economics provides a mechanism for looking at possible ways to optimize resource utilization and reduce wastages.
3. Learning Economics gives insights into the general environment of resource allocation decisions, opportunity costs and project evaluation.
4. It helps to discover new factors that may lead to increase in national wealth.
5. A householder can allocate his income in such a way that his family gets maximum satisfaction.

1.3 SCOPE OF ECONOMICS

The horizon of economics is gradually expanding day by day. It is no longer a branch of knowledge that deals only with the production and consumption. Though the basic thrust of the subject still remains the same, that is, effective utilization of the scarcely available resources efficiently, the study focuses on other aspects as well. Some of the other branches of economics are:

1. **Microeconomics:** This is considered to be the basic economics. Microeconomics may be defined as that branch of economic analysis which studies the economic behaviour of an individual unit or a person or a household. The study of a business unit is called as Managerial Economics. It studies the flow of economic resources

(factors of production) from the households (the resource owners) to business firms and flow of goods and services back from the business firms to households. It is a study of individual decision-making with regard to price fixation and output and its reactions to the changes in demand and supply conditions. Hence, micro economics is also called as 'price theory'.

2. **Macroeconomics:** Macroeconomics may be defined as that branch of economic analysis which studies behaviour of not one particular unit, but of all the decision-making units combined together. Macroeconomics is a study in aggregates. Hence it is often called Aggregative Economics. Macroeconomics deals with the behaviour of aggregates like total employment, gross national product (GNP), national income, general price level, etc. So, macroeconomics is also known as 'income theory'.
3. **International Economics:** Nations trade with each other bringing in foreign exchange reserves. The role of international economics is getting more and more significant now a days.
4. **Public Finance:** Public Finance or fiscal economics is another important branch which analyses the role of government in an economy.
5. **Development Economics:** This branch gained importance after the Second World War. Many countries required heavy push and stimulation for growth and development thus bringing in the branch called development economics.
6. **Urban and Rural Economics:** The urban-rural divide stresses the need for urban economics and rural economics. Because of the growing gap between them and specific problems each has, economists have realised that there should be specific focus on urban areas and rural areas.

Besides the above, there are many new areas where the role of economics is recognized, such as, welfare economics, monetary economics, transport economics, labour economics, agricultural economics, etc.

1.4 SIGNIFICANCE OF MANAGERIAL ECONOMICS

Managerial economics is an application of economic theory in solving business problems. It helps in identifying the best course of alternatives available. It provides necessary skills to enhance business goals and functions. In this sense, it is concerned with the interaction between internal business operations and the business environment outside, such as, marketing, business development, liaising with government, investment climate and finances required.

Managerial economics makes a thorough analysis of key elements involved in business decisions. A manager who wants to increase his market share should have a thorough knowledge about the size, consumers' tastes and preferences, the level of competition, their products, etc. All these inputs will help them have a better understanding of the market. Economic analysis helps in assisting them in designing the course of action and also in measuring the effectiveness of the decisions arrived. Managers understand the intricacies of business problems which make problem solving easier and better. They can arrive at correct and right decisions. They are guided to identify key variables in the business decision making process and in optimizing it.

Most managerial decisions are to be taken under conditions of uncertainty. The uncertainty can be reduced to a certain extent if a detailed and exhaustive investigation is taken up. For example, if a firm wants to enter into a new territory, it is essential that it conducts market research in the new region to understand the mind set of customers, what their product choices are and whether are open to accept new products. The process of research involves the following steps—problem definition, research design, data collection, data analysis and interpretation. Knowledge of managerial economics coupled with research knowledge and statistical techniques of problem solving helps a manager in understanding, interpreting and evaluating different variables.

Managerial economics helps decision makers to understand the impact of the decisions they take on daily basis. Economic analysis helps the business in determining the best path to achieve more profits. For instance, if the company is affected by poor sales and the company is keen to increase its profit element, there may be a suggestion by a manager about price reduction which may result in higher sales. If the product is a commonly consumed product and a necessity good, this action by the firm will definitely increase sales volume. However, a thorough economic analysis has to be undertaken before deciding upon the percentage of price decrease.

Majority of the managerial decision making is based on the following aspects :

What to Produce?

What goods should be produced to satisfy consumer wants is directly dependent on the limited resources available. A country producing goods that maximises consumer satisfaction is said to be allocatively efficient. Economies should decide the best combination of goods and services to meet their needs. For example, they must decide on (a) how much resources should be allocated for consumer goods, and much resources to capital goods, or (b) how much resources should go towards education, how many towards health, defence, etc.

How to Produce?

Combining production inputs to produce the goods decided above in the most efficient manner is the second problem faced by firms. An economy achieves productive efficiency if it produces goods using the least resources possible. Societies should decide the best combination of factors to create the desired output of goods and services. For example, decisions regarding how much land, labour, and capital should be used produce consumer goods such as computers and motor cars should be taken.

For Whom to Produce?

The demographics or the structure of the population of a country decides the actual production of goods. Firms have to decide whether to produce the high income group requirements or the low income wants. A nation addressing this problem is said to have obtained pareto distribution efficiency.

All the above decisions involve proper allocation and utilization of scarce productive resources, namely, land, labour, capital and enterprise. Decisions about resource allocation should be made in three stages:

- **Allocative decisions:** Decisions regarding the types and quantities of goods to be produced from the available productive resources. This requires devising ways and methods to mobilize resources in the desired direction.
- **Productive decisions:** Decisions as to who will produce and where are they produced to satisfy the consumers wants. Production function requires choice of right techniques. When to produce and where to produce are also production related decisions.
- **Distributive decisions:** Decisions as to how the goods are to be distributed. An economic system chalks out its own course of distribution arrangement.

Business activity is therefore concerned with the right use of scarce productive means. Optimum utilization of resources involves a choice between what, how, when, how much and for whom to produce. Prof Halm summarizes the basic problem of all economic systems as the allocation of scarce means among competing ends for the achievement of maximum results.

1.5 SCOPE OF MANAGERIAL ECONOMICS

Managerial economics is the application of economic concepts. It is the economic analysis of problems to help make rational decisions. It is the integration of economic

principles with business practice. The study is pragmatic and an analytical tool useful for decision making in business.

Managerial economics helps in two major functions—(a) it helps managers in decision making and (b) in business forecasting and forward planning. These functions are to be performed under conditions of uncertainty. The following points throw more light on these:

1. **Strategic Planning:** Managerial Economics provides a framework on which long term decisions can be made which have an impact on the behavior of the firm. The perspective of strategic planning is global. The integration of business economics and strategic planning has given rise to a new area of study called ‘Corporate Economics’.
2. **Resource Allocation:** Scarce economic resources are to be used with great efficiency to get the best results from a production process.
3. **Inventory and Queuing:** Inventory decisions require decisions about the right quantity of stocks of raw materials and finished goods to be kept over the period. These decisions are taken considering the market situation, availability of proper supplies, etc. Queuing problems involve decisions relating to installation of machines and hiring of the right number of labour across the different categories of skilled, semi-skilled and unskilled work force.
4. **Pricing Decisions:** Fixation of prices for the firm’s products is an important decision making problem. Pricing decisions require assessment of various pricing techniques and choosing the best one. Competitor analysis of pricing procedures, the degree of competition, advertising strategies adopted by others all play a major role in fixing the firm’s products.
5. **Investment:** Forward planning necessarily involves investment problems. Investment in new machineries for future expansion requires a good deal of calculations and assessment of situations. How much to invest, sources of funds, interest rates charged on such funds, continuation or discontinuance of existing product line, taking up new ventures are some of the investment problems that are addressed by managerial economics.
6. **Demand Analysis and Demand Forecasting:** One of the important requirements of modern business is correct analysis of demand. Demand elasticities help decision makers to identify the correct pricing technique for their products. The demand for a firm’s products is dependent on a number of factors like the price of the product, prices of substitutes and complementary products, consumers’ incomes, their tastes,

preferences and habits, population, etc. These determinants help in forecasting the future demand for the product.

7. **Cost Analysis:** Cost analysis helps in determining the size of the firm, volume of output and factors of production. A study of economic costs is necessary to evaluate the net profits. Economic costs include (a) explicit costs which involve money payments such as administration expenses and marketing expenses and (b) implicit costs which do not involve payments such as use of own premises and managing the business personally.
8. **Profit Analysis:** The incentive of firms to work and move ahead is the lure of profits. Controlling costs and adoption of right pricing policies are essential to assess a firm's profit levels. As firms work under conditions of uncertainty, like demand fluctuations, competitors strategies, technological changes, variations in methods of production, etc., it is essential that firms take right decisions at the right time. Managerial economics helps them to take appropriate decisions.
9. **Capital Budgeting for Investment Decisions:** Any factor which is scarce is expensive. Under conditions of uncertainty as discussed above, it is essential that managers take capital investments decisions with utmost care and diligence. Capital budgeting decisions involve huge amounts of money flows and therefore it is very important that right decisions are taken. A wrong move by the firm will cost a fortune to the company. Capital budgeting proposals require proper evaluation of various alternative project proposals, choosing one which suits the company's objectives and correct and optimal capital allocation. Proper evaluation and choice can be done using managerial economics.

Besides the above strategic areas where managerial economics plays a prominent role, the following other areas are also dealt with.

- Marginal analysis
- Break even analysis
- Cost of capital
- Mergers and Acquisitions

1.6 FUNDAMENTAL ECONOMIC CONCEPTS

The following economic concepts are fundamental to business analysis and decision making:

1. Opportunity cost
2. Optimization or the equi-marginal principle
3. Incremental principle
4. Time perspective
5. Discounting principle

1. Opportunity Cost

Economics deals with choosing one alternative amongst various alternatives. All the alternatives are prioritized and ranked before a particular alternative is chosen which is the top most in the priority list. This implies that the other alternatives are sacrificed. The cost of the project chosen is evaluated in terms of the sacrificed alternatives. A decision is cost free if no sacrifice is involved.

For example : A businessman may invest his own money into his business venture. The opportunity cost can be measured in terms of the interest he would have earned had he invested it in a bank. He compares the expected returns or the prospective yields and concludes that they are greater than the rate of interest and therefore he decides on investing the money in his business. Similarly, a person may take care of all the activities of his business instead of recruiting others. The opportunity cost here is measured in terms of the salary he could have earned had he worked elsewhere. He will continue to run his business as long as he is earning sufficient profits which are equivalent to the salary he would get if he worked for another firm. When he is not continuing to get normal profits, he will close down his business and work outside for a salary.

2. Equi-Marginal Principle: The equi-marginal principle is very significant in determining optimal conditions for resource allocation. This principle states that a factor input should be employed in different activities in such a proportion that its value of marginal product is equal to all the uses, thus ensuring that the optimum level is achieved. For example, symbolically, marginal productivity of labour can be expressed as $MPL_a = MPL_b = MPL_c$ where MPL is marginal productivity of labour. Likewise, for cost minimization the equi-marginal principle can be expressed as $MC_1 = MC_2 = MC_3$ where MC is marginal cost. For revenue maximization, it is $MR_1 = MR_2 = MR_3$ where MR is marginal revenue.

A manager can maximize revenues or minimize costs, both of which result in higher profits. This is referred to as the optimization technique. A manager would equate the marginal cost with marginal revenue which would result in maximization of total profit. The total profits of a firm are maximized when the difference between the total revenue (TR) and total cost (TC) is maximum. As $\text{profit} = \text{TR} - \text{TC}$, firms aim at increasing revenues while minimizing costs.

3. Incremental Principle

Estimating the impact of decision alternatives on costs and revenue and studying the changes in total cost and total revenue resulting from changes in prices, products, procedures, and investments is the incremental concept. Incremental analysis includes two concepts: incremental cost (IC) and incremental revenue (IR). IC is the additional cost incurred for additional output. In other words, it is changes in cost due to changes in level of output. IR is the additional revenue from additional output or the changes in revenue due to changes in output. In order to determine whether the decision is sound or not we should compare the IC and IR of every decision. For every business decision, there is IR and IC. If IR exceeds the IC, or IR is equal to IC the decision can be assumed as a sound decision.

On the basis of the incremental analysis, a manager would like to implement the business action which is profitable. A decision is obviously a profitable one if:

- It increases revenue more than costs
- It reduces costs more than revenues.
- It decreases some costs to a greater extent than it increases other costs
- It increases some revenues more than it decreases other revenues

Some businessmen hold the view that to make an overall profit, they must make a profit on every job. Consequently, they refuse orders that do not cover full cost (labour, materials and overhead) plus a provision for profit. Incremental reasoning indicates that this rule may be inconsistent with profit maximisation in the short run. A refusal to accept business below full cost may mean rejection of a possibility of adding more to revenue than cost. The relevant cost is not the full cost but rather the incremental cost.

4. Time Perspective

Managerial economists widely use the functional time periods, short run and the long run, and their effects of decisions on revenues and costs. One important problem in decision making is maintaining the right balance between the long run and short run

considerations. For example, let us say there is a firm which does not utilize its capacity to the optimum and has some idle capacity. It gets an order for 50,000 units at a rate of ₹ 4 per unit. The production experts calculate that the short run incremental cost (ignoring the fixed cost) is ₹ 3. The order's contribution to overheads and profit is ₹ 1 per unit (Rs.50,000/- for the entire order). When we analyse this case, the following long run repercussions of the order is evident:

1. If the management commits itself with too much of business at lower price or with a small contribution, it will not have sufficient capacity to take up business with higher contribution.
2. If the other customers come to know about this low price, they may demand a similar low price. Such customers may complain of being treated unfairly and feel discriminated against. The firm risks of losing such customers to their competitors. In the above example it is therefore important to give due consideration to the time perspectives. A decision should take into account both the short run and long run effects on revenues and costs and maintain the right balance between long run and short run perspective.

Short term time perspectives are based on short run analysis of the business performance. Seasonal fluctuations are bound to happen and variations in business occur. For example, sales of crackers are high and the demand occurs only during the Deepavali season. A banker has to keep large amounts of liquid cash to meet the heavy withdrawals in the first week of every month. Shops selling school uniforms and school shoes witness huge sales in the beginning of the academic year. In all such cases, inventory management is based on short-term business perspectives. However, in the long run, a business' emphasis is more on growth, development and expansion. Long run planning plays a crucial role in business. External influencing factors are to be considered. For instance, due to the economic progress and rise in salaries in the country, there are a large number of people visiting places. Businesses in the airline industry and road transport witness increasing number of travellers which is expected to continue in future also. To meet this ever-increasing demand, these firms should have long term plans such as increasing the fleet, replacement of old vehicles, etc.

5. Discounting Principle

One of the fundamental concepts in Economics is that the present value of money is greater than the future value. A rupee tomorrow is worth less than a rupee today. Thus, in investment decision making, discounting the future value with the present value is very essential. All the future costs and revenues are discounted to bring them to the present values before a comparison between alternatives is possible and a decision is taken. The following

formula is used to discount the future value:

$PV = A/(1+i)$, where PV is the present value, A is the amount and i is the rate of interest.

For example, if A is 1,000, i is 12%, the present value can be calculated as $1,000/(1+0.12)$ which is equal to 893. Tomorrow's 1,000 is equal to today's 893.

1.7 RELATIONSHIP TO THE FUNCTIONAL AREAS OF BUSINESS ADMINISTRATION

Economics can be applied to several disciplines of management such as:

1. Production Management
2. Marketing
3. Finance
4. Human Resource Management
5. Operations Research

1. Economics and Production Management

A production manager has to take decisions regarding what to produce, when to produce, what quantities to produce, how to produce, how to increase productivity, etc. For all these questions, optimal utilization of available resources is important. Economics deals with production functions such as production process, input-output analysis, cost-benefit analysis, inventory management, pricing policies, etc. which are all considered to have relevance and significance in production management.

2. Economics and Marketing

Manufacturing and marketing are inter-related. Businesses are successful only if the marketing efforts are efficient and bring in sales, that is, whatever is manufactured is sold. Marketing operations of a business are based on consumer behaviour and market demand. Demand analysis and forecasting is an important function of economics. Demand function and elasticities of demand help marketing staff to analyse the effects of various pricing strategies on the sales function. Product differentiation, advertising strategies, decisions involving expansion of business into newer territories, effect of closing down of some products are some other areas where economics can contribute to.

3. Economics and Finance

Finance is a very important function of a business. A firm's continuance or discontinuance depends on the financial flows. Financial management determines the stability

of a firm. Right decisions regarding capital budgeting, investment allocation, inventory issues, depreciation methods, methods of raising capital, interest payments, cost of capital, cash flow management, etc. are very important for the success of a business. Accounting ratios such as net profit ratio, return on investment, price-earnings ratio, and financial ratios are all a part of economic analysis of the firm.

4. Economics and Personnel Management

Human resources are very important for enhanced productivity. Wage payments to labourers, salaries to office staff, perks and fringe benefits to employees have an economic bearing. Labour economics plays a vital role in any organization. Selection and recruitment policies, training, replacement policies are some personnel issues which have a bearing on a firm and are assessed by labour economists. Formulation of wage policy, bonus and incentive plans, training, promotion programmes are based on the efficiency of production process and sales efforts.

5. Economics and Operations Research

Operations research is an integral part of decision making process working towards firm's optimization. Optimization is the art of economizing. Operations research is the application of statistical and economic analysis to solve business problems and to arrive at rational decisions. It is useful in solving diverse business problems like production scheduling, distribution management, advertising budget in different market segments, etc.

1.8 OBJECTIVES OF FIRM

The goals or objectives of a firm are classified into two types—(a) normative goals and (b) descriptive goals.

Normative goals :

It suggests how a firm should act under a given set of values. For instance, how to make the most efficient use of economic resources. Normative objectives advocate what is right and wrong, what ought to be done and not in a given situation. These objectives are based on ethical values and are suggestive in nature laying down which is a better course of action for a firm to adopt. If a company decides to introduce a new product into the market, it has to decide if it has to adopt skim the cream pricing policy wherein it charges high prices initially when the product is introduced and makes quick profits or adopt penetration pricing where in it charges lower prices initially to get people's acceptance. Normative objectives encompass value judgment. All firms lay out normative objectives first. Managerial economics deals with the normative aspects of the firm.

Descriptive objectives :

Descriptive objectives also known as positive objectives are decisions made to achieve the normative objectives of a firm. Managerial decisions usually involve one major question—resource allocation. Resource allocation is to be done adequately and properly both in the short run and long run. Short run decisions are different from long run decisions. In the short run, managers give more importance to demand estimation, production and to pricing policies. In the long run, decisions are made to meet expansion plans, developing new products, entering new territories, etc. These decisions are more of capital budgeting in nature. Managerial economics helps one in understanding the various criteria for carrying out these strategies.

Motives of firm

A firm may have any one or a combination of the following objectives:

1. Profit maximization in the short run and/or in the long run
2. Shareholders' wealth maximization
3. Growth of the firm
4. Sales maximization
5. Long run survival
6. Maximizing social welfare

1. Profit Maximization Objective

Profit is the incentive that an entrepreneur gets for taking the risk of running a business. Every firm looks for maximizing profits and this is a very important motive for a firm to be in the manufacturing or marketing or service business. Profit motive plays an important role in the efficient allocation of economic resources.

Pure or above normal or economic profits are defined as the difference between total revenue or sales receipts and total economic cost of production and promotional cost. Economic costs include both explicit and implicit costs. Economic profits are above abnormal or super normal profits. Profit is the prime motive that determines the quality and type of goods to be produced and sold.

Accounting or Business Profits and Economic Profits

Economic profits are arrived at after the inclusion of both explicit and implicit costs whereas accounting profits are calculated after consideration of explicit costs only such as payment of salaries, rent, interest, marketing expenses, etc. and by not considering implicit

costs like cost of self-owned funds, running the business from company owned premises, owners taking care of business operations instead of hiring outsiders, all of which have no contractual payments are excluded from the computation of accounting cost. Accounting profits are therefore high and give an inflated picture about the business. Managerial economists mean economic profits which gives a true picture of the profits in economic sense.

Normal profit and super normal profits

Profits are the difference between total revenue and total economic cost. A businessman in any type of business expects a minimum rate of return on his investment. This rate of return is the main attraction for him to take up the risk of starting a business. The normal profit is necessary to induce individuals to invest funds and undertake a business activity. It is the cost of capital and a return for the risk taken. It is therefore a part of the total cost of production. Normal profit may be defined as the minimum rate of return sufficient enough to induce a firm to stay and continue in the industry.

Supernormal Profit:

Anything above the normal profit is abnormal or supernormal profit. If a firm gets a higher rate of return than the average cost of production which includes normal rate of profit, the higher rate of return over and above the normal profit is called “Supernormal profit”. It is the difference between the average revenue and average cost of production.

2. Shareholders’ Wealth Maximization or Value Maximization Objective

A firm can have its objective as shareholders’ wealth maximization, which is, maximizing the market value of the firm’s stocks. The shareholders’ return on investing in a firm is the dividends. The shareholders’ value is maximized when the present value of the firm’s expected future net earnings are high. The present value of the firm is obtained by discounting the sum of all future earnings which will be distributed as dividends at the required rate of return. While calculating the required rate of return to calculate present value of future earnings, it is necessary to adjust for the differential risk levels involved in the business over the life of the project.

3. Growth Maximization Objective

Increasing sales, having a bigger market share, larger asset base, growing number of employees are all indicators of a rising and growing business. Individuals and shareholders derive pride and satisfaction to be associated with such businesses and are happy when these firms reach greater heights. Employees of such organizations receive handsome salaries

and better perks and are therefore happy. A happy employee is a highly productive employee and the quality of products of such companies is good and therefore is demanded more in the market, all of which increases sales.

4. Revenue Maximizing Objective

William Boumol introduced the revenue maximizing objective. Managers of some firms are interested in maximizing total revenue to maintain the firm's competitive position in the market. Firms deem it a matter of prestige to be at the number one slot in the industry. This position in many cases is decided on the revenues of firms. Another reason why managers look at maximizing revenues is that many a time, their salaries are linked to the firm's total turnover, that is, revenue rather than on profits.

5. Long run survival

A firm looks at long run survival to maximize its probability of more profits. Decisions therefore centre round such issues and requirements that are long term in nature. However, by facing tough competition and surviving in the short run only ensures that the firm is able to pull on into the future. Managers do not prefer to be associated with short lived firms. To achieve the long term survival objective, business decisions are made in such a way that risks are avoided or minimized.

6. Social Responsibility of Business

A business enterprise contributes greatly to social welfare. Firms cater to the needs of the society. Maximizing consumers' welfare is the most important goal of many firms as managers of such firms realize that profits, value, wealth, sales maximization long term survival are all dependent on this objective. Besides manufacturing and selling goods that customers demand, firms also take interest in social activities like laying roads, providing drinking water facilities to public, beautification of parks, etc.

1.9 SUMMARY

Business decision making is a complicated process as businesses have multiple goals and there is no certainty in business due to their dynamic nature. Managerial economics helps decision makers to understand the impact of the decisions they take. Most managerial decisions are to be taken under conditions of uncertainty. The uncertainty is reduced to a certain extent if a detailed and exhaustive investigation is taken up and managerial economics plays a key role in the process.

There is a close link between managerial economics and other areas of business such as finance, marketing, operations and human resources.

There are many objectives that firms can pursue. The objectives are both long term and short term in nature. Different firms pursue different objectives at different times. However, profit and wealth maximization are the two most important objectives of many firms. This unit serves as an important background to the study of managerial economics. It has presented the basic definitions of profit, both in business accounting and economic terms. In accounting terms, profit has been defined simply as the difference between revenue from sales and explicit or out-of-pocket costs. In economic terms, profit was defined as the return over and above the opportunity costs, that is, the income expected from the second alternative investment or use of business resources.

1.10 KEY WORDS

Managerial Economics: Helps managers in decision making and forward planning. It is the application of economic concepts and economic analysis to the problems in formulating rational managerial decisions

Profits: Difference between total revenue and total cost

Motives: Objectives based on which decisions are taken

1.11 QUESTIONS FOR SELF STUDY

1. Managerial economics is an integration of economic theory and business management. Discuss.
 2. Explain the scope of managerial economics
 3. What are the important objectives for a firm to continue its business?
 4. Differentiate between accounting and economic profits.
 5. If you are an owner of a small firm, what would be your objectives? Justify your answer.
 6. Do the goals of not-for-profit organizations differ from those of private sector firms? Explain.
-

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UNIT - 2 : DEMAND ANALYSIS

STRUCTURE

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Law of Demand
- 2.3 Individual Demand and Market Demand
- 2.4 Types of Demand
- 2.5 Determinants of Demand
- 2.6 Exceptions to the Law of Demand
- 2.7 Factors Influencing Market Demand
- 2.8 Check Your Progress
- 2.9 Summary
- 2.10 Key Words
- 2.11 Questions for Self-study
- 2.12 References

2.0 OBJECTIVES

After studying this unit, you will be able to ;

- Understand the meaning of effective demand
- Explain the law of demand
- Recognize the determinants of demand
- Formulate demand function for various products

2.1 INTRODUCTION

Demand is one of the crucial requirements for the existence of any business enterprise. A firm's sales and profit depend on the demand for their products. In a layman's language, demand is the desire or want for something. In Economics, demand refers to the effective demand, that is, the amount the buyers are willing to purchase at a particular price at a particular period of time. Demand is the desire backed by 'willingness' and 'ability' to pay for a commodity. The ability to pay is affected by factors such as income, savings and price. The willingness to pay is influenced by factors like taste, preferences and price. One may have the ability to pay, but may not be willing to pay because of not liking the product. For example, a person may have the ability to buy a 2 wheeler, but may not do so as his preference may not be a 2 wheeler, but to own a 4 wheeler.

The concept of demand is discussed below:

- 1. Demand is the desire or want backed by money:** Demand is defined as the effective desire or want for a commodity, which is backed up by ability (ability refers to the purchasing power or money) and willingness to pay for it. A person with no source of income wanting to own a Honda City car does not constitute potential demand as he has no ability to pay for it. Demand = Desire + Ability to pay + Willingness to spend
- 2. Demand is always related to price and time:** Demand is a relative term and not an absolute term. Demand for a commodity should always have a reference to price and time. For example, an economist would say that the demand for rice per week per household is 5 kgs at a rate of 50 per kg.
- 3. Demand may be ex-ante or ex-post:** Demand for a commodity may be viewed as ex-ante, that is, intended demand or ex-post, that is, what is already purchased. The former refers to the potential demand, while the latter refers to the actual quantity purchased.

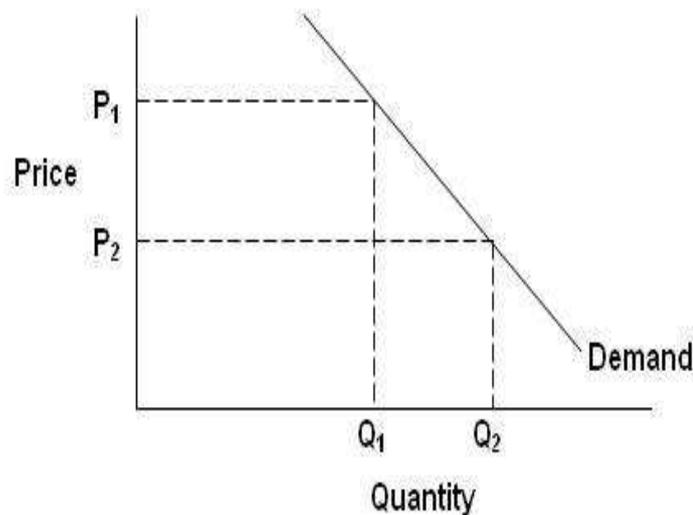
2.2 LAW OF DEMAND

The law of demand states that, “ceteris paribus (other things remaining constant), as the price of a good or service increases, consumer demand for the good or service will decrease, and vice versa”. The quantity demanded and the price of a commodity is inversely related. If the income of the consumer, prices of the related goods, and preferences of the consumer remain constant (ceteris paribus, all other things being constant), then the change in quantity of good demanded by the consumer will be negatively correlated to the change in the price of the good.

Demand Schedule: The demand schedule is a table of the quantity demanded of a good at different price levels. Given a price, it is easy to determine the expected quantity demanded. This demand schedule can be graphed as a demand curve on a chart having the Y-axis representing price and the X-axis representing quantity.

Table 1 depicts the demand schedule and the Fig 1 shows the graphical representation

Price of Apples (in Rupees)	Quantity of apples demanded (Kgs)
50	5
60	4
70	3
80	2
90	1



A demand curve represents a functional relationship between price and quantity. In general, demand curves slope downward from left to right. The horizontal axis, X-axis measures the quantity demanded and vertical axis, Y-axis measures price. This denotes that consumers prefer to buy less at a higher price and more at a lower price.

DEMAND FUNCTION

The quantity of a product demanded by customers depends on a number of variables which in technical terms is known as demand function. Mathematically, a demand function establishes a functional relationship between the demand for the product and its various determining variables.

Symbolically, it is represented as: $D_x = f(P_x, P_s, P_c, Y_d, T, A, N, e)$

D_x is the demand for the product x

P_x is the price of the product itself

P_s is the price of the substitute good

P_c is the price of the complementary good

Y_d is the level of disposable income with the buyers

T is change buyers' tastes and preferences

A is the advertisement effect on the product

N is the change in population

e is any other factor which may influence demand

Demand function is as complex phenomenon. The amount demanded is a function of many determinants. Utmost care is required to identify the key factors which are likely to influence the demand of a product. By demand function, economists mean the entire functional relationship, that is, the entire price-quantity relationship and not just the amount demanded at a given point of time.

2.3 INDIVIDUAL DEMAND AND MARKET DEMAND

Demand schedule is a statement which indicates the price-quantity relationship. It relates the amount a consumer is willing to buy corresponding to a price. There are two types of demand schedule—(a) individual demand schedule and (b) market demand schedule

Individual Demand Schedule

It is a tabular statement showing the various amounts of quantity purchased by an individual at different prices in a particular period of time. The following are the characteristics of the individual demand schedule

1. It does not indicate changes in demand by an individual; it is just an expression of his

behaviour in purchasing the commodity at alternative prices.

2. It shows the variation in demand at varying prices
3. It shows an inverse relationship between price and quantity demanded. More will be demanded at lower prices and less will be demanded at higher prices.

Table 1 gives a hypothetical demand schedule of an individual for the product, apples.

Price per kg. of apples	Amount demanded per week in kgs.
100	2
90	4
80	6
70	8
60	10

Market Demand Schedule

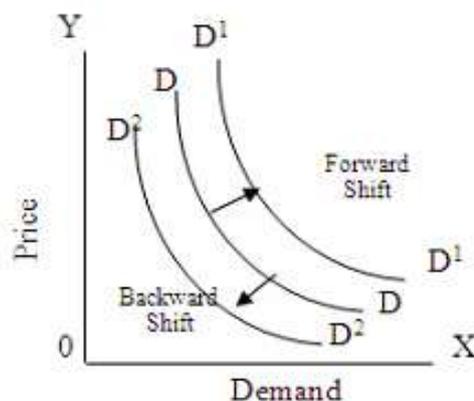
A market demand schedule represents the total market demand for a product at various prices. It is the sum total of all individual demand representing the total demand for the commodity at various prices. Let us assume that there are 3 customers in particular market for apples. Table 2 gives the hypothetical demand schedule of market for the product, apples.

Price in in Rupees	Amount demanded per week			Total market demand = A+B+C
	A	B	C	
100	2	4	6	12
90	3	5	7	15
80	4	6	8	18
70	5	7	9	21
60	6	8	10	24

Market demand function serves as a basis for understanding the revenue consequences of alternative output and pricing policies of the firm.

Changes or Shifts in Demand

If the demand for a product changes only because of changes in the price of the given commodity, the phenomenon is called expansion or contraction in demand. If demand changes not because of price changes but because of other factors or forces, this is a case of either increase or decrease in demand. If the demand increases, there is a forward shift in the demand curve to the right and if the demand decreases, there is a backward shift in the demand curve.



2.4 TYPES OF DEMAND

For a purposeful demand analysis of managerial decision, it is necessary to classify the goods. Policy makers are facilitated by an understanding of demand at various levels of aggregation. The different types of demand are:

Demand for Consumer Goods and Producer Goods: Goods and services demanded by consumers for final consumption and direct satisfaction of their wants and desires are called as consumer goods. Examples are food, clothes and services of doctors, mechanics. Goods which are demanded by producers in the process of production are referred to as producer goods or capital goods, for example, raw materials, tools and equipment, plant and machinery.

Demand for Perishable and Durable Goods: Perishable goods are goods which are to be consumed completely in one period and have to be replaced entirely in a later period. They have no durability and have a short life and become unusable after some time. Durable goods have a long useful life. Consumer durable goods include items like television, refrigerators, furniture, jewellery and cars. The demand for perishable goods is always immediate while demand for durable goods can be postponed.

Autonomous and Derived Demand: Goods whose demand is not tied with the demand of

other goods are known to have autonomous demand. Spontaneous demand based on the urge to satisfy some wants directly is called as autonomous demand. When the demand for a product depends on the demand for some other commodities, it is called as derived demand. By and large, there is no product whose demand is totally independent of other demand. But the degree of dependence varies widely from product to product. Thus, the autonomous and derived demand vary in degree more than in kind.

Individual Demand and Market Demand: Market demand is the summation of demand for a product by all individual buyers in the market. If a market has 1000 buyers, each buyer's demand is called as the individual demand and the sum total of all the 1000 buyers is called as the market demand. A company would be interested in the market demand for its product.

Firm and Industry Demand: Goods produced by one company is called as firm demand while goods produced by all the companies in the sector constitute industry demand. For example, demand for Sony television is firm demand and demand for all televisions of all firms in the television sector is the industry demand.

Short run Demand and Long run Demand: Short run demand refers to existing demand with its immediate reaction to changes in prices, fluctuations in income, etc. Long run demand is that which exists as a result of changes in pricing, product innovation or improvement and product promotion.

Joint Demand and Composite Demand: Demand for certain goods can be interrelated. When two goods are demanded in conjunction with each other at the same time to satisfy a single want, they are said to be joint or complementary demand. Examples are brick and sand, pen and ink, car and petrol. In all these cases, a change in demand for one commodity leads to a change in demand for the other product also. A commodity is said to be have composite demand when it is required for several uses. For example, steel is required for manufacturing automobiles, construction, railways, etc. A change in demand for the commodity by one user will affect the supplies of others and will bring about a change in its price thereby altering the demand pattern of the product.

2.5 DETERMINANTS OF DEMAND

A change in price leads to a change in quantity demanded. There is a movement along the demand curve. There are many factors influencing demand for goods and services. The factors are listed as under:

Price: Price is a very important factor affecting demand. A consumer decides to buy a

commodity keeping its price in mind. As the law of demand states, more quantity is demanded at lower prices and less is purchased at higher prices.

Income: The amount of income that buyers have and how much of the same is available to spend on a good affects the ability to purchase a good. In general, income has a direct effect on the ability to buy a good, that is, more income results in more buying. A purchaser's income determines his purchasing ability. If there is any change in the incomes of consumers, the demand for commodities also changes. For example, if consumers' income increases, they will buy more quantity of some commodities like fruits though the price of fruits do not fall. However, income can actually affect demand in two ways. For normal goods, more income means more demand. For inferior goods, however, more income means less demand.

Tastes, Habits and Preferences: Demand for many goods depends on an individual's tastes and preferences. A chain smoker's demand for cigarettes will not fall even when the prices go up. Demand for coffee, tea, tobacco, paan masala is a matter of habit. Advertising plays an important role in influencing the people's tastes and preferences.

Prices of Relative Goods: The quantity of goods demanded depends on the relative price of related goods such as, substitutes and complementary goods. Different goods satisfy the same needs of consumers and therefore, can be used to replace one another. When a want can be satisfied by alternate similar goods, they are called substitutes. Thus, if the price of one good goes up, the sales of the other rises, and vice versa. For example, some people consider tea and coffee, pepsi and coke as substitutes. The demand for one commodity depends on the relative price of its substitutes. If the prices of tea shoot up, customers switch over to coffee. If the substitutes are relatively expensive, there is more demand for the product if its price is moderately cheaper.

The demand for a commodity is also affected by its complementary goods. When two or more goods are demanded together, they are referred to as complementary goods. For example, shoes and socks, bricks, sand and cement, gun and bullets, are complementary to each other. Complementary goods have joint demand. When the prices of one complementary good fall, the demand for the other products increases. For example, if the price of cement decreases, there is an increased construction activity leading to an increase in demand for bricks and sand.

Consumers' Expectations of Future Prices: Consumers expectations of a further increase or decrease in future prices affect the present demand for a commodity. For example, a slight price rise of a commodity, consumers will buy more in the expectation of a further

price rise. When the prices fall, people expect them to decrease further and therefore, postpone their purchases.

Advertising and Promotional Campaigns: Demand may be affected favourably because of advertising and promotional campaigns. Creative advertising attracts more consumers towards the firm's product, thereby rising the demand for its products. An improvement in packaging, distribution of gifts and freebies and discounts raise the demand for the product.

2.6 EXCEPTIONS TO THE LAW OF DEMAND

It is universally known that as the price of a product falls, the demand rises and vice versa. But, sometimes, there are situations when a fall in prices leads to a fall in demand and a rise in prices results in an increase in demand. The law of demand does not apply to every situation. The demand curve for such cases will be upward sloping. The circumstances when the law of demand becomes ineffective are known as exceptions of the law. Some of these important exceptions are as under.

1. Giffen goods: In the case of certain inferior goods, called Giffen goods, less quantity is demanded when the price falls because of the negative income effect and people's increased preference for a superior commodity with the rise in their real income. Some examples of such goods are bread and vegetable fat as against superior commodities like good quality rice and pure ghee. As the income levels of people rise, they shift to rice instead of bread and use pure ghee instead of vegetable fat.

2. Articles of Snob Appeal: Some commodities are demanded because of their exclusivity. Such goods are prestige goods and have a snob appeal. They satisfy the aristocratic desire of the elite population. These goods are purchased by the upper creamy crest of the society and they use them as a status symbol. Diamonds or antique jewellery are more often purchased from the prestige point of view, the status and respect being due to their high prices. If the prices fall, the rich do not buy them as they no longer are prestige goods.

3. Veblen Effect: Some people buy only at high prices and do not buy if the prices fall. Buying goods at a higher price is a status symbol for them. This is called conspicuous consumption and this theory was developed by Thorstein Veblen. Buying costly goods when their prices rise show the amount of prestige owners have in owning such goods. For example, watching movies in multiplexes with special seats, travelling in executive class in aircraft, watching special entertainment programs are considered to add esteem to a person's social stature.

4. Speculation: When people speculate about changes in the price of a commodity in

future, they may stock goods. When people are convinced that the price of a commodity will rise further in the near future, their current demand will increase. They hoard goods. The recent onion price increase was more due to the hoarding by traders in the hope that the rising trend would continue and they would be able to make more profits at higher prices if they released goods to the market later.

5. Consumers' Psychological Bias or Illusion: when a customer is wrongly biased against the quality of a commodity with the price change, he may contract this demand with a fall in price. It is generally observed that rich people do not buy in a stock clearance sale which is at reduced prices as they are under the presumption that the goods may be of bad quality.

6. Irrational Demand: Irrational demand is neither a planned nor a calculated move of the purchaser. It occurs due to a sudden surge in the whims and fancies and urges of customers. There is no special purpose behind the purchase. For example, sometimes customers buy clothes seeing a display to satisfy their likings and whims and fancies though they did not have any intention of buying clothes when they stepped out for shopping.

2.7 FACTORS INFLUENCING MARKET DEMAND

Price: Market demand for a product will be high when prices are low and vice versa.

Distribution of Wealth in the Community: The market demand for commonly used products tends to be greater if there is equal distribution of income and wealth in the community than in the case of unequal distribution.

Income: As people's income rises demand for goods and services rise too. Goods which obey this rule are called - Normal Goods. However, exceptions to this are inferior goods. Demand for inferior goods decrease as income rises. If margarine is considered an inferior good, as income rises, people will switch to butter. The distribution of incomes will have an effect too on the demand for products.

Community Habits and Preferences: The market demand for a product is greatly influenced by the scale of preferences of the buyers in general. For example, a particular community may be totally vegetarian. The market demand from this community will only be for vegetarian products.

General Standards of Living and Spending Habits of People: When the population in general adopt a high standard of living and are ready to spend more, demand for durable and luxury items tend to increase.

Growth in Population: The size of market demand for a product depends on the number of

buyers in the market. The size and make-up of the population affect demand. If there is a growing population more food is demanded. If the population is stable but is ageing (like in Japan) there will be an increase in demand that old and aged people need, like increased demand for health care services.

Age Structure of Population: Age structure determines the market demand for many products. If the population of a country has more of young college going youth, the demand for education services will be high. Similarly, sex ratio of population has an impact on the demand for products. If the sex ratio is skewed and has more males than females, the demand for goods required by men like motorcycles, will be high.

Future Expectations: If buyers in general expect the prices of a commodity to rise in future, the current market demand will be more as many of them buy in huge quantities and hoard the product. On the other hand, a future fall in prices is expected to result in a decreased demand currently.

Tax Structure: A high tax rate would mean a low demand for goods in general and vice versa. A low taxed commodity will have a relatively higher demand than an untaxed commodity.

Inventions and Innovations: Introduction of new goods and substitutes as a result of inventions and innovations adversely affect the demand for existing products. For example, the introduction of mobile phones completely affected the demand for pagers. Likewise, the demand for floppy diskettes are nil with of the invention of other storage devices like CDs, DVDs and pen drives.

Fashions: Market demand for many products is affected by changing fashion. The demand for tee-shirts is very high with young college going crowd and is based on current fashion amongst youngsters.

Climate or Weather Conditions: Demand for certain products are determined by climatic or weather conditions. For example, the demand for cool juices and air conditioners increase in summer. Similarly, the demand for umbrellas is more during monsoon than in any other season.

Customs, Traditions and Rituals: Demand for certain goods is determined by customs and traditions of a society. During Deepavali, the demand for diyas and crackers is very high and the demand for cakes increase manifold during Christmas.

Advertisement and Sales Propaganda: Market demand for many products is affected by the seller's efforts. Sales promotions of sellers influence demand for products. For example,

car dealers advertise big discounts on car models during the year end which brings in more customers and more sales.

2.8 CHECK YOUR PROGRESS

1. In a market system, prices are determined by
 - a) Corporate executives
 - b) Government bureaucrats
 - c) Supply and demand
 - d) Total market demand

2. According to the law of demand
 - a) There is a positive relationship between quantity demanded and price
 - b) As the price rises, demand will shift to the left
 - c) There is a negative relationship between quantity demanded and price
 - d) As the price rises, demand will shift to the right
 - e) As the price rises, consumers switch their purchases to substitute goods

3. Which of the following would NOT be a determinant of demand?
 - a) The price of related goods
 - b) Income
 - c) Tastes
 - d) The prices of the inputs used to produce the good

4. If buyers expect the price of a good to rise in the future, the result is
 - a) A decrease in supply today
 - b) An increase in supply today
 - c) A decrease in quantity demanded today
 - d) An increase in demand today
 - e) An increase in quantity demanded today

5. Which of the following is reflected by the downward-sloping demand curve?
 - a) The price is positively related to quantity supplied.
 - b) There is an inverse relationship between price and quantity demanded.
 - c) There is a direct relationship between price and quantity demanded.
 - d) When the price falls, buyers willingly buy less.

Answers to check your progress: 1C, 2C, 3D, 4D and 5B

2.9 SUMMARY

Demand is the desire backed by 'willingness' and 'ability' to pay for a commodity. The law of demand states that the quantity demanded and the price of a commodity are inversely related, other things remaining constant. A demand curve represents a functional relationship between price and quantity. In general, demand curves slope downward from left to right. The quantity of a product demanded by customers depends on a number of variables which in technical terms is known as demand function. There are many factors which influence the law of demand, such as, price of the product itself, price of the substitute good, price of the complementary good, level of disposable income with the buyers, change buyers' tastes and preferences, advertisement effect on the product, population, etc.

2.10 KEY WORDS

Law of demand: *Ceteris Paribus*, as the price of a good or service increases, consumer demand for the good or service will decrease, and vice versa.

Giffen goods are inferior goods which are demanded less when prices fall because of the negative income.

Veblen Effect are goods which are bought only at high prices and are not demanded if the prices fall.

Demand function is the quantity of a product demanded by customers which depends on a number of variables.

Demand schedule is a statement which indicates the price-quantity relationship.

2.11 QUESTIONS FOR SELF-STUDY

1. What is demand function? Differentiate between individual demand and market demand.
2. Explain the demand determinants for the following products
 - (a) Sony Television,
 - (b) Dominos Pizza,
 - (c) Mahindra 2 wheelers and
 - (d) Lakme Cosmetics
3. Analyse the demand behaviour of a growing economy for household articles
4. Explain the significance of demand analysis for fixation of prices.

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UNIT - 3 : ELASTICITY OF DEMAND

STRUCTURE

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Price Elasticity of Demand
 - 3.2.1 Types of Price Elasticity
 - 3.2.2 Measurement of Price Elasticity of Demand
 - 3.2.3 Factors Influencing Price Elasticity of Demand
 - 3.2.4 Practical Applications of Price Elasticity of Demand
- 3.3 Income Elasticity of Demand
 - 3.3.1 Types of Income Elasticity
 - 3.3.2 Significance of Income Elasticity
 - 3.3.3 Practical Applications of Income Elasticity of Demand
- 3.4 Cross Elasticity of Demand
 - 3.4.1 Significance of Cross Elasticity of Demand
- 3.5 Advertising or Promotional Elasticity of Demand
 - 3.5.1 Practical Applications of Advertising Elasticity of Demand
- 3.6 Applications of Elasticity on Demand Concept
- 3.7 Check your Progress
- 3.8 Summary
- 3.9 Key Words
- 3.10 Questions for Self-study
- 3.11 References

3.0 OBJECTIVES

After studying this unit, you will be able to ;

- Explain the concept and measurement of price, income, cross and advertising elasticity of demand
- Describe the determinants of demand elasticities
- Identify the importance and application of demand elasticity

3.1 INTRODUCTION

The law of demand states that with an increase in the price of goods, the quantity demanded decreases, other things remaining constant. With this definition, one can understand the direction of change in the demand for a given change in price and not the magnitude of change. If firm can know both, the direction and magnitude of change, it will help in decision making. In Economics, elasticity is defined as the ratio of incremental percentage change in one variable with respect to an incremental percentage change in another variable. The concept of elasticity has a wide range of applications in Economics. An understanding of elasticity is useful to appreciate the responses of demand and supply in a market.

Changes in product price, customers' incomes, competitors' product prices, complementary product prices, advertising outlay of the firm, customers' price expectations have considerable impact on the demand of the firm's products. The degree to which these changes affect the demand is called as "Elasticity of Demand". From a decision-making perspective, a firm would be interested to know the effect of changes of any independent variable in the demand function on the quantity demanded. A firm being able to measure the impact of changes in these variables on the quantity demanded can have effective demand forecasting.

Elasticity of demand is defined as the responsiveness or sensitiveness of demand to a given change in the price of a commodity. It refers to the capacity of demand either to stretch or shrink to a given change in price. Elasticity of demand indicates a ratio of relative changes in two quantities. ie, price and demand.

In view of its importance to decision making, economists consider three important kinds of demand elasticities:

- Price elasticity of demand
- Income elasticity of demand

- Cross price elasticity of demand

3.2 PRICE ELASTICITY OF DEMAND

The extent of responsiveness of quantity demanded of a product to a given change in price is known as the price elasticity of demand. Price elasticity measures the ratio of the relative change in demand and price variables. The coefficient of price elasticity e_p is measured by:

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

Price elasticity is also represented as $(\delta Q/Q) * (P/\delta P)$

Where Q is the original quantity demanded, Q

P is the original price

δQ is the change in demand. This is measured as the difference between the new demand, Q2 and the old demand, Q1, that is $\delta Q = Q2 - Q1$

δP is the change in price. This is measured as the difference between the new Price, P2 and the old Price, P1, that is $\delta P = P2 - P1$

For example, let us assume the price of oranges to be 20 and the quantity demanded in a particular market is 100 kgs. If the prices rise to 21, and the quantity demanded falls to 96kgs, the elasticity of demand is calculated as:

$$\delta Q \text{ is } Q2 - Q1 = 96 - 100 = -4$$

$$\delta P \text{ is } P2 - P1 = 21 - 20 = 1$$

$$\text{Elasticity is measure by } [(\delta Q/Q) * (P/\delta P)] = [(-4/100) * (21/1)] = -0.8$$

Owing to the inverse relationship between price and quantity demanded, the co-efficient of price elasticity of demand is generally negative. However, economists report it as a positive number, referring to its absolute value. Ignoring the sign, elasticity of demand is less than one in the above example. One may obtain various numerical values of coefficient of price elasticity ranging between zero to infinity depending on the magnitude and proportion of change. If the price elasticity coefficient is greater than unity ($e > 1$), the commodity is said to be price elastic, if it is less than unity ($e < 1$), the good is considered to be price inelastic.

3.2.1 TYPES OF PRICE ELASTICITY

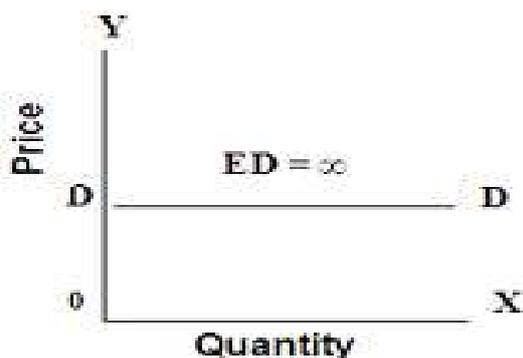
Marshall suggested the following classification of price elasticity of demand depending on the numerical coefficient.

- Unit elasticity of demand ($e = 1$)
- Elastic demand ($e > 1$)
- Inelastic demand ($e < 1$)

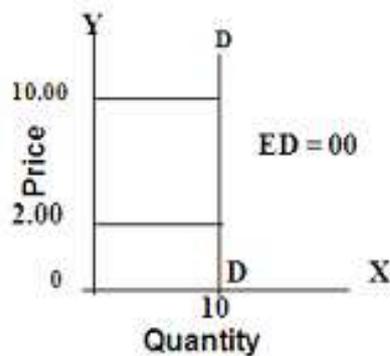
When the commodities demand responds favourably or relatively more to a price change, the demand is said to be elastic demand. When the relative change in demand is less than the relative change in price, it is inelastic demand. Modern economists have reclassified Marshall's price elasticity into the following five heads:

- Perfectly elastic demand
- Perfectly inelastic demand
- Unitary elastic demand
- Relatively elastic demand
- Relatively inelastic demand

Perfectly Elastic Demand: In a perfectly elastic demand situation, the responsiveness of demand to a change in price is infinite, thereby resulting in a flat demand curve. A slight rise in the price of a commodity results in consumers not buying it. The numerical coefficient of perfectly elastic demand is infinity. The demand curve will be horizontal to the X axis for a product with perfectly elastic demand, suggesting that a slight rise in demand would mean zero demand. This is a case of theoretical extremity rarely encountered in real life.

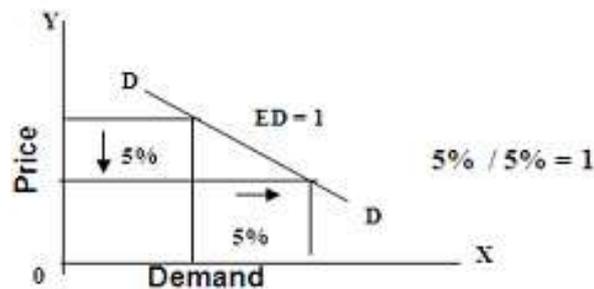


Perfectly Inelastic Demand: When the demand for a commodity shows no response to a change in price, the product is said to have perfectly inelastic demand. The demand curve is a vertical straight line and parallel to OY axis. The quantity demanded remains the same for any given change in prices. Perfectly inelastic demand has zero elasticity. The demand curve is a vertical line and is parallel to Y axis. For example, if the price of a product falls from 10 to 2 and there is no change in the quantity demanded, the numerical co-efficient is 0.

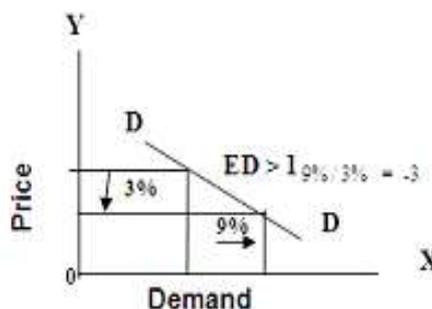


The above figure suggests that whatever the price of a commodity is, OP or OP1 or OP2, an increase or decrease in prices does not lead to an increase or decrease in quantity demanded, that is, the price remains constant. Absolute necessary products with no substitutes, like salt have perfectly inelastic demand,

Unitary Elastic Demand: When the proportion of change in demand is exactly the same as the change in price, the demand is said to be unitary elastic. Numerically, it is expressed as $e = 1$.



Relatively Elastic Demand: When the proportion of change in quantity demanded is greater than the change in price, the demand is said to be relatively elastic. Numerically, the value of relatively elastic demand lies between 1 and ∞ . For example, if the price of a product falls by 3 % and demand rises by 9 %, the demand is said to be relatively elastic demand as the numerical co-efficient of demand is greater than one. A change in demand is more than that of change in price.



Relatively Inelastic Demand: When the proportion of change in quantity demanded is lesser than the change in price, the demand is said to be relatively inelastic. Numerically, the value of relatively elastic demand is less than 1. For example, if a decrease in the prices of a commodity of 8% leads to a 4% rise in demand, the elasticity is $4\%/8\%$ which is equal to 0.5. The change in demand is less than the change in price and hence the demand is relatively inelastic.

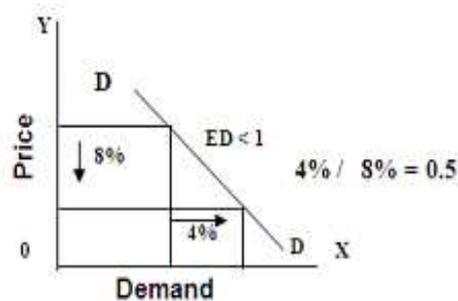
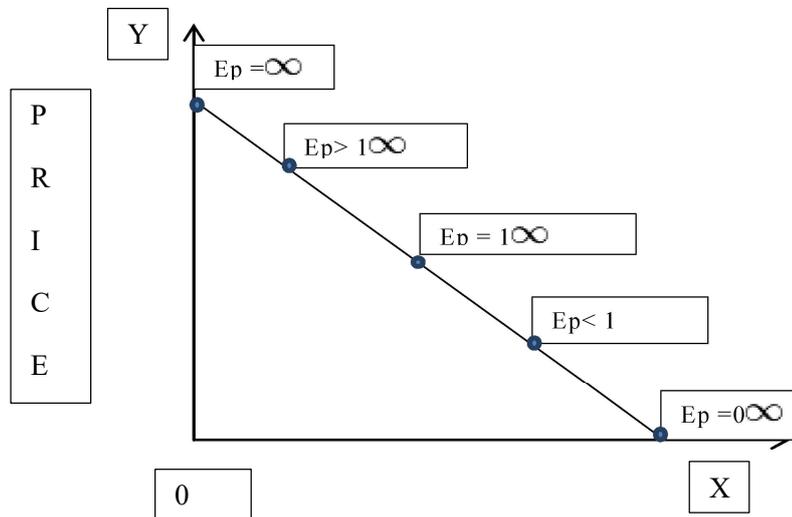


Table 1 Elasticity of Demand—Meaning and Interpretation

Numerical Value	Demand	Meaning and Interpretation
$e = \infty$		all if prices go up slightly
$e = 0$	Perfectly inelastic	Demand remains the same whatever is the change in price
$e = 1$	Unitary	Quantity demanded is exactly the same as the change in price
$e > 1$	Relatively elastic	Proportion of quantity demanded is more than the change in price
$e < 1$	Relatively inelastic	Proportion of quantity demanded is less than the change in price

The following figure summarizes the different types of elasticities.



3.2.2 MEASUREMENT OF PRICE ELASTICITY OF DEMAND

There are three different methods of measuring price elasticity of demand, namely,

- Ratio method
- Outlay method or revenue method
- Point method

Ratio Method

Price elasticity is measured by the ratio between the proportion or percentage change in the quantity demanded and the proportion or percentage change in price

$$(\delta Q/Q) * (\delta P/P)$$

Where Q is the original quantity demanded, Q1

P is the original price, P1

δQ is the change in demand. This is measured as the difference between the new demand, Q2 and the old demand, Q1, that is $\delta Q = Q2 - Q1$

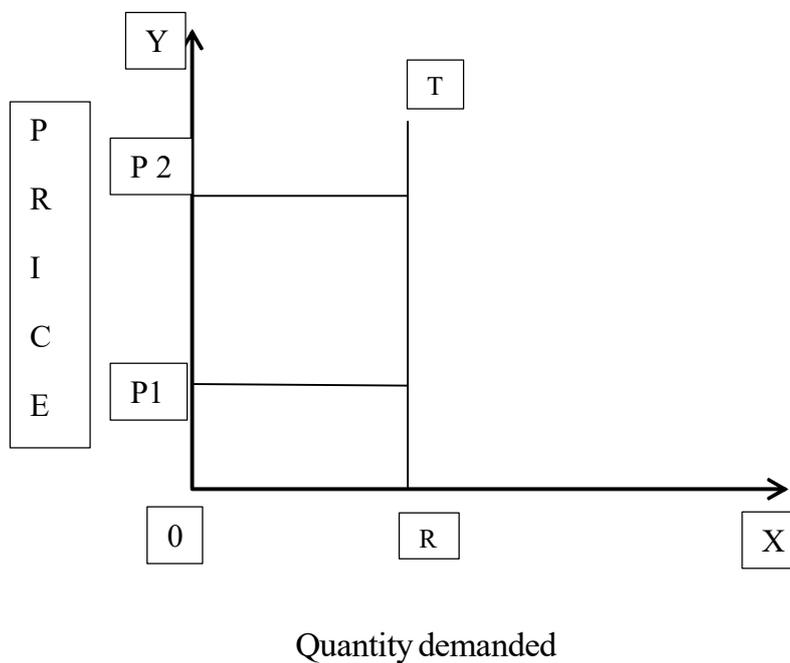
δP is the change in demand. This is measured as the difference between the new Price, P2 and the old Price, P1, that is $\delta P = P2 - P1$

Outlay Method or Revenue Method

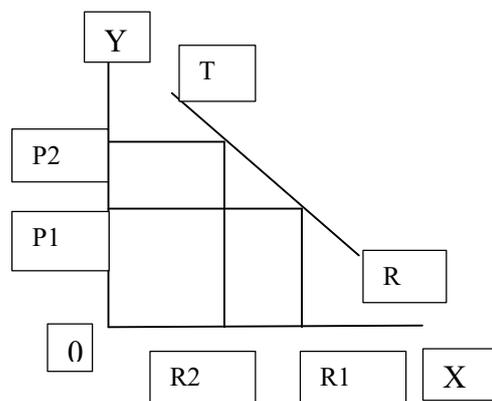
Marshall suggested that the easiest way of ascertaining whether the demand for a product is elastic or not is by examining the change in total outlay of the consumer. Alternatively, the total revenue of the seller corresponding to the change in price of the product can also be observed to determine the elasticity of demand.

$$\text{Total revenue or total outlay} = (\text{Price}) * (\text{Quantity purchased or sold})$$

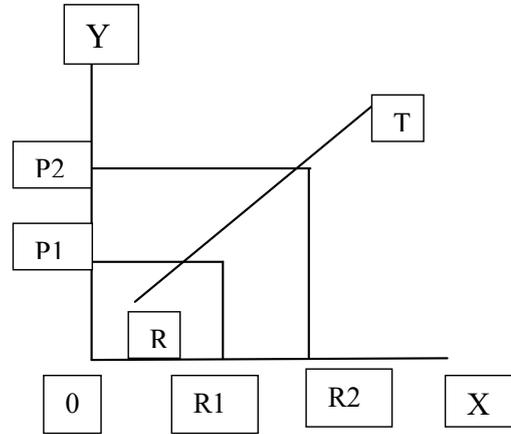
$e_p < 1$: If the total outlay or collection of revenue remains the same as before even after a change in price, the demand is said to be unitary demand.



$e_p > 1$: If a small rise in price leads to a decrease in revenue, elasticity of demand is greater than unity and the product is said to be having elastic demand. When price and total outlay move in opposite directions, the demand is relatively elastic.



$e_p < 1$: If a small rise in price leads to an increase in revenue, elasticity of demand is less than unity and the product is said to be having inelastic demand. When price and total outlay move in the same direction, the demand is relatively elastic.



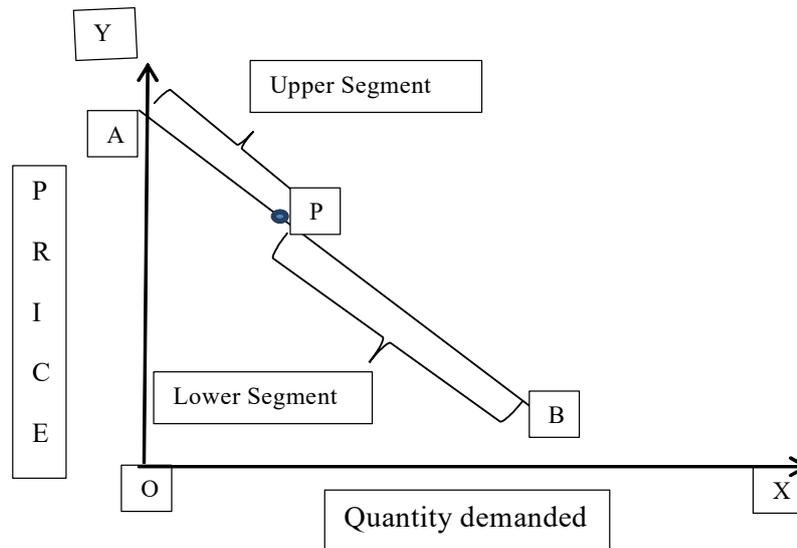
The behavioural relationship between price changes, elasticity and total revenue is summarized as follows:

Table 2: Elasticity and Total Revenue

Type of Elasticity (e)	Price	Total Revenue TR
$e=1$	Increases	Constant
$e=1$	Decreases	Constant
$e>1$ (relatively elastic)	Increases	Decreases
$e>1$ (relatively elastic)	Decreases	Increases
$e<1$ (relatively inelastic)	Increases	Increases
$e<1$ (relatively inelastic)	Decreases	Decreases

Point Elasticity Method or Geometric Method

Marshall suggested point elasticity method or the geometrical method for measuring price elasticity at a point on the demand curve. In this method, the elasticity is measured at different prices (at different points on the demand curve). A point is plotted on the demand curve, point P, which divides the curve into two segments. The point elasticity is the ratio of the lower segment of the curve below the given point to the upper segment of the curve above the point.



Point elasticity = Lower segment of the demand curve below the given point

Upper segment of the demand curve above the given point

In the figure above, $e = PB/PA$.

This method is called point elasticity because it effectively measures the elasticity at a point on the demand curve assuming infinite changes in price and quantity demanded.

Arc elasticity

The method discussed above help us in calculating price elasticity, e_p , of demand when there is a small change in the price of the product. However, this method does not help us when there is a big change in prices. For example, if the price of a product increases from 4 to 5, the change is 25% of the old price. In such cases, 'Arc elasticity of demand' is used. While taking decisions, it is prudent on the part of the management to consider arc elasticity measure rather than the point elasticity measure.

$$e_{\text{arc}} = [(\delta Q/\delta P)] * [(P_1+p_2)/ (Q_1+Q_2)]$$

Where P_1 is original price

P_2 is new price

Q_1 is original quantity demanded

Q_2 is new demand

δp is P_2-P_1

δQ is Q_2-Q_1

Illustration

The initial price of a product is 100 and the quantity demanded is 1000 units. If the price increases to 120, the demand falls to 800 units. What are the point and arc elasticity measures?

$$P_1 = 100, P_2 = 120, Q_1 = 1000, Q_2 = 800, \delta p = 20, \delta Q = -200$$

$$\text{Point elasticity at } P_1 \text{ is } (\delta Q/Q) * (P/\delta p) = (-200/1000) * (100/20) = -1$$

$$\text{Point elasticity at } P_2 \text{ is } (\delta Q/Q) * (P/\delta p) = (-200/800) * (120/20) = -1.5$$

In this case, managers face the dilemma of classifying demand elasticity. Should they consider it to be unitary elastic or more elastic. By using arc elasticity, they arrive at the following measure:

$$e_{\text{arc}} = \frac{\delta Q}{\delta P} * \frac{(P_1 + P_2)}{(Q_1 + Q_2)}$$
$$(-200/20) * \{(100+120)/(1000+800)\} = -1.222$$

Arc elasticity suggests that the elasticity of demand is greater than unity.

3.2.3 FACTORS INFLUENCING PRICE ELASTICITY OF DEMAND

- 1. Nature of the Commodity:** Goods can be classified under three major types—luxury goods, comfort goods and necessary goods. Luxury and comfort goods are price elastic and necessary goods are price inelastic. Demand for cars, television, air conditioners is price elastic as consumers postpone their consumption when their prices increase. On the other hand, demand for food-grains, electricity, cooking oil, etc is inelastic as these are necessities of life and are demanded by consumers at all times.
- 2. Availability of Substitutes:** Demand for a good tends to be elastic when there is a close substitute available to it. This is because of the consumers tendency to buy a cheaper product. For example, demand for salt is inelastic as it does not have a substitute. The product being a necessity consumers buy the product whatever is its price. Whereas in the beverages segment, there are many cocoa products which are substitutes to each other, like Bournvita, Boost, Chocolate Horlicks, etc. Demand is elastic as consumers shift to their consumption to other products when the price of one product increases.
- 3. Consumers' Income:** Millionaires' demand for commodities is relatively inelastic. Their demand pattern is not affected by any significant price changes. Redistribution of income in favour of low income group people tends to make demand for goods elastic.

4. **Proportion of Income Spent on a Commodity:** Elasticity of demand for goods on which consumers spend a high proportion of their income is high. Because of the large amount involved on such goods, demand is sensitive. For Example, vacation travel, entertainment and recreation. If a commodity requires only a small portion of the consumers income, the demand is relatively inelastic. For example, books, pens, etc.
5. **Number of Uses of a Product:** When a commodity has several uses and its price is high, the commodity is put to the most important use first. With a fall in prices, the product is put to other uses as well. For example, demand for electricity is elastic as it has a number of uses—lighting, cooking, heating, etc. Demand for products with few uses is less elastic. If the price of a match box decreases, people will not increase their consumption as the commodity has only a specific use.
6. **Commodity's Durability:** Demand for durable goods, like televisions and refrigerators, are less elastic in the short run and more elastic in the long run. In the short period, the consumers do not think of replacing the goods they have bought whereas in the long run, they have sufficient time to enquire about a product's performance and then make calculated decisions. Hence, demand for durable goods is more elastic in the long period.
7. **Habits:** Some goods like cigarettes, pan masala are consumed more as a habit. Customers of such products buy them whatever their prices are and the demand for them is inelastic.
8. **Time:** In a short period, demand in general is less elastic, while it is elastic in the long run. This is because of the fact that it takes some time for the news of a price change to become known to the buyers. Expecting a further change, consumers may not react to changes in price immediately.
9. **Postponement of Consumption:** Consumption of goods like mobile phones can be postponed when the prices are very high. Likewise, the prices of fruits are very high in off-season which are afforded only by the rich. The average person waits for the season to set in and prices fall for consuming fruits. Demand for goods whose consumption can be postponed are highly elastic.
10. **Range of Prices:** Certain goods like luxury items, air conditioners, four-wheelers, are highly priced in general. A small change in their prices will have an insignificant effect on demand. The demand for such goods is inelastic. If the price change is large, their demand becomes elastic. Similarly, low priced goods which are purchased in bulk, like perishables, onions and tomatoes have inelastic demand. Whatever are their prices, customers consume them.
11. **Jointly Demanded Goods:** Demand for goods which are jointly demanded like car and

petrol, pen and ink are inelastic. For example, a reduction in car prices may not increase demand if the prices of petrol are increasing.

3.2.4 PRACTICAL APPLICATIONS OF PRICE ELASTICITY OF DEMAND

1. Helps in Production Planning
2. Helps in Price Fixation of Different Goods
3. Helps in Reward Fixation for Factor Inputs
4. Helps in Determining the Foreign Exchange Rates
5. Helps in Determining the Terms of Trade
6. Helps in Fixing Tax Rates

3.3 INCOME ELASTICITY OF DEMAND

Income elasticity measures the rate of change in the quantity demanded of a product to a given change in the income of the consumer. It measures the response of consumers to a product given a change in their income. It indicates the extent to which demand changes with a variation in consumers income. It is the ratio of change in the quantity demanded to a change in income.

Income elasticity = Percentage Change in quantity demanded/ Percentage Change in income or $e_m = (\% \delta Q) / (\% \delta M)$

$$e_m = (\delta Q/Q) * (M/ \delta M)$$

where δQ is change in demand

Q is the initial demand

δM is the change in income

M is the initial income

3.3.1 TYPES OF INCOME ELASTICITY

Income elasticity may be classified as follows:

1. Unitary income elasticity of demand $e_m = 1$
2. Income elasticity of demand greater than unity $e_m > 1$
3. Income elasticity of demand less than unity $e_m < 1$

4. Zero income elasticity of demand $e_m = 0$
5. Negative income elasticity of demand $e_m < 0$

Unitary Income Elasticity of Demand: When the percentage change in demand is equal to the percentage change in income, the demand is unitary income elastic. For example, a 10% increase in consumer's income brings in a 10% increase in quantity demanded.

Income Elasticity of Demand Greater than Unity: When the percentage change in demand is greater than the percentage change in income, the demand is greater than 1. For example, if the income of a consumer rises by 10% and the demand for a product increases by 14%, the product's demand is said to be greater than 1.

Income Elasticity of Demand Less than Unity: When the percentage change in demand is less than the percentage change in income, the demand is less than 1. For example, if the income of a consumer rises by 10% and the demand for a product increases by 8%, the product's demand is said to be less than 1.

Zero Income Elasticity of Demand: Zero income elasticity occurs when an increase or decrease in income has no effect on demand and the quantity demanded remains unchanged.

Negative Income Elasticity: When an increase in income causes a decrease in the quantity demanded, the demand is negative income elastic. This is a characteristic feature of inferior goods like jowar and bajra. With an increase in income, the poor tend to consume less of these products and spend more on rice and wheat.

In general, there is a positive correlation between income and demand and income elasticity generally tends to be positive. Other things remaining constant, an increase in income leads to an increase in demand and a fall in income results in decrease in demand. However, negative income elasticity can be observed in inferior and Giffen goods. With a rise in income, a consumer spends less on these goods. The elasticity of demand for durables such as home appliances and cars is high and for necessities like salt and bread, it is low.

The income elasticity is very helpful to classify commodities into various types:

1. Normal goods—income elasticity is positive
2. Inferior goods—income elasticity is negative, example, jowar and bajra
3. Luxury goods—income elasticity is positive and greater than 1, example, air conditioners and cars
4. Essential goods—income elasticity is positive but less than 1, example food grains and fuel

5. Neutral good—income elasticity is zero, example, salt and match box

3.3.2 SIGNIFICANCE OF INCOME ELASTICITY

1. Long-term Business Planning and Demand Forecasting: Demand for luxury goods and comfort goods are highly income elastic. Forecasting and forward planning and expansion can be done by anticipating changes in the income levels of consumers.
2. Market Strategy: Income elasticity of demand is helpful to devise market strategies for new products. Luxuries and comfort goods are sold in markets with high income elasticity of demand and essentials in markets with less income elasticity.
3. Taxation of Income: Luxury goods are income elastic. As the incomes increases, consumers spend more on luxuries. The government can collect more from the rich by way of higher income tax and higher levies on such products.

3.3.3 PRACTICAL APPLICATIONS OF INCOME ELASTICITY OF DEMAND

1. Helps in Determining the Growth Rate of the Firm.
2. Helps in the Demand Forecasting of a Firm.
3. Helps in Production Planning and Marketing
4. Helps to Maintain Stability in Production

3.4 CROSS ELASTICITY OF DEMAND

The cross elasticity of demand is the degree of responsiveness of a commodity's demand to a given change in the price of a related commodity. In cross elasticity, the change in price of one commodity and its effect on another commodity is considered.

Cross elasticity of demand = (Percentage change in demand for product X) / (Percentage change in price of product Y)

$$e_{xy} = (\delta Q_x / \delta P_y) * (P_x / Q_x)$$

δQ is change in quantity demanded of commodity X

Q_x is initial demand of X

P_y is initial price of commodity Y

δP_y is change in the price of commodity Y

Example: Calculate the cross elasticity of demand.

$$e_{xy} = (\delta Q_x / \delta P_y) * (P_x / Q_x)$$

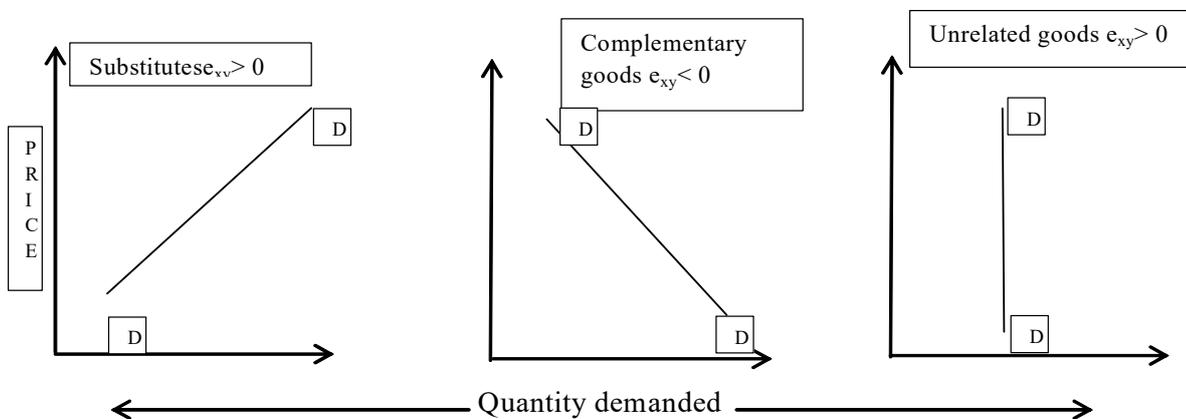
$$(10/1) * (4/50) = 0.8$$

The numerical coefficients of cross elasticity can be positive or negative. The following points are to be noted:

Commodity	Initial price (in Rupees)	Initial quantity demanded (cups)	New price (in Rupees)	New quantity demanded (cups)
Tea	3	50	3	60
Coffee	4	60	5	20

points are to be noted:

- Substitute goods have positive cross elasticity.
- Complementary or jointly demanded goods have negative cross elasticity.
- Unrelated goods have zero cross elasticity.



3.4.1 SIGNIFICANCE OF CROSS ELASTICITY OF DEMAND

1. It gives information about a product's response to changes in prices of other goods. This information is necessary for formulating a firm's pricing policy and to analyse the risks associated with various products.
2. It is helpful to measure the degree of competition in the market. If the price elasticity for a firm's product is high as compared to other products, there is a threat of encroachment by competitors. For example, insurance companies face a lot of

competition from other insurance companies and also in terms of products offered by them.

3. The degree of cross elasticity helps in indicating the nature of market structure, whether it is a monopoly market or a monopolistic market.

3.5 ADVERTISING OR PROMOTIONAL ELASTICITY OF DEMAND

The demand for products in the present era are influenced by advertisements. Advertising elasticity measures the responsiveness of demand to changes in advertisements or promotions.

$$e_a = (\text{Percentage change in sales}) / (\text{Percentage change in advertisement expenses})$$

$$e_a = (\delta Q / \delta A) * (A / Q)$$

Where Q is quantity of sales

A is amount of advertisement expenses

δQ is change in quantity demanded

δA is change in advertisement expenses

Example

The advertisement expenditure of a company was 100000 and later raised to 120000. The sales of the company's product were initially 200000 units and with an increase in advertisement expenses, it went up to 250000 units. The advertising elasticity is measured as:

$$e_a = (\delta Q / \delta A) * (A / Q)$$

$$(50000 / 20000) * (100000 / 200000) = 1.25$$

3.5.1 PRACTICAL APPLICATIONS OF ADVERTISING ELASTICITY OF DEMAND

The study of advertising elasticity of demand is of paramount importance to a firm in recent years because of fierce competition.

1. Helps in Determining the Price level
2. Helps in Formulating Appropriate Sales Promotional Strategy

3.6 APPLICATIONS OF ELASTICITY ON DEMAND CONCEPT

To Businessmen :

The concept of demand elasticity is very important to a businessman in decision making like the pricing policy to be adopted. He should know the likely effect of price changes on the product's demand. He should assess to what extent a price lowering would result in demand expansion. He can know the impact of a price cut or price rise on the sales volume, total revenue and profit of the company.

If the demand elasticity of a product is more than unity, a price cut will lead to increase in sales more than proportionately resulting in an increase in total revenue. If a product has inelastic demand, there is no significant decrease in sales with a rise in prices.

A monopolist can take better decisions with the help of knowledge of demand elasticity. Electricity companies charge different rates from different types of consumers depending on the usage. Domestic customers are charged less than industrial customers.

Income elasticity helps manufacturers forecast and estimate demand for their products.

To the Government:

The government should consider the elasticity of demand while taxing commodities. Tax imposition on commodities with inelastic demand brings in substantial revenue. If the demand is elastic, a rise in prices leads to a reduction in demand and hence a firm's revenues are not high. This will result in less tax revenue to government.

To Trade Unions:

This concept is useful to trade unions in wage bargaining. If the demand for the company's products they are working for is elastic, the union leaders ask for a higher wage to the workers.

International trade:

The concept of demand elasticity is useful to formulate export and import policies of a country.

3.7 CHECK YOUR PROGRESS

1.If the price elasticity of demand for a good is 0.75, the demand for the good can be described as:

A)Normal B) Elastic C) Inferior D) Inelastic

2. When the price of a product is increased 10 percent, the quantity demanded decreases 15 percent. In this range of prices, demand for this product is:

A) Elastic B) Inelastic C) Cross-elastic D) Unitary elastic

3. The price elasticity of demand measures

A) The slope of a budget curve.

B) How often the price of a good changes.

C) The responsiveness of the quantity demanded to changes in price.

D) How sensitive the quantity demanded is to changes in demand

4. The price elasticity of demand equals

A) The percentage change in the quantity demanded divided by the percentage change in the price.

B) The change in the quantity demanded divided by the change in price.

C) The percentage change in the price divided by the percentage change in the quantity demanded.

D) The change in the price divided by the change in quantity demanded

Answers to check your progress: 1D, 2A, 3C and 4A

3.8 SUMMARY

Effective demand forecasting requires that a firm is able to measure the impact of changes in variables such as price, income, substitutes' prices, trends and fashion, habits, etc. on the quantity demanded. Demand for a product depends on price and a number of other factors. To understand the quantitative changes in price and demand, one has to study the elasticity of demand. Price elasticity of demand indicates the percentage change in demand as a consequence of change in prices. One can exactly measure the extent of price elasticity of demand with the help of different methods like ratio, revenue and point methods.

Income elasticity measures the quantum of changes in demand and changes in income of the customers. Cross elasticity is the extent of change in the price of one commodity and corresponding changes in the demand for another related commodity. Advertising elasticity measures the responsiveness of demand to changes in advertisements or promotions. The concept of elasticity of demand has great theoretical and practical application in all aspects

of business life. Knowing these elasticities help businessmen forecast demand accurately. It also helps the government to fix tax rates on commodities and to formulate import and export policies. The trade union leaders use it effectively in bargaining for better wages from the company.

3.9 KEY WORDS

Elasticity is the change in the quantity demanded in response to a change in price, income, substitutes' prices, trends and fashion, habits, etc.

Price elasticity is the rate of change in the quantity demanded to a change in price of the product

Income elasticity is the rate of change in the quantity demanded to a change in incomes of the consumer

Cross elasticity is the rate of change in the quantity demanded to a change in prices of substitutes or related products

Advertising elasticity is the rate of change in the quantity demanded to a change in promotional expenditure

3.10 QUESTIONS FOR SELF STUDY

1. A firm increases its promotional expenditure from 50000 to 75000. Its sales increased by 20% over the initial volume of 100000 units. Measure the promotional elasticity of demand.
2. What is elasticity of demand? What are the factors that influence elasticity?
3. Explain the cross elasticity of demand. What is the cross elasticity of substitute goods and complementary goods?
4. Distinguish between price, income, cross and advertisement elasticity of demand with appropriate examples.
5. What is point elasticity? How do you measure it?

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UNIT - 4 DEMAND ESTIMATION AND FORECASTING

STRUCTURE

- 4.0 Objectives
- 4.1 Introduction to Demand Estimation
- 4.2 Short term Demand Estimation
 - 4.2.1 Objectives of Short Period Demand Estimation
 - 4.2.2 Uses of Short Term Demand Forecasting
- 4.3 Long term Demand Forecasting
 - 4.3.1 Objectives of Long Period Demand Estimation
 - 4.3.2 Uses of Long Term Demand Forecasting
- 4.4 Steps in Demand Estimation
- 4.5 Demand Estimation Methods
 - 4.5.1 Direct Methods
 - 4.5.2 Indirect Methods
- 4.6 Demand Forecasting for New Products
- 4.7 Check Your Progress
- 4.8 Summary
- 4.9 Key Words
- 4.10 Questions for Self-study
- 4.11 References

4.0 OBJECTIVES

After studying this unit, you will be able to ;

- explain the importance and need for demand estimation and forecasting in decision making
- Identify the different forecasting techniques
- Elucidate appropriate models for demand forecasting

4.1 INTRODUCTION TO DEMAND ESTIMATION

Demand forecasting refers to the estimation of future demand for a product under given conditions. An important aspect of demand analysis is correct demand forecasting of products. Such forecasts are very useful to management in the short run and long run as information regarding future demand is very important for planning and scheduling production, purchasing raw materials, finance acquisition, etc. Such information is essential to avoid over and under production. Firms should estimate the future demand for their products. Demand forecasts play an important role in planning the acquisition of men and material, organizing production and sales channels.

Demand forecasts are done at micro and macro levels. A good demand forecasting method must be accurate, reasonable, economical, durable, flexible, simple, quick yielding and permit changes in the demand relationships on day to day basis. The important features of demand forecasting are:

1. A forecast is made for a specific period of time which would be sufficient to take a decision and put into action.
2. It is in terms of specific quantities
3. It is undertaken in an uncertain atmosphere.
4. It is based on historical information and the past data.
5. It tells us only the approximate demand for a product in the future.
6. It is based on certain assumptions and therefore not precise.

4.2 SHORT PERIOD DEMAND ESTIMATION

All business firms seek to estimate the demand for their products. Knowing the demand is a significant activity for the firm. The firm should understand the current demand for its products so that it can avoid over-production or under-production in the following term.

Over production leads to moneys locked up in business and under production drives customers to look for substitutes ultimately resulting in loss of customers. These unpleasant situations are best avoided by successful firms. Information about the current level of demand also helps firms determine their pricing policy and promotional policy which in turn leads to higher sales and revenues. Demand estimation is the process of finding current values of demand at different price levels. It is information about the current demand for a firm's product. If the demand, product and pricing data is collected for a short period, usually a year or less, it is known as short term demand estimation.

4.2.1 OBJECTIVES OF SHORT TERM DEMAND ESTIMATION

1. To reduce costs of raw materials, cut down raw material consumption and maintain sufficient stock of materials to meet market requirements
2. To set sales targets to salesmen and meet sales budget estimates
3. To arrange for promotional activities for the product, such as advertising, banners, etc.
4. To prepare pricing policies for the products
5. To prepare production schedules and avoid over production and under production
6. To arrange for short term financial requirements of the firm

4.2.2 USES OF SHORT TERM DEMAND FORECASTING

Demand forecasts for short periods are made on the assumption that the company functions on a certain production capacity and the period is too short to change the existing production capacity. It is generally presumed that a short run period is of one year duration.

1. **Production planning:** It helps in determining the level of output at various time intervals thus avoiding under or over production.
2. **Helps to formulate right purchase policy:** It helps in better material management—buying right quantity of raw materials and control inventory levels (raw material and finished goods) cutting down the cost of operation.
3. **Helps to frame realistic pricing policy:** It helps to formulate a rational pricing policy to meet the short run and seasonal variations in demand.
4. **Sales forecasting:** It helps the company to set realistic sales targets.
5. **Helps in estimating short run financial requirements:** It helps the company to plan the finances required for achieving the production and sales targets. The company will be able to raise the required finance well in advance at reasonable rates of interest.

6. **Reduce elements of chance:** The firm can plan its production properly and face the challenges of competition efficiently.
- 7 **Helps to evolve a suitable labour policy:** A proper sales and production policy helps to determine the exact number of labourers to be employed in the short run.

4.3 LONG PERIOD DEMAND FORECASTING

Some firms have a futuristic approach and therefore are interested in long term demand estimation. They are interested in long run production planning, new product development, expansion, investment in new products, etc. Such decisions have long term impact on the firm. Though the actual production may start after a considerable period of time, planning and streamlining of activities begin at present. For example, large cement plants or steel industries require three to five years to begin production. It is therefore necessary to forecast demand five years hence. Thus, demand forecasting may be defined as the process of finding values for demand in various future time periods.

4.3.1 OBJECTIVES OF LONG PERIOD DEMAND ESTIMATION

1. To ascertain future demand for the product and prepare for expansion activities
2. To understand new lines of profitable business before making huge investments
3. To prepare long term financial planning
4. To estimate man power requirements required to meet the sales forecasts

4.3.2 USES OF LONG TERM DEMAND FORECASTING

Long run forecasting of probable demand for a product is generally for a period of 3 to 5 or 10 years.

1. **Business Planning:** Forecasting helps in planning expansion of existing units and construction of new production units. Capital budgeting of a firm is based on long run demand forecasting.
2. **Financial Planning:** It helps to plan the long run financial requirements and investment programs. Decisions as to the quantity of money to be raised from the open market, types of issues, timing of issues, etc. can be planned.
3. **Manpower Planning:** It helps in strategizing the long term human resource requirements and types of training to be provided.
4. **Business Control:** Control over costs helps a business to earn higher profits thus making it possible to regulate business effectively and to meet the challenges of the market.

5. **Determination of the Growth Rate of the Firm:** Accurate demand forecasting can help the management know the levels of the company's growth.
6. **Stability in the Working of the Firm:** Fluctuations in production cause ups and downs in business. Demand forecasting reduces production uncertainties and help in stabilizing the activities of the firm.
7. **Indicates Interdependence of Different Industries:** Demand forecasts of particular products become the basis for demand forecasts of other related industries, e.g., demand forecast for cement industry supply information to the most likely demand for machinery, raw material etc.

4.4 STEPS IN DEMAND ESTIMATION

The following are the major steps involved in demand estimation

- Specification of the demand function
- Data collection
- Specification of demand function

1. Demand function is the relationship that exists between the quantity demanded and all factors influencing the demand. The factors influencing demand are the price of the product, prices of substitutes, prices of complementary goods, advertisements and promotional activities, consumers' incomes, tastes and preferences, fashion, expectations about future prices, climatic and weather conditions, etc. The demand function can be expressed as:

$$Q_x = b_1P_x + b_2Y + b_3P_s + b_4P_c + b_5P_a + b_6P_{tp} + b_7P_f + b_8P_{fe} + b_9P_{cw} + e$$

Q_x is the quantity demanded of product X

b_1, b_2, b_3, \dots are coefficients of the demand function

P_x is the price of the product

Y is the income or GDP

P_s is the price of the substitute

P_c is the price of complementary good

P_a is the advertisement effect

P_{tp} is consumers' tastes and preferences

P_f is fashion

Pfe is expectations about future prices

Pcw is climatic and weather conditions

e is the error term representing random or unspecified factors

2. Data Collection

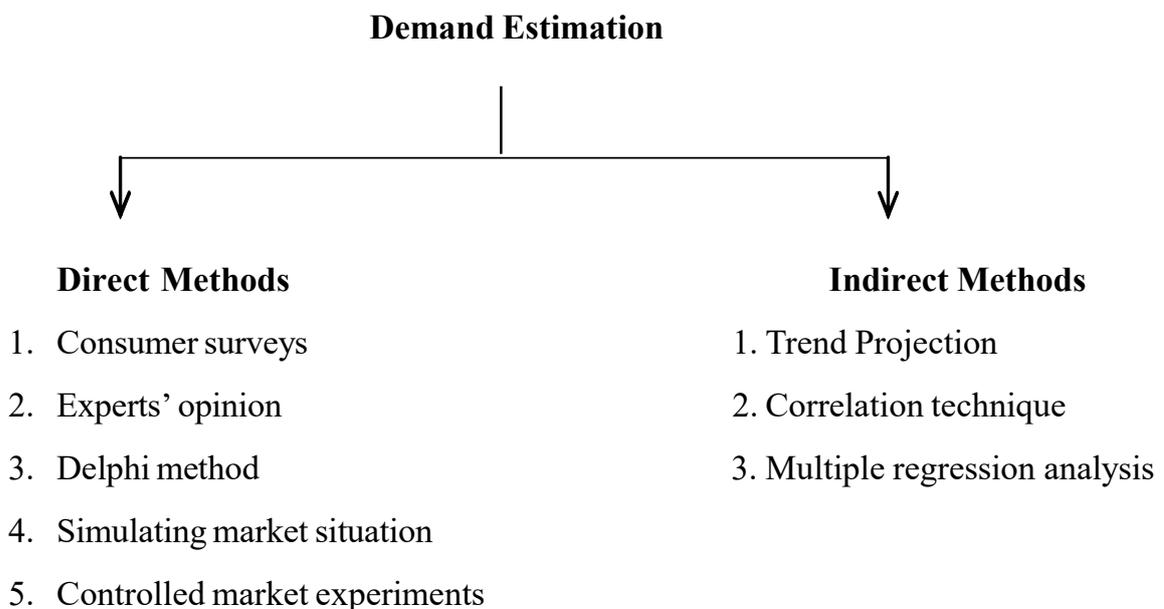
Required data is collected for the variables identified in the demand function. Tools like correlation and regression analysis is used to study the empirical relationship and the degree of association of the determinant variables of demand.

3. Result Reporting and Interpretation

The empirical values are reported in a detailed and systematic manner. The various parameters are reported as short term and long term elasticity.

4.5 DEMAND ESTIMATION METHODS

There are 2 methods of demand estimation—direct and indirect methods. In direct methods, inputs from customers and experts' opinion are collected by talking to them personally or through questionnaires. Their opinions and feedback about product pricing, prices, quality and uniqueness of substitutes and complementary goods, promotional campaign, etc. is collected.



4.5.1 DIRECT METHODS

1. Consumer Surveys

Questionnaires containing questions about buyers' intentions with regard to prices, quality, advertising, usefulness, uniqueness, packing, etc. are collected through personal interviews, by mail or through telephonic interviews. In the personal interview method, house to house survey is made to get information about the product. Though a very expensive method, it is considered to be the best method to elicit information. If it is not possible to meet respondents personally, mail surveys are taken up by companies. The advantage of this method is that a large number of people can be covered in a short time and is not very expensive. In the telephonic interview method, the respondents are contacted over phone and their opinions sought. This method is preferable when quick information is desired.

2. Experts' Opinion Survey

The sales line managers and executives are the people who are in constant touch with the consumers. The customers give their feedback about the company's products to these people about the product very often. A firm can ask its sales force to undertake surveys in their regions regarding the expected future demand for the product and about the current pricing and promotional campaigns. The data so collected may be tabulated and inferences drawn by the management. The company can also take the help of the market consultants and professional experts who are into the business of forecasting. This method of collecting information from experts is also called as "Collective Opinion" method as the forecasts are based on the aggregate opinion of the experts in the field.

Between the two methods above, survey method is simple and less expensive than the direct consumer survey method. It requires less time and is a reliable method to judge the market. However, it suffers from some drawbacks. The opinions are subjective and not completely reliable. The views and estimations of the firm's representatives may be biased. The salesmen, to protect their jobs and to project a good image to the management may give highly optimistic figures and may over estimate demand.

3. Delphi Method:

Delphi method is experts' opinion method introduced by Olaf Helmer in the late 1940s. This method is used for conducting opinion poll or survey. It is simply an extension of the simple expert opinion poll method. This method is used to consolidate the divergent expert opinions and to arrive at a probable estimate of future demand. Under this method, a group of experts are repeatedly questioned for their opinion and their agreement or disagreement to the issue is clearly identified. It is a time-saving method which can be

effectively used on a heterogeneous group of experts with different backgrounds. The major drawback of this method is that it pre-supposes that the participants are objective in approach and possess great thinking ability and reasoning.

4. Simulated Market Situation

An artificial market situation is created and participants are selected. The participants are then given some money by the company asking them to spend in an artificially simulated departmental store. Different prices are set up or different promotional efforts are put up for the products. Members are asked to spend money on competing products and their responses regarding price changes and promotional efforts are observed and noted down. Later necessary decisions about price and promotional efforts are taken.

Simulated market situations have the limitations of being time-consuming, expensive and the results not being a true representation of the market. The participants should be rightly chosen in order to have the right picture of the market.

5. Controlled Market Experiments

A firm may reduce the price in one market and observe buyers' reactions. Alternatively, different prices may be fixed for different markets and the buyers' responses observed. Likewise, a promotional campaign may be launched in one or some markets and the reactions of customers recorded. If the responses are positive and satisfactory, the company can then launch the product on a bigger scale with sufficient promotional support. This method of price fixation is useful when the product is new and there are no close substitutes to the product and the firm is not sure about market reactions to the product. Price experimentation helps the firm to identify the right price. Controlled market experiments will help companies in identifying the coefficients or elasticities of independent variables in the demand function.

The disadvantages of this method is that it is a very expensive method. Changes in sales may not occur solely due to price changes. Several other factors like income, tastes, preferences, fashion, etc. contribute to sales of a product. These factors are not considered in this experiment. Secondly, if the experiment is conducted over a very short period, the results may not be reliable. The experiment must be conducted over a long period to establish a definite relationship between the controlled factor and the sales level.

4.5.2 INDIRECT METHODS

Indirect methods of demand forecasting for short period primarily consist of statistical tools like trend projections and regression analysis. Once the demand function is clearly specified, coefficient or elasticities of independent variable is found with the help of regression analysis. The following two methods are widely used to estimate demand

1. Trend Projections

In this method, past data about the dependent and independent variables are used. This method is also called the Time Series Analysis Method. Time series is a set of observations taken at specified time, generally at equal intervals. It depicts the historical pattern under normal conditions. This method is not based on any particular theory as to what causes the variables to change but merely assumes that whatever forces contributed to change in the recent past will continue to have the same effect. This technique is based on the assumption that the factors responsible for the past trends would continue to be the same in future as well and in the same magnitude and direction. On the basis of time series, it is possible to project the future sales of a company. Data is collected for a particular period, say for five years or ten years and the resulting trend is extrapolated into future periods. The results are used as the basis for demand estimation. Changes in time series data arise on account of the following reasons:

1. **Secular or Long-run Movements:** Secular movements indicate the general conditions and direction in which graph of a time series move in a relatively long period of time.
2. **Seasonal Movements:** Time series undergo changes during seasonal sales of a company. During festival season, sales clearance season etc., there are many unexpected changes.
3. **Cyclical Movements:** Change in time series or fluctuations in the demand for a product during different phases of a business cycle like depression, revival, boom etc. are called as cyclical movement changes.
4. **Random Movements:** When changes take place at random and there is no particular reason, it is called irregular or random movements. These movements imply sporadic changes in time series occurring due to unforeseen events such as floods, strikes, elections, earth quakes, droughts and other such natural calamities. Such changes take place only in the short run and have their own impact on the sales of a company.

An illustration of time series analysis will make things clear.

Illustration 1

The following are the rainfall recorded in Karnataka for 10 years. Calculate the line of best fit.

Year	Sales (in 000 units)
2001	10
2002	12
2003	11
2004	15
2005	18
2006	14
2007	20
2008	18
2009	21
2010	25

To find the line of best fit, the following equation is used.

$$Y = a + bX$$

Y represents the rainfall which is dependent variable

A is the intercept and b is the coefficient of X (an independent variable). In the above example, it represents the different time periods, 1,2,3,4 and so on.

To calculate the values of a and b, the following equation is used:

$$Y = Na + b\sum X$$

$$XY = a\sum X + b\sum X^2$$

Where N is the number of observations

Year	Sales in 000 units	Time Period	X ²	XY
2001	10	1	1	10
2002	12	2	4	24
2003	11	3	9	33
2004	15	4	16	60
2005	18	5	25	90
2006	14	6	36	84
2007	20	7	49	140
2008	18	8	64	144
2009	21	9	81	189
2010	25	10	100	250
N=10	ΣY=164	ΣX=55	ΣX ² =385	ΣXY=1024

Solution:

Substituting the above values in the equation, we get

$$164 = 10a + 55b$$

$$1024 = 55a + 385b$$

Solving these two simultaneous equations, we get the value of a and b as 8.26 and 1.48 respectively. The equation for the line of best fit is $Y = a + bX$, can now be written as

$$Y = 8.26 + 1.48b.$$

With the help of this equation, we can compute the sales for 2015, 2018 and 2020.

Applying the equation,

$$\text{For 2015 } Y = 8.26 + 1.48 * 15 = 30.46 \text{ thousand units}$$

$$\text{For 2018 } Y = 8.26 + 1.48 * 18 = 34.90 \text{ thousand units}$$

$$\text{For 2020 } Y = 8.26 + 1.48 * 20 = 37.86 \text{ thousand units}$$

Illustration 2

A fast food restaurant conducted a study of the demand of burgers. It found that the average daily demand (D) in terms of price (P) is given by the equation:

$$D = 700 - 5P$$

Required: (a) How many burgers can the restaurant sell per day if the price one burger is 25/-?

(b) If the restaurant wants to sell 500 burgers per day, what is the price it should charge?

(c) What is the highest price one should be willing to pay?

Solution:

(a) $D = 700 - 5P$

Given $P = 25$, $D = 700 - 5 * 25 = 575$

(b) $D = 700 - 5P$

Given $D = 500$, the equation can be written as $500 = 700 - 5P$ which is equal to $500 - 700 = -5P$. Solving this, we get $P = 40$.

(c) $D = 700 - 5P$

$D = 1$, therefore, $1 = 700 - 5P$

$P = (700 - 1) / 5 = 699 / 5 = 139.8$

1. Regression Analysis

This is a widely used statistical technique to estimate the value of the unknown variable from the known values of variables. It is a very useful tool to find the change in quantities demanded when other independent variables like price, income, tastes, preferences, promotions, etc. change. Let us suppose that advertising expenditure (X) and sales (Y) of a product are closely related. With the help of a regression equation, we find the regression equation and estimate the probable value of Y, that is, sales for a given value of X (advertisement expenditure).

While determining the demand functions of a commodity, the analyst may come across some products whose demand function depends on a single independent variable. For example, if in a city there are only 2 modes of transportation—public transport system and autos available for people. On a particular day an auto association want to estimate the demand for auto rides on account of strike by public transport alternative. The variable auto ride is directly proportional to non-availability of public transport. One is a dependent variable and the other independent. Auto is independent and public transportation is dependent.

The above case is a single variable demand function. When two variables are considered and a relationship established between the dependent and the independent variable, it is called a simple regression. If on the other hand, a researcher wants to estimate the demand for sweets to be sold in a festive season, he would look into various variables like the product's own price, income, population, etc. When the relationship is between the dependent variable and a number of independent variables, it is known as Multiple Regression. Solving regression equations and calculating the values are very complex and requires time. However, with statistical software, simple and multiple regressions are estimated quickly.

Example (Single Variable Model)

The following data represents the population and the consumption of rice in a particular city. Forecast the demand for rice for the year.

Year	Population	Rice consumption (000 tons)
2000	10	40
2001	12	50
2002	15	60
2003	20	70
2004	25	80
2005	30	90
2006	40	100

Solution:

The regression equation is represented by the formula $Y = a + bX$, where Y is the quantity of rice consumption, X is the population and a and b are constants.

The trend line is $Y = Na + b\Sigma X$

$$XY = a\Sigma X + b\Sigma X^2$$

Calculation of the linear equation

Year	Population (millions) (X)	Rice consumption (000 tons) (Y)	X ²	XY
2000	10	40	100	400
2001	12	50	144	600
2002	15	60	225	900
2003	20	70	400	1400
2004	25	80	625	2000
2005	30	90	900	2700
2006	40	100	1600	4000
$\Sigma n = 7$	$\Sigma X = 152$	$\Sigma Y = 490$	$\Sigma X^2 = 3994$	$\Sigma XY = 12000$

Substituting and solving the equations, $Y = Na + b\Sigma X$

$$XY = a\Sigma X + b\Sigma X^2$$

We get $Y = 27.44 + 1.96X$

The demand for 2010 when the population is expected to be 150 millions can be calculated as under: $Y = [27.44 + 1.96X] = [27.44 + 1.96*150]$ which is equal to $321.44*1000$ tons = 321440 tons

4.6 DEMAND FORECASTING FOR NEW PRODUCTS

When a firm introduces a new product into the market, it faces a peculiar problem in estimating the demand for it. As the product is new, no past data is available and therefore it is difficult to project sales. Customers survey and experts opinions may be taken up to estimate the probable sales. The following approaches may be used to estimate the demand.

- 1. Evolutionary Approach:** If the new product is an improvement over an existing product, it may replace the old product completely. In such cases, past sales of the existing product can be relied upon to project the sales of the new product. It is assumed that the new

product will also have the same demand and sales as the old product. Example—demand for smartphones are projected based on the sales of ordinary cell phones.

2. **Substitute Approach:** If the new product is a substitute of an existing product, the share of the old product in the total market sales help to estimate the probable demand for the new product. Example—if a new variant of a car is to be introduced into the market, information about the market conditions and the sales of the older substitutes are collected and later the probable sales of the new car is estimated.
3. **Growth Curve Approach:** The growth rate and the sales of a new product can be estimated based on the growth of established products of similar nature. For example, demand for new household durables like furniture, television sets and refrigerators can be estimated by analysing the growth curves of similar existing furniture, television sets and refrigerators.
4. **Sales Experience Approach:** This approach is more suitable for new day to day used products. Buyers' responses to new products like soaps and detergents, tooth pastes and shampoos can be found from controlled market experience. New products can be introduced in some test markets and based on the information collected from the users of this market, the probable demand for new products are estimated. Most of the fast moving consumer goods fall under this category. A test market which is a representative of the average mind-set of people is selected and the product launched in this territory. Customer responses on the various factors like price, packaging, appearance, etc. are collected and later the product is launched nation-wide. For example, the detergent Ariel and Surf Excel were introduced in this fashion.
5. **Opinion Sampling Method:** A fair idea on market acceptance of a new product can be ascertained through consumer surveys. This can be done through the use of questionnaire, personal interviews or mail surveys which may be conducted by using the direct method of demand estimation, sampling.
6. **Vicarious Approach or Experts' Opinion:** Customers reactions to new products can be found indirectly through dealers, salesmen, consultants and market experts. These people know the market trends and customer opinions and feedback about old products which help new product manufacturers gain some knowledge about customer preferences.

In conclusion, companies try several of the above approaches to estimate demand for new products. No one approach is accurate. The substitute approach may suit some products while for some others, opinion sampling may have to be relied upon. Of all the methods listed above, vicarious approach is the simplest, quickest and least complicated. However, salesmen

and dealers in their enthusiasm to present a rosy picture about a product may sometime over estimate and give wrong reports. Their reports should not blindly taken, instead should be counter checked before taking a final decision.

4.7 CHECK YOUR PROGRESS

1. One purpose of short-range forecasts is to determine
 - a. Production planning
 - b. Inventory budgets
 - c. Research and development plans
 - d. Job allocation
 - e. All of the above
2. Forecasts used for new product planning, capital expenditures, facility location or expansion, and R&D typically utilize a
 - a. Short-range time horizon
 - b. Medium-range time horizon
 - c. Long-range time horizon
 - d. All of the above
3. Decisions relating to production scheduling involve:
 - a) Short-term forecasting
 - b) Both short-term as well as medium-term forecasting
 - c) Medium-term forecasting
 - d) Long-term forecasting
4. Demand forecasting is important for
 - a) Price control
 - b) Business planning
 - c) Competitive strategy
 - d) All of the above

Answers to check your progress: 1E, 2A, 3A and 4D

4.8 SUMMARY

An important aspect of demand analysis is the correct forecasting of demand for their products. Demand forecasting refers to the estimation of future demand under given conditions. Such forecasts are very useful to management in the short run like production planning, purchase policy, pricing policy, sales forecasting, estimating short run financial requirements, labor policy, stock control, etc. In the long run, they help in efficient business planning, financial planning, to regulate business efficiently, to determine the growth rate of firm and to stabilize the activities of the firm. Demand forecasts are done at micro and macro levels. A good demand forecasting method must be accurate, economical, durable, flexible, simple, quick yielding and permit changes in the demand relationships on day to day basis. Statistical methods like trend projection and economic indicators are generally used to make demand forecasts.

4.9 KEY WORDS

Demand Forecasting is the estimation of future demand under given conditions.

Consumer Survey Method of demand forecasting involves directly interviewing the potential customers

Experts' Opinion Method is a firm seeking the help of its sales force to undertake surveys about the expected future demand, current levels of pricing and promotional campaigns about the product.

Delphi Method of demand forecasting is a group of experts being repeatedly questioned for their opinion and their agreement or disagreement about an issue.

Simulated Market Situation is creating an artificial market like situation and the participants participating in the buying-selling process

Controlled Market Experiments: In this method, a firm reduces the price and observes buyers' reactions. Alternatively, it may fix different prices for different markets and observe the buyers' responses.

Trend Projection is the study of movements of variables through time using time-series data.

Regression Analysis estimates the demand for a product by the use of independent or explanatory variables.

4.10 QUESTIONS FOR SELF STUDY

1. What are the important methods of demand forecasting
2. Distinguish between short term demand estimation and long term demand forecasting
3. Write short notes on
 - a. Delphi method
 - b. Vicarious approach
 - c. Controlled market experiments
4. The annual sales of a company are as follows:

Year	Sales (In lakhs)
2007	45
2008	48
2009	54
2010	63
2011	79

Fit a straight line trend and estimate the sales of 2014.

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DEPARTMENT OF STUDIES AND RESEARCH IN MANAGEMENT

M.B.A I Semester

Course – 2

MANAGERIAL ECONOMICS

BLOCK

2

THEORY OF PRODUCTION AND COSTS

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BLOCK –2: THEORY OF PRODUCTION AND COSTS

The block 2 contains 4 units (unit-6 to unit-9) where the unit-6 includes information relating to Concept of production function, short-run production function, the law of diminishing marginal returns, returns to scale, empirical production function etc further unit-7 includes information relating to economies of scale, internal and external economics, diseconomies of scope, learning curve etc next unit- 8 includes the contents relating to types of costs, production and costs relationship in the short and long run. Nature of short run costs, expansion path etc further unit-9 includes information relating to cost-volume profit-analysis, break even analysis, graphical presentation of break even analysis, limitations of CVP analysis etc.

UNIT - 5 : THORY OF PRODUCTION

STRUCTURE:

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Concept of Production Function
- 5.3 Short-run Production Function
- 5.4 The Law of Variable Proportions
- 5.5 The Law of Diminishing Marginal Returns
- 5.6 Long-run Production Function
- 5.7 Returns to Scale
- 5.8 Empirical Production Function
- 5.9 Check Your Progress
- 5.10 Summary
- 5.11 Keywords
- 5.12 Questions for Self Study
- 5.13 References

5.0 OBJECTIVES

After studying this Unit, you will be able to ;

- understand the concept of production
- Highlight the concept of the production function.
- Examine isoquant analysis and its applications in long-run situations.
- Explain the concept of returns to scale and its relationship to production functions
- Analyze and explain relationships between total, average and marginal product, and the different stages of production.

5.1 INTRODUCTION

Production theory examines the physical relationships between inputs and output. In technical sense, production is the transformation of resources into commodities over time and /or space. In simplest form we can define production as the act of converting or transforming input into output. In other words, production refers to all of the activities involved in the production of goods and services to hiring workers, purchasing raw materials, running quality control, cost accounting, and so on, rather than referring merely to the physical transformation of inputs into outputs of goods and services. The output of a firm can either be a final commodity or an intermediate product such as computer and semiconductor respectively. The output can also be a service rather than a good such as education, medicine, banking etc.

5.2 CONCEPT OF PRODUCTION FUNCTION

The rate of output of a good functionally depends on the quantity of inputs used per unit of time. Production function shows technological-physical relationship between inputs and outputs. In other words, a production function is an equation, tables, or graph showing the maximum output of a commodity that a firm can produce per period of time with each set of inputs. In production function both inputs and outputs are measured in physical rather than in monetary units. Here technology is assumed to remain constant during the period of the analysis. “The production function is the name given to the relationship between rates of input of productive services and the rate of output of product. It is the economist’s summary of technical knowledge” (Stigler).

In algebraic terms, the production function may be written as,

$$Q = f(a, b, c, d, \dots, n, T)$$

Where Q represents output produced per unit of time.

f denotes function relationship. A, b, c, d, ... n represent the quantities of various inputs used per time period. T refers to the prevailing state of technology which is assumed to be constant.

A simplest general equation of the production function of a firm using labour (L) and capital (K) to produce a good or service (Q) or shows the maximum amount of output (Q) that can be produced within a given time period with each combination of (L) and (K). This can be defined as follows:

$$Q = f(L, K)$$

The most celebrated empirical production is the Cobb-Douglas production function, prefounded by C.W. Cobb and P.H. Douglas America to enquire physical inputs and output relationship in some manufacturing industries in America and other countries. Today is employed in all sector of the economy to measure the relationship between inputs and output.

Cobb-Douglas production function for two variable as shown below,

$$Q = a (L^b K^{1-b})$$

Where Q is the quantity of output, L and K stand for the amounts of labour and capital, respectively while a is efficiency parameter and b and 1-b are the shares of labour and capital.

For a better understand of production function concept we can show the relationship between inputs and output in a tabular form for two inputs. The following table shows the production function with two inputs. By using one unit of labour and one unit capital the firm would produce 3 units of output. In the same way if firm use 5 units of labour and 4 units of capital it would produce 40 units of output and so on.

Table : 1 Input – output Table

K							Q
6	1 0	2 4	3 1	3 6	4 0	3 9	
5	1 2	2 8	3 6	4 0	4 2	4 0	
4	1 2	2 8	3 6	4 0	4 0	3 6	
3	1 0	2 3	3 3	3 6	3 6	3 3	
2	7	1 8	2 8	3 0	3 0	2 8	
1	3	8	1 2	1 4	1 4	1 2	
	1	2	3	4	5	6	L

5.3 SHORT-RUN PRODUCTION FUNCTION

Inputs and output relationship in Production function can be studied by classifying it on the basis time as production function in short-run and production function in long-run. In the short run it is assumed that at least one of the factors of production remains unchanged or fixed, whereas in the long run all factors of production are variable. In a two-input production model, in the short run, the changes in the output (physical product) are the result of changes in the variable input. In the long run the level of the output of a firm can change as a result of changes in any or all inputs.

To study production function in the short-run economists have developed two important laws, namely, the law of variable proportions and the law of diminishing returns. Let us first consider law of variable proportions.

5.4 LAW OF VARIABLE PROPORTIONS

The law of variable proportions describes the relationship between inputs and output in the short period. Under this law it is assumed that only one factor of production is variable while other factors are fixed.

The law states: When increasing amounts of one factor of production are employed in production along with a fixed amount of some other production factor, after some point, the resulting increases in output of product become smaller and smaller. In other words, first the marginal returns to successive small increases in the variable factor of production turn down and then eventually the overall average returns per unit of the variable input start decreasing.

Assumptions of Law of Variable proportions:

1. Only one factor is varied and all other factors should remain constant.
2. Technology does not change.
3. The scale of the output is unchanged.
4. All units of factor inputs varied are homogeneous.

To clarify the law further, three import concept are used, namely, Total product, Average product and Marginal product. Let us define these concepts first and then consider their use in better understanding of law.

Total product: Total product is the total amount of output produced by the firm over a certain period. In the short run, total output obviously increase with an increase in the variable input. Thus it can be expressed as, $TP = Q = f(L)$ where TP is total product and L denotes

labour, which is assumed to be a variable factor.

Average Product:

Average product refers to the total product per unit of a given variable factor. In other words, the average product (AP) of an input is the total product divided by the level of the variable input. AP tells us, on average, how many units of output are produced per unit of variable input used. The average product of variable factor, labour can be written as, $AP_L = TP / L$ as holding input capital, K constant.

Marginal Product:

The marginal product (MP) of a variable input is the change in output (or TP) resulting from a one unit change in the input. MP tells us how output changes as we change the level of the input by one unit. Consider the two input production function $Q=f(L,K)$ in which input L is variable and input K is fixed at some level. The marginal product of input L is defined as holding input K constant. $MP_L = TP / DL$.

To illustrate the working of this law, let us take a hypothetical production schedule of a firm as given in the following table:

Table: 2 Production Schedule

Labour	Total Product (TP)	Average Product (AV)	Marginal Product (MP)
0	0	-	-
1	3	3	3
2	8	4	5
3	12	4	4
4	14	3.5	2
5	14	2.8	0
6	12	2	-2

Following are the interesting points emerge from the above production schedule:

The law of diminishing returns becomes evident in the marginal product column. Initially, the marginal product of the variable input, labour rises. Total product rises at an increasing rate and average product also increases. This is analytically described as stage of increasing returns. It is stage I in the Figure-1.

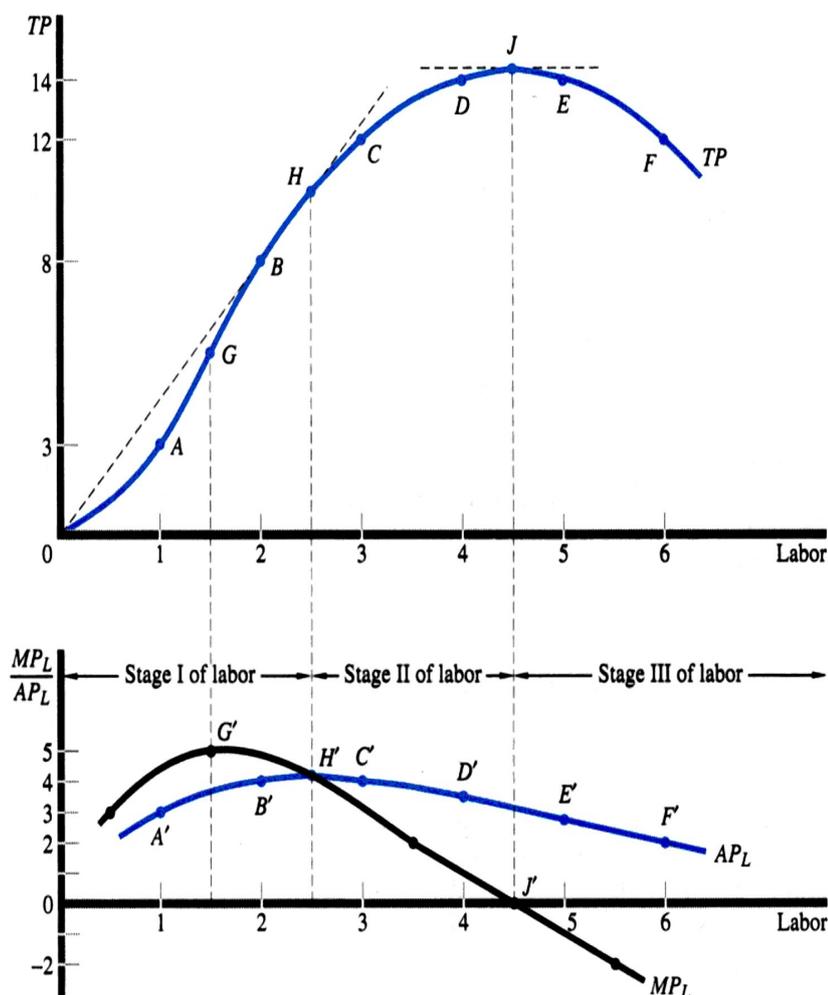
Reaching a certain point, in the production schedule when the fourth unit of labour is employed the marginal product begins to diminish. This indicates that the rate of total product

slows down. This is stage II in the figure-1.

When the average product is maximum, the marginal product is equal to the average product. In our illustration, when 3rd labour unit is employed, the average product and marginal product are same, namely, 4.

As the marginal product tends to diminish, it ultimately becomes zero and negative thereafter. This is shown as stage III. When the marginal product becomes zero, the total product is maximum and when marginal product becomes negative, total product begins to decline and average product is also declining at this stage.

Figure: 1 Total Product, Average Product, Marginal Product and Stages of Production.



The reasons for the operation of diminishing marginal return in the three stages are due to two fundamental characteristics of factor inputs, namely, indivisibility of fixed fac-

tors and imperfect substitutability between inputs. Indivisibility of fixed factors implies disproportional use of fixed factor with variable input.

6.5 THE LAW OF DIMINISHING MARGINAL RETURNS

The Law of Diminishing Returns, also referred to as the Law of Diminishing Marginal Returns, states that in a production process, as one input variable is increased there will be a point at which the marginal per unit output will start to decrease, holding all other factors constant. In other words, keeping all other factors constant, the additional output gained by another one unit increase of the input variable will eventually be smaller than the additional output gained by the previous increase in input variable. At that point, the diminishing marginal returns take effect.

5.6 LONG-RUN PRODUCTION FUNCTION: PRODUCTION WITH TWO VARIABLE INPUTS

So far we were considered one only one factor is variable and all other factors are fixed. But in the long run, firm has a wider choice since all factor inputs are variable. Hence, this section discusses the production analysis in the long run with the help of iso-quants.

Isoquants

Iso-quants are similar to indifference curve in the consumer behaviour analysis. An isoquant is a curve that shows various input combinations that yield the same total quantity of output. In other words, isoquants show combinations of two inputs that can produce the same level of output. It is assumed that the output involved is the maximum that can be produced from those combinations of inputs. Thus the position or equation of an isoquant can be derived from the production function. It corresponds to the concept of an indifference curve in consumer theory, and has analogous properties. For example we can talk of an isoquant map, where each curve represents a greater quantity of output as one moves further away from the origin.

The three main properties that isoquants have in common with indifference curves are:

Negative slope. This is because the inputs are usually assumed to be substitutable for each other; if a firm uses more of one input it needs less of another.

Convexity. This means that their slope is decreasing from left to right; the reason for this relates to the properties of the marginal rate of technical substitution..

Non-intersection. It is necessary because by definition each iso-quant represents a quantum

of output. Therefore, if two iso-quants intersect each other it would involve logical contradiction as a particular iso-quant represent a small as well as large quantity of output. To avoid this iso-quants do not intersect as one of the properties.

Figure 2 shows an iso-quant map, based on the data in Table 1. Points M,N, R, S and T correspond to the values indicated in the table for the iso-quant 12Q. Thus it can be seen that the output of 12 units can be achieved by using either five units K, capital and one unit of L, labour (point M) or 1 unit of K and six units of L (point T).

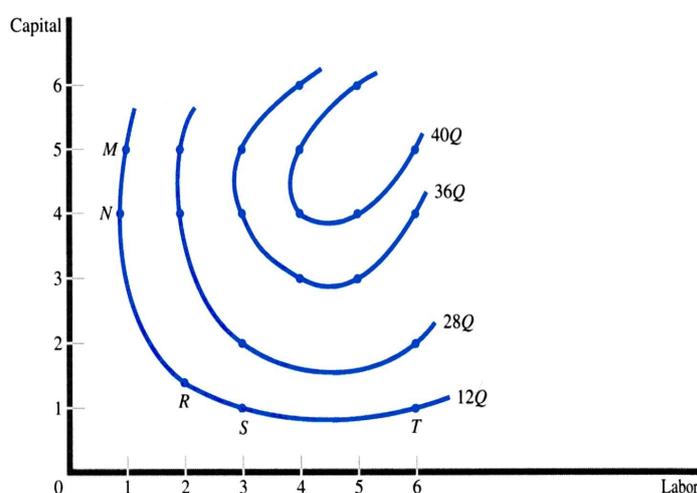


Figure: 2 Iso-quant Map

Economic Region of Production

Economic region of the iso-quant is identified by drawing tangents to the curves parallel to the two axis and the points of tangency indicate zero marginal productivity of the abundant factor. In words negatively sloped portions of the iso-quants within the ridge lines represents economic region of production of a firm. Ridge lines are the lines that separate the negatively sloped portions from the positively sloped portions of the isoquant. The economic region of production can be seen from the Figure-3.

Z and V are tangency points on the iso-quant 36Q. These points represent zero marginal productivity of capital and labour respectively on 36Q. Joining points of zero marginal productivity on all iso-quants we derive ridge lines. The economic region is the area covered by these ridge lines.

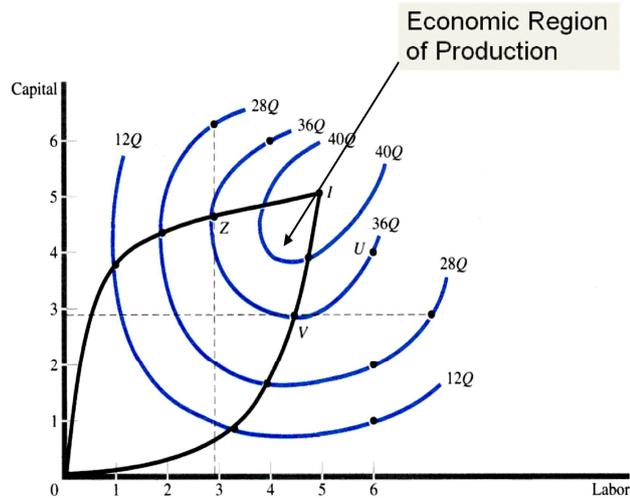


Figure: 3 – Economic Region of Production

The Marginal Rate of Technical Substitution

The marginal rate of technical substitution (MRTS) is a measure of the degree of substitutability between two inputs. More specifically, the MRTS of X for Y corresponds to the rate at which one input (X) can be substituted for another (Y), while maintaining total output constant. It is shown by the absolute value of the slope of the isoquant; thus in moving from point N to point R the MRTS is 2.5 [$MRTS = (2.5/1) = 2.5$], meaning that if one additional unit labour is used we can give up two and half capital units and still produce 12 units of output.

The slope of the iso-quant is decreasing in absolute magnitude from left to right. This means that as more and more labour is used to produce a given output, the less easily the capital input can be substituted for it. The reason for this is the occurrence of the law of diminishing returns. Thus as more labour is used and less capital, the marginal product of additional labour falls and the marginal product of the capital lost increases. Figure -4 describe the Marginal rate technical substitution between labour and capital.

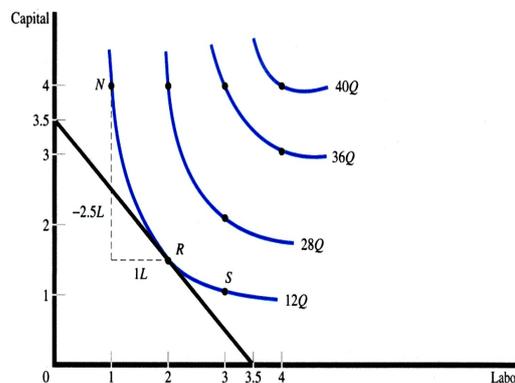


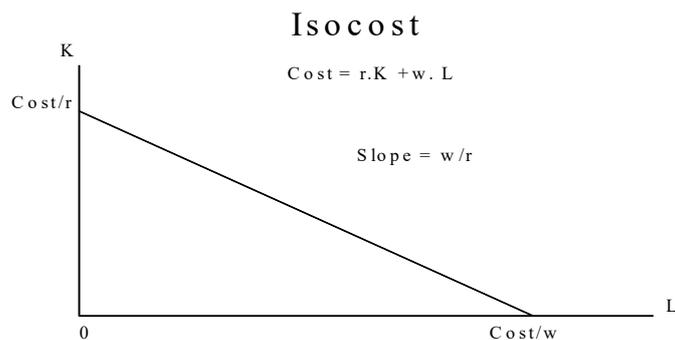
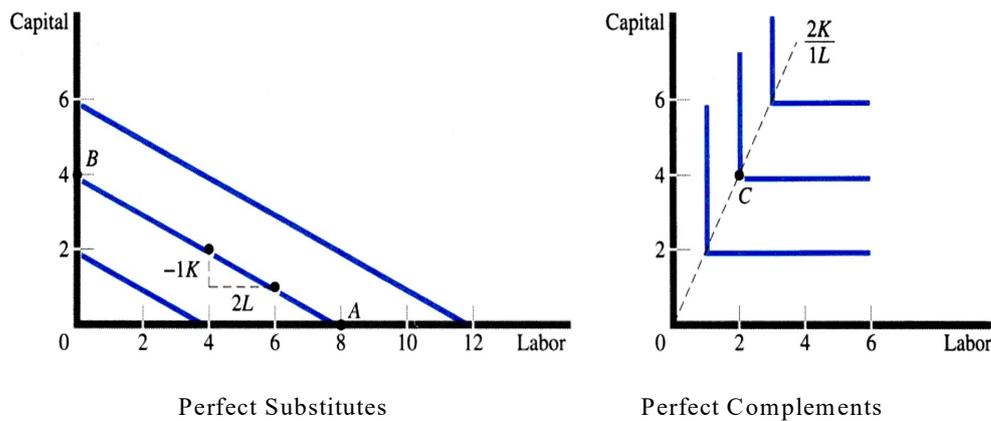
Figure: 4 - Marginal Rate Technical Substitution

There are two extreme cases of input substitutability, namely perfect substitutability and zero substitutability. When an isoquant is straight line or MRTS is constant, inputs are perfect substitutes whilst an isoquant is right angled, inputs are perfect complements (zero substitutes). Following figure-5 shows the perfect and zero substitutes.

Iso-cost Line

The concept iso-cost line is similar to budget line discussed in consumer behaviour analysis. Iso-cost line is derived from the prices of the inputs. This line shows the different combinations of inputs that can be employed given a certain level of cost outlay. In other words, iso-cost line shows all the combinations of two factors that can be purchased for given expenditure outlay by the firm. Thus the slope of the isocost line is given by the ratio of the input prices, w/r . In terms of a cost function it is written as $\text{Cost} = r.K + w.L$ where r rent for capital and w represents wage of labour. The graphical representation of iso-cost line is shown in Figure -6.

Figure-5 Perfect and Zero substitutes.



5.7 RETURNS TO SCALE

The long run production process is described by the concept of return to scale.

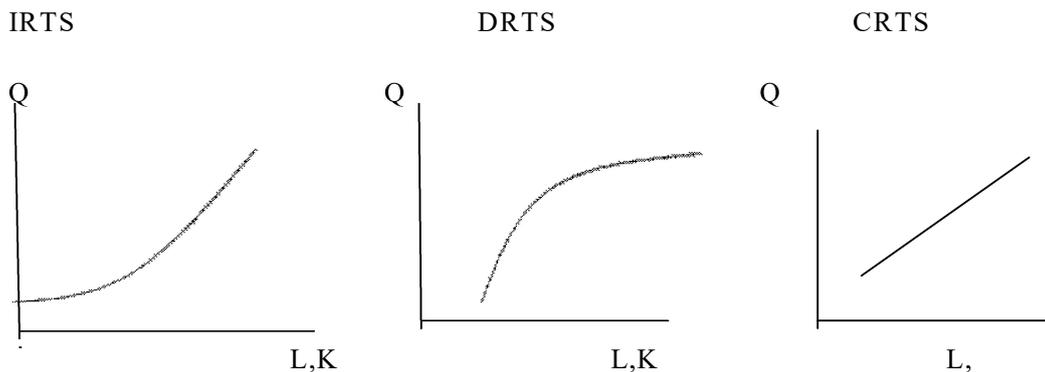
Returns to scale describes what happens to total output as all of the inputs are changed by the same proportion. It analyses the effects on output of an increase in the scale of production. An increase in scale involves a proportionate increase in all the inputs of the firm. The resulting proportionate increase in output determines the physical returns to scale for the firm. If the production function is $Q = f(L, K)$, then return to scale can be measured as $\lambda Q = f(hL, hK)$

If $\lambda = h$, then f has constant returns to scale.

If $\lambda > h$, then f has increasing returns to scale.

If $\lambda < h$, then f has decreasing returns to scale.

Graphically, the returns to scale concept can be illustrated using the following graphs.

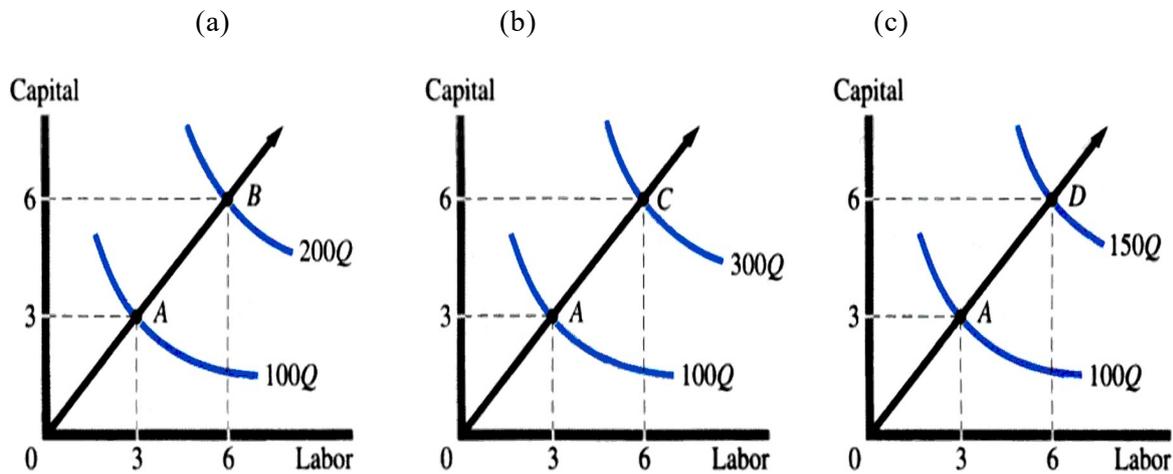


Returns to scale can be of three types. The following are the three types of physical return:

1. Increasing returns to scale (IRTS). This refers to the situation where an increase in inputs results in a more-than-proportional increase in output.
2. Decreasing returns to scale (DRTS). This refers to the situation where an increase in inputs results in a less-than-proportional increase in output.
3. Constant returns to scale (CRTS). This refers to the situation where an increase in inputs results in an exactly proportional increase in output.

The returns to scale is also analysed through iso-quants.

Figure -7 Constant, Increasing and Decreasing Return scale



Constant Return to Scale

Increasing Return to Scale

Decreasing Return scale

Constant, increasing and decreasing return scales are shown in figure -7 respectively. In figure -7 (a) if the both labour and capital are increase from 3 units to 6 units output has been increased from 100Q to 200Q. That is labour and capital inputs are doubled the output is also doubled. Figure -7 (b) shows increasing return, where an increase in inputs like labour and capital doubled output is more than doubled or increase more than proportionately. 7(c) of the reports decreasing return scale though inputs are doubled but output has increased less than proportionally.

5.8 EMPIRICAL PRODUCTION FUNCTION

Many studies have been undertaken to empirically study and statistically calculate the relationship between physical inputs and physical output. One of such empirical production functions is Cobb Douglas production function. It is given by a formula ———

$$Q = AL^{\hat{a}}K^{\hat{a}}$$

Where Q is total output,

L stands for quantity of labour,

K is quantity of capital,

A, \hat{a} and \hat{a} are positive constants.

To estimate the above Cobb-Douglas production function it should be expressed in to double log form:

$$\text{Log } Q = \text{log } A + \hat{a} \text{ log } L + \hat{a} \text{ log } K$$

It was empirically found that the sum of exponents of Cobb-Douglas production function is equal to one. That is $\hat{a} + \hat{b}$ is equal to one. This implies that it is a linearly homogenous production function.

Following are important features of Cobb-Douglas Production Function

1. Average Product of factors of production used up in this function depends upon the ratio in which the factors are combined for the production of commodity under consideration
2. Marginal Product of factors of production used up in this function also depends upon the ratio in which the factors are combined for the production of commodity under consideration
3. Cobb-Douglas production function is used in obtaining marginal rate of technical substitution (the rate at which one input can be substituted for the other to produce same level of output) between two inputs.
4. As seen earlier, the sum of exponents of Cobb Douglas production function is equal to one. ($\hat{a} + \hat{b} = 1$). This is a measure of returns to scale. When $\hat{a} + \hat{b} = 1$, it is constant returns to scale, $\hat{a} + \hat{b} > 1$, it indicates, increasing returns to scale and when $\hat{a} + \hat{b} < 1$, it indicates diminishing returns to scale.

5.9 CHECK YOUR PROGRESS

1. A Production function measures
 - a. Relationship between inputs and output
 - b. Technological relationship between inputs and output
 - c. Relationship between inputs with input
 - d. Relationship between outputs with input
2. Marginal product labour is

a. $MP_L = DTP / DL$	b. $MP_L = TP / L$
c. $MP_L = TP / DL$	d. $MP_k = DTP / DK$
3. Return to Scale applies to

a. Short run	b. very short run	c. Long run	d. All the above
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Answer to check your progress: 1) b, 2) a, 3) c

5.10 SUMMARY

Production analysis describes amounts inputs used for the production of goods and services. Economists describe this task with the production function, an abstract way of discussing how the firm gets output from its inputs. It describes, in mathematical terms, the technology available to the firm. The Law of Variable Proportions Is also called the Law of Decreasing marginal returns. It states that “ An increase in some inputs relative to other fixed inputs will, in a given state of technology , cause the output to increase, however after a certain point extra output resulting from the same additions of extra inputs will become less and less. In the long run production analysis, returns to scale refers to changes in output subsequent to a proportional change in all inputs (where all inputs increase by a constant factor.

5.11 KEY WORDS

Production function: Production function shows technological relationship between inputs and outputs.

Short run: At least one of the factors of production remains unchanged or fixed. **Long run:** All factors of production are variable

Return scale: Returns to scale describes what happens to total output as all of the inputs are changed by the same proportion

MRTS: The marginal rate of technical substitution is a measure of the degree of substitutability between two inputs.

5.12 QUESTIONS FOR SELF STUDY

1. What is production function? How does long run production function differ from a short run production function?
2. What is meant by the three stages of production in the short run?
3. Explain the shapes of the total product, marginal product and average Product curves.
4. Explain the laws of returns to scale.
5. What do you mean by law of diminishing marginal returns? Discuss.

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UNIT - 6 : ECONOMIES OF SCAALE, SCOPE AND LEARNING CURVE

STRUCTURE:

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Economies of Scale
- 6.3 Internal Economies
- 6.4 External Economies
- 6.5 Diseconomies of Scale
- 6.6 Economies of Scope
- 6.7 Learning Curve
- 6.8 Check Your Progress
- 6.9 Summary
- 6.10 Key words
- 6.11 Questions for Self Study
- 6.12 References

6.0 OBJECTIVES

After studying this unit, you will be able to ;

- Give the meaning of economies and diseconomies of scale, and learning curve
- Analyse economies and diseconomies of scale
- Describe the reasons for origin of economies and diseconomies of scale.
- Bring out the importance of the economies and diseconomies of scale.
- Identify the significance of learning curve in decision making.

6.1 INTRODUCTION

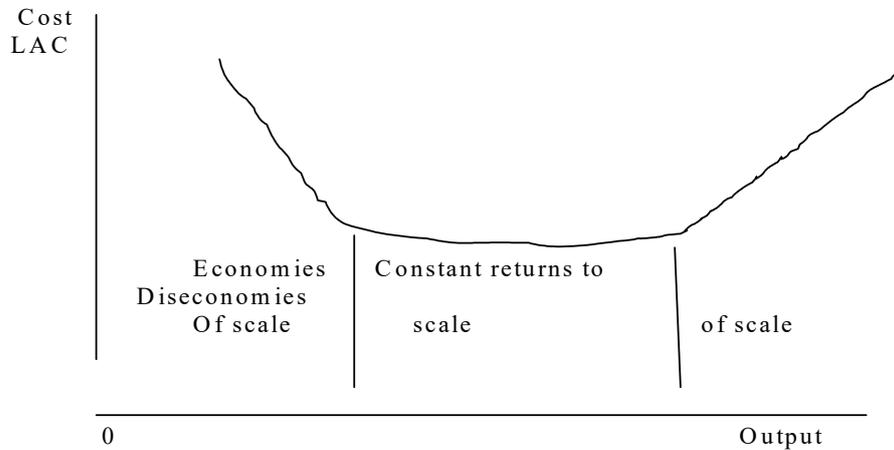
The scale of production means the size of the production unit of a firm or business establishment. The scale of the production can range from very small to very large, depending upon the quantity of production of the firm. Thus, the scale of production positively varies with the size of the firm. This large scale production is more economical, yields more profit, enables the firm to have a high market share and meet the increased demand. Economies of scale refers to the reduction in unit cost realised when the firm produces two or more products jointly rather than separately.

6.2 ECONOMIES OF SCALE

Large scale production is economical in the sense that the cost of production is low. The low cost is a result of what is called “economies of scale”. The simplest statement describing economies of scale is that average cost decreases as quantity increases. This is consistent with the left hand side of the typical U-shaped average cost curve. The opposite of economies of scale is diseconomies of scale and is described by the right side of the curve.

If a firm is in a region of its average cost curve where there are economies of scale, it will lower its average cost by producing more.

Figure – 1 Economies of Scale



Economies of scale may be classified as

- (i) Internal economies and (ii) External economies

6.3 INTERNAL ECONOMIES

Internal economies arise from the growth of the firm itself; in this sense they are controllable and under the influence of management decision-making. These economies are open to an individual firm when its size expands. Further, internal economies cannot be realised unless the firm increases its output, i.e., expands its size. Hence, these are solely enjoyable by the firm itself when its sale of production increases, independently of the actions of other firms.

There are four main categories of internal economies of scale:

a. Technical economies

These arise mainly from increased specialization and indivisibilities. Larger firms can make use of more specialized equipment and labour in the production process, for example by using assembly lines. Virtually every product that is produced for the mass market, from jeans to CDs, computer chips to bottled soft drinks, is produced on some kind of assembly line. This has the advantage of increasing both labour and capital productivity. Such processes need a large initial investment, because they cannot perform the relevant functions on a small scale; thus indivisibilities are involved. A good example of this is car production; assembly lines for producing cars have to be very large in order to perform all the necessary tasks. These economies are physical and occur at the level of the product. Indivisibilities also occur in other forms: larger firms are able to use more expensive but often more effective advertising media, like television, and they can afford to undertake

research and development activities that small firms could not afford. Such economies are at the level of the firm as a whole.

Other technical economies relate to increased dimensions: as size increases, volume increases more rapidly than surface area. Since volume often determines output while surface area determines cost, unit costs fall as size increases. This is particularly important in the transportation and storage industries, and explains the development of jumbo (now super-jumbo) jets and super tankers. These economies occur mainly at the level of the plant.

A final technical economy relates to massed resources: larger firms find it easier to combine equipment or facilities with different capacities more efficiently, with less idle capacity. For example, a car manufacturer needs to use an engine-block casting facility, a panel-pressing facility, a paint shop and various machining and assembly facilities; these all tend to be of different sizes for technical reasons. Similarly, larger firms have a proportionately lower need for reserves of spare parts and maintenance workers. These economies are sometimes called multiplant economies, as opposed to intraplant economies, because they occur at the level of the firm rather than the individual plant.

These technical economies tend to be the most important source of economies of scale for most firms. They occur particularly in mass manufacturing, public utilities and mass transportation.

b. Managerial economies

Large firms find it easier to attract and use more specialized managers, who are more skilled and productive at performing specific managerial functions. Thus a small firm may employ a general manager for all managerial functions; a mid-sized firm may employ separate managers for the main managerial functions of production, marketing, finance and human resources; a large firm may employ various managers within the marketing department, for example in purchasing, advertising, sales, public relations and market research. Like the technical economies these are physical in nature; they also occur mainly at the level of the whole firm.

c. Marketing economies

These relate mainly to obtaining bulk discounts; by buying in bulk larger firms can often enable their suppliers to obtain the technical economies of scale above. These discounts relate not just to buying raw materials and components but also to buying advertising. For example, if a firm buys twice as much advertising space or time, the total cost will usually less than double, thus unit costs will fall (assuming the firm sells twice as much). This type of economy of scale is obviously of a monetary nature.

d. Financial economies

The most obvious factor here is that large firms can often borrow at a lower interest rate, because they have a better credit rating, representing a lower default premium. In addition they have more sources of finance; they can use the capital markets, for example by issuing commercial paper, bonds and shares. These forms of raising finance often involve a lower cost of capital.

6.4 EXTERNAL ECONOMIES

External economies arise from the growth of the industry, and are independent of the size of the firm. These economies are shared by all the in an industry. They are result of the growth and expansion of any particular industry or a group of industries as whole. External economies are sometimes called economies of concentration because they tend to arise when firms in the same industry are located close together. The chief types of external economies are (i) Economies of localisation (ii) economies of information and (iii) Economies of disintegration.

(i) Economies of localization: when all firms are located in one place, all of them derive mutual advantages through the training of skilled labour, provision of transport facilities, etc. these are in fact the benefits of localization. Concentration of a particular industry in one area, in course of time, results in the development of conditions to the industry. All these result in reduction of cost of production.

(ii) Economies of information: A large and growing industry can bring out trade and technical publication to which every firm can have access. Producers are, thus, saved from independent research which is very costly. Statistical, technical and other market information becomes more readily available to all firms in a growing industry and leads to reduce cost.

(iii) Economies of vertical integration: The growth of the industry will make it possible to split up production and some subsidiary job can be left to be done more efficiently by specialized firm. New subsidiary industry may grow up large produce the output at lower cost and supply the same to main industry. The cost of production is thereby reduced.

6.5 DISECONOMIES OF SCALE

Beyond a limit of production, however, certain disadvantages of large scale production emerge. When the firm expand the production beyond optimum level, the very internal and external economies turn out to be diseconomies. Diseconomies of scale are aspects of increasing scale that lead to rising long-run unit costs. Again they can be internal or external, physical or monetary, and can arise at the level of product, plant or firm. There are again four

main sources of diseconomies of scale, though these do not correspond exactly to the four categories of economies of scale described above.

1. Technical diseconomies

Increased specialization can lead to problems as well as benefits. Workers doing repetitive jobs can suffer from low motivation, which reduces productivity and increases the chance of industrial unrest. The number of days lost through strikes tends to be higher in industries that feature such processes, for example car manufacturing, mining, engineering and transportation and communications. Furthermore, a stoppage in such industries, whether caused by event like a machine breakdown, can cause the whole production process to come to a halt because of the interdependence of operations.

2. Managerial diseconomies

Large firms are more difficult to manage because communications tend to break down, both vertically and horizontally. This creates inefficiencies as cooperation and coordination within the firm suffer. Firms may try to combat this tendency by employing more administrative workers, but this is also going to increase unit costs. This communications problem is a major reason why many large firms are trying to contract services out to other firms and create flatter organizational structures.

3. Marketing diseconomies

Although larger firms can often gain discounts in buying raw materials in bulk, there may be offsetting disadvantages of buying inputs in large quantities. If the firm is relying on local sources that are in limited supply, the high demand may drive up the price of such inputs; for example, the firm may have to offer higher wages to attract the desired quantity of workers.

4. Transportation diseconomies

Larger firms, particularly if they only use one plant, may face additional transportation costs as they try to increase the size of their market; the average transportation distance of goods to customers will increase. Again the above diseconomies relate only to cost disadvantages of large firms, or conversely the cost advantages of small firms. Larger firms may have other disadvantages, in terms of having less flexibility, a slower speed of response to environmental changes and the reduced ability to offer personal service to their customers.

6.6 ECONOMIES OF SCOPE

Whereas economies of scale relate to cost reductions caused by increasing scale, economies of scope occur when changing the mix of operations has cost benefits. For

example, producing 100,000 units of product X may involve a unit cost of £100 if X is produced by itself; but if 100,000 units of X are produced along with a quantity of product Y, then the unit cost of producing X may fall. The same may happen to the unit cost of Y compared with producing it by itself. There are two main causes of this:

- 1 The products may use common processing facilities; for example, different car models being produced at the same plant.
- 2 There may be cost complementarity, especially when there are joint products or by products, for example petrochemicals.

It is also possible for a firm to experience diseconomies of scope if it sells products that ‘clash’ with each other in some way.

The extent of economies of scope can be measured by estimating the percentage cost reduction caused by joint production, as follows:

$$ES = \frac{C(Q_1) + C(Q_2) - C(Q_1 + Q_2)}{C(Q_1 + Q_2)}$$

where $C(Q_1)$ and $C(Q_2)$ represent the costs of producing outputs Q_1 and Q_2 independently, and $C(Q_1+Q_2)$ represents the cost of producing outputs Q_1 and Q_2 jointly. If economies of scope exist, the joint cost is less than the sum of the individual costs, thus ES is positive. The larger the value of ES, the greater the economies of scope; if ES is zero there are no economies of scope.

6.7 LEARNING CURVE

There are many situations, not just in business but also in everyday life, where we learn better ways of doing something over time. Examples are playing tennis, using a keyboard, driving a car, or solving problems in managerial economics. In the workplace the factors that are involved are increased familiarization with the tasks involved, improvements in production methods, more efficient use of raw materials and machinery and fewer costly mistakes. These factors are obviously interdependent. The reason proposed for the learning curve effect was the learning by production workers, resulting in direct labour costs being reduced (Figure-2). It was only later that additional benefits in terms of production methods and indirect labour and other costs were considered.

The learning curve measures the impact of workers’ experience on the costs of production. It describes the relationship between a firm’s cumulative output and the amount of inputs needed to produce a unit of output.

The theoretical definition of the learning curves propounds that the more a person is engaged in an activity, the better a person becomes at it. Improvement and expertise result as a process or activity is repeated. As a result of this repetition, it can be construed as a “learned” activity. Continuous learning is imperative to the progress of an organization. Thus as the rate of learning increases in an activity/process, the more productive and efficient the activity/process becomes.

We can express the learning curve relationship as: $U = f(T)$

where U is some measure of unit cost and T represents cumulative output. It is important to note that this function is fundamentally different from the normal cost functions analysed in cost theory. This means that the learning curve is neither a short-run nor a long-run cost function but can apply to any time horizon. Its effect is to cause the cost functions considered so far to shift downwards over time (Figure-3)

Figure -2 Learning Curve

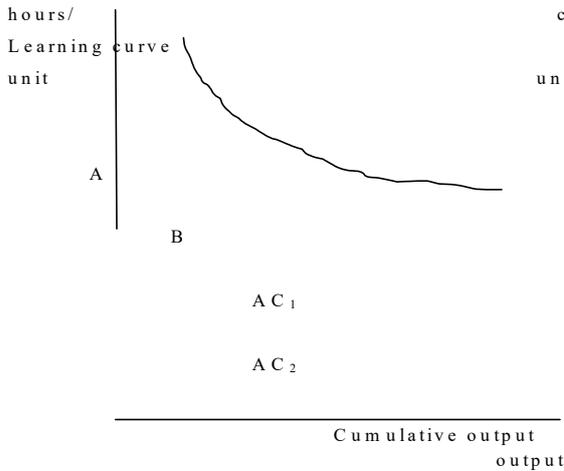
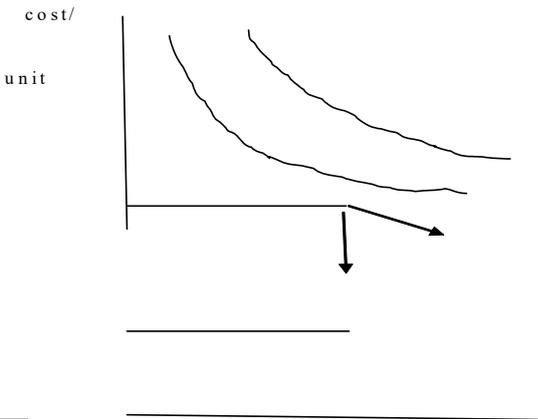


Figure -3 Economies of scale and



The conceptual discovery of the learning curve took place in 1925 by the Commander of Wright-Patterson Air Force Base. It was determined that the “direct labor input per airplane declined with considerable regularity as the number of airplanes produced increased” (Colley). Consequently, this meant that the cost per constructing an individual airplane declined as the production levels increased. In other words, more airplanes could be produced by the same employees, equipment, and facilities.

6.8 CHECK YOU PROGRESS

1. Economies to scale refer to
 - A) The fact that in the long run, fixed costs remain constant as output increases.
 - B) The range of output over which the long-run average cost falls as output increases.
 - C) The point at which marginal cost equals average cost.
 - D) A feature of short-run production functions but not long-run production functions.
2. “Diseconomies of scale” occur in
 - A) The short run, but not the long run. B) The long run, but not the short run.
 - C) Both the short run and the long run. D) Neither the short run nor the long run
3.) The long run is a time period in which
 - A) All inputs are variable.
 - B) one year or less elapses.
 - C) All inputs are fixed.
 - D) There is at least one fixed input and at least one variable input
4. What name is the given to cost reductions which result from learning
 - A) Cost curve B) Income Curve C) Average cost curve D) Learning Curve.

6.9 SUMMARY

Economies of scale are aspects of increasing scale that lead to falling long run average costs; diseconomies of scale are the opposite. They can thus be regarded as the cost advantages and cost disadvantages for a firm or plant in growing larger. Economies and diseconomies can arise at the level of the product, the plant and the firm as a whole. Economies of scope arise when there are cost complementarities of producing products together. The learning curve describes the situation where unit costs are reduced as cumulative output increases, because of learning better ways of performing a task or tasks.

6.10 KEY WORDS

Economies of scale: The simplest statement describing economies of scale is that average cost decreases as quantity increases.

Internal economies: Internal economies arise from the growth of the firm itself; in this

sense they are controllable and under the influence of management decision-making.

External economies: External economies arise from the growth of the industry, and are independent of the size of the firm.

Diseconomies: Diseconomies of scale are aspects of increasing scale that lead to rising long-run unit costs

Learning curve: The learning curve measures the impact of workers' experience on the costs of production

6.11 QUESTIONS FOR SELF STUDY

1. What is meant by economies of scale? Give examples.
2. Discusses internal economies of scale.
3. What are the major external economies? Explain
4. Explain the application of learning in cost analysis.

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UNIT - 7 : THEORY OF COST

STRUCTURE:

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Types of Costs
- 7.3 Production and Costs Relationship in the Short-run
- 7.4 Types of Production Costs and Their Measurement
- 7.5 Nature of Short Run Costs
- 7.6 Cost Functions
- 7.7 Production and Cost Relationship in the Long Run
- 7.8 Expansion Path
- 7.9 Check Your Progress
- 7.10 Summary
- 7.11 Key words
- 7.12 Questions for Self Study
- 7.13 References

7.0 OBJECTIVES

After studying this unit, you will be able to ;

- explain the meaning and use of different concepts of cost.
- show how different concepts of cost are relevant for managerial decision making.
- Discuss how production relationships underlie cost relationships.
- Analyze cost behaviour in the short run.
- Elicudate cost behaviour in the long run.
- Highlight how cost relationships can be derived in mathematical terms.

7.1 INTRODUCTION

Cost analysis is also vital in managerial economics and managers must have a good understanding of cost relationships if they are to maximize the value of the firm. Many costs are more controllable than are factors affecting revenue. Cost of production of a commodity is the aggregate of price paid for the factors of production used in producing a commodity. Cost of production therefore, denotes the value of factors of production employed. In short, the value of inputs required in production of a good determines its cost of production.

Just as with production theory, the distinction between short run and long run is an important one also in cost analysis. In the short run, managers are concerned with determining the optimal level of output to produce from a given plant size and then planning production accordingly, in terms of the optimal input of the variable factor, scheduling and so on. In the long run, all inputs are variable so the most fundamental decision the firm has to make is the scale at which to operate. The optimal scale is the one that is the most efficient, in economic terms, for producing a given output.

The term ‘cost, has various concept. They are described in next section.

7.2 TYPES OF COSTS

Fixed Costs

These costs relate do not vary directly with the level of output. Examples of fixed costs include:

- Rent paid on buildings and business rates charged by local authorities.
- The depreciation in the value of capital equipment due to age.

- Insurance charges.
- The costs of staff salaries e.g. for people employed on permanent contracts.
- Interest charges on borrowed money.
- The costs of purchasing new capital equipment.
- Marketing and advertising costs.

Variable Costs

Variable costs vary directly with output. i.e. as production rises, a firm will face higher total variable costs because it needs to purchase extra resources to achieve an expansion of supply. Examples of variable costs for a business include the costs of raw materials, labour costs and other consumables and components used directly in the production process.

Explicit and Implicit costs

Explicit costs can be considered as expenses or out-of-pocket costs (rent, raw materials, fuel, wages); they are normally recorded in a firm's accounts. However, the economic cost of using a resource is its opportunity cost, which is the cost of forgoing the next most profitable use of the resource, or the benefit that could be obtained from the next-best use. This involves both explicit and implicit costs.

Let us take the example of a student considering undertaking an MBA; the relevant costs can be classified as either explicit costs or implicit costs. Explicit costs include fees, books, accommodation, food, transportation, recreation and entertainment and so on. Not all of these may be directly related to doing an MBA, the last category for example, so they can be regarded as incidental costs. Money still has to be made available to pay these costs.

Implicit costs are non-cash costs, like the salary that could have been earned, leisure time forgone (if work required on the MBA exceeds the hours of salaried work), and interest forgone on assets which have to be used to pay MBA expenses.

Historical and Current

Historical costs represent actual cash outlay and this is what accountants record and measure. This means measuring costs in historical terms, at the time they were incurred. Although this is relevant for tax purposes it may not reflect the current costs.

Current costs refer to the amount that would be paid for an item under present market conditions. Often current costs exceed historical costs, particularly with inflation. In some

situations, for example IT equipment, current costs tend to be below historical costs because of rapid improvements in technology. In this case the item being costed may no longer be available, and the appropriate cost is the replacement cost. This is the cost of duplicating the productive capability of the item using current technology. Replacement cost is the relevant cost for decision-making. The following example illustrates this principle.

Sunk and Incremental costs

Sunk costs are costs that do not vary according to different decisions. An example was given earlier in the case of the MBA student's accommodation; the accommodation cost was the same whether or not the student did the MBA. Often these costs refer to outlays that have already occurred at the time of decision making, like the cost of market research conducted before deciding whether to launch a new product.

Incremental costs refer to changes in costs caused by a particular decision. Using the same example, if the student would have to pay £4,000 for yearly accommodation doing a salaried job and £6,000 for accommodation to do the MBA, the incremental cost associated with the decision to do the MBA would be £2,000 (assuming simplistically that there are no other costs or benefits related to the differences in accommodation). Incremental costs are the relevant costs for decision-making.

Private and Social Costs

Private costs refer to costs that accrue directly to the individuals performing a particular activity, in other words they are internal costs. For private firms these are the only costs that are relevant, unless there are ethical considerations.

Social costs also include external costs that are passed on to other parties, and are often difficult to value. For example, motorists cause pollution and congestion which affect many other people. Social costs are relevant for public policy decision making.

7.3 PRODUCTION AND COST RELATIONSHIP IN SHORT RUN

Production and cost relationship is observed in the short run as well as long run. The short run cost analysis describes cost –output relationship or the behaviour of the costs under a given scale of output. Where long run cost analysis explains cost-output relationship with changing scale of production. This analysis is vital for a manager to consider the price or equilibrium level of output determination.

Before consider cost behaviour in the short run, let us first consider types of production costs and their measurement.

7.4 TYPES OF PRODUCTION COSTS AND THEIR MEASUREMENT

Total Cost (TC)

Total cost is the aggregate of expenditure incurred by the firm in producing a given level of output. Total cost is measured in relation to production function by multiplying factor prices with their quantities. That is $TC = f(Q)$ which means total cost varies with quantities. In short run total cost is divided into Total fixed cost and Total variable cost at each level of output. Symbolically expressed as $TC = TFC + TVC$.

Total Fixed Cost (TFC)

Total fixed costs are related to the fixed factors and do not vary with output in the short run. Examples are rent, insurance, interest payments, and depreciation. These costs may vary in the short run, for example if the interest rate rises, but not because of a change in output.

Total Variable Cost (TVC)

Total variable costs are related to the variable factors and vary directly with output. Examples of variable costs are raw materials, wages, depreciation related to the use of equipment, and some fuel costs. Further, total variable cost is an increasing function of output.

Average fixed cost (AFC). This refers to total fixed costs divided by output; we can write average fixed cost as:

$$AFC = TFC/Q$$

Average variable cost (AVC) : This refers to the total variable costs divided by output; thus we can write:

$$AVC = TVC/Q$$

Average total cost (ATC): This refers to total costs divided by output; we can write:

$$ATC = TC / Q$$

Marginal cost (MC): This can be defined as the additional cost of producing an additional unit of output. Thus we can write:

$MC = \text{change in total costs} / \text{change in output}$,

Above defined cost concepts provide a better measure of the performance of the firm in terms of efficiency and these cost can directly compare with price of the commodity and decisions can easily be derived regarding profit.

Table -1 : Cost Schedule for Fixed Cost

Output (000s)	Total Fixed Costs (Rs 000s)	Average Fixed Cost (AFC)
0	30	
1	30	30
2	30	15
3	30	10
4	30	7.5
5	30	6
6	30	5
7	30	4.3

The table -2 gives an example of the short run costs of a firm

Table – 2 Short Run Costs of a Firm

Output Units	Total Fixed Cost TFC (£s)	Total Variable Cost TVC (£s)	Total Cost TC (£s)	Average Total Cost ATC (£ per unit)	Marginal Cost MC (£)
0	100	0	100		
20	100	40	140	7.0	2.0
40	100	60	160	4.0	1.0
60	100	74	174	2.9	0.7
80	100	84	184	2.3	0.5
100	100	90	190	1.9	0.3
120	100	104	204	1.7	0.7
140	100	138	238	1.7	1.7
160	100	188	288	1.8	2.5
180	100	260	360	2.0	3.6
200	100	360	460	2.3	5.0

7.5 NATURE OF SHORT RUN COSTS

Nature of short run costs curves can be discussed by classifying into total costs and unit costs, namely, average and marginal costs.

Nature of short run total costs

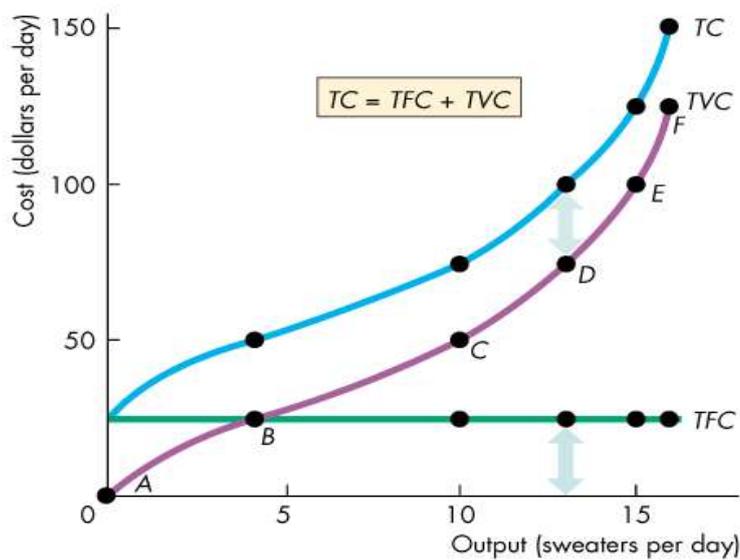
Short run total cost curves are represented in Figure -1. The shape of the curves reveals the following important points about the behaviour of various total costs.

- Total fixed cost is the same at each output level. Thus fixed costs are independent of

level of output.

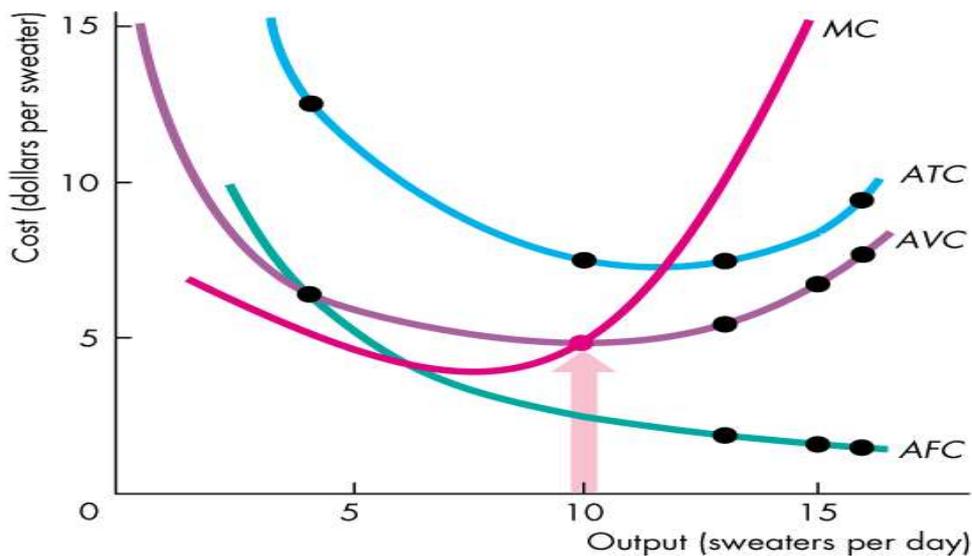
- Total variable cost increases as output increases and it is direct cost of output. But variable cost increasing at a decreasing rate initially, but after a point, it increases at an increasing rate. This is because of operation of law of variable proportion discussed under production analysis.
- Total cost, which is the sum of TFC and TVC also increases as output increases.

Figure -1 Short Run total Cost Curves



Nature of Short Run Unit Cost Curves

Figure -2 Short run unit cost curves



The short run unit cost curves are shown Figure-2. From this figure the following important observations can be made.

AFC decreases as the output increases. Since the AFC remain the same for all levels output, average fixed cost decline continuously. Hence, AFC curve is a rectangular hyperbola.

Average variable cost generally declines in the initial stages as the firm expands and approaches the optimum level of output. After plant reached optimum level of output, the variable cost begins to rise sharply. Thus, the average variable cost curve declines initially, reaches the minimum and then goes on rising. The average variable cost, thus, is U shaped. The reason for U shaped average variable cost is the operation of increasing returns in the initial stages and diminishing returns after the minimum point of the curve.

Since the average total cost (ATC) is sum of average fixed and average variable costs, the ATC is a vertical summation of AFC and AVC curves. The ATC is also a U shaped curve. At low levels of output, ATC falls because both AVC and AFC are falling and reaches a minimum point. Then, AVC starts to rise while AFC continues to fall, but AVC rises faster than AFC falls; this means that the effect of diminishing returns more than offsets the spreading of fixed costs, causing ATC to rise.

The marginal cost curve also assumes U shape indicating that in the beginning, the marginal cost declines as output increases, thereafter; it remains constant for a while and then starts rising upward. Marginal cost curve represent the slope of total cost curve at different levels of output. Then the shape of marginal cost is also U shape for the reasons already stated for average variable cost.

Relationship Between Marginal Cost and Average Cost

By observing the nature of marginal and average cost curves from the figure-2, the following relationship can be seen:

When ATC is minimum, the MC is equal to AC. Thus, MC curve must intersect at the minimum point of ATC curve.

When ATC is falling, MC is also falling initially, after a given level of output MC starts rising but ATC continues to fall. However, ATC is greater than MC. Thus, MC and ATC are falling, MC curve lies below the ATC curve.

Once MC is equal to ATC, then as the output increases ATC will start rising and MC continues to rise further but now MC will be greater than ATC. Therefore both costs are rising and MC curve will always lies above the ATC curve.

7.6 COST FUNCTIONS

Cost-output relationship is expressed through the cost function. A general form of the cost function can be written as:

$TC = f(Q)$ where TC is total cost and Q denotes output. In empirical estimation of cost-output relationship three mathematical form of cost function are used. They are as follows:

Linear cost function, Quadratic cost function and Cubic cost function.

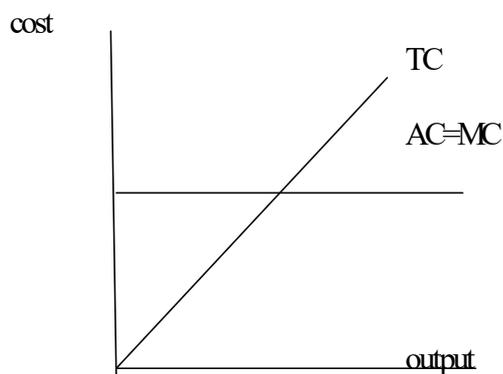
A linear short run cost function is stated as:

$$TC = a + bQ$$

Where, a and b are parameters of the function, a is intercept and b is slope coefficient. 'a' represents total fixed cost and bQ represents total variable cost.

The graphical representation of linear cost function is depicted in the figure-3.

Figure – 3 Linear Cost Function

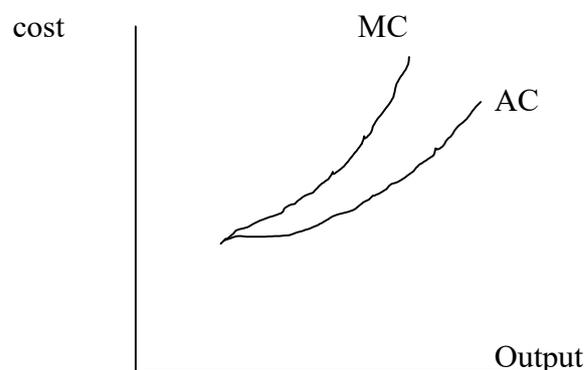


Another form of the cost function is quadratic function shown as below:

$$TC = a + bQ + cQ^2$$

When we plotted the quadratic cost function graphically AC and MC curves are shown in Figure-4.

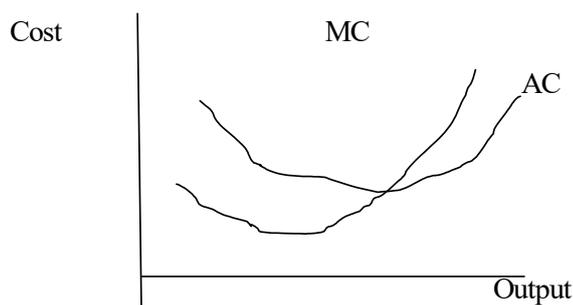
Figure-4 – Quadratic Cost Function



$$TC = a + bQ + cQ^2 + dQ^3$$

The graphical representation of linear cost function is depicted in the figure-5.

Figure 5: Cubic Cost Function



7.7 PRODUCTION AND COST RELATIONSHIP IN THE LONG RUN

In the long run the firm can change all its inputs; therefore all costs are variable. In this context the main decision that managers must make is the determination of the optimal plant size or scale of the firm, given a certain target level of output. Since firm can change all its factors of production, it can expand its plant size in order to meet the long term increase in demand or reduce plant capacity if there is a drop in demand. Long run analysis is also described as ‘planning horizon. Which implies that firm is actually operate in the short run, the long run is only a perspective view for the future course of action. Thus, the long run comprises all possible short run situations from which a choice is made for the actual course of operation.

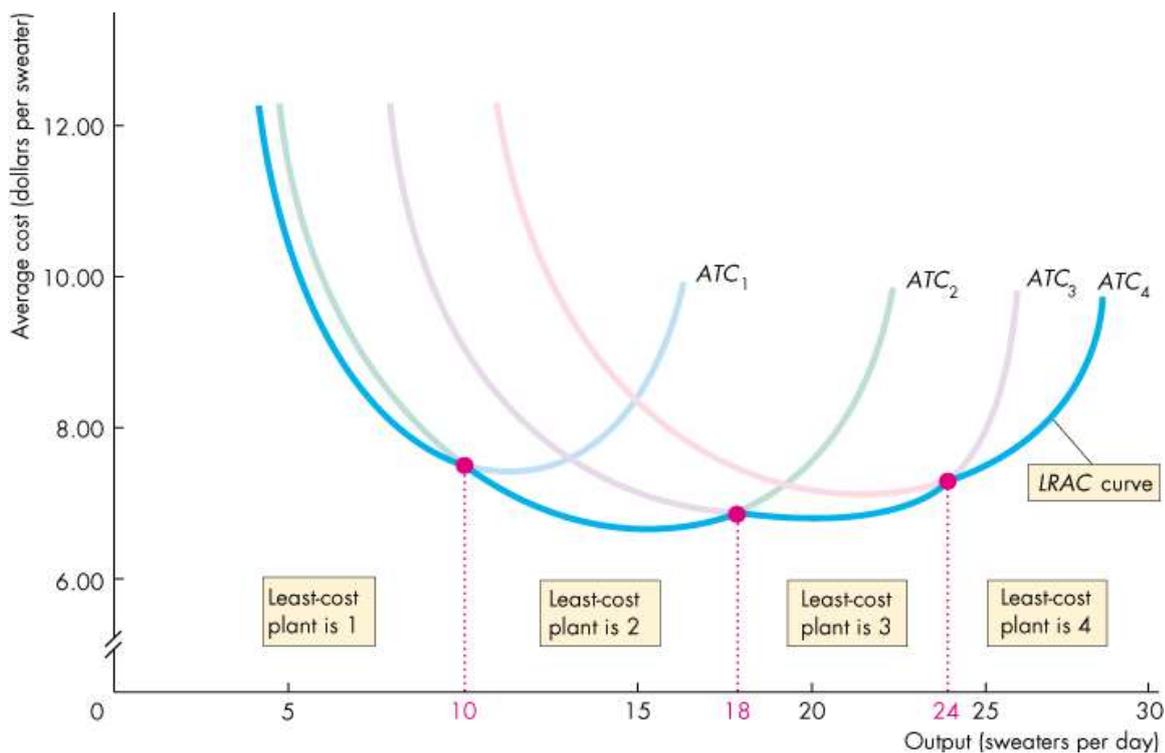
Derivation of the Long Run Average Cost Curve (LAC)

Long run average cost curve is the envelope of the various short average cost curves. Hence, it is also known as ‘envelop curve’. The long-run average cost curve shows the

minimum average cost at each output level when all inputs are variable, that is, when the firm can have any plant size it wants. In figure-6, the LAC is derived as tangent to short run costs curves like, ATC_1 , ATC_2 , ATC_3 and ATC_4 and thus, it is a flatter U shaped curve.

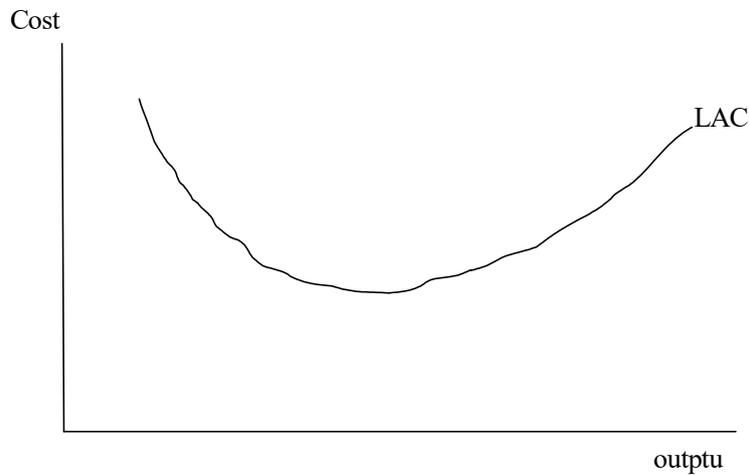
In figure 6 tangent points of four short run costs curves are used to derive LAC curve. Tangency point of each short run cost curve represents least cost plant at a given level of output. For example to produce up to 10 units of output plant 1 is preferred (ATC_1). If the output increases beyond this level (greater than 10 units) short run average cost rises, hence plant 2 (ATC_2) would be considered as least-cost plant to produce output for the range 10 units to 18 units. If the firm intends to increase its output above 18 units then the choice production is on ATC_3 . Decision to install plant size by the firm depends on expected demand for the product. If the firm expect higher demand firm would install a larger plant, otherwise decrease its plant size.

Figure -6 : Derivation of Long Run Average Cost Curve



If we relax the assumption of the existence of only four plants and assumes that the available technology includes many plant sizes, each suitable for a certain level of output, the points of interaction of consecutive plants are more numerous. If this is satisfied then, we will obtain a continuous broad U shaped long run average cost curve.

Figuer-7 : Long Run Cost Curve

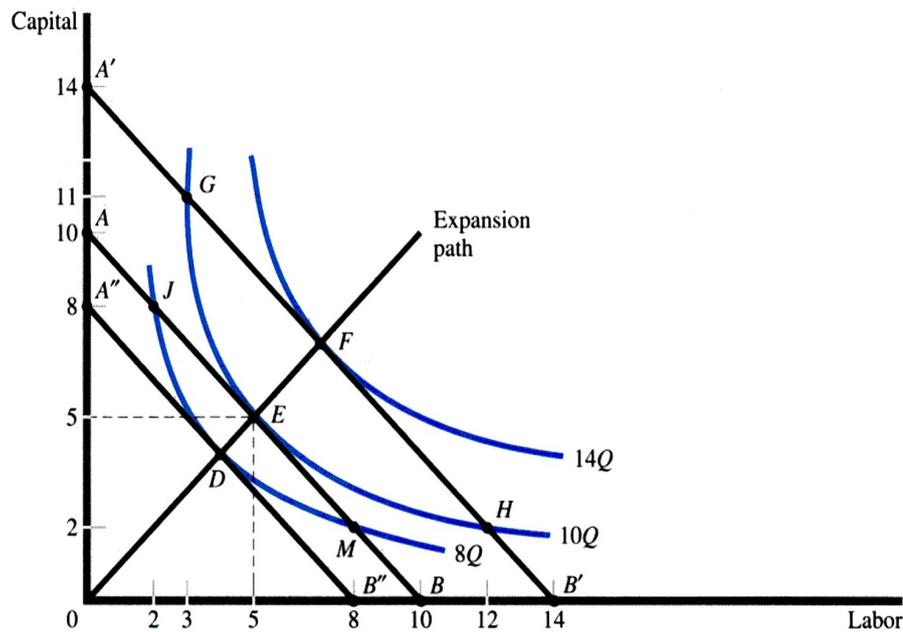


The flatter U shape of the LAC curve reflects the laws of returns to scale. According to these laws the unit costs of production decrease as the output increases, due to the economies of scale which larger level of outputs make possible. This economies of scale exists only up to a certain level of output, which is known as optimum level of output, because with this level of output all possible economies of scale are exploited. If the firm increase the output even after this optimum level there are diseconomies of begins to operate.

7.8 EXPANSION PATH

The locus of all such points of tangencies between the Isoquant and the parallel Isocost lines is the expansion path for the firm. Expansion path gives the efficient (least-cost) input combinations for every level of output. Along expansion path, input-price ratio is constant & equal to the marginal rate of technical substitution. The shape of the expansion path line depends on the production function and the slope depends on ratios of factor prices. If the production function is homogeneous the expansion path will be a straight line and if it is non-homogeneous then the optimal expansion path will not be a straight line.

Figure – 8 : Expansion Path



7.9 CHECK YOUR PROGRESS

1. Opportunity cost means
 - (a) The number of hours needed to earn money to buy it.
 - (b) What you give up to get an item.
 - (c) Always less than the dollar value of the item.
 - (d) Always equal to the dollar value of the item.
2. Average cost is calculated by
 - (a) $AC = Q/C$ (b) $AC = AVC / Q$ (c) $AC = FC / Q$ (d) $AC = TC / Q$
3. Variable costs are:
 - A) Sunk costs. B) Multiplied by fixed costs.
 - C) Costs that change with the level of production.
 - D) Defined as the change in total cost resulting from the production of an additional unit of output
4. Total cost is the sum of fixed costs and
 - A) implicit costs. B) accounting costs.

C) explicit costs. D) variable costs

Answer to check your progress: 1) b, 2) d, 3) c 4) d

7.10 SUMMARY

Managers must have knowledge of various cost concepts in their decision making process like, opportunity cost, sunk cost, implicit cost, explicit cost and so on. Cost analysis is described by classifying the analysis as short run and long run. In the short run, one or more of a firm's inputs are fixed. In this period, the presence of diminishing returns determines the shape of the cost curves. The average variable cost and average total cost curves are U-shaped. The short-run marginal cost curve increases beyond a certain point, and cuts both average cost curves from below at their minimum points.

In the long run, all inputs to the production process are variable. As a result, the choice of inputs depends both on the relative costs of the factors of production and on the extent to which the firm can substitute among inputs in its production process. The shape of long run average cost curve has flatter U shape and economies and diseconomies of scale are responsible the shape of LAC.

7.11 KEY WORDS

Cost of Production: Cost of production of a commodity is the aggregate of price paid for the factors of production used in producing a commodity.

Cost Function: A function relationship between cost and output.

Marginal Cost: Marginal cost is the change in the [total cost](#) that arises when the quantity produced has an increment by unit.

Planning Curve: Long run cost curve is also known as Planning Curve, since it is a guide to the entrepreneur in his decision to plan the future expansion of his output.

7.12 QUESTIONS FOR SELF STUDY

1. Explain the various types of costs.
2. Why the short run average cost curve is U shaped?
3. Discuss the concepts of AFC, AVC, ATC and MC and show their interrelationship.
4. Examine the cost and output relationship in the long run.
5. Explain the managerial significance of long run average cost curve.

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UNIT - 8 : COST-VOLUME-PROFIT ANALYSIS

STRUCTURE:

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Basic Concepts and Their Measurement
- 8.3 Assumptions of Cost-Benefit-Analysis
- 8.4 Use of Cost-Benefit-Analysis
- 8.5 Break-Even Analysis
- 8.6 Graphical Presentation Of Break –Even Analysis
- 8.7 Limitations of CVP analysis
- 8.8 Illustration of Cost-Volume-Profit Analysis
- 8.9 Check Your Progress
- 8.10 Summary
- 8.11 Key words
- 8.12 Questions for Self Study
- 8.13 References

8.0 OBJECTIVES

After studying this unit, you will be able to ;

- Understand the assumptions of cost-volume-profit (CVP) analysis
- Explain the features of CVP analysis
- Determine the breakeven point and output level needed to achieve a target operating income
- Explain CVP analysis in decision making and how sensitivity analysis helps managers cope with uncertainty
- Use CVP analysis to plan variable and fixed costs

8.1 INTRODUCTION

Cost-Volume-Profit (CVP) analysis is a key step in many decisions. It analysis examines the relationships between changes in activity and changes in total sales revenue, costs and profit. It may provide very useful information particularly for a business that is commencing operations or facing difficult economic conditions. CVP analysis assists by determining how many units of a product must be sold so that the business 'breaks even' i.e. total costs, both fixed and variable are covered by total sales revenue. It allows the business to consider the effect on profits of various changes in operating costs and revenues such as a reduction in selling price or an increase in fixed costs; to determine the sales volume required to achieve a specific profit level and to establish the amount by which the current sales level can decrease before losses are incurred. Hence, it is a vital tool used in many business decisions.

8.2 BASIC CONCEPTS AND THEIR MEASUREMENT

1. Contribution Margin. Contribution margin is the amount remaining from sales revenue after variable expenses have been deducted. It contributes towards covering fixed costs and then towards profit.

2. Unit Contribution Margin. The unit contribution margin can be used to predict changes in total contribution margin as a result of changes in the unit sales of a product. To do this, the unit contribution margin is simply multiplied by the change in unit sales. Assuming no change in fixed costs, the change in total contribution margin falls directly to the bottom line as a change in profits.

Unit CM = Unit Price - Variable Cost per Unit

Total CM = Total Sales - Total Variable Costs

3. Contribution Margin Ratio (CM ratio): The contribution margin (CM) ratio is the ratio of the contribution margin to total sales. It shows how the contribution margin is affected by a given dollar change in total sales. The contribution margin ratio is often easier to work with than the unit contribution margin, particularly when a company has many products. This is because the contribution margin ratio is denominated in sales dollars, which is a convenient way to express activity in multi-product firms. It can be calculated as shown in the following formula:

$$\text{CM Ratio} = \frac{\text{Unit Contribution Margin}}{\text{Unit Price}} = \frac{\text{Total contribution Margin}}{\text{Total sales}}$$

4. Break-Even Point: The break-even point is the point in the volume of activity where the organization's revenues and expenses are equal.

Breakeven Point = Fixed Costs / Contribution Margin per Unit

Contribution Margin = Unit Selling Price - Variable Costs

BEP in Sales Revenue

Break-even point in number of sales revenue is calculated using the following formula:

Break-even Sales Dollars = Price per Unit x Break-even sales Units

BEP in Units:

Break-even point in units is calculated using the following formula:

B/E Sales = Variable Costs + Fixed Costs

Price x No. of Units = Variable Cost per Unit x No. of Units + Total Fixed Costs

PX = VX + FC

5. Target Profit: is about finding out the estimated business activities to perform to earn a target profit during a certain period of time. Among these activities, management is especially interested to find out the sales volume required to generate a target profit.

6. Margin of Safety: Margin of safety is the difference between expected or budgeted sales and break-even sales.

Margin of safety (in units) = budgeted sales units – breakeven sales units

$$\text{Margin of Safety in (as \%)} = \frac{\text{Budgeted Sales} - \text{Break - even Sales}}{\text{Budgeted Sales}} \times 100$$

or

$$\text{Margin of safety percentage} = \frac{\text{Margin of Safety in Dollars}}{\text{Total sales}}$$

7. Operating Leverage: Operating Leverage (OL) is the effect that fixed costs have on changes in operating income as changes occur in units sold, expressed as changes in contribution margin. It can be measured by using following formula:

$$\text{OL} = \frac{\text{Contribution Margin}}{\text{Operating Income}}$$

8.3 ASSUMPTION OF COST-BENEFIT-ANALYSIS

CVP analysis relies on several assumptions to simplify the complex relationship among costs, revenues, and activity levels. Key assumptions are:

1. Changes in revenues and costs occur only because of changes in output.
2. Total costs can be separated into fixed and variable costs.
3. Revenues and costs are linearly related to output within the relevant range.
4. Unit selling price, unit variable costs, and fixed costs are known and constant.
5. The analysis covers only a single product or product mix.
6. The analysis is not impacted by the time value of money.

8.4 USE OF COST- VOLUME – PROFIT ANALYSIS

Cost-volume-Profit analysis is used:

1. To know the level of sales is needed to avoid the losses.
2. To understand the sales volume needed to earn a target profit.
3. To measure the effect of reduce in selling price on profit.
4. To know the sales volume required to meet the additional fixed charges arising from an advertising campaign.

- To understand the new-break-even point when there is change in prices, costs, and volume.

8.5 BREAK-EVEN ANALYSIS

Break-even analysis is a technique of representing and studying the inter-relationship of the three basic components of CVP: cost, volume and profit. The break-even analysis determines a relationship between the revenues and costs with respect to volume. Break-even analysis is always taken as an important part of profit planning as it gives the planner many insights into the data with which he or she is working. It is a point where the profit is zero as the total revenues are equal to total costs. In other words, it is that level of activity (in units or in ₹) at which revenue equals cost.

The basic equation to find break- even point is

$$\text{B/E Sales} = \text{Variable Costs} + \text{Fixed Costs}$$

Illustration : if selling price for widgets is ₹ 12 each, VC = ₹ 8 each and FC= ₹ 40,000 per month then B/E sales is:

$$\text{B/E} = \text{VC} + \text{FC}$$

$$12W = 8W + 40,000$$

$$12W - 8W = 40,000$$

$$4W = 40,000$$

$$W = 40,000 / 4$$

$$W = 10,000 \text{ widgets}$$

The break-even point in units is 10,000 units and the break-even point in rupees is computed as follows:

$$= (10,000 \text{ units}) \times (₹ 12)$$

$$= ₹ 1,20,000$$

We can alter the formula any missing variable. For example, with previous data, suppose, if the production is fix at 10,000 widgets, to know what price to be charged:

$$\text{B/E} = \text{VC} + \text{FC}$$

$$10,000P = 10,000 (8) + 40,000$$

$$10,000P = 80,000 + 40,000$$

$$= ₹ 1,20,000$$

$$P = 1,20,000/10,000$$

P (price) = 12 (Selling price per unit).

Of course no firm wants to just earn break-even income. We can easily change the above equation to insert a target profit, say, 20,000.

$$\text{B/E sales} = \text{VC} + \text{FC} + \text{Profit}$$

$$12W = 8W + 40,000 + 20,000$$

$$12W - 8W = 40,000 + 20,000$$

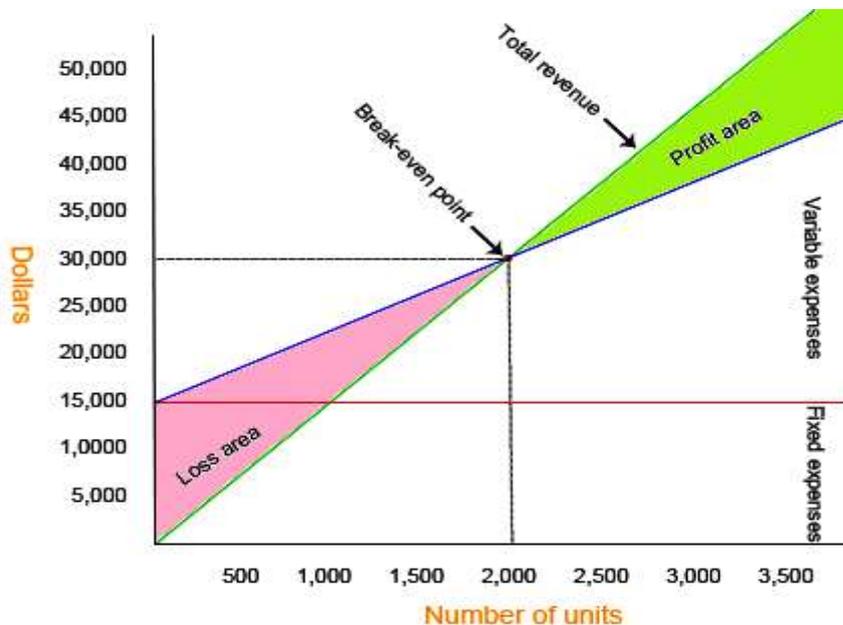
$$4W = 60,000$$

$$W = 60,000/4$$

W = 15,000 widgets.

8.6 GRAPHICAL PRESENTATION OF BREAK –EVEN ANALYSIS

The graphical presentation of dollar and unit sales needed to break-even is known as **break-even chart** or **CVP graph**:



The number of units have been presented on the X-axis (horizontally) where as dollars have been presented on Y-axis (vertically). The straight line in red color represents the total annual fixed expenses of \$15,000. The blue line represents the total expenses. Notice that the line has a positive or upward slop that indicates the effect of increasing variable expenses

with the increase in production. The green line with positive or upward slop indicates that every unit sold increases the total sales revenue. The total revenue line and the total expenses line cross each other. The point at which they cross each other is the *break-even point*. Notice that the total expenses line is above the total revenue line before the point of intersection and below after the point of intersection. It tells us that the business suffers a loss before the point of intersection and makes a profit after this point. The break-even point in the above graph is 2,000 units or \$30,000 that agrees with the break-even point. The difference between the total expenses line and the total revenue line before the point of intersection (BE point) is the *loss area*. The loss area has been filled with pink color. Notice that this area reduces as the number of units sold increases. It means every additional units that is sold before the break-even point reduces the loss of the business. The difference between the total expenses line and the total revenue line after the point of intersection (BE point) is the profit area. The profit area has been filled with green color. Notice that this area increases as the number of units sold increases. It means every additional unit that is sold after the break-even point increases the profit of the business.

8.7 LIMITATIONS OF CVP ANALYSIS

CVP analysis can be a very useful aid to managerial decision-making. There are, however, some important limitations of the technique. The main one is the set of restrictive assumptions on which it is often based. Profit does not usually increase linearly with output; many firms will have to reduce price in order to increase sales because they are not price-takers. Furthermore, as output increases they are likely to face diminishing returns as they approach capacity in the short term; inefficiencies and the payment of overtime wages may increase unit variable costs. In the long run a number of factors may invalidate the simplified analysis above. The firm may change its capacity, thereby changing fixed costs. It may also change the quality of its products and its product mix. Therefore, as with other decision tools, CVP analysis must be used with care.

8.8 ILLUSTRATIONS OF COST-VOLUME-PROFIT ANALYSIS

Illustration 1. The fixed costs at Company X are \$1 million annually. The main product has revenue of \$8.90 per unit and \$4.50 variable cost. (a) Determine the breakeven quantity per year, and (b) Annual profit if 200000 units are sold.

Let Q_{BE} be the breakeven quantity.

$$8.9Q_{BE} = 1,000,000 + 4.5Q_{BE}$$

$$Q_{BE} = 1,000,000/(8.90-4.50) = 227,272 \text{ units}$$

(b) Profit = R – TC

$$= 8.90Q - 1,000,000 - 4.5Q$$

At 200,000 units: Profit = 8.90(200,000) – 1,000,000 - 4.50(200,000)

$$= \$-120,000 \text{ (loss)}$$

Illustration 2: A product currently sells for \$12 per unit. The variable costs are \$4 per unit, and 10,000 units are sold annually and a profit of \$30,000 is realized per year. A new design will increase the variable costs by %20 and Fixed Costs by %10 but sales will increase to 12,000 units per year. (a) At what selling price do we break even, and (b) If the selling price is to be kept same (\$12/unit) what will the annual profit be?

$$\text{Profit} = \text{revenue} - \text{costs}$$

$$30000 = 10000(12) - [10000(4) + \text{FC}] \quad \text{FC} = \text{fixed costs}$$

$$\text{FC} = 50000$$

(a) New variable cost = \$4(1.2) = \$4.8 per unit.

$$\text{New fixed costs} = 50000(1.1) = \$55000$$

Let x = breakeven selling price per unit, then

$$12000x = 55000 + 12000(4.8)$$

or, $x = \$9.38/\text{unit}$

(b) Profit = 12000(12) – 12000(4.8) - 55000

$$= \$31400$$

Illustration 3. COST-VOLUME-PROFIT ANALYSIS

PART 1: INCOME STATEMENT

REVENUES	
SALES QUANTITY	250
SALES PRICE	75
TOTAL REVENUES	18,750
UNIT VARIABLE COSTS	
MATERIALS	
LABOR	

SELLING COSTS	
TOTAL UNIT VARIABLE COSTS	35
TOTAL VARIABLE COSTS	8,750
CONTRIBUTION MARGIN	10,000
FIXED COSTS	
MANUFACTURING	
SELLING	
ADMINISTRATIVE	
TOTAL FIXED COSTS	5,000
NET INCOME	5,000

PART 2: COST-VOLUME-PROFIT ANALYSIS

BREAKEVEN IN UNITS	125
BREAKEVEN IN \$	9,375
UNIT CONTRIBUTION MARGIN	40
CONTRIBUTION MARGIN RATIO	0.533
OPERATING LEVERAGE	3.75
MARGIN OF SAFETY	125 units

8.9 CHECK YOUR PROGRESS

1. Which of the following is not an assumption of cost-volume-profit analysis?
 - a. The time value of money is incorporated in the analysis.
 - b. Costs can be classified into variable and fixed components.
 - c. The behavior of revenues and expenses is accurately portrayed as linear over the relevant range.

- d. The number of output units is the only driver.
2. Contribution margin is calculated as
- a. Total revenue – total fixed costs.
 - b. Total revenue – total manufacturing costs (CGS).
 - c. Total revenue – total variable costs.
 - d. Operating income + total variable costs.
3. Which of the following is the correct description of the break-even point
- a. Where total revenue equals total fixed costs
 - b. Where total revenue equals total variable costs
 - c. Where total revenue equals total contribution
 - d. Where total revenue equals total fixed costs and variable costs
4. Which of the following best describes a fixed cost?
- a. A cost that is unaffected by the level of output
 - b. A cost that is unaffected by the level of inflation
 - c. A cost that involves a long-term commitment by the business
 - d. A cost that is unaffected by time

1. A 2. C 3. D 4. A

8.10 SUMMARY

Cost-volume-profit (CVP) analysis illustrates how managers use that model to help answer important “what-if” business questions. CVP analysis also helps the managers to the risks and rewards of decisions they are considering, by illustrating how the “bottom-line” is affected by changes in activity levels and/or key pricing or cost components. CVP analysis is based on several assumptions, one of which is that fixed costs can be distinguished from variable costs. However, whether a cost is variable or fixed depends on the time period for the decision and also the range of activity (relevant range) being considered.

8.11 KEY WORDS

Cost-volume –profit analysis: CVP analysis examines the relationships between changes in activity and changes in total sales revenue, costs and profit

Break –even point: The break-even point is the point in the volume of activity where the organization's revenues and expenses are equal.

Contribution margin: Contribution margin is the amount remaining from sales revenue after variable expenses have been deducted

Target income: Target income is about finding out the estimated business activities to perform to earn a target profit during a certain period of time

8.12 QUESTIONS FOR SELF STUDY

1. What cost-volume-profit analysis and how is it used for decision making?
2. What assumptions and limitations should managers consider when using CVP analysis?
3. What is the breakeven point? Analyse with an illustration.
4. The variable cost per gift basket is ₹ 2, fixed costs are ₹ 5, 000 per month, and the selling price of a basket is ₹ 7. How many baskets must be produced and sold in a month to earn a profit of ₹ 1,000?

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DEPARTMENT OF STUDIES AND RESEARCH IN MANAGEMENT

M.B.A I Semester

Course – 2

MANAGERIAL ECONOMICS

BLOCK

3

MARKET STRUCTURES

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BLOCK –3: MARKET STRUCTURES

The block 3 contains further 4 units (unit-10 to unit-13) where the unit-6 includes information relating to unit-10 includes information relating to market structures, determinants and various forms of market structure, perfect and imperfect markets, monopoly, duopoly and oligopoly, monopolistic competition etc, unit- 11 includes information relating to marginal revenue and average revenue, conditions of the equilibrium of the firm, equilibrium in the long run and equilibrium of an industry etc further unit-12 covers concepts of the demand and revenue under monopoly, cost under monopoly, determination of price and equilibrium under monopoly, marginal revenue and cost analysis, price and equilibrium determination under monopoly etc finally unit-13 covers the concepts of monopolistic competition and imperfect competition, revenue and cost curves under monopolistic competition etc.

UNIT - 9 : MARKET STRUCTURES

STRUCTURE:

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Market Structure
- 10.3 Concept of Market Structure
 - 10.3.1 Determinants of Market Structure
 - 10.3.2 Various forms of market structure
- 10.4 Perfect and Imperfect Markets
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- 10.7 Monopoly
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 - 10.7.3 Features of Monopoly
 - 10.7.4 Assumptions of Monopoly
- 10.8 Duopoly and Oligopoly
 - 10.8.1 Oligopoly
 - 10.8.2 Features of Oligopoly
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10.9.1 Features of Monopolistic Competition

10.9.2 Difference between Perfect Competition and Monopolistic Competition

10.10 Check your Progress

10.11 Summary

10.12 Keywords

10.13 Questions for Self Study

10.14 References

9.0 OBJECTIVES

After studying this unit, you will be able to ;

- Explain the concept of Market Structure and its determinants.
- Understand various forms of market structure
- Compare and contrast various market structures
- Identify the features of Perfect competition, Monopoly, Oligopoly and Duopoly and Monopolistic competition
- Differentiate between Perfect Competition and Monopolistic Competition

9.1 INTRODUCTION

In order to maximize profits or shareholder wealth, managers must use the information that they have relating to demand and costs in order to determine strategy regarding price and output, and other variables. However, managers must also be aware of the type of market structure in which they operate, since this has important implications for strategy; this applies both to short- run decision-making and to long-run decisions on changing capacity or entering new markets.

It is useful to start by explaining the characteristics of markets and different types of market structure, with a general examination of the relationships between structure, conduct and performance.

9.2 MARKET STRUCTURE

Market structure refers to the features of a particular market. There are various types of markets having their own specific features. The behavior and performance of the firms in the industry is influenced by its market structure.

The Market is a set of conditions in which buyers and sellers come in contact for the purpose of exchange. In Economics, however, the term ‘market’ does not refer to a particular place as such but it refers to a market for a commodity or commodities. In the words of Cournot, a French economist, “Economists understand by the term market not any particular market place in which things are bought and sold but the whole of any region in which buyers and sellers are in such free intercourse with one another that the price of the same goods tends to equality easily and quickly”.

Thus, the essentials of a market are

- (a) A commodity which is dealt with;

- (b) The existence of buyers and sellers;
- (c) A place, be it a certain region, a country or the entire world; and
- (d) Such intercourse between buyers and sellers that only one price should prevail for the same commodity at the same time.

Markets may be categorized into product market and factor market. A 'Product market' or 'commodity market' refers to an arrangement in effecting buying and selling of commodities. A 'factor market' is one in which factors of production such as land, labour and capital are transacted.

Factors Governing market Structure

Market structure influences the behavior and performance of firms on the markets. Following factors affect the structure of market.

- 1. Number of sellers :** In case, there are large number of sellers the market will be perfect competitive market. If there is only one seller it will be monopolistic market. In the same way it may be monopolistic competition or oligopoly or duopoly.
- 2. Number of buyers :** Large number of buyers make market competitive. The quantity of goods purchased by buyers also influences structure of market. Lesser number of buyers make market centralized . The number of buyers and the place of their residence makes the market local, national and international.
- 3. Product differentiation :** Identical product with differentiation makes the market monopolistic competitive. The difference may be as regards size, colour, content, variety, brand etc.,
- 4. Conditions of entry into the market :** In case of free entry and exist of firms the market will be perfectly competitive. It will be monopolistic market if there are restrictions.

9.3 CONCEPT OF MARKET STRUCTURE

The concept of market structure is central to both economics and marketing. Both disciplines are concerned with strategic decision-making. In decision-making analysis, market structure has an important role through its impact on the decision-making environment. The extent and characteristics of competition in the market affect choice behavior among the actors. Market structure refers to all characteristics of a market that influence the behavior of buyers and sellers when they come together to trade.

9.3.1 DETERMINANTS OF MARKET STRUCTURE

The key factors in defining a market structure are :

- (a) Short-run and long run objectives of buyers and sellers in the market
- (b) Belief of buyers and sellers about the ability of themselves and others to set prices
- (c) Degree of product differentiation
- (d) Technologies employed by agents in the market
- (e) Amount of information available to agents about the good and about each other
- (f) Degree of coordination or noncooperation agents may exhibit
- (g) Extent of entry and exit barriers

A buyer or seller(agent) is said to be competitive if the agent assumes or believes that the market price is given and that the agent's actions do not influence the market price. We sometimes say that a competitive agent is a price taker.

9.3.2 VARIOUS FORMS OF MARKET STRUCTURE

In economics, markets are classified according to the structure of the industry serving the market. Industry structure is categorized on the basis of market structure variables, which are believed to determine the extent and characteristics of competition. Those variable, which have received the most attention, are number of buyers and sellers, extent of product substitutability, costs, ease of entry and exit, and the extent of mutual interdependence.

Markets may be classified on the basis of different criteria, such as geographical space or area, time element and the nature of competition. The classification of different types of market structures are as follows.

1. Area

- Local Market
- Regional markets
- National Markets
- World Markets

2. Time Element

- Very short period market
- Short period market
- Long period market

- Very long period market

3. Competition

- Perfect competition
- Imperfect Competition
- Monopoly
- Oligopoly
- Monopolistic competition

1. Classification of market on the basis of Area

- a) Local Market : Purchasers and sellers are restricted to specific locality. These markets are restricted to perishable goods only, such as mil, fresh vegetables, fruits, fish, eggs etc. Bricks and certain food grains have also local market. Due to the advancement of means of transport the area of the local market is widening.
- b) Regional Market : Purchases and sales of commodities is mainly restricted within the region, such as Rajasthani bangles, turbans and books written in Grumukhi language.
- c) National market: These commodities are purchased and sold within the entire country, such as cement, iron, mangoes, cloth and share of the company.
- d) International Market: Commodities which can be purchased and sold all over the world have international market. Example of these commodities are gold and silver.

2. Classification on the basis of Time Element :

Sometimes the time element is used to classify the market. The time is classified as very short period, short period and long period. Very short period markets relate to transactions in those commodities, which are fixed in supply are perishable in nature. Since supply is fixed, only the chances in demand influence the price in such markets.

The short period markets are those where supply can be increased without any limitation. The influence of demand on price is therefore, greater in case of short period market than in case of long period markets. Both these markets exist in durable goods.

9.4 PERFECT AND IMPERFECT MARKETS

A market is said to be perfect when all the potential sellers and buyers are promptly aware of the prices at which transaction takes place and all the offers made by other sellers and buyers, and when any buyer can purchase from any seller and conversely. On the other hand, a market is said to be imperfect when some buyers or sellers or both are not aware of the offers being made by others. Naturally, therefore, different prices come to prevail for the same commodity at the same time in an imperfect market. In a perfect market, on the other hand, the same price rules throughout the market.

These four market structures each represent an abstract characterization of a type of real market.

<i>Type of market</i>	<i>Number of firms</i>	<i>Similar or differentiated products</i>	<i>Cost of information</i>	<i>Barrier to entry</i>	<i>Examples</i>	<i>Special Characteristics</i>
Perfect competition	Many	Identical	Low	Low	Financial Markets etc.	Economic profits equals zero in the long run. Price equals marginal cost and, in the long run, the minimum of the average total cost.
Monopoly	One	Identical	Low	High	Public utilities like telephone, electricity, etc.,	Economic profit can exceed zero in the long run. Price exceeds marginal cost and there is 'deadweight loss' due to an under provision of output.
Monopolistic competition	Many	Differentiated	Costly	Low	Restaurants, retail services, manufacturing; tea, toothpaste, TV sets, shoes, refrigerators, etc.,	Economic profit equals zero in the long run. Price exceeds marginal cost but is less than the minimum of average total cost.
Oligopoly	Few	Similar or differentiated	Small to significant	High but not impossible	Wholesale, construction, energy, manufacturing, computing	There is in terminate firm behavior as there is an incentive to compete or collude.

9.5 PERFECT COMPETITION

Perfect competition refers to the market structures where competition among the sellers and buyers prevails in its most perfect form. In the perfectly competitive market, a single market price prevails for the commodity, which is determined by the forces of total demand and total supply in the market. The terminology 'Perfect Competition' is quite common but not quite universal. The term 'Pure Competition' is also sometimes used. The term 'P-Competition' is used where P can stand for perfect, pure or price competition.

9.5.1 CHARACTERISTICS OF PERFECT COMPETITION

A perfect competitive structure is defined by certain characteristics. For any industry to have a perfect competitive structure, it must have all the characteristics given below;

- 1. Many Buyers and Sellers :** A perfectly competitive industry contains a large number of small firms, each of which is relatively small compared to the overall size of the market. This ensures that no single firm can exert market control over price or quantity. If one firm decides to double its output or stop producing entirely, the market is unaffected. The price does not change and there is no discernible change in the quantity exchanged in the market.
- 2. Homogenous Product :** Each firm in a perfectly competitive market sells an identical product, what is often termed 'homogeneous goods'. The essential feature of this characteristic is not so much that the goods themselves are exactly or perfectly the same, but that buyers are unable to discern any difference. In particular, buyers cannot tell which firm produces a given product. There are no brand names or distinguishing features that differentiate products.
- 3. Perfect Knowledge of Market Conditions :** In perfect competition, buyers are completely aware of sellers' prices, such that one firm cannot sell its good at a higher price than other firms. Each seller also has complete information about the prices charged by other seller so they do not inadvertently charge less than the going market price. Perfect knowledge also extends to technology. All perfectly competitive firms have access to the same production techniques. No firm can produce its good faster, better, or cheaper because of special knowledge of information.
- 4. Free Entry and Exit of Firms :** Perfectly competitive firms are free to enter and exit an industry. They are not restricted by government rules and regulations, start-up cost, or other barriers to entry. While some firms incur high start - up cost or need government permits to enter an industry, this is not the case for perfectly competitive firms. Likewise, a perfectly competitive firm is not prevented from leaving an industry as is the case for government regulated public utilities.
- 5. Perfect Mobility of Factors of Production :** A necessary assumption of perfect competition is that factors of production are perfectly mobile. Perfect mobility of factors alone can ensure easy or exit of the firms.
- 6. Government Non-intervention:** Perfect competition also implies that there is no government intervention in the working of market economy. There are no tariffs, subsidies, control on supply of raw material, licensing policy or other government

interference. Government non-intervention is essential to permit free entry of firms and for automatic adjustment of demand and supply through the market mechanism.

7. **Absence of Transport Costs Element :** It is essential that competitive position of no firm is adversely affected by the transport cost differences. It is thus assumed that there is absence of transport cost as all firms are closer to the market or there is equal transport cost faced by all, as all firms are supposed to be equally far away from the market.

9.5.2 ADVANTAGES OF PERFECT COMPETITION

Advantages of Perfect Competition are

- a) Perfectly competitive markets are highly competitive. Scarce resources are put into use in the best manner and thereby economic efficiency is achieved.
- b) In a perfectly competitive market, the long run equilibrium price is equal to marginal cost.
- c) Since the price is equal to the marginal cost, firms can only make normal profits in the long run.
- d) Under the perfect competition, firms achieve the grand equilibrium that is an equilibrium output where all the cost and revenues are equal. Therefore, firms produce the maximum output at least cost, and thereby achieve a maximum efficiency.
- e) In perfect competition, the welfare of consumer is maximum. Since products and services are made available to the consumer at the lowest possible price and in the highest possible quantities.
- f) Under the perfect competition, firms get inspiration to bring forth new ideas in terms of product and services. Whenever they introduce new product and services, **they ensure** some short – term abnormal or additional profits. When other firms in the industry decide to produce the new product, supply increases and prices are expected to fall in the long run, leading to normal profits in the long run.

9.6 IMPERFECT COMPETITION

Imperfect competition takes three main forms:

- (a) Monopoly
- (b) Oligopoly
- (c) Monopolistic Competition.

9.7 MONOPOLY

The term 'Monopoly' has been taken from the two Greek words 'Mono' which means single and 'Poly' meaning seller.

The monopoly is that market form in which a single producer controls the whole supply of single commodity, which has no close substitutes. In other words, a monopoly market is one in which there is only one seller of a product having no close substitute. Two important points should be noted in regard to this definition.

First there must be single producer or seller in the market, if it is to be called a monopoly. Since there is only one firm under monopoly, that single firm constitutes the whole industry. Therefore, the distinction between the firm and industry disappears under conditions of monopoly. In monopoly, the firm and the industry are identical.

Secondly, the commodity produced by the producer should not have close substitutes, if he is to be called a monopolist. The monopolies are price – makers, not price takers. A monopolist is having freedom and independence in price-making. The essential feature of a monopoly is its being a single firm having exclusive control over the output of a commodity for which there is no other commodity with a strong cross elasticity of demand.

This second condition can also be expressed in terms of cross-elasticity of demand. If there is to be monopoly, the cross-elasticity of demand between the product of the monopolist and the product of any other producer must be very low.

9.7.1 ABSOLUTE AND LIMITED MONOPOLY

There is a distinction between absolute and limited monopoly. An absolute or pure monopoly refers to a form of market which is controlled by a single producer, and he is in a position to charge any price for his product. For absolute monopoly power, the firm must have control over the supply of all goods and services in the country as a whole. Such pure monopoly is merely a theoretical concept. It is a rare phenomenon in reality. Any commodity is bound to have a substitute, though it may be a very remote one. For example, a stereo record player is a remote substitute for television as a means of entertainment.

In reality, we find a limited monopoly or a relative monopoly. The monopolist in the real world has a limited degree of monopoly power, as he is the producer controlling the market supply of a particular product, which has no close substitutes. Some economists, however implies absence of close substitutes, but it does not mean absence of competition, as it has to face competition from remote substitutes. There may not be immediate rivals to a simple monopolist but his degree of monopoly power is not absolute, as the possibility of

competition at any time is not completely ruled out. For example, the railways in India are a public monopoly, but there are different substitutes available for the purpose, e.g. road transport service, airways, etc., These different substitutes, however, cannot be regarded as close substitutes of railway services.

Monopoly may change if :

- (a) Consumer demands patten change.
- (b) Close substitutes emerge for the monopolist's product
- (c) New firms are able to enter the industry
- (d) Government intervenes to control the monopoly.

9.7.2 CAUSES OF MONOPOLY

Monopoly can exist only when there are strong barriers to the entry of rivals. Following are the main causes that lead to monopoly situation :

- (1) In some industries competition is impractical, inconvenient or simply not workable. Such industries are called natural monopolies. Automatically, such industries may acquire monopoly power. For instance, in the case of public utilities like telephone service, water supply, transport, electricity, etc., the supply by more than one firm is basically inconvenient and relatively costly to consumer. Hence monopoly is preferred in such cases. Thus, the government grants exclusive rights to a particular firm for operating public utilities like gas supply, electricity, etc., but the governemtn reserves the right to regulate the operations of such monopolies to prevent abuses of monopoly power it has granted.
- (2) Exclusive knowledge of techniques of production also creates monopoly to a firm. If the firm alone possesses the technical know – how about the production of a commodity, the entry rivals in the market is not possible and automatically the firm acquires monopoly position.

9.7.3 FEATURES OF MONOPOLY

- 1. The monopolist is the single producer or seller of a particular good or service in the market. Thus, under monopoly firm and industry are identical.
- 2. Rivalry from the producers of substitutes is so remote as to be insignificant. Indirect rivalry may exist in the form of the existence of substitutes but close substitutes will not exist.
- 3. The monopolist is a price maker and not a price taker. His price fixing power is

absolute. He can fix the price for the product as he likes. He can vary price from buyer to buyer.

4. A monopoly firm itself being the industry, it faces a downward sloping demand curve for its product. That means it cannot sell more output unless the price is lowered.
5. In the monopoly market, there are legal, technical, economic or natural obstacles, which may restrict the entry of new firms. The monopoly is not a permanent phenomenon. The firm which appears to be monopoly now may not remain a monopoly in future.
6. Legislative enactments regarding patents and copyrights, trademarks, etc., grant monopoly to the firms and such legal provisions prevent the entry of rivals in the market.
7. The entry of new competitors may be blocked or the rivals may be eliminated by a aggressive cut-throat tactics of the monopolist like aggressive price cutting, product disparagement, hiring away of strategic personnel of rivals, pressure on banks not to grant credit and pressure on resource suppliers to withhold materials, spurious and exhausting law suits and spying and sabotage.

9.7.4 ASSUMPTIONS OF MONOPOLY

- There are a significant number of sellers as well as buyers in the 'group'.
- Products of the sellers are separated, however they are close substitutes of one another.
- There is free entry as well as exit of the organization in the group.
- The objective of the firm is to maximize profits, both in the short run as well as in the long run.

9.8 DUOPOLY AND OLIGOPOLY

Duopoly and oligopoly are two special situations of monopolistic competition. Duopoly is a market situation in which there are two sellers selling an identical product. There shall not be any agreement between them regarding price or output. The two sellers are completely independent but both will take into consideration the other's policies.

Duopoly may be of two types :

- (a) Duopoly without product differentiation
- (b) Duopoly with product differentiation,

Duopoly without Product Differentiation:

Under duopoly the simplest cases will be those where the two monopolists are supposed to be selling an identical product and there is no product differentiation. Very likely there will be collusion between the two. They may agree on a price, or decide quotas, or divide the territory in which each is to market his good. Obviously, this collusion creates monopoly conditions in the market and price determination will be similar to that under monopoly. If both the firms are selling their products are homogeneous. If any one firm tries to increase the price it will lose its sale. Hence both firms must sell at the same price. In these conditions, each firm fixes the price just like in a monopoly.

9.8.1 OLIGOPOLY

Oligopoly is a market structure in which a very few firms produce products that are either close or perfect substitutes for one another. Oligopoly markets can, therefore, be homogeneous and heterogeneous. It is characterized by competition amongst the few. Product differentiation, control of inputs by existing producers, legal restrictions and scale economies are some of the important entry barriers in the oligopoly market structure.

9.8.2 FEATURES OF OLIGOPOLY

The oligopoly consists of the following features:

1. Few sellers: The market is dominated by a few large firms selling either homogeneous or differentiated products.
2. Barriers to entry: There are high barriers for a new seller to enter the market.
3. Homogeneous or differentiated products: Products may be homogeneous or highly differentiated.
4. Advertising and publicity: Both homogeneous and heterogeneous oligopoly is characterized by non-price competition in the form of advertising and publicity.
5. Price rigidity: There is price rigidity and hence, price stability within the market.
6. Constant struggle: Oligopoly markets are collusive or competitive. Competition consists of struggle of rivals against rivals.
7. Abnormal Profits: Profits in oligopoly markets may be abnormally high.
8. Interdependence: There is a high degree of interdependence between firms about fixing of price and determination of output.
9. Kinked demand curve : Firms in the oligopolistic market have a kinked demand curve for their products.

The example of oligopoly structures are supermarkets, banking industry, chemical, oil, medicinal drugs, broad casting, cement, automobile, and tobacco etc.,

9.9 MONOPOLISTIC COMPETITION

Monopolistic competition is a market situation where there are many sellers of a particular product, but the product of each seller is in some way differentiated in the minds of consumers from the product of every other seller. Product differentiation is the basic condition giving rise to monopolistic competition. Under the monopolistic competition, sellers are numerous but none of them is in a position to control a major part of the supply of the common commodity which all of them are offering for sale. But each seller differentiates his position of the supply of that commodity from the portions sold by other in such a way that buyers hesitate to shift their purchases from his product to that of another in response to price differences.

A wide range of consumer goods like toothpaste, soaps, cigarettes, radio, TVs, scooters, commercial vehicles, photo-copies, electronic type writers, etc., are subject to a large degree of product differentiation as means of attracting customers. If product differentiation persists over a long time, the business clearly derives some slight monopolistic advantage from having a unique product. So long as a consumer has an impression that the brands of product is different and superior to others, he will be willing to pay more for that brands than for any other brands of the same commodity. If a firm is able to create a brand loyalty through product differentiation, it gets a certain amount of pricing discretion. As regards sales promotion efforts, successful publicity campaigning may create such a lasting impression on consumer that they may continue to stick to the particular product even though the rival firm's product is better.

9.9.1 FEATURES OF MONOPOLISTIC COMPETITION

The following are the salient features of monopolistic competition:

- 1. Large number of sellers :** There are a large number of sellers in monopolistic competition and it becomes impossible for each seller to react every other seller's moves.
- 2. Large number of buyers.**
- 3. Product differentiation:** Product differentiation is the main feature in monopolistic competition. Each seller differentiates his/her product from others on some attribute. Hence the products in this market are not homogeneous but heterogeneous. This feature of product differentiation gives each seller the power to price his/her products differently from others. For example, while there is a large variety of toilet soap, a particular brand

of soap is priced differently from, the others. Though the product is the same, each seller places his product in the market as though it is unique and does not have any substitute. The product may be differentiated due to branding / packing also.

- 4. Free entry and exit:** There is no barrier for any kind, be a technical, legal, cost related for entry and exit to firms and industry.

9.9.2 DIFFERENCE BETWEEN PERFECT COMPETITION AND MONOPOLISTIC COMPETITION

The following table shows how the situation of perfect competition is different from monopolistic competition:

<i>Perfect Competition</i>	<i>Monopolistic Competition</i>
It is a myth	It is fact of life
Products are homogeneous	Products are differentiated
The price prevailing in the market is the same for all the products	There are different prices for differentiated products
Advertisement is not necessary	Advertisement is must to sustain in the market

9.10 CHECK YOUR PROGRESS

1. In _____ market goods are sold at uniform price :
 - a) Perfect Competition
 - b) Monopoly
 - c) Oligopoly
 - d) Duopoly

2. In _____ market there are two sellers of the commodity.
 - a) Perfect Competition
 - b) Monopoly
 - c) Duopoly
 - d) Oligopoly

3. In a perfectly competitive market _____ price of commodity prevails.
 - a) Different
 - b) Uniform

c) Very high

d) Very low.

Answers for Check Your Progress:

1. (a)

2. (c)

3. (b)

9.11 SUMMARY

Market economy pricing is conditioned by the market structure. There are many different market structures. Perfect competition is accorded great important as a market structure by the classical and neoclassical economists. Types of market structures formed by the nature of competition. Traditionally, the nature of competition is adopted as the fundamental criterion for distinguishing different types of market structures. The degrees of competition may vary among the sellers as well as the buyers in different market situations. The nature of competition among the sellers is viewed based on two major aspects: The number of firms in the market and the characteristics of products, such as whether the products are homogeneous or differentiated. Perfect competition and monopoly are the two extremes of the market situations. Other forms of market such as oligopoly and monopolistic competition fall in between these two extremes. Oligopoly and monopolistic competition are the market situations characterized by imperfect competition. In the real world, market is neither perfectly competitive nor a monopoly. The majority of imperfectly competitive producers in the real world produce goods, which are neither completely different nor completely the same. They produce the goods, which are similar to those produced by their rivals. This implies that the goods produced in the market are close substitutes. It follows that such producers must always be concerned about the manner in which the action of these rivals affects their own profits. This kind of market is know as ‘Monopolistic competition’ or group equilibrium.

9.12 KEYWORDS

Market : Any area over which buyers and sellers are in such close touch with one another, either directly or through dealers that the prices obtainable in one part of the market affect the prices paid in other parts.

Perfect Competition – Many sellers of a standardized product;

Monopolistic competition – Many sellers of a differentiated product;

Oligopoly – few sellers of a standardized or a differentiated product ;

Monopoly – a single seller of a product for which there is no close substitute.

Imperfect Competition : A market structure wherein individual firms exercise control over the price to a smaller or larger degree depending upon the degree of imperfection present in a case.

9.13 QUESTIONS FOR SELF STUDY

1. What do you mean by a Market? Explain its important features.
2. What is a perfect competition market? Describe its features
3. Differentiate between perfect and imperfect market.
4. What is monopoly? Explain its features. Is monopoly always good for the economy?
5. Do we find monopoly in the real world? What are the causes of monopoly?
6. Differentiate between perfect competition and monopolistic competition.

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UNIT - 10 EQUILIBRIUM OF FIRM AND INDUSTRY OUTPUT DECISION UNDER PERFECT COMPETITION

STRUCTURE:

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Marginal Revenue and its relation with Average Revenue
- 11.3 Conditions of the Equilibrium of the firm
- 11.4 Equilibrium of firm in the Short Run
 - 11.4.1 Equilibrium of firm in the Short Run: Firms getting Super –Normal Profits
 - 11.4.2 Equilibrium of firm in the Short Run : Firms getting normal profits
 - 11.4.3 Equilibrium of firm in the Short Run: Firms getting Losses
- 11.5 Equilibrium in the Long Run and Equilibrium of an Industry
- 11.6 Equilibrium of an Industry
 - 11.6.1 Conditions of an Industry's Equilibrium
 - 11.6.2 Short – Run Equilibrium of the Industry
 - 11.6.3 Long – Run Equilibrium of the Industry
- 11.7 Check your progress
- 11.8 Summary
- 11.9 Keywords
- 11.10 Questions for self study
- 11.11 References

10.0 OBJECTIVES

After studying this unit, you will be able to ;

- Analyse the concept of Equilibrium of the firm and Industry
- Understand the concept of Equilibrium of the firm in the Short run
- Explain the concept of Equilibrium of the Industry in the Long run

10.1 INTRODUCTION

Equilibrium indicates a situation in which there is a complete adjustment of the various forces operating there, and there is no inducement to change. The consumer is said to be in equilibrium, when he derives maximum satisfaction.

A firm is said to be in equilibrium when it has no incentive either to expand or to contract its output. A firm would not like to change its level of output only when its total profits are maximum. A rational entrepreneur will expand output if he thinks he can increase his total profits and he will contract his output if he thinks he can avoid losses and thus increase his total profits. Hence, making a maximum profit or incurring a minimum loss is an important condition of a firm's equilibrium.

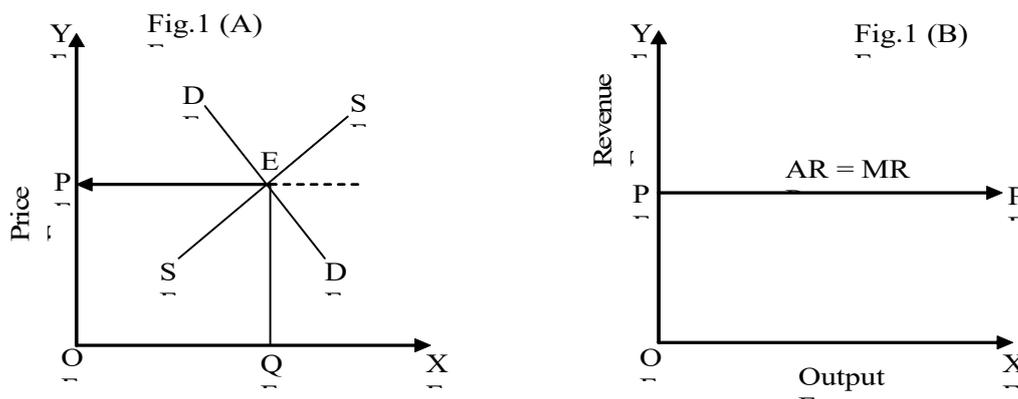
Meaning of the Firm : In the words of Waston, "A firm is a unit engaged in the production for sale at a profit and with the objective of maximizing the profit".

Meaning of Industry: Perfect competition refers to that situation of market in which there are numerous firms producing homogeneous products. A group of such firms is called **industry**.

Meaning of Firm's Equilibrium or Maximum Profit: A firm is in equilibrium when it is satisfied with its existing amount of output. A firm in equilibrium has no tendency either to increase or to decrease its output. The firm will be in this situation when either it will be earning maximum profit or incurring minimum loss. In the words of Hanson, "A firm will be in equilibrium when it is of no advantage to increase or decrease its output."

FIRM'S PROFIT MAXIMIZATION OR EQUILIBRIUM UNDER PERFECT COMPETITION

The perfectly competitive firm is a price taker, but what price does it take? It takes that price, which is set up by the industry. The equilibrium price in perfect competition is the price at which quantity demanded by all buyers in the market is equal to the quantity supplied by all sellers in the market. In other words, price is determined at the point where industry's demand curve intersects Industry's supply curve.



In fig. 1 (A) total demand curve DD intersects industry's supply curve SS at point E. Thus point E is the equilibrium point and OP is the equilibrium price. The individual firms must take this price as given fig. 1 (B) refers to firm's demand curve. The firm will have to sell all its output at the prevailing price OP. It may sell more units or less units, but it will charge OP price only. The firm can neither increase nor decrease this price; because price is determined by industry and not by firm. As such firm's demand curve (PP) will be parallel to OX – axis, or perfectly elastic signifying that the firm can sell any number of units at OP price. A competitive firm can sell one more unit of output without reducing the price it receives for its previous units, so total revenue will rise by an amount equal to the price. We know that rise in total revenue by selling one more unit is marginal revenue. Thus average revenue or price is equal to marginal revenue for the competitive firm. For example, if a firm is selling 10 units at a price of 5, total revenue is 50. If it sells 11 units at price of 5, as it can with perfectly elastic demand curve, total revenue rises from 50 to 55. Hence marginal revenue will be 5 (55 – 50), which is same as average revenue or price (MR=AR). Thus for a competitive firm the demand curve will represent both the average revenue curve as well as marginal revenue curve.

In short, the perfectly competitive firm must take the price as given. In maximizing profit therefore it can make only a decision about how much output it will produce at that price. The firm's decision

The firm's decision about the profit maximizing output can be studied with reference to two time periods viz. (i) Short run Equilibrium of the firm and (ii) Long run equilibrium of the firm.

10.2 MARGINAL REVENUE AND ITS RELATION WITH AVERAGE REVENUE

The equilibrium of the firm is usually discussed in terms of marginal cost and marginal revenue. Before the conditions of equilibrium of firm are explained, it is necessary to describe the concept of marginal revenue and its relation with average revenue.

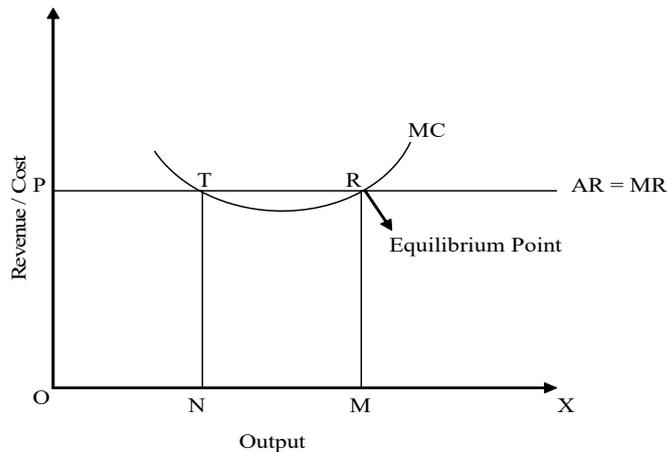
Average revenue and marginal revenue : Average revenue is the revenue per unit of the commodity sold. It is found by dividing total revenue by number of units sold. But, since different units of a commodity are sold at the same price in the market, average revenue equals the price at which the commodity is sold. Thus, average revenue means price. It is revenue for the seller and price for the consumer.

Marginal revenue at any level of the firms' output is the net revenue earned by selling an additional unit of the product. It is the additions to the total revenue that is earned by selling 'n' units of product instead of n-1 units, where n is any given number. Marginal revenue can also directly found by taking out the difference between the total revenue before and after selling the additional unit.

In a perfect competitive market, whatever the quantity produced and sold, the price would be the same. Hence, under perfect competition, $\text{price} = \text{AR} = \text{MR}$. Average revenue and marginal revenue would be the same in a perfect market.

Marginal cost is the additional cost incurred by a firm for producing one unit in addition to the total output. Marginal revenue is the additional revenue obtained by a firm by selling one more unit additionally. The total profits of a firm can be increased by expanding output as long as the addition to the total revenue is greater than the addition made to the total cost. That is, a firm increases its output so long as its marginal revenue is more than its marginal cost. The firm stops production, when $\text{MR} = \text{MC}$. Beyond this point, if production is expanded the MC would be greater than MR and the firm gets loss. Hence, the output is stopped only when $\text{MR} = \text{MC}$. The level of output where $\text{MR} = \text{MC}$ is the point of maximum profit. Hence the firm attains equilibrium position when $\text{MR} = \text{MC}$. At an equilibrium position the MC curve must cut MR curve from below. If the MC curve cuts MR curve from above, the firm has scope to increase its output as the MC falls. It is only with the upward sloping MC curve the firm attains equilibrium. While MC is rising, it cuts MR curve from below.

This can be understood with the help of Fig :2



In Fig.2, MC curve is cutting the MR curve at two points, namely, at T and R. At both these points $MC=MR$. But after the point T the MC is falling and lower than MR. Hence production need not be stopped at T. Beyond the point R, MC is greater than MR. Hence production cannot be made after R. Hence the output should invariably be stopped at point R, there MC is cutting MR from below. Hence R is the point of equilibrium.

10.3 CONDITIONS OF THE EQUILIBRIUM OF THE FIRM

Main conditions of the equilibrium of a firm are as under :

1. Maximum Profits : Profit of a firm is equal to the difference between its total revenue (TR) and total cost (TC). One of the conditions of the equilibrium of the firm is that its profit ($\text{profit} = TR - TC$) should be maximum.
2. Marginal cost should be equal to marginal revenue ($MC=MR$)
3. MC curve cuts MR curve from below.

The above conditions of equilibrium of a firm can be examined in two ways:

- 1.Total Revenue and Total Cost Approach
- 2.Marginal Revenue and Marginal Cost Approach.

A firm is in equilibrium when it is earning maximum profit. A firm's total profit can be estimated by the difference between total revenue and total cost e.g.

$$\text{Profit} = TR - TC$$

A firm is in equilibrium when it produces that amount of output at which the difference between total revenue and total cost, i.e., total profit, is maximum.

Thus we conclude that for a firm to be in equilibrium position, two conditions must be satisfied under perfect competition:

1. $MC=MR$; and
2. MC curve must cut MR curve from below at the equilibrium output.

10.4 EQUILIBRIUM OF FIRM IN THE SHORT RUN

The short run has been defined as a period of time sufficient to allow the firm to adjust its output by increasing or decreasing the amount of variable factors of production, but during which fixed factors of production cannot be altered. Thus, in the short run, the size and kind of plant cannot be changed, nor can new firms enter the industry.

In explaining the equilibrium of firm under perfect competition both in the short run and long run, we assume that all firms are working under identical cost conditions. This means that average cost and marginal cost curves are identical for all the firms. The entrepreneurs of all the firms are equally efficient. Further we assume that the factors of production used by the different firms are homogeneous and are available at given and constant prices.

10.4.1 EQUILIBRIUM OF FIRM IN THE SHORT RUN: FIRMS GETTING SUPER-NORMAL PROFITS

In the short run a firm may get either super-normal profits, losses or normal profits. All the three possibilities are discussed in the following lines:

Firms getting super-normal profits : In fig . 3, at point Q, $MC=MR$. OM is the equilibrium output and OP is the equilibrium price. RM is the average cost. The difference between average revenue and average cost is the profit per unit, i.e. QR ($MQ - MR$).

Therefore Total profits = Profits per unit X Total output , i.e. total profits = $QR * OM$

$$QR * SR (? . OM=SR) = PQRS.$$

Firm's Equilibrium Position under super Normal Profit

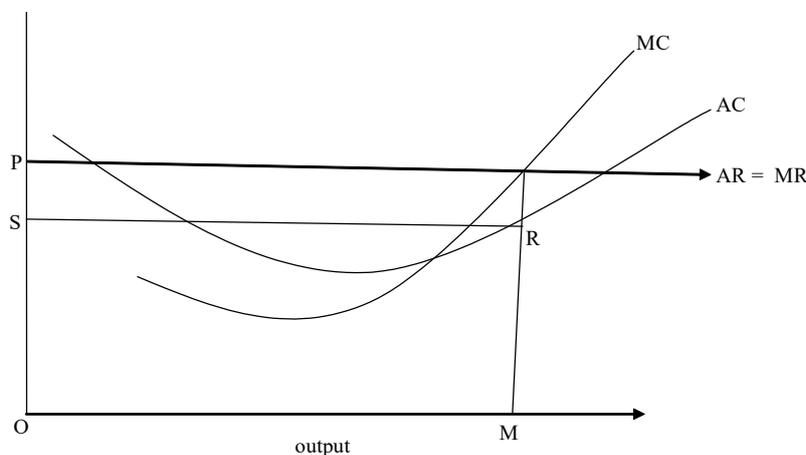


Fig 3

The area of the rectangle PQRS shows the super – normal profits that a firm can get. As all the firms are working under identical cost conditions, all firms must be making super – normal profits. As all the firms in the industry have identical cost curves with the firm represented in the figure, all would be making super – normal profits.

There will be a tendency for the new firms to enter the industry to compete away these super – normal profits. But the short run is not a period sufficient for the new firms to enter. Therefore, the existing firms will continue to earn super – normal profits at the price OP in the short period.

Thus, with price OP, all the firms in the industry will be in equilibrium at Q but industry, as a whole, will not be in equilibrium as there will be a tendency for the new firms to enter the industry.

10.4.2 EQUILIBRIUM OF FIRM IN THE SHORT RUN: FIRMS GETTING NORMAL PROFITS

Firms Getting Normal Profits : Firms get normal profits only when $AR=AC$. In Fig 4, ‘E’ is the point of equilibrium where $MC=MR$. OM is the equilibrium output and OP is the price. At ‘E’ the $AR=AC$. Hence firms must be making normal profits. (Normal profits are included in average cost curve). Since all the firms in the industry are making only normal profits, there will be no tendency either for the new firms to enter or for the existing firms to quit the industry.

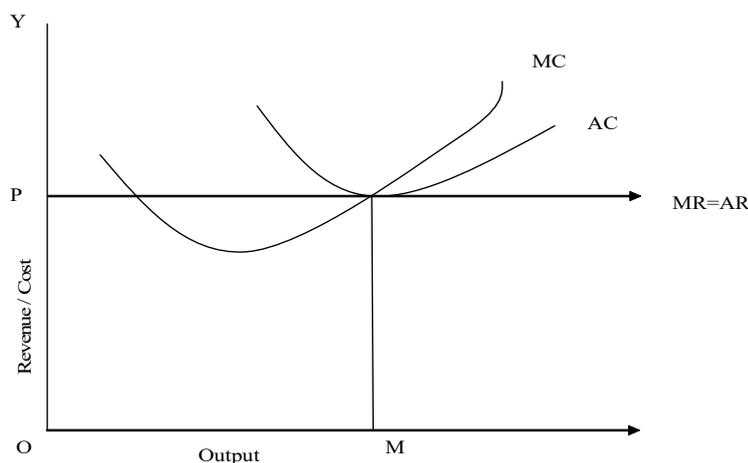


Fig . 4 : Firms equilibrium position under normal profits.

Thus, even in the short run, the industry will be in equilibrium with price OP and firms producing OM at point E. In other words, even in the short run, full equilibrium, i.e., equilibrium of all firms as well as of the industry as a whole, will be achieved with price OP and the firm producing at point E or output OM. But the attainment of full equilibrium in

the industry in the short run is a rare phenomenon. Very rarely the firms get normal profits in the short run.

10.4.3 EQUILIBRIUM OF FIRM IN THE SHORT RUN: FIRMS GETTING LOSSES

Firms getting losses : The inefficient firms may be getting losses in the short run. When $AC > AR$ the firm makes losses.

It can be seen in Fig. 5, that OM is the equilibrium output and OP is the price and MQ is the average cost which more than the average revenue. The difference is QE(MQ-ME) is the loss per unit.

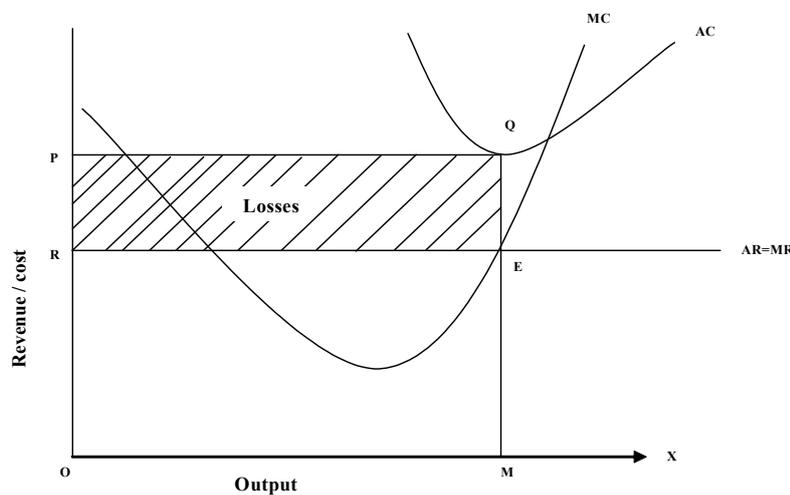


Fig no. 5 : Firm's equilibrium position under losses.

Therefore Total losses = Loss per unit * Total output

$$=QE * OM$$

$$=QE * RE = PQER$$

The rectangle PQER represents the total losses obtained by the firm.

Thus, the firm in the short run may make either super – normal profits, normal profits or losses. Now a question naturally arises as to why the firm continues operating if it is incurring losses. If it cannot leave the industry (because of short period), why does it not at least shut down to avoid losses?

Even if a firm is shut down, it will have to bear the fixed costs in the short run, because the short period is a period during which firms cannot alter their fixed capital equipment. Only variable cost can be avoided by stopping a production. It implies that when a firm is

closed down, its losses would be equal to the total fixed costs. Hence if losses are lesser than the fixed costs the firm cannot be closed down, as it can minimize the losses. That is, it will cover entire variable costs and part of the fixed cost. If losses are more than the total fixed costs the firm will shut down to avoid losses.

11.5 EQUILIBRIUM IN THE LONG RUN AND EQUILIBRIUM OF AN INDUSTRY

In the long run, the firm is said to be in equilibrium when the following two conditions are satisfied :

- (a) $MR = MC$ and
- (b) $AR = \text{Minimum AC}$.

These conditions can be understood with the help of Fig . 6

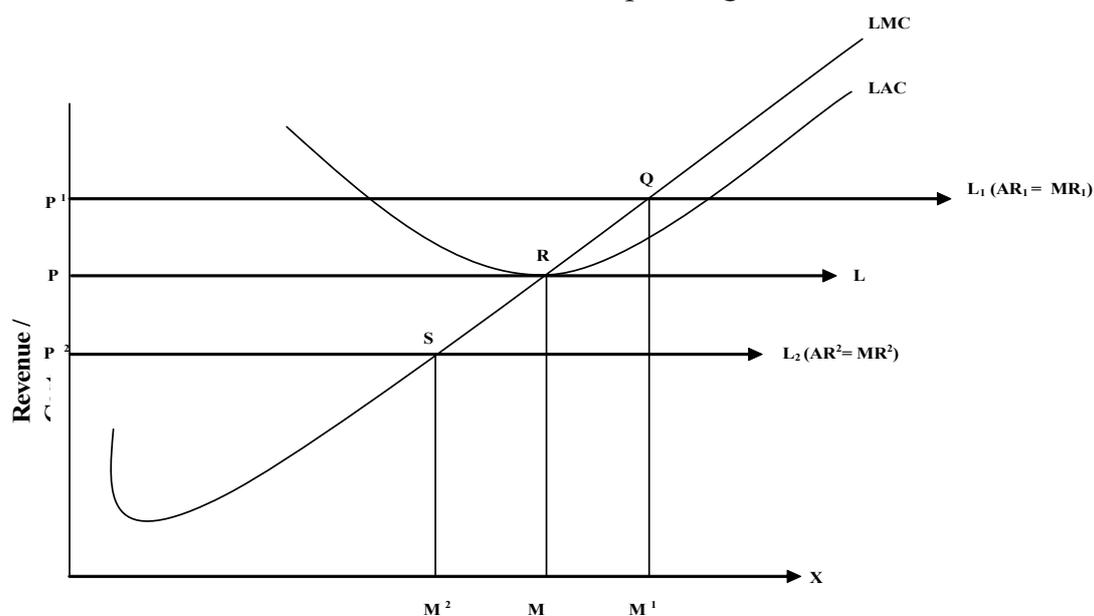


Fig 6 : Equilibrium position in the long run.

In Fig. 6, LAC is the long – run average cost curve and LMC is the long – run marginal cost curve. At price OP_1 the point of equilibrium would be Q ; where $AR > AC$. Hence the firm will be earning super – normal profits. Since all the firms are assumed to be identical, all would be earning super- normal profits. Hence, there will be incentive for the new firms to enter the industry. As a result, the price will be forced down to the level OP at which price; the firm is in equilibrium at R and is producing OM output.

At point R or equilibrium output OM , the price is equal to average cost, and hence the firm will be earning only normal profits (normal profits are included in average cost).

Therefore, at price OP, there will be no tendency for the outside firms to enter. Hence, the firm will be in equilibrium at OP price and OM output.

On the contrary, a firm under perfect competition cannot be in the long – run equilibrium at price OP_2 . Though the price OP_2 is equal to marginal cost at point S, or at output OM_2 but price OP_2 is lower than the average cost at this point and thus the firm will be incurring losses. Since all the firms in the industry are identical in respect of cost curves, all would be incurring losses. To avoid these losses, some of the firms will leave the industry. As a result, the price will rise to OP, where again the firms are making normal profits. When the price OP is reached the firms would have no further tendency to quit. Thus, we conclude that at price OP, the firm under perfect competition is in equilibrium in the long run when price = MC = Minimum AC.

Now, at price OP, besides all firms, being in equilibrium at output OM, the industry will also be in equilibrium, since there will be no tendency for new firms to enter or the existing firms to leave the industry, because all will be earning normal profits. Thus, at OP price, full equilibrium, i.e., equilibrium of all the individual firms and also of the industry, as a whole, is achieved in the long run under perfect competition.

10.6 EQUILIBRIUM OF AN INDUSTRY :

The group of firms producing homogeneous products is called industry. Such firms are found only under perfect competition. An industry is in equilibrium when it has not tendency to change, that is when no firms wish to leave it and no new firms are being attracted to it". New firms will have no tendency to enter an industry when the existing firms are earning only normal profits. In economics, normal profit refers to that minimum income which an entrepreneur must get for his work otherwise he will leave that industry. In other words, normal profit is the opportunity cost of his services. Normal profits of a firm are included in its total costs. Thus, when the firms of an industry earn only normal profits, no new firm will feel tempted to enter that industry as it will have no charm of earning super-normal profits. Likewise, existing firms will be under no compulsion to leave the industry as they have no fear of incurring losses. If new firms do not enter the industry and existing firms do not leave it, then industry will have no tendency either to expand or to contract. Such a situation is referred to as equilibrium of the industry.

10.6.1 CONDITIONS OF AN INDUSTRY'S EQUILIBRIUM

An industry may expand or contract in two situations :

1. When the existing firms of the industry increase or decrease their output
2. When new firms have a tendency to enter and the existing ones to leave the in

dustry. If both these situations have no tendency to change, there will be no tendency to expand or contract on the part of industry and so industry will be in equilibrium.

Thus, there are two conditions of an industry's equilibrium:

- 1. Constant number of firms :** An industry will be in equilibrium when the number of its firms remains constant. In this situation, no new firm will enter and no old firm will leave the industry.
- 2. Equilibrium of firms :** Another condition of an industry's equilibrium is that all firms operating in it are in equilibrium and have no tendency either to increase or to decrease their output.

10.6.2 SHORT – RUN EQUILIBRIUM OF THE INDUSTRY

The industry is in equilibrium at that price at which quantity demanded is equal to quantity supplied. But for industry to be in full equilibrium, in the short run, is very rare. Full equilibrium position is possible only when all firms earn just normal profit. But in the short – run, some firms may be earning super – normal profit and other may be incurring losses. Equilibrium of the industry is shown diagrammatically in Fig. 7.

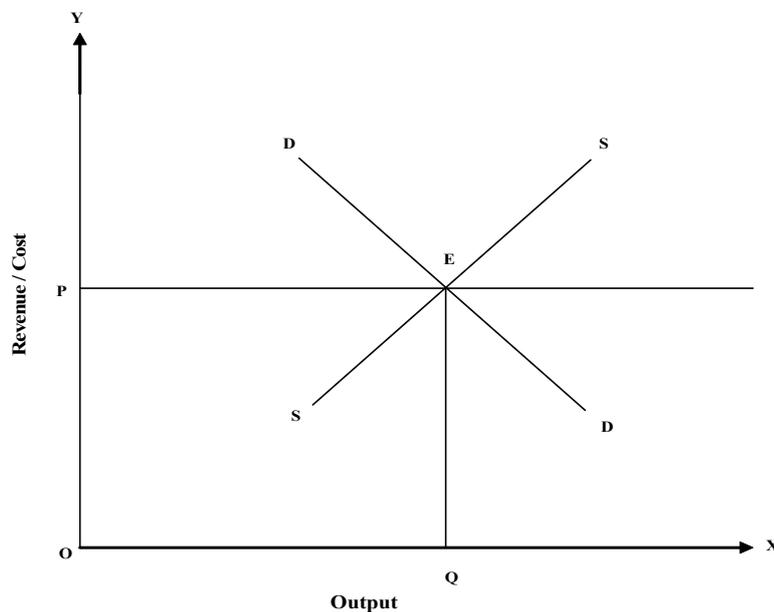


Fig 7 (A)

Fig 7(B)

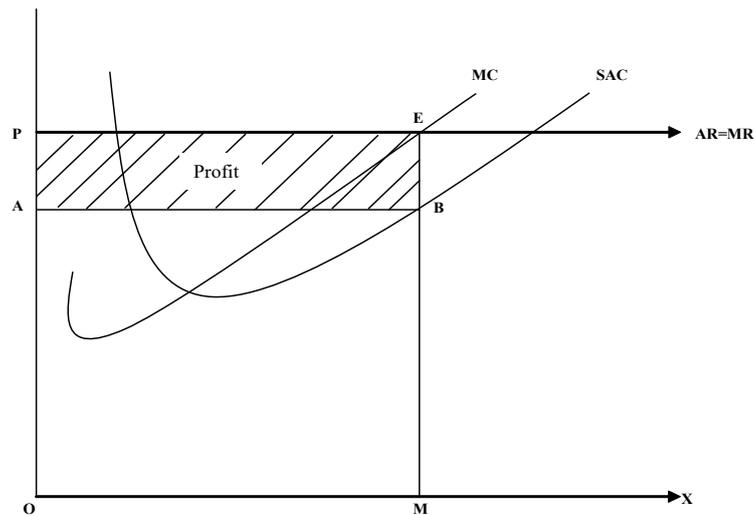
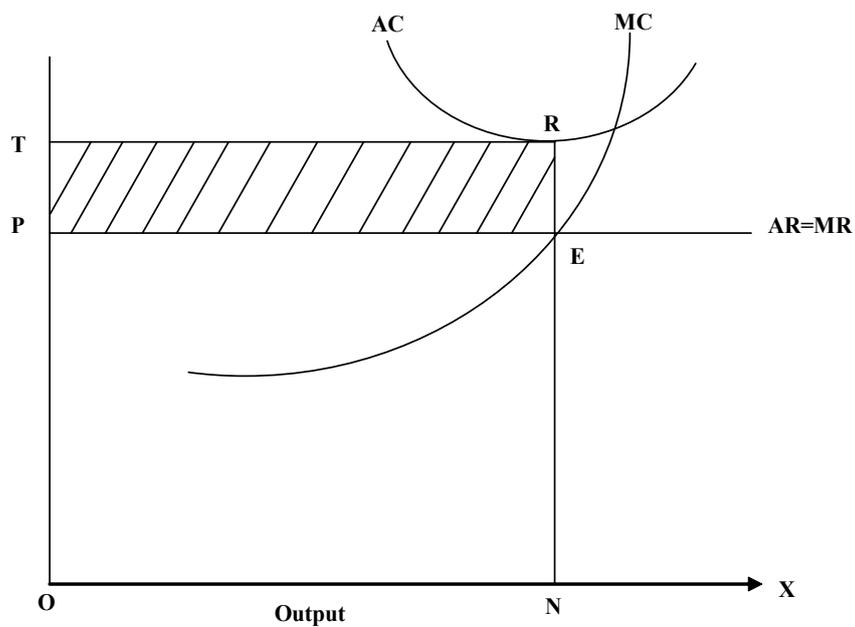


Fig 7 (C)



In fig 7(A) short-run equilibrium of the industry is shown. DD is the demand curve and SS the supply curve of industry. They both intersect at point E. So point E indicates equilibrium of industry. In this case OP is the equilibrium price and OQ is the equilibrium output. But it will not be full equilibrium of industry, if some firms are getting super normal profit and other are incurring losses.

In fig 7 (B) the firm is getting super-normal profit at the prevailing price OP as shown by ABEP shaded area.

In Fig 7 (C) firm is incurring losses at the prevailing price OP as shown by PERT shaded

area. In the long run firms suffering losses will leave the industry. On the other hand, firms earning super normal profit will expand their production capacity.

Besides, allurements of super-normal profit will attract new firms to enter the industry. Consequently, industry will be in equilibrium in the long run only if all firms are getting normal profit. In short, the industry is in equilibrium at that price at which the demand for the supply of its production are equal. But in the position of equilibrium of industry, the firms may earn super normal profit or incur losses. As such, industry is ordinarily not in full equilibrium in short period.

11.6.3 LONG – RUN EQUILIBRIUM OF THE INDUSTRY

Industry is in equilibrium in the long-run when the following two conditions are fulfilled

1. Each firm of the industry is in equilibrium, that is, its marginal cost is equal to marginal revenue and marginal cost cuts marginal revenue from below.
2. There is no tendency to change the number of firms, that is, when long-run average cost is equal to average revenue (Price).

$$LAC = AR$$

In this situation, firms will be earning only normal profits. No new firm will enter nor old one will leave industry. In the words of Koutsoyiannis, “With all firms in the industry being in equilibrium and with no entry or exit, the industry is in equilibrium”. Long – run equilibrium of the industry is explained diagrammatically in Fig. 8

Fig 8 (A)

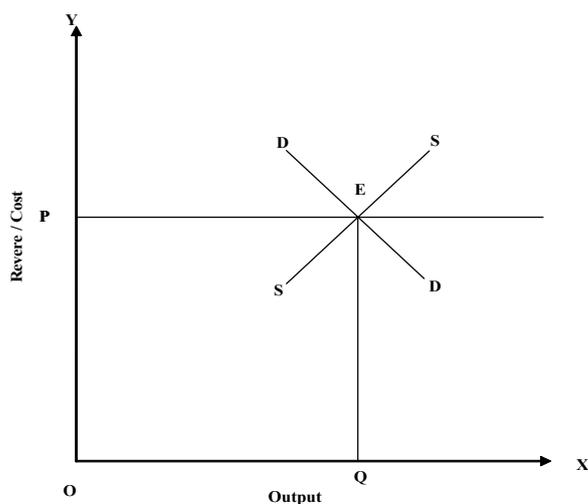
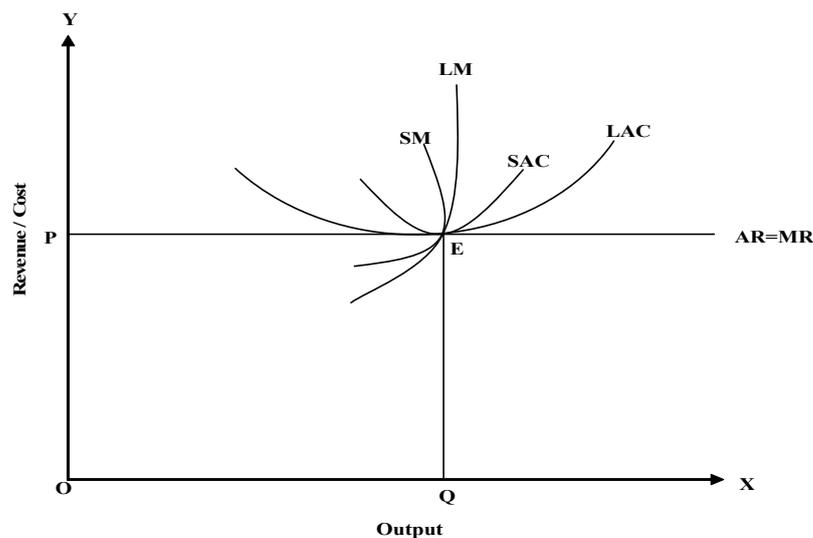


Fig 8 (B)



In fig 8 (A) industry's equilibrium is shown. DD is demand and SS is supply curve of the industry. Both intersect each other at point 'E'. Thus E is the equilibrium point of the industry, that determines OP as the equilibrium price.

In fig 8 (B) equilibrium of the firm is shown. It indicates that at OP price the firm is producing at minimum cost. Firms are getting only normal profits. At OP price firm is in equilibrium because: $LMC=SMC=MR$. This equality refers to the maximum profits earned by the firm. It fulfills the first condition of industry's equilibrium. The second condition of industry's equilibrium is also fulfilled at OP price; i.e. firm is earning normal profit at this price. Consequently, neither any new firm will have a tendency to enter nor any old firm will have a tendency to leave the industry, because $LAC=SAC=AR$.

This position of equilibrium is being expressed by point 'E' which represents minimum average cost. In short, as said by Leftwitch, "The existence of long-run industry equilibrium, requires long-run individual equilibrium at a no-profit, no-loss level of operation". An industry is in equilibrium when its firms are earning normal profit. Long-run equilibrium of the industry means that no new firm has a tendency to enter it nor any old firm has a tendency to leave it. This Will happen when firms do not expect any super normal profits nor do they fear any losses.

11.7 CHECK YOUR PROGRESS

1. Which of the following are features of perfect market ?
 - a) Many sellers and buyers
 - b) Homogeneous product

- c) Free entry and exit of firms
 - d) All the above
2. 'Long run' can be defined as a period of time
- a) Long enough to recover the cost of production of a good
 - b) Long enough to recover fixed costs
 - c) Long enough to enable producers of a good to change the quantities of all resources they employ.
 - d) In which equilibrium is established.

Answers for check your progress

1. (d)
2. Equilibrium under perfect competition : A firm is in equilibrium when it maximizes its profits. Maximum profits will occur where

10.8 SUMMARY

Industry and firms have to formulate different strategies for the determination of price and output in different market structures. Every firm aims at drawing such an output-price strategy that it should yield maximum profit and minimum loss. Such a situation is termed, the equilibrium of the firm.

A firm cannot always take independent decisions as regard its price and output. It is the market structure, under which a firm operates, that sets the tone for the formulation of output-price strategy.

Under a perfectly competitive market, the equilibrium price of a commodity is determined by the intersection of market demand curve and the market supply curve. Under the conditions of perfect competition an industry is the price-maker and the firm is the price – taker.

Under the perfect market condition, the price of the commodity is determined by the market forces. That is the forces of demand and supply. The price is determined by the demand and supply in equilibrium is known as the equilibrium price.

In the short run, there are some firms earning abnormal profits, a few other firms making normal profits or break even and still other firms suffering losses. However in the long run, all the firms in the industry will earn only normal profits, since their average cost of production is equal to average revenue.

10.9 KEYWORDS

Long period Supply Curve : Long period supply curve of an industry will depend upon whether it works under increasing, constant or decreasing cost conditions. Accordingly, the long period supply curve would slope upwards to the right, may horizontal or may slope downwards to the right.

Equilibrium of a firm : Under perfect competition, an individual firm is price – taker. It can produce any output and sell it at the prevailing market price. Therefore, for an individual firm, average revenue and marginal revenue are equal at all level of output.

Perfect Competition : When certain conditions prevail in the market, it is called a situation of perfect competition. These conditions are 1) Many buyers and sellers, 2) Homogenous product 3) Free entry and exit of firms, 4) Perfect knowledge to buyers and sellers, 5) perfect mobility of factors of production, 6) No transport cost.

10.10 QUESTIONS FOR SELF STUDY

1. Discuss the conditions of equilibrium of an industry.
2. Point out the main difference of the equilibrium of a firm and industry.
3. Draw diagrams to show short run equilibrium of a firm under perfect competition.
4. Explain short and long run equilibrium of an industry under perfect competition.
5. Write a short note on :
 - a) Equilibrium of firm in the Short Run: Firms getting Super –Normal Profits
 - b) Equilibrium of firm in the Short Run : Firms getting normal profits
 - c) Equilibrium of firm in the Short Run: Firms getting Losses

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UNIT - 11 : EQUILIBRIUM OF FIRM AND INDUSTRY OUTPUT DECISION UNDER SIMPLE MONOPOLY

Structure:

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Demand and Revenue Under Monopoly
- 11.3 Cost under Monopoly
- 11.4 Determination of Price and Equilibrium under Monopoly
 - 11.4.1 Total Revenue and Total Cost Analysis
 - 11.4.2 Marginal Revenue and Marginal Cost Analysis
- 11.5 Price and Equilibrium determination under monopoly or Short run Equilibrium
 - 11.5.1 Equilibrium of firm in the Short Run: Firms getting Super –Normal profits
 - 11.5.2 Equilibrium of firm in the Short Run: Firms getting Normal Profits
 - 11.5.3 Equilibrium of firm in the short run : Firms getting Minimum Loss
- 11.6 Price and Equilibrium determination under monopoly or Long –run Equilibrium
- 11.7 Check Your Progress
- 11.8 Summary
- 11.9 Keywords
- 11.10 Questions for self study
- 11.11 References

11.0 OBJECTIVES

After studying this unit, you will be able to ;

- Highlight the concept of Equilibrium of the firm and Industry under Monopoly
- Enumerate the concept Demand and Revenue Under Monopoly
- Understand Determination of Price and Equilibrium under Monopoly
- Analyze the concept of Equilibrium of the firm and industry in the Short run
- Explain the concept of Equilibrium of the firm and Industry in the Long run

11.1 INTRODUCTION

Monopoly is that situation of market in which there is a single seller of a product. Price –output determination under monopoly is also an analysis of the equilibrium of the monopoly firm as well as the monopoly industry. The aim of the monopolist is to maximize his profits. But unlike his counterparts in the competitive market, he is not content merely with normal profits. He wants to earn super – normal profits. Therefore, he adjusts his production in such a way what he is able to get maximum net profits. He can do so only at that output and at that price at which marginal cost is equal marginal revenue, (which is the general principle of equilibrium).

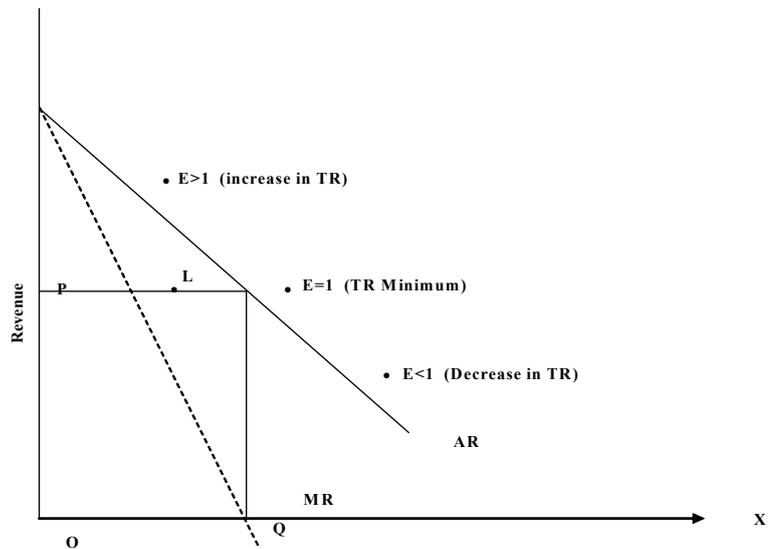
In order to find out the equilibrium price and output under monopoly, it is necessary for us to analyze the demand and cost curve of the monopoly firm.

Definition : According to Koutsoyiannis, “Monopoly is a market situation in which there is a single seller, there are no close substitutes for commodity it produces, there are barriers to entry”.

11.2 DEMAND AND REVENUE UNDER MONOPOLY

In a monopoly situation, there is no difference between firm and industry. Accordingly, under monopoly situation, firm’s demand curve also constitutes industry’s demand curve. Demand curve of the monopolist is also average revenue (AR) curve. It slope downward. It means if the monopolist fixes high price, the demand will shrink. On the contrary, if he fixes low price, the demand will expand. Under monopoly, average revenue and marginal revenue curves are separate from one another. Both slope downwards.

Fig 1 shows average revenue (demand) curve and marginal revenue curve. Both are sloping downward. Marginal revenue curve is below average revenue (or demand) curve.



Following facts come to light as a result of negative AR and MR :

1. Demand rises with fall in price (AR), Hence, by lowering the price, a monopolist can sell more units of the commodity.
2. At point ‘N’, total revenue will be maximum, because total revenue is obtained by multiplying quantity sold by price i.e $TR = P * Q$
3. Average revenue is another name of price per unit i.e., $P=AR$
4. With fall in price, both AR and MR fall, but fall in MR is more. Rate of fall in MR is usually more than rate of fall in AR.
5. Average revenue is never zero, but marginal revenue may be zero or even negative.

In fig. 1, AR is a linear demand curve, slope of MR curve is twice the slope of AR curve, because $PL=LN$. At point ‘N’, total revenue (TR) is maximum because marginal revenue (MR) at point Q is zero.

At OP price, the monopolist will produce OQ quantity of output, because this price affords him maximum total revenue. At OP price level, total revenue is OPNQ or OALQ. Area below MR curve is always equal to total revenue (TR).

11.3 COST UNDER MONOPOLY

Under monopoly, shape of different cost curves is exactly like that under perfect competition. Fixed Cost (FC) curve is parallel to OX – axis and average fixed cost (AFC) curve is rectangular hyperbola. Average Variable Cost (AVC) curve, marginal cost (MC) curve and average cost (AC) curve are U-shaped. Whereas, marginal cost curve is the supply curve of the firm under perfect competition and marginal cost is equal to price (average

revenue) in long-run equilibrium under perfect competition, but under monopoly marginal cost curve is not the supply curve and price (average revenue) is higher than marginal cost. It may also be noted that a monopolist is not obliged to sell a given amount of the commodity at a given price. If he fixes the price, then how much quantity he will have to supply at that price, will be left to the decision of the buyers. If buyers demand more, he will have to supply more. If buyers demand less, he will have to supply less. Accordingly, under monopoly, the concept of supply curve becomes meaningless.

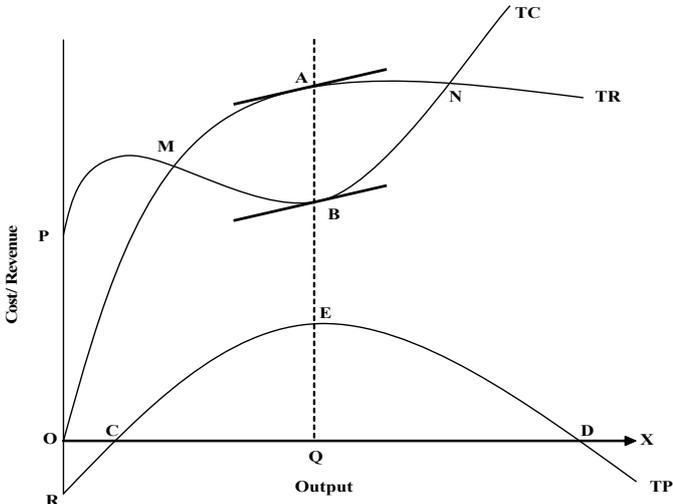
11.4 DETERMINATION OF PRICE AND EQUILIBRIUM UNDER MONOPOLY

A monopolist will so determine the price of a product as to get maximum profit. A monopolist is in equilibrium when he produces that amount of output which yields him maximum total profit. A monopolist is also in equilibrium in the short-period when he incurs minimum loss. Under monopoly, price and equilibrium are determined by two different approaches.

1. Total Revenue and Total Cost Analysis
2. Marginal Revenue and Marginal Cost Analysis

11.4.1 TOTAL REVENUE AND TOTAL COST ANALYSIS

Monopolist can earn maximum profit by selling that amount of output at which difference between total revenue and total cost is maximum. By fixing different prices or by changing the supply of the product, a monopolist tries to find out that level of output at which the difference between total revenue and total cost is maximum, that is, total profit is maximum. That amount of output at which a monopolist earns maximum profit will constitute his equilibrium situation. It is explained with the help of Fig 2 .



In this figure, TC is total cost curve and TR total revenue curve. TR curve begins from point of origin O, meaning thereby that at zero output, total revenue too will be zero. But total cost (TC) curve begins from P meaning thereby that even if the firm discontinues its production temporarily, still it will have to bear fixed cost shown by OP. Total profit is represented by TP curve. It begins from point R, signifying that initially firm is faced with negative profits. Fig . 2 shows that as the firm increase its production, total revenue is also increasing. However, in the beginning total revenue is less than total cost. Thus, RC portion of TP curve indicates that the firm is incurring losses. At point M, total revenue is equal to total cost (TR=TC), meaning thereby that firm is in no-profit and no-loss situation as is also indicated by point C of TP curve. Point M is called 'Break even point'. When firm produces more than point M, then its total revenue will be exceeding its total cost (TR>TC). TP curve also slopes upwards from point C onwards. It indicates that firm is earning profit. When TP curve will reach its highest point 'E', then the firm will be earning maximum profits. This amount of output (OQ) will be called equilibrium output.

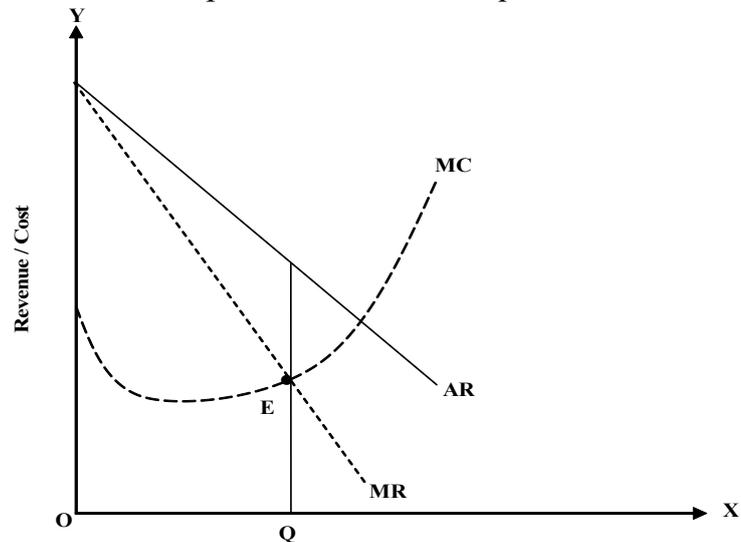
If the firm produces more than the equilibrium output then the difference between TR and TC curves will narrow down and at point N both these curves will intersect each other, that is, total revenue will become equal to total cost. It means the profit of the firm will go on diminishing and at the said point the firm will be in no-profit and no-loss situation, as is indicated by point 'D' on TP curve. Thus point 'N' is also called 'Break even point'. If the firm produces more than this, then TR will be less than TC and the firm will incur losses. In short, the firm will earn maximum profit at point E. In order to know the maximum profit of the firm, tangents are drawn to TR and TC curves. The points at which tangents are parallel, their distance is maximum. In the above figure, tangents are parallel at points 'A' and 'B' which also indicate maximum distance between TR and TC. In this situation, the firm will earn maximum profit as is clear from point E on TP curve. This approach of finding monopoly price and equilibrium is known as Trial and Error Method, because in this method, the monopolist, by fixing different prices, calculates as to which particular price will yield him maximum profit and equilibrium position.

11.4.2 MARGINAL REVENUE AND MARGINAL COST ANALYSIS

In case of monopoly, one can know about price determination or equilibrium position with the help of marginal revenue and marginal cost analysis. According to this analysis, a monopolist will be in equilibrium when two conditions are fulfilled, namely,

- i) $MC = MR$
- ii) MC curve cuts MR curve from below.

A monopolist earns maximum profit when he is in equilibrium.



It is explained with the help of Fig.3. In this fig. output is shown on OX – axis and cost/revenue on OY – axis. MC is marginal cost curve. AR and MR are average revenue and marginal revenue curves. Point ‘E’ is an equilibrium point where $MC=MR$ and MC curve cuts MR curve from below. OQ is the equilibrium output.

Price and equilibrium determination under monopoly are studied with reference to two time periods. (A) Short Period and (B) Long period.

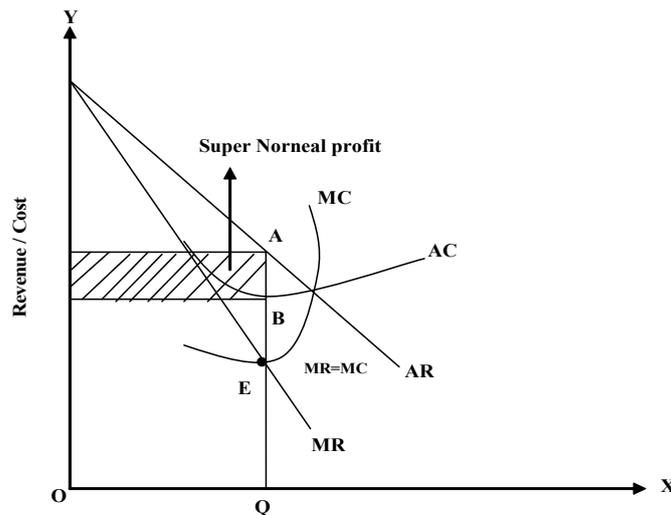
11. 5 PRICE AND EQUILIBRIUM DETERMINATION UNDER MONOPOLY OR SHORT RUN EQUILIBRIUM

Short – run refers to that period in which is so short that a monopolist cannot change fixed factors, like machinery, plant, etc.,. Monopolist can increase his output in response to increase in demand by changing his variable factors. No doubt fixed factors will also be utilized to their maximum capacity to increase the output. Similarly, when demand decreases, the monopolist will reduce his output by reducing variable factors and by slowing down the intensive use of fixed factors. A monopolist will be in equilibrium when he produces that amount of output at which (i) Marginal cost is equal to marginal revenue and (ii) Marginal cost curve cuts marginal revenue curve from below. A Monopolist in equilibrium may face any of the three situations in the short period, viz.,

- (1) Super Normal Profit,
- (2) Normal profit and
- (3) Minimum Loss

11.5.1 EQUILIBRIUM OF FIRM IN THE SHORT RUN : FIRMS GETTING SUPER-NORMAL PROFITS

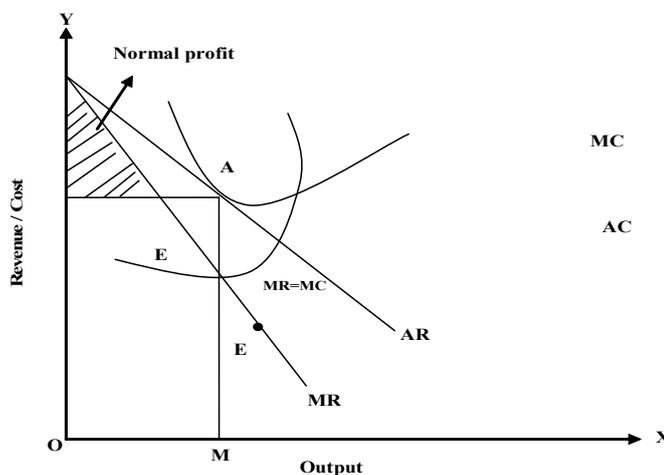
If the price (AR) fixed by the monopolist in equilibrium is more than his average cost (AC), then he will get super normal profit. The monopolist will produce upto the extent where $MC=MR$. This limit will indicate equilibrium output. If the price of equilibrium output is more than average cost ($AR > AC$) then the monopolist will earn super normal profit. It is shown in Fig. 4



In this figure, the monopolist will produce OM units of output and sell it at AM price; which is more than average cost BM by AB per unit. ($AM - BM = AB$). Thus, in this situation the total super normal profit of the monopolist will be $ABDC$.

11.5.2 EQUILIBRIUM OF FIRM IN THE SHORT RUN : FIRMS GETTING NORMAL PROFITS

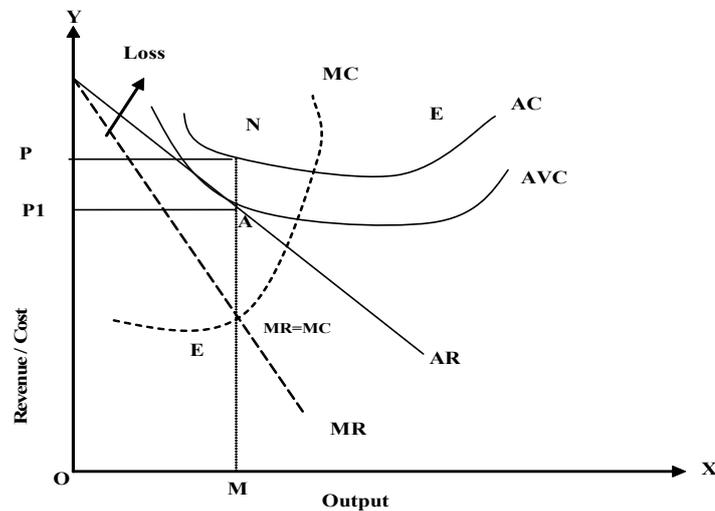
If in the short run equilibrium ($MC=MR$), the monopolist price (AR) is equal to its average cost (AC), i.e. $AR = AC$, then he will earn only normal profit.



Equilibrium of the monopoly firm in the short –run is shown in Fig.5. In this figure, the firm is in equilibrium at point E, where $MC=MR$ and OM is the equilibrium output. At this output, average cost (AC) curve touches average revenue (AR) curve at point A. Thus, at point ‘A’ price OP (AM) is equal to the average cost (AM) of the product. Monopoly firm, therefore earns only normal profit in equilibrium situation, as at equilibrium output its $AC=AR$.

11.5.3 EQUILIBRIUM OF FIRM IN THE SHORT RUN : FIRMS GETTING MINIMUM LOSS

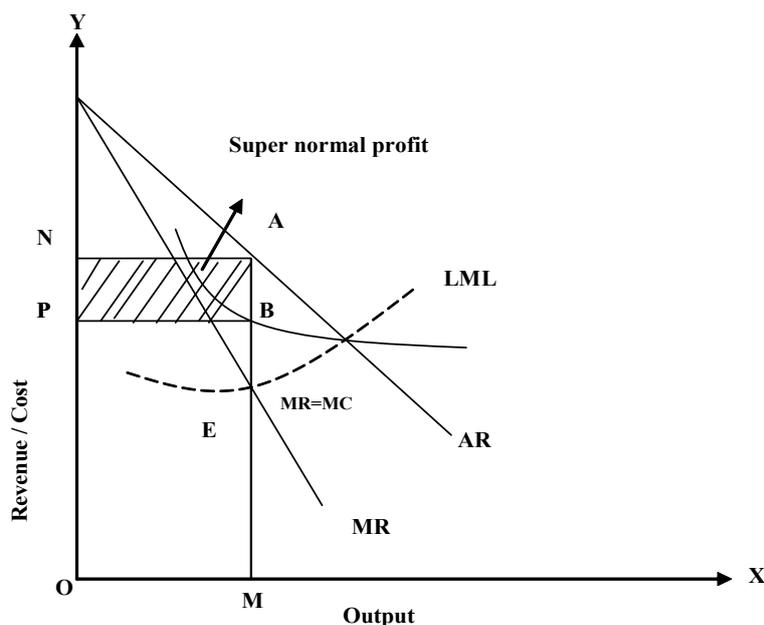
In the short run, the monopolist may incur loss also. If in the short –run price falls due to depression or fall in demand, the monopolist may continue his production so long as the low price covers his average variable cost (AVC). In case the monopolist is obliged to fix a price which is less than average variable cost, then he will prefer to stop production. Accordingly, a monopolist in equilibrium, in the short period, may bear minimum loss equivalent to fixed costs. In this situation, equilibrium price (AR) is equal to average variable cost (AVC) and the monopolist bears the loss of fixed costs. The monopolist will have to bear this loss even if he chooses to discontinue production in the short period. Thus, minimum loss = $AC-AVC$. This situation of equilibrium is expressed in Fig. 6.



According to this figure, the monopolist is in equilibrium at point E, where $MC=MR$ and produces OM output. The price of equilibrium output OM is fixed at OP_1 (AM). At this price, average variable cost (AVC) curve touches AR curve at point A. It means that the firm will get only average variable cost from the prevailing price. The firm will bear the loss of fixed costs, or AN per unit. The firm will bear total loss equivalent to NAP_1P as shown by the shaded area. It will constitute minimum loss to the firm. If the monopolist is obliged to fix a price lower than OP_1 , he would prefer to discontinue production.

11.6 PRICE AND EQUILIBRIUM DETERMINATION UNDER MONOPOLY OR LONG - RUN EQUILIBRIUM

In the long-run, the monopolist will be in equilibrium at a point where his long-run marginal cost is equal to marginal revenue ($LMC = MR$). In the long run, because of sufficiently long period at the disposal of the monopoly firm, all costs can be varied and supply can be increased in response to increase in demand. In the short run, equilibrium price can be more than, equal to or less than the average cost, but in the long-run, price (AR) is more than the long –run average cost. If price is less than long-run average cost, the monopolist would like to close down the unit rather than suffer the loss. In the long-run, a monopolist earns super normal profit. Monopoly firm in the long-run is not contented with normal profit alone, as the firms under perfect competition do, rather it is in a position to earn super normal profit. Thus, in the long-run the monopolist will fix the price in such a way as to earn super normal profit. Super –normal profit refers to a situation where $AR > LAC$.



Long – run equilibrium of the monopolist is explained with the help of Fig. 7. In this figure, point E indicates the equilibrium of the monopolist. At point E, $MR = LMC$, hence OM is the equilibrium output and ON is the equilibrium price. BM is the long –run average cost. Price (average revenue) AM being more than long-run average cost BM ($AR > LAC$), the monopolist will get super normal profit. Accordingly, the monopolist earns ($AM - BM = AB$) super normal profit per unit. His total super normal profit will be ABPN as shown by shaded area.

11.7 CHECK YOUR PROGRESS

1. Under monopoly AR and MR curves are
 - (a) Horizontal
 - (b) Vertical
 - (c) Downward sloping
 - (d) None of the above
2. Under monopoly when there is short period equilibrium, the firm will have
 - (a) Profits
 - (b) Losses
 - (c) Profits or losses
 - (d) None of the above
3. A Monopolist reaches Equilibrium when
 - (a) His output is maximum
 - (b) He charges high price
 - (c) His marginal cost to equal to marginal revenue
 - (d) His average cost is minimum
4. Which of the following are the steps to control monopolies?
 - (a) Nationalization
 - (b) Anti – monopoly legislation
 - (c) Consumer boycott
 - (d) All the above
5. Monopoly implies which of the following conditions?
 - (a) Single seller
 - (b) Seller has considerable control over price
 - (c) Aim of the seller is maximum profits
 - (d) All the above

Answers for Check your progress

1. (c)
2. (c)
3. (c)
4. (d)
5. (d)

11.8 SUMMARY

Features of monopoly are – single seller, no substitute for his product and no entry of firm. Monopolist always aims at abnormal profit. Monopolist always aims at abnormal profit. Monopolies created by factors like control over raw materials, patents copy rights and small market. Monopoly price is highest in economic theory. It is fixed by the monopolist based on MC and elasticity of Demand. $AR > MR$. Both curves will be falling. Demand curve will also be falling curve. The conditions for short period and long period equilibrium under monopoly are (a) $MC = MR$ (b) MC Curve cuts MR curve from below. When there is short period equilibrium a monopolist will have profits or losses. But in the long run monopolist will have profits or losses. But in the long run a monopolist must earn abnormal profit otherwise he will leave the market.

The term pure monopoly means an absolute power of a firm to produce and sell a product that has no close substitute. In other words, a monopolized market is one in which there is only one seller of a product having no close substitute. The cross elasticity of demand for a monopoly product is either zero or negative. A monopolized industry is a single-firm industry. Firm and industry are identical in a monopoly setting. In a monopolized industry, equilibrium of the monopoly firm signifies the equilibrium of the industry. There is no certainty that a monopoly firm will always earn an economic or supernormal profit. Whether a monopoly firm earns economic profit or normal profit or incurs loss depends on its cost and revenue conditions, potential competitors and government policy in respect of monopoly. The decision rules regarding optimal output and pricing in the long-run are the same as in the short run. In the long – run, however, a monopolist gets an opportunity to expand the size of its firm with a view to enhance its long-run profits. The expansion of the plant size may, however, be subject to such conditions, as (a) Size of the market (b) expected economic profit and (c) risk of inviting legal restrictions.

11.9 KEYWORDS

Monopoly : Means a market in which the supply of a commodity or service is controlled by a single seller. (Mono means single, poly means seller)

Monopoly price : While price under perfect competition is lowest, monopoly price is highest. It is fixed by the monopolist based on marginal cost and nature of elasticity of demand. AR is greater than MR. Under monopoly, both AR and MR curves are downward sloping curves (negative slope). Therefore demand curve of the monopolist is also downward sloping.

Twin conditions for short period Equilibrium are : a) $MC = MR$, b) MC curve cuts MR curve from below.

Long run equilibrium under monopoly : The conditions of equilibrium are same as short period equilibrium. The condition is long run

11.10 QUESTIONS FOR SELF STUDY

1. Define Monopoly and explain the determination of price and output under monopoly in the short period.
2. Explain and illustrate the determination of price under monopolistic competition in the short – run and the long – run.
3. Explain Equilibrium of firm in the Short Run when Firms getting Minimum Loss.
4. Explain Equilibrium of firm in the Short Run when Firms getting Normal Profits.

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UNIT – 12 EQUILIBRIUM OF FIRM AND INDUSTRY OUTPUT DECISION UNDER MONOPOLISTIC COMPETITION

STRUCTURE:

- 12.0 Objectives
- 12.1 Introduction
- 12.2 Monopolistic Competition and Imperfect Competition
- 12.3 Revenue and cost curves under monopolistic competition
- 12.4 Short term equilibrium of the firm under Monopolistic Competition
- 12.5 Long –term equilibrium of the firm under Monopolistic competition
- 12.6 Group equilibrium under monopolistic competition
- 12.7 Check your progress
- 12.8 Summary
- 12.9 Keywords
- 12.10 Self assessment questions
- 12.11 References

12.0 OBJECTIVES

After studying this unit, you will be able to ;

- Explain the concept of Monopolistic Competition and Imperfect Competition
- Enumerate the concept of Revenue and Cost curves under monopolistic Competition
- Understand Determination of Price and Equilibrium under Monopolistic competition
- Examine the concept of Equilibrium of the firm and industry in the Short run

12.1 INTRODUCTION

So far we have studied two extreme situations of the market; namely perfect competition and monopoly. But the real life situation is the mid-way between these two extremes. This is Imperfect Competition. In economics, imperfect competitive market situation became a subject of study only after 1933, when Mrs. Joan Robinson, published her book, “The Economics of Imperfect Competition” in England. Imperfect competition is a wide term that includes, the following situations of market : (1) Monopolistic Competition, wherein the number of sellers is quite large; (2) Oligopoly , wherein the sellers are few in number; (3) Duopoly, where there are only two sellers. In this unit we will learn Equilibrium of firm and industry output decision under Monopolistic competition.

12.2 MONOPOLISTIC COMPETITION AND IMPERFECT COMPETITION

In the preceding chapter, we were concerned with the analysis of forces determining price under the two extreme situations, namely, that of Perfect Competition on the one hand, and of pure monopoly on the other. In actual life, it is almost impossible to discover a single commodity which is exchanged under conditions of perfect competition, and it is equally difficult to discover examples of pure monopoly. The reality, however, is to be found somewhere between the two extreme situations. The large majority of markets in real life display the characteristics of both monopoly as well as competition; in some, the monopoly element predominates, while in others, competition holds away. Such market situations, where neither pure monopoly nor perfect competition prevails, are referred to by the economists as imperfectly competitive markets. In other words, imperfect competition is that market situation which lies between the two extremes of perfect competition and pure monopoly. It implies imperfection in perfect competition. In other words, imperfect competition prevails where any of the conditions of perfect competition

is absent. Imperfect competition is a very wide term and includes a great variety of market forms, ranging from near monopoly at one extreme to nearly perfect competition at the other.

12.3 REVENUE AND COST CURVES UNDER MONOPOLISTIC COMPETITION

The average revenue curve (or, demand curve) of a firm under monopolistic competition is neither perfectly elastic (as under perfect competition) nor rigidly inelastic (as under monopoly). In other words, the average revenue of the firm is neither a horizontal straight line as under perfect competition nor a downward sloping steep line as under monopoly. Why is it that the firm under monopolistic competition does not have a horizontal average curve? The reason is that under monopolistic competition the firm sells a slightly differentiated product (unlike the homogeneous product sold under perfect competition) having close though not perfect substitutes, and there are also consumer preference vis-a vis the product. As such, the firm cannot sell unlimited quantities of the product at the established price. Consequently the average revenue curve of the firm cannot be perfectly elastic or a horizontal line. In the same manner, the average revenue curve of the firm under monopolistic competition cannot be steep like the average revenue curve of a monopoly firm. The reason is that the monopoly firm produces a commodity for which there are no substitutes at all, while the firm under monopolistic competition sells a product for which there are close substitutes available in the market. Consequently, the demand for the product of the firm under monopolistic competition is much more elastic than that of a monopoly firm.

12.4 SHORT – TERM EQUILIBRIUM OF THE FIRM UNDER MONOPOLISTIC COMPETITION

Before we discuss short – term equilibrium of the firm under monopolistic competition, we would like to emphasize one important point with regard to profits earned by the firm in question. If the firm earns abnormal profits by bringing out a new and popular product, it will have to be very alert if it wants to continue these profits. The reason is that the existence of abnormal profits will serve as a temptation to other firms in the same group to bring out closely similar products and compete away the abnormal profits of the firm in question.

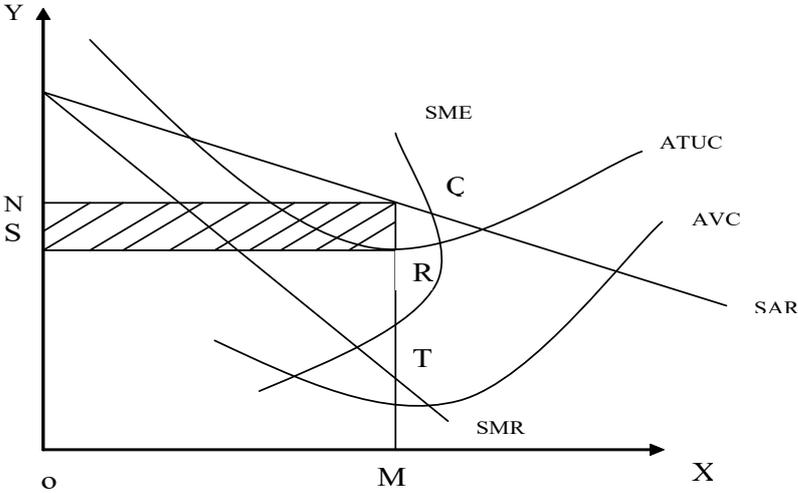
It, therefore, follows that in monopolistic competition any abnormal profits earned by a firm will tend to be competed away in the long period. In the short run, of course, a firm under monopolistic competition may be able to earn abnormal profits because other firms are not in a position to bring out closely similar products in that period. Nor can new firms

enter the group during the short period. In the short period, therefore, the abnormal profits may exist, but in the long period they are bound to be competed away by other firms. The result will be that in monopolistic competition the long period equilibrium position will be one where the individual firm earns only normal profits.

According to Prof. Chamberline, the firm under monopolistic competition has a wider range of decisions to make than under perfect competition. The firm may vary its price and with it, its sales and output; it may vary its price and with it, its sales and output; it may vary the quality of its product and may engage in sales – promotion activities (advertisement, publicity propaganda, etc.,).

In the present section, we shall confine ourselves to a study of the price- output adjustments of the firm in the short run with the objective of earning maximum profits.

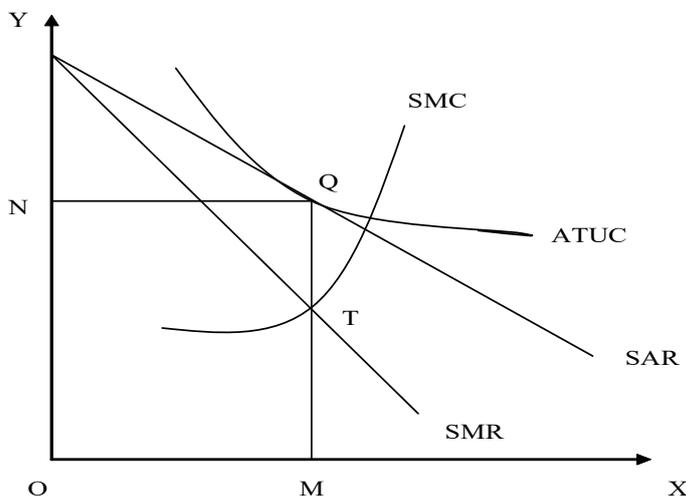
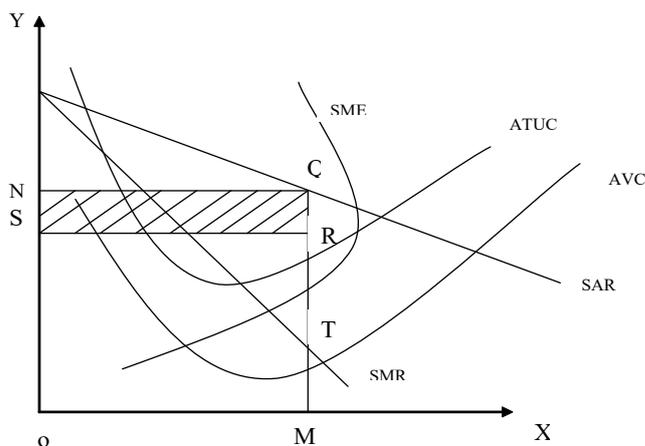
As in other market forms, the firm under monopolistic competition attempts to maximize its profit. It will, therefore, choose that price and level of output at which it will be able to secure maximum amount of profit. This equilibrium position is indicated by the equality of marginal revenue and marginal cost.

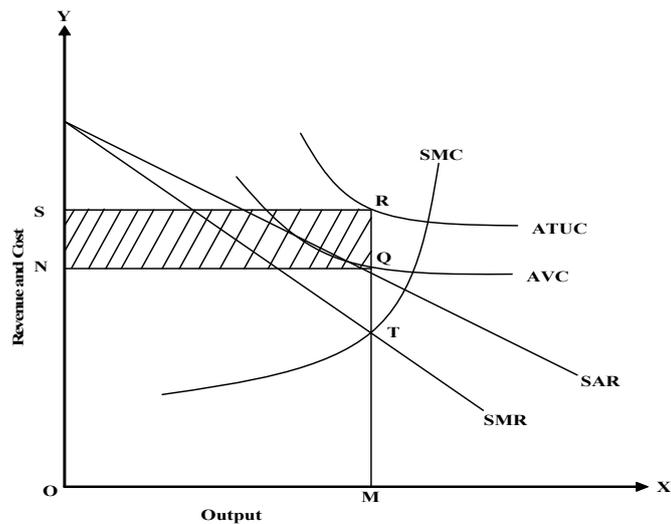


In the short period, the firm under monopolistic competition will have average fixed cost, average variable cost, average total unit cost and the marginal cost. But in the long run, the firm will have only its average total unit cost and its corresponding marginal cost. We shall first represent the short period equilibrium of the firm with the help of revenue and cost curves. In this diagram SAR is the short run average revenue curve. SMR is its corresponding short-period marginal revenue curve. AVC is the average variable cost curve, while ATUC is the average total unit cost curve. SMC is the short period marginal cost curve. The firm is in equilibrium at T, because MR and MC are equal at this point. OM is the

equilibrium output and QM (or ON) is the profit maximizing price. The firm is earning an excess profit indicated by the shaded area $NSRQ$. As pointed out earlier, the firm under monopolistic competition can earn excess or abnormal profit in the short period, though in the long period such profits tend to disappear, and only normal profits are earned by the firm. It should be noted here that we have taken only one firm out of hundreds which got to constitute a monopolistically competitive industry. The price charged and the quality offered by this firm may not be identical with the prices and qualities of other firms. Old and well-established firms will generally charge higher prices, while new and young firms will be content to charge lower prices. The costs of the various firms will also be different. Larger firms will have lower average costs, while the smaller firms' average costs may be higher. In the short run, it is possible for some firms to earn abnormal profits, for some to earn normal profits, while some may incur even losses.

These three possibilities under monopolistic competition have been depicted here diagrammatically





In Diagram (A), the firm is earning an abnormal profit indicated by the shaded area NSRQ; in diagram (b) the firm is earning only normal profit (because QM is not only the average revenue or price, it is also the average cost); in diagram (c), the firm is incurring a loss indicated by the shaded area NSRQ (because the average revenue or price QM is lower than the average cost RM).

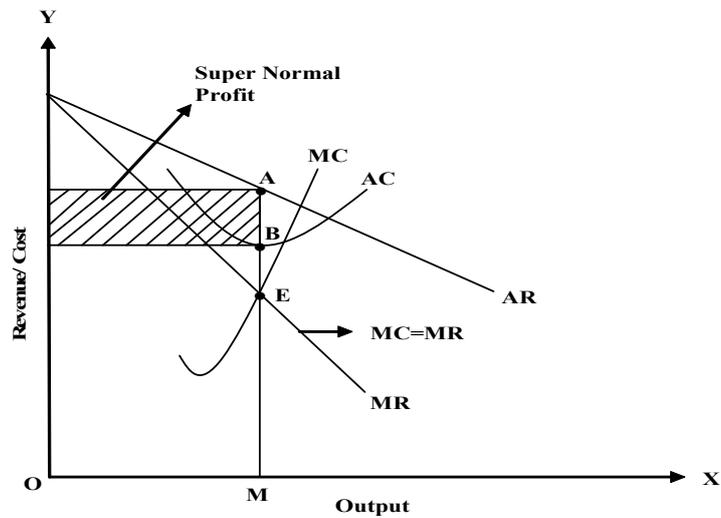
It should however, be remembered that in the short run, under monopolistic competition, the individual firm may realize its equilibrium(means earning maximum profits or incurring minimum losses) but the group as a whole is not in stable equilibrium because the number of firms will have a tendency to change(increase or decrease).

In Monopolistic competition may face any of the three situations in the short period, Viz.,

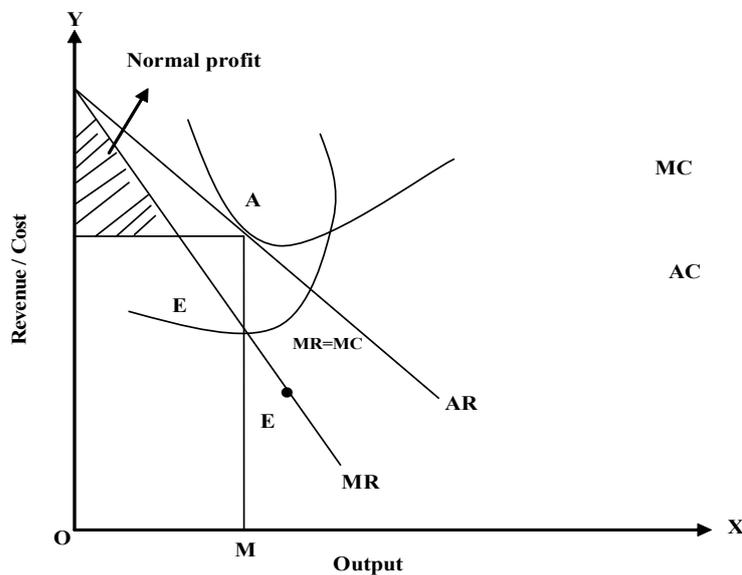
1. Super Normal Profit
2. Normal Profit
3. Minimum Loss

Short run equilibrium position of a firm under monopolistic competition can be explained with the help of the following diagrams :

1. Super Normal Profit : Fig 3 shows that firm is in equilibrium at point E, because at this point $MC = MR$. Point E indicates that the firms equilibrium output is OM. Price of equilibrium output is $OP = AM$. This equilibrium price AM is greater than average cost BM ($AM > BM$). Hence, the firm earns super normal profit equivalent to the difference between AM and BM, i.e. AB per unit. Total super normal profit of the firm in equilibrium is ABCP, shaded area.

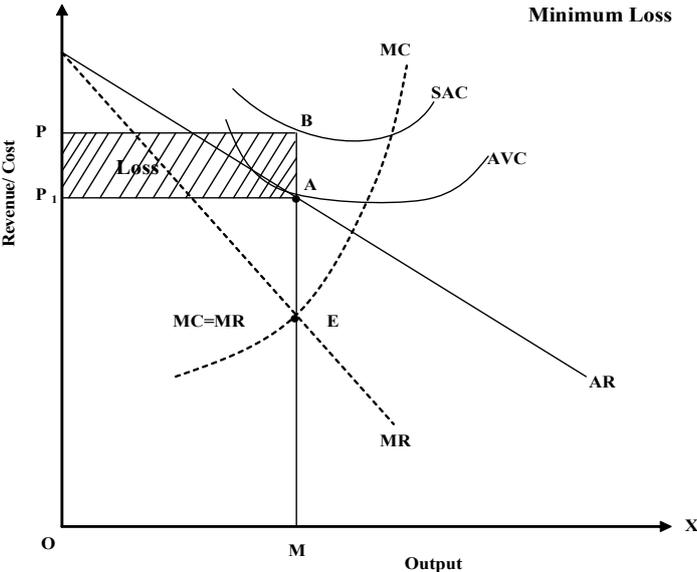


2. Normal Profit : In the short – period, a firm under monopolistic competition may earn normal profit. In fig. 4, firm is in equilibrium at point E where $MC = MR$ and OM will be the equilibrium output. Price of the equilibrium output is $OP (=AM)$ and average cost is also $OP (=AM)$. It is so because, AR curve is touching AC curve at point A. Hence, in the position of equilibrium AR is equal to AC and the firm earns normal profit.



3. Minimum Loss : In the short – period, a firm in equilibrium may incur loss of fixed cost. It is the minimum loss of the firm. In fig. it is evident that the firm will be in equilibrium at point E. At this point $MC = MR$. In equilibrium position, the firm will produce OM units of output. Price of equilibrium output OM is $OP_1 (=AM)$ and average cost $OP (=BM)$. Average cost of the firm is more than the price, i.e. $(AC > AR)$. Hence, the firm suffers a loss equivalent to $BM - AM = AB$ per unit. But the price of equilibrium output OM

is equal to average variable cost (AVC), as curve AVC touches curve AR at point 'A'. Thus, in case of equilibrium of firm will get its AVC from the prevailing price AM, but it will have to incur loss of fixed cost equivalent to AB per unit. The total loss of the firm will be BAP₁P, the shaded area.



Thus, in the short – period, (i) if $MC = MR$, then the output produced by the firm, at the point of equilibrium, will yield maximum profit. It will not be advisable for the firm to produce, more than it; (ii) If price is less than average variable cost ($AR < AVC$), the firm should stop its production, because such a price will not cover the average variable cost of production, (iii) if price or average revenue is more than average cost ($AR > AC$) the firm will get super normal profit, (iv) if price or average revenue is less than the average cost ($AR < AC$), the firm will incur minimum loss; however, the firm will continue its production as long as the prevailing price covers variable cost.

12.5 LONG – TERM EQUILIBRIUM OF THE FIRM UNDER MONOPOLISTIC COMPETITION

Long period is that time period in which every firm can change its production capacity in response to change in demand. The firm can change the size of its plant and machinery and new firms can enter the industry. In the long-period, each firm will produce upto that limit where marginal revenue is equal to long – run marginal cost. In the long run, firms earn normal profit only. No firm can get super normal profit in the long-run, because of following reasons:

1. If firms earn super normal profit, then several new firms will be attracted to the industry as entry into the industry is free. As a result of it, total supply will increase. Total supply will now be distributed among large number of firms and they will be deprived of the super normal profit.
2. In order to create more demand for their product new firms will lower the prices, old firms too will lower the price of their products, if they are to exist in the market. Thus, because of fall in price both – old and new firms will get only normal and not super normal profit.
3. Because of low cost of installation and free entry, when new firms join the industry, demand for factors of production increases leading to increase in factor cost. Consequently, average cost of production will go up. Thus, high average cost on the one hand and low price of the product on the other will cause the super – normal profit to disappear.

12.6 GROUP EQUILIBRIUM UNDER MONOPOLISTIC COMPETITION

Under perfect competition there are large number of firms producing homogeneous products. Collectively, these firms are called industry. Under monopoly, there is only one firm. There is no question of industry or group. Under monopolistic competition there are many firms producing close substitutes. In other words, there product differentiation. Chamberlin has used the term ‘group’ instead of industry, for the group of such firms as produce differentiated products. For example, group of firms manufacturing toilet soaps or tooth – pastes.

The main features of long run equilibrium are :

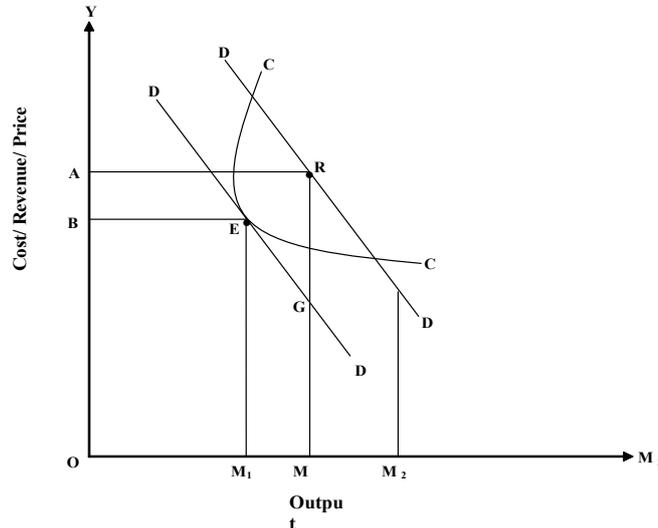
- a) Firms reach equilibrium when $MC = MR$
- b) There is group or industry equilibrium when $Price = LAC$
- c) All firms earn only normal profits in the long run
- d) The firms do not produce full capacity output like perfect competition.
- e) Price is greater than MC. Therefore, socially desirable and optimal output is not produced in this market.

Determination of Group Equilibrium on the basis of two assumptions :

1. Demand and costs of all the firms of a group are the same.

- Number of firms in the group is so large that no individual firm by its own decision can influence the price and output of other firms.

Group equilibrium is explained diagrammatically.



In this figure, DD is demand curve and CC is cost curve. Each producer would like to fix price equal to OA, because at this price, difference between revenue and cost is the maximum. Such a price will yield super normal profits equivalent to BARG. This super normal profit will tempt many new firms to join the group. Consequently, the total market demand will be distributed among several sellers. This will make the demand curve to shift to the left as D_1D_1 . The number of producers will go on increasing until D_1D_1 curve becomes tangent to cost curve CC. This will happen at point E. No firm will now earn super normal profits. Each firm of the group will, in this situation, be in equilibrium. OB will be the equilibrium price of the group and OM_1 will be the equilibrium output.

12.7 CHECK YOUR PROGRESS

Which of the following statements are correct and which are incorrect? Give reasons if brief for your answers.

- Product differentiation is an important feature of Monopolistic competition.
- Each firm has a downward sloping demand curve under monopolistic competition.
- Monopolistic Competition means :
 - Large number of seller
 - Product differentiation
 - Freedom of entry and exit of firms
 - All the above

4. Monopolistic competition differs from perfect competition primarily because in monopolistic competition.
 - (a) There is product differentiation
 - (b) There are barriers to entry
 - (c) There is uniform price
 - (d) There is perfect knowledge on the part of buyers and sellers.
5. In the long run, both under perfect competition and monopolistic competition
 - (a) Firms earn only abnormal profit
 - (b) Firms earn only normal profit
 - (c) Firms produce full capacity output
 - (d) Firms realize all economies of scale
6. Under Monopolistic competition AR (price) is
 - (a) Greater than MR
 - (b) Less than MR
 - (c) Equal to MR
 - (d) Constant

Answers to check your progress :

1. **Correct** : In monopolistic competition, there are many firms offering variations of the same product. The products are differentiated in such a way that the product of any one firm is a close substitute of products of other firms.

2. **Correct** : If a firm under monopolistic competition lowers the price of its product, it can attract the customers of other firms selling close substitutes. Thus price cut is expected to increase quantity demanded. The demand curve is, therefore, downward sloping.

3. **(d)**

4. **(a)**

5. **(b)**

6. **(a)**

12.8 SUMMARY

It is a type of imperfect competition. Its features are (a) large number of sellers. But each seller controls a part of the market example. Different brands of tooth paste. (b) Product differentiation. Each firm differentiates the product by changing the colour, appearance, packaging quality or quantity. (c) There is freedom of entry and exit of firms.

Price is medium price – between competitive price and monopoly price. Price includes production costs and selling costs (Advertisement costs) $AR > MR$. Both AR and MR curves are falling. Demand curve also will be sloping downward. The conditions for short period equilibrium are (a) $MC = MR$ (b) MC curve cuts MR curve from below. When there is short period equilibrium a firm will earn abnormal profit or incur losses. The long run equilibrium is called group equilibrium. The conditions for long run equilibrium are (1) $MC = MR$, (2) $Price = AC$. In the long run firms will earn only normal profit. There will be excess capacity since LAC is not minimum. Firms produce less than full capacity output. Monopolistic competition is a market structure characterized by a large number of firms selling differentiated products belonging to the same product group. A monopolistically competitive market is one that is characterized by :

- i. Many firms and buyers, that is, the market is comprised of a large number of independently acting firms and buyers.
- ii. Differentiated products, that is the product offered by competing firms are differentiated from each other in one or more respects. These difference may be of a physical nature,

12.9 KEYWORDS

Monopolistic competition : Monopolistic competition is an extreme type of imperfect competition. This is a market structure characterized by a large number of firms selling differentiated products belonging to the same product group.

Equilibrium of the firm : The firm in monopolistic competition maximizes profits when its marginal revenue equals its marginal cost. Its price exceeds marginal cost. If the monopolistically competitive firm is earning excess profits in the short run new firms will join the industry and compete, so excess profits will fall. In long run equilibrium, price equals average cost.

Short period equilibrium under monopolistic competition : The conditions for short period equilibrium under monopolistic competition are a) $MC = MR$, b) MC curve must cut MR curve from below.

Long Run equilibrium under Monopolistic competition : a) $MC = MR$ (firm equilibrium condition), b) $Price = AC$ (Group equilibrium condition)

12.10 SELF ASSESSMENT QUESTIONS

1. Explain and illustrate the determination of price under monopolistic competition in the short – run and the long – run.
2. Explain the price – output equilibrium of a firm and industry under monopolistic competition in the short run and in the long run.

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DEPARTMENT OF STUDIES AND RESEARCH IN MANAGEMENT

M.B.A I Semester

Course – 2

MANAGERIAL ECONOMICS

BLOCK

4

PRICING DECISIONS AND MARKET STRUCTURES

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BLOCK – 4 : PRICING DECISIONS AND MARKET STRUCTURES

The block 4 contains further 4 units (unit-14 to unit-17) where the unit-14 includes information relating to factors determining price, price determination under perfect competition, monopoly pricing, pricing under monopolistic competition, oligopoly pricing, price discrimination etc next unit, unit-15 includes contents relating to objectives of pricing policy, considerations in formulating pricing policy, pricing methods in practice, pricing strategies etc further unit-16 contains information relating to theories of profit, profit policy, profit maximization and profit planning, classification of profits, the measurement of profits etc further unit- 17 contains the information relating to break even analysis, contribution analysis, assumptions and limitations of break even analysis, calculating break even analysis etc.

UNIT -13 : PRICING DECISIONS AND MARKET STRUCTURES

STRUCTURE:

- 13.1 Objectives
- 13.2 Introduction and Meaning
- 13.3 Factors determining price
- 13.4 Market structures and pricing decisions
- 13.5 Price determination under Perfect competition
- 13.6 Monopoly pricing
- 13.7 Pricing under Monopolistic competition
- 13.8 Oligopoly pricing
- 13.9 Price Discrimination
- 13.10 Summary
- 13.11 Key words
- 13.12 Self-Assessment Questions
- 13.13 References

13.1 OBJECTIVES

After studying this units, you will be able to ;

- Explain the importance of price
- Identify the factors that determine Price
- Highlight the price discrimination and its effects
- Discuss the various market structures and its price determination.

13.2 INTRODUCTION AND MEANING

In ordinary usage, price is the quantity of payment or compensation given by one party to another in return for goods or services.

In modern economies, prices are generally expressed in units of some form of currency. (For commodities, they are expressed as currency per unit weight of the commodity, e.g. euros per kilogram.)

In every economic system, the prices of goods and services are crucial magnitudes. A price is a sacrifice to one who pays it but it is a gain to one who gets it. Everybody is concerned with the prices in one way or other. If the market for a commodity is perfectly competitive then firms supplying that commodity would be passive as far as price determination is concerned. The price of the commodity will be determined by the market itself through interplay of demand and supply for the commodity. The firm in such situation will be 'price taker' and the pricing decision problem is solved by the market itself. On the other hand, if the market is not competitive then the firm supplying that commodity will have market power to fix the price for that, as in the case of monopoly. The firm will be 'price maker' in the situation. The prices whether fixed by the firm itself or by someone else for it, say the market or the government are obviously most important business parameters.

Pricing is not an easy task. A pricing policy has to be well conceived as there are many pricing problems with practical considerations.

13.3 FACTORS DETERMINING PRICE

The following are the general considerations, or factors that affect pricing or formulating a pricing policy by a firm:

Kind of Market Structure: Pricing policy is to be set in the light of competitive situation in the market. If the firm is operating under perfect competition it acts only as

price taker and there is hardly any choice left. The firm has a pricing problem, when there is imperfect or monopolistic competition. Under monopoly the firm is a price maker. It has to set its own price policy. Usually, a manufacturing firm today operates under imperfectly competitive market condition, and hence it has to set its own price policy, as may be feasible. According to Joel Dean, how much price discretion a firm has depends on the market conditions, such as:

- The number, relative size, and product lines of competitors, *i.e.*, degree of closeness of substitute products supplied by the rivals.
- The likelihood of potential competition. This depends on the possibilities of entry of new firms in the market and the relative entry barriers.
- The stage of consumer acceptance of the product. In other words, degree of patronization of the buyers towards the given product manufactured by the firm.
- The degree of potential market segmentation or sub-division and chances of price discriminations.
- The degree of product differentiation adopted by the concerned firm in comparison to the rivals in the market.
- The opportunities and possibilities for variation in the product service bundle.
- The richness of the mixture of service, advertisement and sales propaganda and the reputation of the firm and qualitative improvement in the product bundle.
- The cross elasticity of demand provides a unique dividing line between differentiated products and homogeneous products and an idea of the market condition and its relative competitiveness. If there is low cross elasticity of demand for the firm's product, it suggests a higher degree of monopoly power and possibility of selling its product at a high price - at a premium or even at a discount, without disturbing competitors' prices or sales. When there is little product differentiation, but there are a few sellers, *i.e.*, there is an oligopoly market, the quantity that the firm can sell at various prices depends upon the reactions of the rivals to these prices, and it is not easy to predict the rivals' behavior in an oligopoly market.

Goal of Profit and Sales : Pricing should normally aim at stimulating profitable combination sales. Sometimes, the firm may also seek profit maximization. Sometimes, the firm may want to capture the market through sales maximization. But, in any case, sales should also be more profit oriented and never be loss oriented, under normal circumstances.

Long Range Welfare of the Firm :Prices should be set to promote the long range welfare and well-establishment of the firm in the market. The firm may seek to discourage entry of the rivals through its low price policy.

Flexibility: Pricing policy should be flexible enough to meet the changes in the demand pattern and market situation.

Business Objective: The firm has to set a clear vision of its business objective such as survival, growth, etc.

Other Miscellaneous Proposals :A firm may also consider certain other proposals in its pricing policy, such as:

- Prices should be adapted and individualized in accordance with the diverse competitive situations encountered by different varieties of products produced by the firm.
- Provision may be made for a predetermined and systematic method of pricing new products which may be introduced by the firm in course of time under its business planning for expansion.
- Determination of replacement parts prices form an organised classification of parts by type and manufacture.
- Determination of the price discount structure, *i.e.*, price discount differentials for distribution channels quantity-wise, territory-wise terms of payments-wise, etc.
- Prices have to be viewed in relation to the quality and quantity of the firm's product and its promotional policies and sales expenditures.

The other important factors to be considered while determining prices are:

1. Costs
2. Demand for the Product
3. Consumer psychology
4. Competition
5. Profit
6. Government Policy
7. Price sensitivity
8. Reutilization of pricing

13.4 MARKET STRUCTURES AND PRICING DECISIONS

In economic sense, a market is a system by which buyers and sellers bargain for the price of a product, settle the price and transact their business-buy and sell a product. Personal contact between the buyers and sellers is not necessary. In some cases, e.g., forward sale and purchase, even immediate transfer of ownership of goods is not necessary. Market does not necessarily mean a place. The market for a commodity may be local, regional, national or international. What makes a market is a set of buyers, a set of sellers and a commodity. Buyers are willing to buy and sellers are willing to sell, and there is a price for the commodity.

We are concerned with the question: How is the price of a commodity determined in different kinds of markets? The determination of price of a commodity depends on the number of sellers and the number of buyers. Barring a few cases, e.g., occasional phases in share and property markets, the number of buyers is larger than the number of sellers. The number of sellers of a product in a market determines the nature and degree of competition in the market. The nature and degree of competition make the structure of the market. Depending on the number of sellers and the degree of competition, the market structure is broadly classified as given in Table

Table 13.1 *Types of Market Structures*

<i>Market structure</i>	<i>No. of firms and degree of production differentiation</i>	<i>Nature of industry where prevalent</i>	<i>Control over price</i>	<i>Method of marketing</i>
1. Perfect Competition	Large no. of firms with homogenous products	Financial markets and some farm products	None	Market exchange or auction
2. Imperfect Competition:				
(a) Monopolistic competition	Many firms with real or perceived product differentiation	Manufacturing: tea, toothpastes, TV sets, shoes, refrigerators, etc.	Some	Competitive advertising, quality rivalry
(b) Oligopoly	Little or no product differentiation	Aluminium, steel, cigarettes, cars, passenger cars, etc.	Some	Competitive, advertising, quality rivalry
(c) Monopoly	A single producer, without close substitute	Public utilities: Telephones, Electricity, etc.	Considerable but usually regulated	Promotional advertising if supply is large

Source: Samuelson, P.A. and W.D. Nordhaus, *Economics*, McGraw-Hill, 15th Edn., 1995, p. 152.

Market Structure and Pricing Decisions

The market structure determines a firm's power to fix the price of its product a great deal. The degree of competition determines a firm's degree of freedom in determining the price of its product. The degree of freedom implies the extent to which a firm is free or independent of the rival firms in taking its own pricing decisions. Depending on the market structure, the degree of competition varies between zero and one. And, a firm's discretion or the degree of freedom in setting the price for its product varies between one and none in the reverse order of the degree of competition. As a matter of rule, **the higher the degree of competition, the lower the firm's degree of freedom in pricing decision and control**

over the price of its own product and vice versa. Let us now see how the degree of competition affects pricing decisions in different kinds of market structures.

13.5 PRICE DETERMINATION UNDER PERFECT COMPETITION

Under perfect competition, a large number of firms compete against each other for selling their product. Therefore, the degree of competition under perfect competition is close to **one**, i.e., the market is highly competitive. Consequently, firm's discretion in determining the price of its product is close to none. In fact, 'in perfectly competitive market, price is determined by the market forces of demand and supply and a firm has to accept the price determined by the market forces. If a firm uses its discretion to fix the price of its product above or below its market level, it loses its revenue and profit in either case. For, if it fixes the price of its product above the ruling price, it will not be able to sell its product, and if it cuts the price down below its market level, it will not be able to cover its average cost. In a perfectly competitive market, therefore, firms have little or no choice in respect to price determination.

Perfect competition is a market setting in which there is a large number of sellers of a homogeneous product. Each seller supplies a very small fraction of the total supply. No single seller is powerful enough to influence the market price. Nor can a single buyer influence the market price. Market price in a perfectly competitive market is determined by the market forces-market demand and market supply. Market demand refers to the demand for the industry as a whole: it is the sum of the quantity demanded by each individual consumer or user at different prices. Similarly, market supply is the sum of quantity supplied by the individual firms in the industry. The market price is, therefore, determined for the industry, and is given for each individual firm and for each buyer. Thus, a seller in a perfectly competitive market is a 'price-taker, not a 'price-maker'.

In a perfectly competitive market, therefore, the main problem for a profit maximizing firm is not to determine the price of its product but to adjust its output to the market price so that profit is maximum.

The mode of price determination-price level and its variation-depends on the time taken by the supply position to adjust itself to the changing demand conditions. Therefore, price determination under perfect competition is analyzed under three different time periods:

- (i) market period or very short-run,
- (ii) short-run and
- (iii) long-run.

(i) Price Determination in Market Period.: In the market period, the total output of a product is fixed. Each firm has a stock of commodity to be sold. The stock of goods with all the firms makes the total supply. Since the stock is fixed, the supply curve is perfectly inelastic, as shown by the line SQ in Fig. In this situation, price is determined solely by the demand condition. Supply remains an inactive factor. For instance, suppose that the number of marriage houses (or tents) in a city in a marriage season is given at OQ [(Fig]. and the supply curve takes the shape of a straight vertical line, as shown by the line SQ. Suppose also that the demand curve for marriage houses (or tents) during an average marriage season is given by D_1 . Demand curve and supply line intersect at point M, determining the rent for each marriage house at $MQ = OP_1$. But, suppose during a marriage season, demand for marriage houses (or tents) increases suddenly because a larger number of parents decide to celebrate the marriage of their daughters and sons; because auspicious dates for marriage are not available in the next few years. In that case, the demand curve D_1 shifts upward to D_2 . The equilibrium point-the point of intersection between demand and supply curves-shifts from point M to P, and marriage house rentals rise to $PQ = OP_2$. This price becomes a parametric price for all the buyers.

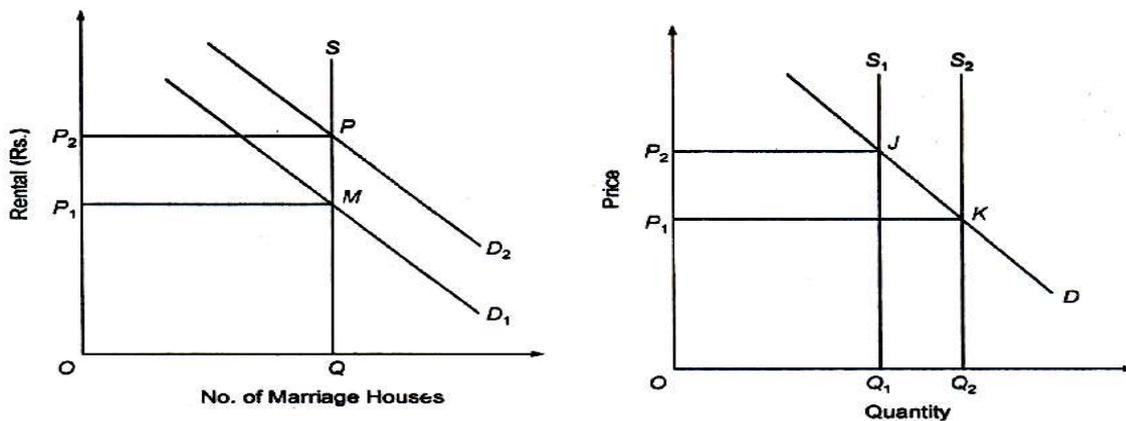


Fig. 13.1 (a) Demand Determined Price in Market Period

Fig. 13.1 (b) Supply Determined Price in Market Period

Similarly, given the demand for a product, if its supply decreases suddenly for such reasons as droughts, floods (in case of agricultural products) and sudden increase in export of a product, prices of such products shoot up. For example, price of onions had shot up recently due to export of onion. In case of supply determined price, supply curve shifts leftward causing rise in price of the goods in short supply. This phenomenon is illustrated in Fig. (b). Given the demand curve (D) and supply curve (S_2)' the price is determined at OP_1 . Demand curve remaining the same, the fall in supply makes the supply curve shift leftward to S_1 . As a result price increases from OP_1 to OP_2 .

The other examples of very short-run markets may be daily fish market, stock markets, daily milk market, coffin markets during a period of natural calamities, certain essential medicines during epidemics, etc.

(ii) Price in the Short-Run.: A short-run is, by definition, a period in which firms can neither change their scale of production or quit, nor can new firms enter the industry. While in the market period (or very short-run) supply is absolutely fixed; in the short-run, it is possible to increase (or decrease) the supply by increasing (or decreasing) the variable inputs. In the short-run, therefore, supply curve is elastic. The determination of market price in the short-run is illustrated in Fig. (a) and adjustment of output by the firms to the market price and firm's equilibrium are shown in Fig. (b). Fig. (a) shows the price determination for the industry by the demand curve DD and supply curve SS , at price OP_1 or PQ . This price is fixed for all the firms in the industry.

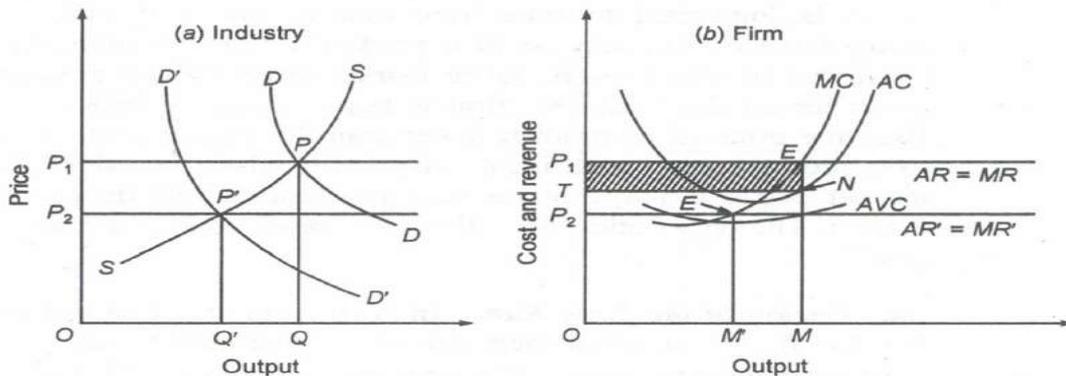


Fig. 13.2 Pricing under Perfect Competition in the Short-run

Given the price P_1 (OP_1), an individual firm can produce and sell any quantity at this price. But any quantity will not yield maximum profit. Given their cost curves, the firms are required to adjust their output to the price PQ so that they maximize their profit.

It is important to note here that in the short-run, a firm in a perfectly competitive market may be in a position to earn *economic profit*. It may as well be forced to make losses. Once market price for the product is determined, it is given for all the firms. No firm is large enough to influence the prices. If a firm fixes the price of its product lower than the market price, it may lose a part of its total profit, or may even incur losses. If it raises the price of its product above the market price, it may not be in a position to sell its produce in a competitive market. The only option for a firm is to produce as much as it can sell at the given price.

(iii) Pricing in the Long-Run: In contrast to the short-run conditions, in the long run, the firms can adjust their size or quit the industry and new firms can enter the industry. If market price in the long run is such that $AR > AC$, then the firms make economic or super normal profit. As a result, new firms get attracted towards the industry causing increase in market supply at the given price. Increase in market supply causes rightward shift in the supply curve. Similarly, if $AR < AC$, then firms make losses. Therefore, marginal firms quit the industry causing decrease in market supply. This causes a leftward shift in the supply curve. The rightward shift in the supply curve pulls down the price and its leftward shift pushes it up. This process continues until price is so determined that $AR = AC$, and firms earn only normal profit.

The price determination in the long-run and output adjustment by individual firms are illustrated graphically in Fig

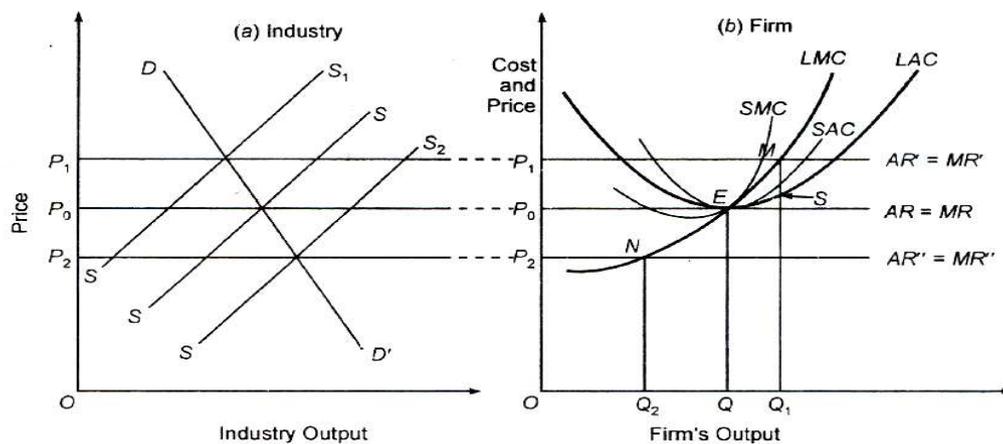


Fig. 13.3 Pricing under Perfect Competition in the Long-run

13.6 MONOPOLY PRICING

In case of a monopoly, the degree of competition is close to nil. An uncontrolled - monopoly firm has full control over the price of its product. A monopoly, in the true sense of the term, is free to fix any price for its product, of course, under certain constraints, viz., (i) the objective of the firm, and (ii) demand conditions.

Pricing and Output Decision: Short-Run Analysis

As under perfect competition, pricing and output decisions under monopoly are based on profit maximization hypothesis, given the revenue and cost conditions. Although cost

conditions, i.e., AC and MC curves, in a competitive and monopoly market are generally identical, revenue conditions differ. Revenue conditions, i.e., AR and MR curves, are different under monopoly-unlike a competitive firm, a monopoly firm faces a downward sloping demand curve. The reason is a monopolist has the option and power to reduce the price and sell more or to raise the price and still retain some customers. Therefore, given the price-demand relationship, demand curve under monopoly is a typical downward sloping demand curve.

The short-run revenue and cost conditions faced by a monopoly firm are presented in Fig. Firm’s average and marginal revenue curves are shown by the AR and MR curves, respectively, and its short-run average and marginal cost curves are shown by SAC and SMC curves, respectively. The price and output decision rule for profit maximizing monopoly is the same as for a firm in the competitive industry. As noted earlier, profit is maximized at the level of output at which $MC = MR$. Given the profit maximization condition, a profit maximizing monopoly

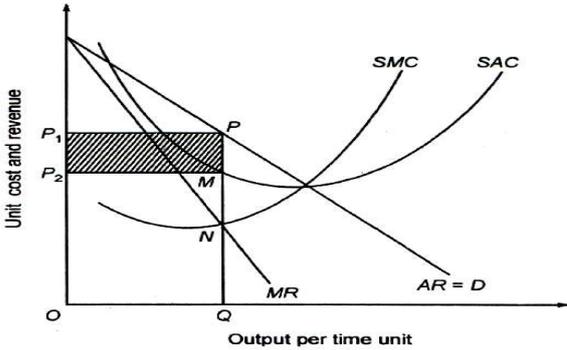


Fig. 13.4 Price Determination under Monopoly: Short-run

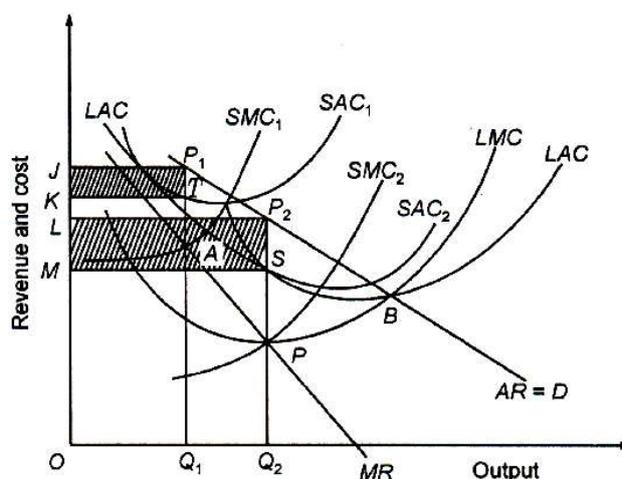
firm chooses a price-output combination at which $MR = SMC$. Given the firm’s cost and revenue curves in Fig. 13.4, its MR and SMC intersect at point N. An ordinate drawn from point N to X-axis, determines the profit maximizing output for the firm at OQ. At this output, firm’s $MR = SMC$. The ordinate NQ extended to the demand curve ($AR = D$) gives the profit maximizing price at PQ. It means that given the demand curve, the output OQ can be sold per time unit at only one price, i.e., $PQ (= OP)$. Thus, the determination of output simultaneously determines the price for the monopoly firm. Once price is fixed, the unit and total profits are also simultaneously determined. Hence, the monopoly firm is in a state of equilibrium.

At output OQ and price PQ , the monopoly firm maximizes its unit and total profits. Its per unit monopoly or economic profit (i.e., $AR - SAC$) equals $PQ - MQ = PM$. Its total profit, $P_2M \times PM = \text{area } P_1PMP_2$ as shown by the shaded rectangle. Since in the short-run, cost and revenue conditions are not expected to change, the equilibrium of the monopoly firm will remain stable.

Monopoly Pricing and Output Decision in the Long-Run:

The decision rules regarding optimal output and pricing in the long-run are the same as in the short-run. In the long-run, however, a monopolist gets an opportunity to expand the size of its firm with a view to enhance its long-run profits. The expansion of the plant size may, however, be subject to such conditions as (a) size of the market, (b) expected economic profit and (c) risk of inviting legal restrictions. Let us assume, for the time being, that none of these conditions limits the expansion of a monopoly firm and discuss the price and output determination in the long-run.

The equilibrium of monopoly firm and its price and output determination in the long-run is shown in Fig. The AR and MR curves show the market demand and marginal revenue conditions faced by the monopoly firm. The LAC and LMC show the long-run cost conditions. It can be seen in Fig. 13.5, that monopoly's LMC and MR intersect at point P determining profit maximizing output at OQ_2 . Given the AR curve, the price at which the total output OQ_2 can be sold is P_2Q_2 . Thus, in the long-run, equilibrium output will be OQ_2 and price P_2Q_2 . This output-price combination maximizes monopolist's long-run profit. The total long-run monopoly profit is shown by the rectangle $LMSP_2$.



Price Discrimination under Monopoly

Price discrimination means selling the same or slightly differentiated product to different sections of consumers at different prices, not commensurate with the cost of differentiation. Consumers are discriminated on the basis of their income or purchasing power, geographical location, age, sex, colour, marital status, quantity purchased, time of purchase, etc. When consumers are discriminated on the basis of these factors in regard to price charged from them, it is called **price discrimination**. There is another kind of price discrimination. The same price is charged from the consumers of different areas while cost of production in two different plants located in different areas is not the same. Some common examples of price discrimination, not necessarily by a monopolist, are given below:

- (i) physicians and hospitals, lawyers, consultants, etc., charge their customers at different rates mostly on the basis of the latter's ability to pay;
- (ii) merchandise sellers sell goods to relatives, friends, old customers, etc., at lower prices than to others and offer off-season discounts to the same set of customers;
- (iii) railways and airlines charge lower fares from the children and students, and for different class of travelers;
- (iv) cinema houses and auditoria charge differential rates for cinema shows, musical concerts, etc.,
- (iv) some multinationals charge higher prices in domestic and lower prices in foreign markets, called 'dumping', and
- (v) lower rates for the first few telephone calls, lower rates for the evening and night trunk-calls; higher electricity rates for commercial use and lower for domestic consumption, etc. are some other examples of price discrimination.

13.7 PRICING UNDER MONOPOLISTIC COMPETITION

As the degree of competition decreases, firm's control over the price and its discretion in pricing decision increases. For example, under monopolistic competition, where degree of competition is high but less than one, the firms have some discretion in setting the price of their products. Under monopolistic competition, the degree of freedom depends largely on the number of firms and the level of product differentiation. Where product differentiation is real, firm's discretion and control over the price is fairly high and where product differentiation is nominal or only notional, firm's pricing decision is highly constrained by the prices of the rival products.

13.8 OLIGOPOLY PRICING

The control over the pricing discretion increases under oligopoly where degree of competition is quite low, lower than that under monopolistic competition. The firms, therefore, have a good deal of control over the price of their products and can exercise their discretion in pricing decisions, especially where product differentiation is prominent. However, the fewness of the firms gives them an opportunity to form a cartel or to make some settlement among themselves for fixation of price and non-price competition.

13.9 PRICE DISCRIMINATION

Price discrimination means charging different prices from different customers or for different units of the same product. In the words of Joan Robinson: "The act of selling the same article, produced under single control at different prices to different buyers is known as price discrimination." Price discrimination is possible when the monopolist sells in different markets in such a way that it is not possible to transfer any unit of the commodity from the cheap market to the dearer market. Price discrimination is, however, not possible under perfect competition, even if the two markets could be kept separate. Since the market demand in each market is perfectly elastic, every seller would try to sell in that market in which he could get the highest price. Competition would make the price equal in both the markets. Thus price discrimination is possible only when markets are imperfect.

Types of price discrimination :

Firstly, it may be personal based on the income of the customer. For example, doctors and lawyers charge different fees from different customers on the basis of their incomes. Higher fees are charged to rich persons and lower to the poor.

Secondly, price discrimination may be based on the *nature of the product*. Paperback is cheaper than the deluxe edition of the same book, for the former is bought by the majority of readers, and the latter by libraries. Unbranded products, like open tea, are sold at lower prices than branded products like Brooke Bond or Lipton tea. In the case of services too, such price discrimination is practiced when off-season rates of hotels at hill stations are very low as compared to the peak season.

Thirdly, price discrimination is also related to the *age, sex and status* of the customers. Barbers charge less for children's hair-cuts.

Fourthly, discrimination is also based on the *time* of service. Cinema houses at certain places, like New Delhi, charge half the rates in the morning show than in the afternoon shows.

Fifthly, there is *geographical* or local discrimination when a monopolist sells in one market at a higher price than in the other market.

Lastly, discrimination may be based on the *use* of the product. Railways charge different rates for different compartments or for different services.

Conditions for price discrimination

For price discrimination to exist the following conditions must be satisfied:

- (1) Market Imperfections.
- (2) Agreement among Rival Sellers.
- (3) Geographical or Tariff Barriers.
- (4) Differentiated Products.
- (5) Ignorance of Buyers.
- (6) Artificial Differences between Goods.
- (7) Differences in Demand.

Degrees of price discrimination:

1. Discrimination of the First Degree or Perfect Discrimination

Discrimination of the first degree occurs when a monopolist charges “a different price against all the different units of commodity in, such wise that the price exacted for each was equal to the demand price for it and no consumer’s surplus was left to the buyers.” Joan Robinson calls it perfect discrimination when the monopolist sells each unit of the product at a separate price.

2. Discrimination of the Second Degree or Multi-part Pricing

In discrimination of the second degree, the monopolist divides the consumers in different slabs or groups or blocks and charges different prices for different slabs of the same product. Since the earlier units of the product have more utility for the consumers than the later ones, the monopolist charges a higher price for the former units and reduces the price for the later units in the respective slabs. Such discrimination is only possible if the demand of each consumer below a certain maximum price is perfectly inelastic.

3. Discrimination of the Third Degree or Multi-part Pricing:

When a profit maximizing monopolist sets different prices indifferent markets having

demand curves with different elasticity, he is practicing the third degree price discrimination. It happens quite often that a monopolist has to sell his goods in two or more markets, completely separated from one another, each having a demand curve with different elasticity. A uniform price cannot be set for all the markets without losing profits. The monopolist is, therefore, required to find different price quantity combinations that can maximize his profit in each market.

International price discrimination: 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 and the remaining output at a high price in the home market. 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.” Viner’s definition is simple. According to him, “Dumping is price discrimination between two markets in which the monopolist sells a portion of his produced product at a low price and the remaining part at a high price in the domestic market.”

Viner explains two other types of dumping. One, reverse dumping in which the foreign price is higher than the domestic price. This is done to turn out foreign competitors from the domestic market. When the product is sold at a price lower than the cost of production in the domestic market, it is called reverse dumping. Two, when there is no consumption of the commodity in the domestic market and it is sold in two different foreign market, out of which one market is charged a high price and the other market a low price. But in practice, dumping means selling of the product at a high price in the domestic market and a low price in the foreign market. We shall explain price determination under dumping in this sense.

Types of Dumping

Dumping can be classified in the following three ways:

1. Sporadic or Intermittent Dumping. It is adopted under exceptional or unforeseen circumstances when the domestic production of the commodity is more than the target or there are 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. This is possible only if the foreign demand for his commodity is elastic and the producer is a monopolist in the domestic market. His aim may be 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 this type 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.

2. Persistent Dumping. When a monopolist continuously sells a portion of his commodity at a high price in the domestic market and the remaining output at a low price in the foreign market, it is called persistent dumping. This is possible only if the domestic demand for that commodity is less elastic and the foreign demand is highly elastic. When costs fall continuously along with increasing production, the producer does not lower the price of the product more in the domestic market because the home demand is less elastic. However, he keeps a low price in the foreign market because the demand is highly elastic there. Thus, he earns more profit by selling more quantity of the commodity in the foreign market. As a result, the domestic consumers also benefit from it because the price they are required to pay is less than in the absence of dumping.

3. Predatory Dumping. The predatory dumping is one in which a monopolist firm sells its commodity at a very low price or at a loss in the foreign market in order to drive out some competitors. But when the competition ends, it 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, its profit may be more.

Objectives of Dumping

The main objectives of dumping are as follows:

1. **To Find a Place in the Foreign Market.** A monopolist resorts to dumping in order to find a place or to continue himself in the foreign market. Due to perfect competition in the foreign market, he lowers the price of his commodity in comparison to the other competitors so that the demand for his commodity may increase. For this, he often sells his commodity by incurring loss in the foreign market.
2. **To Sell Surplus Commodity.** When there is excessive production of a monopolist's commodity and he is not able to sell in the domestic market, he wants to sell the surplus at a very low price in the foreign market. But it happens occasionally.
3. **Expansion of 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. **New Trade Relations.** The monopolist practises dumping in order to develop new trade relations abroad. For this, he sells his commodity at a low price in the foreign market, thereby establishing new market relations with those countries. As a result, the monopolist increases his production, lowers his costs and earns more profit.

Price determination under dumping

Under dumping, the price is determined just like discriminating monopoly. The only 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 dumping, a monopolist sells his commodity at a high price in the domestic market and at a low price in the foreign market.

Conditions

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

1. The main aim of the monopolist is to maximize his profit.
2. The elasticities 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.
3. The foreign market should be perfectly competitive and the domestic market is monopolistic.
4. The buyers in the domestic market cannot buy the cheap commodity from the foreign market and bring it in the domestic market.

Effects of dumping :

Dumping affects both the importer and exporter countries in the following ways:

Effects on Importing Country

The effects of dumping on the country, in which a monopolist dumps his commodity, depend on whether dumping is for a short period or a long period and what is 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 while. Due to the low price of the dumped commodity, the industry of that country has to incur a loss for some time because less quantity of its commodity is sold.

2. 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 bear 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 economy.
4. If the dumped commodities are cheap capital goods, they will lead to the setting up of a new industry. But when the imports of such commodities stop, this industry will also be shut down. Thus ultimately, the importing country will incur a 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 after competition ends and he sells the same commodity at a high monopoly price, the importing country incurs a loss because now it has to pay a high price.
6. If a tariff duty is imposed to force the dumper to equalize prices of the domestic and imported commodity, it will not benefit the importing country.
7. But a lower fixed tariff duty benefits the importing country if the dumper delivers the commodity at a lower price.

Effects on Exporting Country

Dumping affects the exporting country in the following ways:

1. When domestic consumers have to buy the monopolistic commodity at a high price through dumping, there is loss in their consumers' surplus. But if a monopolist produces more commodity in order to dump it in another country, consumers benefit. This is because with more production of the commodity, the marginal cost falls: 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 price increase. The consumers will be losers and the monopolist will profit. 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 commodities. 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.

Anti-dumping measures

The following measures are adopted to stop dumping:

1. Tariff Duty. To stop dumping, by the importing country
2. Import Quota.
3. 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.
4. Voluntary Export Restraint. To restrict dumping, developed countries enter into bilateral agreements with other countries from which they fear dumping of commodities.

13.10 SUMMARY

In every economic system, the prices of goods and services are crucial magnitudes. A price is a sacrifice to one who pays it but it is a gain to one who gets it. Everybody is concerned with the prices in one way or other. If the market for a commodity is perfectly competitive then firms supplying that commodity would be passive as far as price determination is concerned. The price of the commodity will be determined by the market itself through interplay of demand and supply for the commodity. The firm in such situation will be 'price taker' and the pricing decision problem is solved by the market itself. On the other hand, if the market is not competitive then the firm supplying that commodity will have market power to fix the price for that, as in the case of monopoly. The firm will be 'price maker' in the situation. The prices whether fixed by the firm itself or by someone else for it, say the market or the government are obviously most important business parameters.

13.11 KEY WORDS

Price : price is the quantity of payment or compensation given by one party to another in return for goods or services.

Perfect competition : Perfect competition is a market setting in which there is a large number of sellers of a homogeneous product.

Monopoly : In monopoly, the degree of competition is close to nil. An uncontrolled - monopoly firm has full control over the price of its product.

Price discrimination : Price discrimination means charging different prices from different customers or for different units of the same product.

Dumping : Dumping is international price discrimination. Here an exporter firm sells a portion of its output in a foreign market at a very low price and the remaining output at a high price in the home market.

13.12 SELF-ASSESSMENT QUESTIONS

1. Explain the importance of setting price.
2. Explain the various market structures. Also write in detail how the price is fixed in each structure?
3. What is price Discriminating? Is it necessary? Explain
4. Explain Dumping and its effects in detail.
5. What are the factors that affect pricing?

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UNIT - 14 PRICING POLICY, METHODS, AND STRATEGIES

STRUCTURE:

- 14.1 Objectives
- 14.2 Introduction and Meaning
- 14.3 Objectives of pricing policy
- 14.4 Considerations in formulating pricing policy
- 14.5 Factors involved in Pricing Policy
- 14.6 Pricing Methods in Practice
- 14.7 Pricing Strategies
- 14.8 Summary
- 14.9 Key Words
- 14.10 Self-Assessment Questions
- 14.11 References

14.1 OBJECTIVES

After studying this unit, you will be able to ;

- Understand the importance of pricing policy
- Discuss the factors involved in pricing
- Understand various methods of pricing
- Identify the strategies of pricing

14.2 INTRODUCTION AND MEANING

In every economic system, the prices of goods and services are crucial magnitudes. A price is a sacrifice to one who pays it but it is a gain to one who gets it. Everybody is concerned with the prices in one way or other. A pricing policy is a standing answer to recurring question- what should be the ideal Price? A systematic approach to pricing requires the decision that an individual pricing situation be generalized and codified into a policy coverage of all the principal pricing problems. Policies can and should be tailored to various competitive situations. A policy approach which is becoming normal for sales activities is comparatively rare in pricing. Most well managed manufacturing enterprises have a clear cut advertising policy, product customer policy and distribution-channel policy. But pricing decision remains a patchwork of adhoc decisions. In many, otherwise well managed firms, price policy have been dealt with on a crisis basis. This kind of price management by catastrophe discourages the kind of systematic analysis needed for clear cut pricing policies.

14.3 OBJECTIVES OF PRICING POLICY

Pricing is not an end in itself. Pricing is a means to an end. Therefore, the firm must explicitly lay down its pricing objectives. The firm's overall objectives serve as guiding principle to pricing. Thus, firm's business objectives are normally spelled out as the objectives of its price policy. Empirical evidences reflect that theoretical goal of profit maximisation is rarely taken in practice by the business firms in their price policy.

The following are the commonly adopted major pricing objectives of a business firm:

- **Survival.** Basically, in these days of monopolistic competition or dynamic changes and business uncertainties, a firm is always interested in its continued survival first. For the sake of assuring continued existence, generally, a firm is ready to tolerate all kinds of upheaval in product lines, organisational and even personnel changes.

- **Rate of Growth and Sales Maximisation.** A firm may be interested in setting a price policy which will permit a rapid expansion of the firm's business and its sales maximisation.
- **Market Shares.** By adopting a price policy the firm may wish to capture a larger share in the market and acquire a dominating leadership position. In oligopoly market, this is quite common.
- **Target Return on Investment.** The firms may have a predetermined target return of their investment, for instance say 10 per cent.
- **Preventing Competition,** In pricing its product, the firm may keep an eye on rival's entry. So, it may fix up the price such that would prevent competition.
- **Making Money.** Some firms are interested in making a fast buck taking their monopoly advantage into account and try to sell their goods at premium. Thus, pricing objective may be of making money.
- **Service Motive.** A firm may set pricing policy such as to serve the community and improve its welfare.
- **Regular Income.** Some firms are interested in maintaining regular flow of income. so would set their price policy accordingly.
- **Price Stabilization.** The firms may be generally interested in keeping their prices stable within certain range over a period of time, irrespective of marginal changes in demand and costs.
- **Market Penetration.** Some companies want to maximise unit sales. They believe that a higher sales volume will lead to lower unit costs and higher long run profit. They set the lowest price, assuming the market is price sensitive. This is called market penetration pricing.
- **Marketing Skimming.** Many companies favor setting high prices to 'skim' the market. Dupont is a prime practitioner of market skimming pricing. With each innovation, it estimates the highest price it can charge given the comparative benefits of its new product versus the available substitutes.
- **Early Cash Recovery.** Some firms set a price which will create a mad rush for the product and recover cash early. They may also set a low price as a caution against uncertainty of the future.

- **Price-Profit Satisfaction.** The firms are interested in keeping their prices stable within certain period of time irrespective of changes in demand and costs, so that they may get the expected profit.

However, the survival of the firm is always the underlying objective in pricing. In practice, thus, the following interrelated pricing objectives are commonly held:

- To fulfill a goal rate of return on investment;
- To seek the anticipated rate of growth;
- To improve the market share;
- To stabilize prices and profit margins for the regular flow of income.

14.4 CONSIDERATIONS IN FORMULATING PRICING POLICY

The following considerations involve in formulating the pricing policy:

(i) Competitive Situation. Pricing policy is to be set in the light of competitive situation in the market. We have to know whether the firm is facing perfect competition or imperfect competition. In perfect competition, the producers have no control over the price. Pricing policy has special significance only under imperfect competition.

(ii) Goal of Profit and Sales. The businessmen use the pricing device for the purpose of maximizing profits. They should also stimulate profitable combination sales. In any case, the sales should bring more profit to the firm.

(iii) Long Range Welfare of the Firm. Generally, businessmen are reluctant to charge a high price for the product because this might result in bringing more producers into the industry. In real life, firms want to prevent the entry of rivals. Pricing should take care of the long run welfare of the company.

(iv) Flexibility. Pricing policies should be flexible enough to meet changes in economic conditions of various customer industries. If a firm is selling its product in a highly competitive market, it will have little scope for pricing discretion. Prices should also be flexible to take care of cyclical variations.

(v) Government Policy. The government may prevent the firms in forming combinations to set a high price. Often the government prefers to control the prices of essential commodities with a view to prevent the exploitation of the consumers. The entry of the government into the pricing process tends to inject politics into price fixation.

(vi) Overall Goals of Business : Pricing is not an end in itself but a means to an end. The fundamental guides to pricing, therefore, are the firms overall goals. The broadest of them is survival. On a more specific level, objectives relate to rate of growth, market share, maintenance of control and finally profit. The various objectives may not always be compatible. A pricing policy should never be established without consideration as to its impact on the other policies and practices.

(vii) Price Sensitivity. The various factors which may generate insensitivity to price changes are variability in consumer behavior, variation in the effectiveness of marketing effort, nature of the product, importance of service after sales, etc. Businessmen often tend to exaggerate the importance of price sensitivity and ignore many identifiable factors which tend to minimise it.

(viii) Reutilization of Pricing. A firm may have to take many pricing decisions. If the data on demand and cost are highly conjectural, the firm has to rely on some mechanical formula. If a firm is selling its product in a highly competitive market, it will have little scope for price discretion. This will have the way for reutilized pricing.

14.5 FACTORS INVOLVED IN PRICING POLICY

The pricing of the products involves consideration of the following factors:

- (i) Cost Data
- (ii) Demand Factor
- (iii) Consumer Psychology
- (iv) Competition
- (v) Profit
- (vi) Government Policy

(i) Cost Data in Pricing

Cost data occupy an important place in the price setting processes. There are different types of costs incurred in the production and marketing of the product. There are production costs, promotional expenses like advertising or personal selling as well as taxation, etc. They may necessitate an upward fixing of price. For example, the prices of petrol and gas are rising due to rise in the cost of raw materials, such as crude transportation, refining, etc. If costs go up, price rise can be quite justified. However, their relevance to the pricing decision

must neither be underestimated nor exaggerated. For setting prices apart from costs, a number of other factors have to be taken into consideration. They are demand and competition.

(ii) Demand Factor in Pricing

In pricing of a product, demand occupies a very important place. In fact, demand is more important for effective sales. The elasticity of demand is to be recognized in determining the price of the product. If the demand for the product is inelastic, the firm can fix a high price. On the other hand, if the demand is elastic, it has to fix a lower price. In the very short term, the chief influence on price is normally demand. Manufacturers of durable goods always set a high price, even though sales are affected. If the price is too high, it may also affect the demand for the product. They wait for arrival of a rival product with competitive price. Therefore, demand for product is very sensitive to price changes.

(iii) Consumer Psychology in Pricing

Demand for the product depends upon the psychology of the consumers. Sensitivity to price change will vary from consumer to consumer. In a particular situation, the behaviour of one individual may not be the same as that of the other. In fact, the pricing decision ought to rest on a more incisive rationale than simple elasticity. There are consumers who buy a product provided its quality is high. Generally, product quality, product image, customer service and promotion activity influence many consumers more than the price. These factors are qualitative and ambiguous. From the point of view of consumers, prices are quantitative and unambiguous. Price constitutes a barrier to demand when it is too low, just as much as where it is too high. Above a particular price, the product is regarded as too expensive and below another price, as constituting a risk of not giving adequate value. If the price is too low, consumers will tend to think that a product of inferior quality is being offered. With an improvement in incomes, the average consumer becomes quality conscious. This may lead to an increase in the demand for durable goods. People of high incomes buy products even though their prices are high. In the affluent societies, price is the indicator of quality. Advertisement and sales promotion also contribute very much in increasing the demand for advertised products. Because the consumer thinks that the advertised products are of good quality. The income of the consumer, the standard of living and the price factor influence the demand for various products in the society.

(v) Profit Factor in Pricing

In fixing the price for products, the producers consider mainly the profit aspect. Each producer has his aim of profit maximisation. If the objective is profit maximisation,

the critical rule is to select the price at which $MR = MC$. Generally, the pricing policy is based on the goal of obtaining a reasonable profit. Most of the businessmen want to hold the price at constant level. They do not desire frequent price fluctuation. The profit maximisation approach to price setting is logical because it forces decision makers to focus their attention on the changes in production, cost, revenue and profit associated with any contemplated change in price. The price rigidity is the practice of many producers. Rigidity does not mean inflexibility. It means that prices are stable over a given period.

(vi) Government Policy in Pricing

In market economy, the government generally does not interfere in the economic decisions of the economy. It is only in planned economies, the government's interference is very much. According to conventional economic theory, the buyers and sellers only determine the price. In reality, certain other parties are also involved in the pricing process. They are the competition and the government. The government's practical regulatory price techniques are ceiling on prices, minimum prices and dual pricing. In a mixed economy like India, the government resorts to price control. The business establishments have to adopt the government's price policies to control relative prices to achieve certain targets, to prevent inflationary price rise and to prevent abnormal increase in prices.

14.6 PRICING METHODS IN PRACTICE

There are four important methods of pricing:

- (i) Cost plus or full cost pricing.
- (ii) Going rate policy.
- (iii) Pricing for a rate of return.
- (iv) Administered prices.

Cost plus Pricing

Cost plus pricing is the most commonly adopted method. Under this method cost of a product is estimated and a margin of some kind of profit is added on the basis of which the pricing is determined. Empirical evidences have shown that a majority of the business firms usually set prices for their products on the basis of cost plus a fair profit percentage.

Briefly, thus: $\text{Cost plus Pricing} = \text{Cost} + \text{Fair Profit}$.

In cost plus pricing principle in practice, cost refers to full allocated cost. According to Joel Dean (1976), there are, however, three different concepts of the cost component

used in the formula of cost pricing:

- Actual cost;
- Expected cost; and
- Standard cost.

Actual cost refers to historical cost for the latest available period. It covers wage bills, raw material costs, and overhead charges at the then current output rate. Expected cost means a forecast for the pricing period on the basis of expected prices, output rates and productivity. Standard Cost refers to a normal cost determination at some normal rate of output at a given level of capacity utilization and productivity at a normal level. In practice, usually, the cost base is determined from engineering estimates plus cost experience historical data and projections. Fair Profit: By fair profit is usually meant a fixed percentage of profit mark-up. It is arbitrarily determined. Typically it is determined at 10 per cent in many cases. However, fair profit mark-up differs from industry to industry and among different firms in the same line of production. These variations are due to many factors, such as:

- Differences in turnover rate.
- Differences in risks.
- Differences in competitive intensity; and
- Differences in traditions or customary fixation of profit margin in different businesses.

Apparently the 'fair profit' in cost plus principle in practical business is fundamentally different from the concept of 'normal profit' in economic analysis. Cost-plus pricing is essentially mark-up pricing in practice. It is determined by adding a percentage mark-up to the average variable cost (or marginal cost in monopoly) of the product. Thus:

$$P = AVC + M$$

where, M = mark-up measured as X%(A VC). It is also referred to as contribution margin.

For example, a firm's AVC is ₹ 50 and contribution margin (X%) is 10% (thus 0.1 (50) =

5)

$$\therefore P = 50 + 5 = ₹ 55.$$

In practice however, cost plus pricing method is regarded as more suitable when the

producers are uncertain about the market demand for their products and would prefer stability when rivals' price strategies are unknown.

Mark-up Price

Mark-up is expressed in terms of percentage. Either cost-price or sale price is taken as the base in determining the mark-up.

- Cost Price-based Mark-up = $100 \left(\frac{\text{Rupee Mark-up}}{\text{Cost Price}} \right)$
- Sale Price-based Mark-up = $100 \left(\frac{\text{Rupee Mark-up}}{\text{Sale Price}} \right)$

Illustration

Cost price of a leather bag	=	1,000
Mark-up decided by the seller	=	₹ 200
∴ Selling Price	=	₹ 1,200
Mark-up % based on Cost Price	=	$\frac{200}{1000} = 20\%$
Mark-up % based on Sale Price	=	$\frac{200}{1200} = 16.7\%$

Given the rupee cost and the desired percentage of mark-up, sales price can be worked by measuring sales mark-up as: $100 - \text{cost-based mark-up}$.

Illustration :

Suppose a retailer buys a produce for ₹ 200 at the wholesale rate. He fixes the cost-based mark up at 30%

Thus: Sale-price mark-up = $100 - 30 = 70\%$ or 0.7

∴ Sales Price = $\frac{200}{0.7} = 285.71$

Usually mark-ups are calculated on the selling price at each stage of business transaction in a channel of distribution.

The mark-up price can be arrived at by using the formula:

$$\text{Mark-up Price} = \frac{AC}{(1 - R)}$$

Where,

AC = average cost

R = expected return (%) on sales (i.e., mark-up)

Illustration :

A garment manufacturer produces 1,000 shirts at the total cost of ₹ 50,000. The average cost is: $50,000/1,000 = ₹500$. If the return on sales is expected 40%. Then:

Mark-up Price = $500 / 1 - 0.4 = 500 / 0.6 = ₹ 833.33$.

Advantages of Cost Plus Pricing

The main advantages of cost-plus pricing are:

1. When costs are sufficiently stable for long periods, there is price stability which is both cheaper administratively and less irritating to retailers and customers.
2. The cost-plus formula is simple and easy to calculate.
3. The cost-plus method offers a guarantee against loss-making by a firm. If it finds that costs are rising, it can take appropriate steps by variations in output and price.
4. When the firm is unable to forecast the demand for its product, this method can be used.
5. When it is not possible to gather market information for the product or it is expensive, cost-plus pricing is an appropriate method.
6. Cost-plus pricing is suitable in such cases where the nature and extent of competition is unpredictable.

Shortcomings of the Cost Plus Pricing Methods

The following are the major drawbacks of the Cost Plus Pricing:

- 1 It completely ignores consumer's preference and demand.
- 2 It has thus one sided approach. It takes only costs and firm's profit margin into account.
- 3 It does not take account of the effect of competition.
- 4 It ignores rival's reaction in prescribing a price for the firm's product.
- 5 It over-stresses the precision of allocated costs. In practice, however, cost allocation lacks precision.
- 6 Its concept of full cost may not be relevant for the pricing decision.
- 7 It ignores the significance of incremental costs in pricing decision.
- 8 It thus solely considers conventional accounting system, and ignores economic tools altogether.

Rate of Return Pricing

Another method is that the firms determine the average profit mark-up on costs necessary to produce a desired rate of return on its investment. Say, for instance, a firm may set its price of the product in order to get on an average a 12 per cent return on net investment. Under the rate of return pricing policy, price is determined along a planned rate of return on investment. The rate of return is to be translated into a per cent mark-up as profit margin on cost. The profit margin is determined on the basis of a normal rate of production. The total cost of a year's normal production is estimated and regarded as standard cost. Then capital turnover is computed by taking the ratio of invested capital to the annual standard cost. The mark-up percentage of profit margin is obtained by multiplying capital turnover by the goal rate of return. Thus, if capital turnover (C) is 0.5 and the goal rate of return (R) is 12 per cent on invested capital, then:

$$\begin{aligned}\text{Mark-up Profit Margin} &= C \times R \\ &= 0.5 \times 12 = 6 \text{ per cent}\end{aligned}$$

This method is essentially cost plus pricing method but an improved one since it builds price on cost which is standardized and it develops a profit mark-up related to a rate or return.

Going Rate Pricing

The going rate pricing is opposite of full cost, or cost plus pricing. The going rate pricing is not just the phenomenon of perfect competition. It is usually happening in oligopoly and monopolistic competition. The going rate pricing policy means that though the firm has the power to fix up its own price for the product it will not do so but instead it tries to adjust its own price policy in time with the general pricing structure prevailing in the industry or market.

The going rate pricing is adopted when:

- 1 Costs are difficult to measure: and
- 2 The firm wants to avoid tension of price rivalry in the market: or
- 3 When there is price leadership of a dominant firm in the market.

Administered pricing

The term administered prices was introduced by Keynes for the prices charged by a monopolist and therefore determined by considerations other than marginal cost. A

monopolist being a price-maker consciously administers the price of his product. He plays a personal part by restricting the output to establish higher price for the product. Unlike competitive prices thus administered prices are not determined by the impersonal play of market forces. Indian economists like L. K. Jha and Malcolm Adiseshiah gave a slightly different meaning of administered prices. According to the Indian economists an administered price for a commodity is the one which is decided and arbitrarily fixed by the government. It is not allowed to be determined by the free play of market forces of demand and supply. Administered prices in a market economy are the results of government intervention. They are prescribed by the government rather than determined by the market mechanism. For example, prices of petrol diesel, kerosene and liquid gas are the administered prices in India. In short, administered prices are the prices which are fixed and enforced by the government.

The following are the major characteristics of administered prices:

- 1 They are fixed by the government.
- 2 They are statutory, i.e , they are legally enforced by the government.
- 3 They are regulatory in nature.
- 4 They are meant as corrective measures.
- 5 They are the outcome of the price policy of the government.

Need for Administered Prices

Administered prices imply government intervention in the free functioning of the market mechanism. There are many reasons for the government intervention in the market and fixation of prices in some areas of agricultural and non-agricultural (industrial) sectors. The need for administered prices or the prices of the price regulation by the government may be stressed on the following counts:

- 1 To correct the imperfections of the market mechanism and lopsidedness in price structure of the free enterprise or mixed economy.
- 2 To check the undesirable price rise, of scarce essential consumption goods and raw materials, especially, when their demand outstrips their supply.
- 3 To check the undue price rise of scarcely available essential consumption goods and raw materials, especially, when their demand outstrips their supply.

- 4 To provide a relatively stable and assured income to the farmers. in the wake of fluctuating land produce on account of changing weather conditions, especially the vagaries of monsoons.
- 5 To put a check on high prices charged by the producers under the profit maximization motive by taking the advantage of their monopolistic position or growing market demand against the slow pace of the growth of market supply.
- 6 To provide wage goods and other essential items of mass consumption at low subsidized prices to the poor sections of society.
- 7 To protect the interest of the weaker sections of the society.
- 8 To discourage or encourage the consumption of certain commodities.
- 9 To mitigate inflation or prevent stagflation.
- 10 Administered price policy may be designed to avert recession.
- 11 To raise public revenue.
- 12 To ensure the efficient allocation of resources.
- 13 To promote egalitarian goal. That is to improve economic welfare of the masses and fulfill the socialist goal.
- 14 To ensure equitable distribution of scarce goods.

Other Methods of pricing are:

- 1 Marginal Cost Pricing
- 2 Customary Pricing
- 3 Sealed Bid Pricing
- 4 Loss- leader Pricing
- 5 Predatory pricing
- 6 Limit Pricing
- 7 Ramsey pricing
- 8 Peak Load Pricing
- 9 Product Bundling
- 10 Prestige Pricing and Psychological Pricing

- 11 Value Pricing
- 12 Price Positioning
- 13 Demand oriented pricing
- 14 Retail Pricing
- 15 Delivered pricing
- 16 Promotional pricing

14.7 PRICING STRATEGIES

There are different types of pricing strategies which are normally adopted by firms. A few important are explained as under:

1. Pricing a New Product :

Pricing is a crucial managerial decision. Most companies do not encounter it in a major way on a day-to-day basis. But there is need to follow certain additional guidelines in the pricing of the new product. The marketing of a new product poses a problem for any firm because new products have no past information. Here the firm is also not in a position to determine consumer reaction. The question is, what do we mean by a new product? New products for our purposes will include original products, improved products, modified products and new brands that the firm develops through its own R & D efforts. When the company introduces its product for the first time, the whole future depends heavily on the soundness of initial pricing decision. Top management is accountable for the new product's success record. The price fixed for the new product must :

- (i) Earn good profits for the firm over the life of the product;
- (ii) Provide better quality at a cheaper price and at a faster speed than competitors;
- (iii) Face rising R & D, manufacturing and marketing costs and
- (iv) Satisfy public criteria such as consumer safety and ecological compatibility.

The firm can select two types of strategy:

- (A) Skimming Pricing
- (B) Penetration Pricing
- (A) Skimming Pricing**

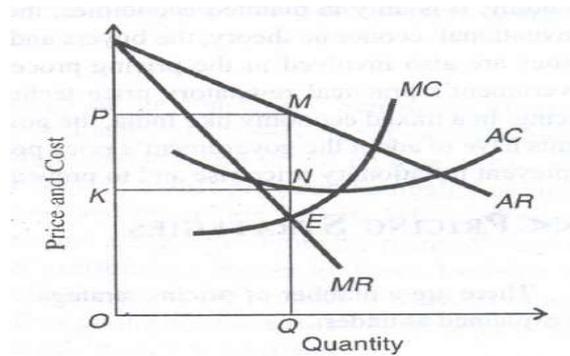


Fig. 1

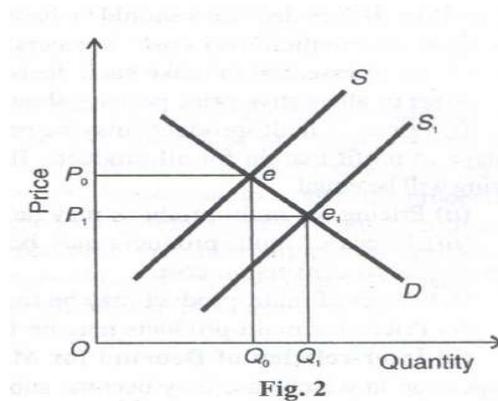
Skimming pricing is known as charging high price in initial stages. This can be followed by a firm by charging skimming price for a new product in pioneering stage. When demand is either unknown or more inelastic at this stage, market is divided into segments on the basis of different degree of elasticity of demand of different consumers. This is a short period device for pricing. The demand for new products is likely to be less price elastic in the early stages, that is, the initial high price helps to “Skim the Cream” of the market which is relatively insensitive to price. This policy is shown in Fig. 1, where the manufacturer of new product initially determines OP price and sells OQ quantity. Thus he receives KPMN abnormal profit. For example, in the beginning the prices of computers, T.Vs, electronic calculators, etc., were very high but now they are declining every year. A high initial price together with heavy promotional expenditure may be used to launch a new product if conditions are appropriate.

(B) Penetration price

Penetration price is known as charging lowest price for the new product. This is aimed to quick in sales, capture market share, utilize full capacity and economies of scale in productive process and keep the competitors away from the market. Penetration price policy can be adopted in the following circumstances:

1. There is very high price elasticity of demand.
2. There are substantial cost savings due to enhanced production process.
3. By nature the product is acceptable to the mass of consumers.
4. There is no strong patent protection.
5. There is imminent threat of potential competition so that a big share of the market must be captured quickly.

Penetration price is a long term pricing strategy and should be adopted with great caution. Penetration pricing is successful also when there is no elite market. When a firm adopts a penetrating pricing policy, adjustments to price throughout the product life cycle are minimal. Since this policy prevents competition, it is also referred to as 'Stay-out' price policy. Penetration price is explained in Fig. 2, where market price is OP_0' and quantity demanded is OQ_0 . Now the producer of a new product fixes the price less than the market price i.e., OP_1 , and sells OQ_1 , more quantity. Obviously, it has a wide potential market.



The comparison between skimming pricing and penetration pricing is that high skimming price policy needs vigorous and costly promotional effort to back it but low penetration price would require low promotional expenditures. But the policy is inappropriate where (i) the total market is expected to stay small, and (ii) the new product calls for capital recovery over a long period.

2. Pricing strategy for Multiple Products:

The traditional theory of price determination is based on the assumption that the firm produces a single homogeneous product. But firms usually produce more than one product. When firms produce several products, managers must consider the interrelationships between those products. Such products may be joint products or multi-products. Joint products are those where inputs are common in productive process. Multi-products are creation of the product line activity with independent inputs but common overhead expenses. Pricing of multi-product or joint product requires little extra caution and care. For evolving price policy for multi-product firm, certain basic considerations involved in decision making are :

1. Price and cost relationship in product line,
2. Demand relationship in product line, and
3. Competitive differences.

Pricing of joint products can be explained under two different circumstances:

1. When there is fixed proportion of products.
2. When there is variable proportion of products.

i) Joint Products with Fixed Proportion : In joint product case with fixed proportion of quantity, there is no possibility of increasing one at the expense of another. In this situation, the costs are joint and cannot be increased at the expense of another. In this situation, the costs are joint and cannot be allocated to each product on any sound basis. Although the two goods are produced together, their demands are independent. However, there is a single marginal cost curve for both products. This reflects the fixed proportion of production, i.e., the marginal cost is the cost of supplying one more unit of the product package. Where goods are jointly produced as in the case of mutton and hides, pricing decision should take this interdependency into account.

ii) Joint Products with Variable Proportions : Pricing of joint products which can be produced with variable proportions presents interesting analysis of price, cost and output. When it is possible for a firm to produce joint products in different proportions, the total cost has to be divided among different products because there cannot be a single marginal cost curve.

The major problem in pricing multiple products is that each product has a separate demand curve. But, since all the products are produced under one establishment by interchangeable production facilities, they have only one joint and one inseparable marginal cost curve. That is, while revenue curves, AR and MR, are separate for each product, cost curves, AC and MC, are inseparable. Therefore, the marginal rule of pricing cannot be applied straightaway to fix the price of each product separately. The problem, however, has been provided with a solution by E. W. Clemens.” The solution is similar to the technique employed to illustrate third degree price discrimination under profit maximization assumption. As a discriminating monopoly tries to maximize its revenue in all its markets, so does a multi-product firm in respect of each of its products. To illustrate the multiple product pricing, let us suppose that a firm has four different products-A, E, C and D in its line of production. The AR and MR ‘curves for the four branded products are shown in four segments of Fig. The marginal cost for all the products taken together is shown the curve MC, which is the factory marginal cost curve. Let us suppose that when the MRs for the individual products are horizontally summed up, the aggregate MR (not given in the figure)

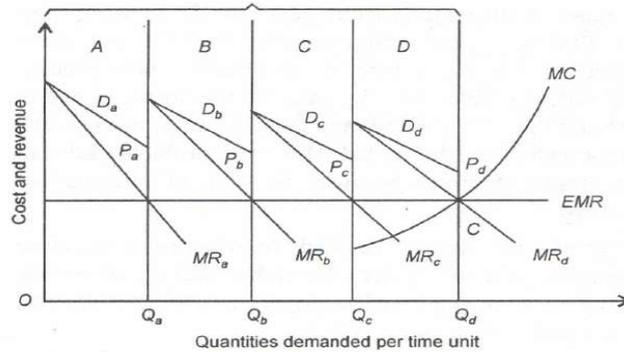


Fig. 15.1 Multi-Product Pricing

passes through point C on the MC curve. If a line parallel to the X-axis, is drawn from point C to the Y-axis through the MRs, the intersecting points will show the points where MC and MRs are equal for each product, as shown by the line EMR, the Equal Marginal Revenue line. The points of intersection between EMR and MRs determine the output level and price for each product. The output of the four products are given as OQ_a of product A; Q_b of B; Q_c of C; and Q_d of D. The respective prices for the four products are: P_a for product A; P_b for B; P_c for C, and P_d for D. These price and output combinations maximize the profit from each product and hence the overall profit of the firm.

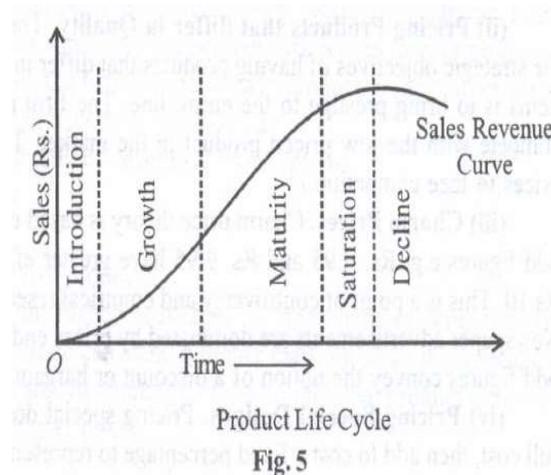
3. Product-Line Pricing:

Product line pricing is an important practical problem for most modern industrial enterprises. Since almost every firm makes several related products, product line pricing is an important phase of price policy. Product line pricing refers to the determination of prices of the individual products which form units of an output package. From the viewpoint of management a typical modern firm produces multiple models, styles or sizes of output each of which can be considered a separate product. Although product line pricing requires same economic concepts used for single product pricing, the analysis becomes complicated, however, by demand and production externalities which arise because of substitutability or complementary between the products on the demand or the production side.

The problem of product line pricing is to find the proper relationship among the prices of members of a product group. Product line pricing can include use-differentials (e.g., fluid milk vs. cheese milk), seasonal differentials (e.g., morning movie specials) and style cycle differentials. These are all phases of product line pricing. The pricing under this strategy is as same as joint product pricing.

4. Pricing over the Life Cycle of a Product:

The cycle begins with the invention of the new product. The innovation of a new product and its degeneration to a common product is termed as the life cycle of a product. Figure depicts the life cycle of a product. Every product moves through a lifecycle having five phases as shown in the figure and they are:



- (i) **Introduction.** This is the first stage in the life cycle of a product. This is an infant stage. The product is a new one. The product is put on the market, awareness and acceptance are minimal. There are high promotional costs. Therefore, the profit maybe low. The firm can use the following types of pricing policy, i.e., skimming price policy or centralizing price policy or penetrating pricing policy depending on the substitute available in this stage.
- (ii) **Growth.** In this stage, a product gains acceptance on the part of consumers and businessmen. The product begins to make rapid sales gains because of the cumulative effects of introductory promotion, distribution work or mouth influence. The product satisfies the market. For the purpose of pricing, there is not much difference between growth and maturity stages.
- (iii) **Maturity.** At this stage, keen competition increases. Sales growth continues, but at a diminishing rate, because of the declining number of potential customers. Competitors go for mark-down price. Additional expenses are involved in the product's modification and improvement, thus profit margin slips. This period is useful because it gives out signals for taking precaution in pricing policy.

- (iv) **Saturation.** In this stage, the sales are at the peak and further increase is not possible. The demand for the product is stable. The rise and fall of sale depend upon supply and demand. There is little additional demand to be stimulated, it happens to be its replacement demand. Therefore, the product pricing in the saturation stage is full cost plus normal mark-up.
- (v) **Decline.** Sales begin to diminish absolutely as the customers begin to tire of a product. The competitors have entered the market with substitutes and imitations. Price becomes the competitive weapon. The first step in pricing strategy at this stage is obviously to reduce the price with the objective of retaining sales at some minimum level. The product should be reformulated to suit the consumers preferences, it is possible in the case of few commodities.

5. Cyclical Pricing:

Cyclical pricing refers to the pricing decisions of the firm which are taken to suit the fluctuations in the business conditions. To simplify decision making: in response to the alterations in the entire economic system, it is necessary for the firm to have some kind of policy based on cyclical price behavior. It is more apparent to say that prices are slashed during recession and pegged up during a demand-pull or a demand-push. In formulating a policy of cyclical pricing, various factors such as demand, competition, cost push, price rigidity, price fluctuations, fluctuations due to substitutes, purchasing power, market share and demand fluctuation should be taken into account. In these conditions costs are bound to rise. Under this situation, what kind of pricing policy should be followed by the firms? It is difficult to answer this question.

6. Transfer Pricing:

Transfer pricing is one of the most complex problems in pricing. The growth of large scale multidivisional organizations has given rise to the problem of pricing commodities that are transferred internally from one division to another. The divisional organizations are preferred due to the following reasons:

1. It provides a systematic way of delegation and decision making
2. For proper evaluation of contribution, and
3. For the precise evaluation of manager's performance.

this involves the problem of sub-optimization, The transfer price must satisfy the following two criteria:

1. It should help establish the profitability of each division or department.
2. It should permit and encourage maximization of the profits of the company as a whole.

For determining the transfer price there are three alternative methods. They are explained as follows:

(i) **Market Price Basis.** The suitable system of transfer of goods from one division to another under the same management to another company, is the market price basis. The market price should be the transfer price. Wherever a market price exists for a product, the inter-divisional transfer price should equal the market price to avoid sub-optimization. This method definitely avoids the possibility of passing the inefficiencies of one department to the other departments.

(ii) **Cost Basis.** In case the product produced by a division of the firm can be sold only to another division of the firm, the inter-divisional transfer should be priced at the level of the actual cost of production. Here transfer prices will be useful to achieve the best joint level of output. It will maximize profits.

(iii) **Cost Plus Basis.** Under this method the goods and services of each department are charged on the basis of actual cost plus a margin by way of profit. The major defect of this method is that the transferring department may add a high margin so as to raise the profit of the department. It may result in setting the ultimate price unduly high thereby affecting sales.

7. Pricing strategy for Established Products:

Many producers enter the market often with a new brand of a commodity for which several substitutes are available. For example, cold drinks like Coke and Spot were quite popular in the market during 1980s when new brands like Limca, Thumbs Up, Double Seven, Mirinda, Pepsi, etc., were introduced in the market overtime. Many other models of motor cars appeared in the market despite the popularity of Maruti cars. So has been the case with many consumer goods. A new entrant to the market faces the problem of pricing his product because of strong competition with established products. This problem of pricing of a new brand is known as *pricing in relation to the established products*.

Generally three types of pricing strategies are adopted in pricing a product in relation to its well established substitutes,

- (i) Pricing below the ongoing price,

(ii) Pricing at par with the prevailing market price and

(iii) Pricing above the existing market price.

Pricing Below the Market Price: Pricing below the prevailing market price of the substitutes is generally preferred under two conditions. *First*, if a firm wants to expand its product-mix by adding a new product to its line of production with the objective of utilizing its unused capacity. Also, when the firm expects to face tough competition with the established brands, the strategy of pricing below the market price is generally adopted. This strategy gives the new brand an opportunity to gain popularity and establish itself. This strategy is similar to the *penetrating pricing*. *Second*, this technique of pricing has been found to be more successful in the case of innovative products. When the innovative product gains popularity, the price may be gradually raised to the level of market price.

Pricing at Market Price: Pricing at par with the market price of the existing brands is considered to be the most reasonable pricing strategy for a product which is being sold in a strongly competitive market. In such a market, keeping the price below the market price is not of much avail because the product can be sold in any quantity at the existing market rate. This strategy is also adopted when the seller is not a 'price leader'. It is rather a 'price-taker' in an oligopolistic market.

Pricing Above the Prevailing Market Price : Sometimes some firms price their product above the on-going or prevailing market price of the competitive products. This strategy is adopted when a seller intends to achieve a prestigious position among the sellers in the locality. This is a more common practice in case of products considered to be a commodity of conspicuous consumption or a prestigious good or deemed to be a product of much superior quality. Consumers of such goods prefer shopping in shopping malls of a posh locality of the city. This is known as the 'Veblen Effect'.

8. Differential Pricing:

Differential pricing is a method that is used by some sellers to tailor their prices to the specific situation of buyers. The firm may charge the same or different prices for the same product. It is a practical device available to manage and to enlarge profits. It exploits the difference in demand elasticities. The most common ones include quantity differentials, location differentials, product use differentials and time differentials. To achieve differential pricing, it is necessary to segment markets. The common techniques utilized for market segmentation are differences in product design, quality, choice of channel, time of sale, patents, packaging and advertising.

The major goals of price differentials are the following:

- (i) implementation of different market strategy,
- (ii) to achieve profitable market segmentation,
- (iii) to attract new customers,
- (iv) to face competition, and
- (v) to solve production problem.

Differential pricing is done through:

- (A) Distributor Discounts
- (B) Quantity Discounts
- (C) Cash Discounts
- (D) Geographical Price Differentials

9. Peak Load Pricing:

There are certain non-storable goods, e.g., electricity, telephones, transport and security services, etc., which are demanded in varying measures during the day as well as night. For example, consumption of electricity reaches its peak in day time. It is called 'peak-load' time. It reaches its bottom in the night. This is called 'off-peak' time. Electricity consumption peaks in daytime because all business establishments, offices and factories come into operation. Electricity consumption decreases during nights because most business establishments are closed and household consumption falls to its basic minimum. Another example of 'peak' and 'off-peak' demand is of railway and air services. During festivals, summer holidays, 'Pooja' vacations, etc., the demand for railway and air travel services rises to its peak. A technical feature of such products is that they cannot be stored. Therefore, their production has to be increased in order to meet the 'peak-load' demand and reduced to 'off-peak' level when demand decreases.

10. Dual Pricing:

Dual pricing refers to two types of prices for a commodity, viz. (i) controlled price and (ii) market price. Controlled price of the product is directly fixed up by the government for a certain portion of the total output. Its market price is the freely determined market price for the remaining quantity of output.

11. Export Pricing:

Export pricing relates to pricing of products exported by the firm. Its decision is based in view of International Marketing. World market is complex, competitive and sensitive. In determining the export pricing the firm should be fully aware of the varied market structures and changing business environment for the products in different countries from time to time. Product cost is not the only cost for consideration in export pricing. Sales promotion cost is also a crucial factor. Other non-price factors also play significant role in export marketing. Delivery cost, and demonstration costs, display discount costs, rivals prices and business policies, qualities of the products and so on need to be considered. For exporters, export marketing strategies rather than price matters much. In a global trading. export prices are usually decided on the basis of what the traffic can bear. Pricing of goods for exports is often unrelated to basic output costs or domestic price level. Economists have suggested marginal cost pricing as the basis of export pricing in a developing economy such as India.

14.8 SUMMARY

Pricing is a crucial aspect of any business. In practice, however, it is the most difficult task to decide a right pricing policy. This is because, on the one hand, the market dictates price and yet the firm is acting as a price maker for its own differentiated product. Unlike other functional areas of management. It is also not easy to pin down the concrete goals and measure accurate results in pricing. There is possibility for a trade-off between the level of price and the sales volume or the market share. It is, therefore, necessary to reconcile for an optimum pricing - that is try to get closer to a better price which can produce a tremendous effect on the business profitability.

14.9 KEY WORDS

Fair Profit: By fair profit is usually meant a fixed percentage of profit mark-up. It is arbitrarily determined. Typically it is determined at 10 per cent in many cases.

Penetration price: Penetration price is known as charging lowest price for the new product.

Differential pricing: Differential pricing is a method that is used by some sellers to tailor their prices to the specific situation of buyers.

Export pricing: Export pricing relates to pricing of products exported by the firm.

Transfer pricing: Transfer pricing policy is associated with the multi-national corporations

(MNCs). Transfer pricing refers to intra-firm pricing: the pricing of products transferred from the production or sales unit of a multinational firm in one country to the another unit of the firm in another nation.

Joint products : Joint products are those where inputs are common in productive process. Multi-products are creation of the product line activity with independent inputs but common overhead expenses.

14.10 SELF-ASSESSMENT QUESTIONS

1. What are the considerations involved in formulating the price policy?
2. Explain the objectives of price policy.
3. What is market penetration?
4. Briefly explain market skimming.
5. Explain the different factors involved in pricing policy.
6. Explain the various pricing strategies.
7. Explain the pricing policy of a new product.
8. Explain the pricing policy of joint products
9. Explain the pricing over the life cycle of a product.
10. What is transfer pricing? Explain the different alternative methods for determining the transfer price.
11. What is differential pricing?
12. Explain the major goals of price differentials.
13. Explain the cost-plus pricing method.

CASE STUDY

Analyse the Case 'A1- Publishers' and answer the question given at the end of the Case. The A1-Publishers (A1P) is a private publishing concern. A1P published a book on Economics in 2013.

It priced the book at ₹ 125 and expected the sales to be approximately 2000 copies. It expected to earn (net distributors' discount) 80 per copy. A1P was aware that this expected rate of earnings would be just enough to cover the unit cost of the book. After the book was launched in the market, the publisher started getting feedback from its distributors. One of

the major retail stores reported to A1P that the price of ₹ 125 was too high. According to it, by pricing the book at ₹ 70 the sale of the book would be appreciably high, may be three or even four times higher than at present. This belief of the retail stores was based on the premise that a price around ₹ 70 would result in gift sale of the book. The management of A1P, no doubt, agreed with the retail store that the sales of the book would increase if its price is lowered, but its calculations revealed that the sale of the book would increase by only 50 per cent if the price is reduced to ₹ 70.

The management of the A1P arrived at a certain pre-publication estimates of the cost of the said book but actual cost of publication turned out to be higher due to substantial changes at the proof stage by the author. Table 1 shows the break-up of actual cost of publication of the book.

Table 1. Cost of Publication of the Book on Economics

1. Stock	24,000
2. Composing	₹ 55,000
3. Printing	₹ 21,000
4. Art Work	₹ 4,000
5. Miscellaneous	₹
Production Expenses	4,500
6. Overheads	₹ 21,700
7. Mailing	₹ 5,800
8. Binding	₹ 14,000
9. Freight	₹ 5,000
Total Cost .	₹ 1,55,000
	₹

Questions

1. What would be the incremental cost per book for the production lot exceeding 2,000 books?

(You may assume that more press runs would be needed to meet the increase in production, composing costs are fixed for one press run, binding costs have a fixed cost element of ₹ 3,000 per lot, the remaining costs are proportional to output. You may add any other assumption deemed appropriate to you.)

2. Assuming that the proportion of retail price going to the publisher is about the same at various prices, estimate elasticity of demand, marginal revenue and incremental revenue under the assumptions:
 - (a) 100 per cent increase in sales at the lower price,
 - (b) 200 per cent increase in sales, at the lower price,
 - (c) 50 per cent increase in sales at the lower price,
3. Suppose stocks of unsold books are piling up in the company; if you were the top management personnel, would you recommend a market reduction price? How would you go about deciding?

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UNIT - 15 : PROFIT ANALYSIS

STRUCTURE:

- 15.1 Objectives
- 15.2 Introduction
- 15.3 Theories of profit
- 15.4 Profit Policy
- 15.5 Profit maximization and Profit Planning
- 15.6 Classification of Profits
- 15.7 Determinants of long term and short term Profit
- 15.8 The measurement of profit
- 15.9 Summary
- 15.10 Key Words
- 15.11 Self-Assessment Questions
- 15.12 References

15.1 OBJECTIVES

After studying this unit, you will be able to ;

- Understand the meaning of profit
- Analyze the long term and short term profits
- Discuss the measurement of profits.

15.2 INTRODUCTION

A business firm is always profit motivated. Profit seeking is the motive force of any business undertaking. Market economy is, thus, profit oriented. Thus, the classical economists have regarded profit maximization as the sole objective of the business firm in a capitalist economy. In economic theory, the basic assumption is that though a rational firm seeks to maximise profit, profit seeking is not the only objective of a business.

Profit is the reward of the entrepreneur rather than the entrepreneurial functions. Profit differs from the return on other factors in three important respects

- (a) Profit is residual income and not contractual or certain income as in the case of other factors
- (b) There are much greater fluctuations in profits than in the rewards of other factors
- (c) profits may be negative whereas rent, wages and interest must always be positive.

The term “profit” means all excess of income over costs and this includes the earnings of self-used factors; i.e., entrepreneur’s own land, capital and his own labour work called respectively implicit rent, implicit interest and implicit wage. But in economics, profit is regarded as a reward for the entrepreneurial functions of final decision making and ultimate uncertainty bearing.

The concept of profit entails several different meanings. Profit may mean the compensation received by a firm for its managerial function. It is called normal profit which is a minimum sum essential to induce the firm to remain in business. Profit may be looked upon as a reward for true entrepreneurial function. It is the reward earned by the entrepreneur for bearing the risk. It is termed as supernormal profit analysis. Profit may imply monopoly profit. It is earned by a firm through extortion, because of its monopoly power in the market. It is not related to any useful specific function. Thus monopoly profit is not a functional reward. Profit may sometimes be in the nature of a windfall. It is an unexpected reward

earned by a firm just by mere chance, an inflationary boom.

Profit is the earning of entrepreneur. To the economist, the most significant point about profit is that it is a residual income. However, the term profit has different connotations. In short, the following are the distinctive features of profit as a factor reward:

- (i) It is not a predetermined contractual payment.
- (ii) It is not a fixed remuneration.
- (iii) It is a residual surplus.
- (iv) It is uncertain.
- (v) It may even be negative. Other factor rewards are always positive.

In reality, profit is not an end in itself. For the survival of the business, of course, depends on the firm's ability to earn some profit so as to keep it alive, which may not be or need not be the maximum. Even from an egalitarian point of view, profit is not a sinful act. Reasonable profit is the righteous reward of the entrepreneur for his entrepreneurial and organizational activity. As such, a rational profit policy and planning is important for a modern business firm.

15.3 THEORIES OF PROFIT

The theories of profits could be analyzed and explained as follows:

- Profit as the reward for risk bearing and uncertainties,
- Profit as the consequence of frictions and imperfections in the economy (dynamic theory of profits),
- Profit as a reward for successful innovation and
- Profit as a payment for organizing other factors of production.

To some economists, profits are nothing different from rent. Rent is defined as a differential surplus. Similarly profit also arises when some entrepreneurs have more ability over others in the field of production. While rent refers to land, profit refers to production. A superior entrepreneur enjoys more talent as compared to a marginal entrepreneur. Prof. Senior and Prof. Mill treated rent and profit on the same level and this was responsible for developing a full fledged theory of profit by the American economist Prof. F Walker. His theory is called the "Rent Theory of Profit". Prof. Walker's concept of profit is synonymous

with Prof. Richardo's theory of rent. Rent arises due to the fact that not all pieces of land have the same fertility and productivity; likewise profit arises due to differential factors in talent and ability of the entrepreneur, who is supposed to be the captain of industry. This position ensures the emergence of differences in industrial revenue profit, just like the differences in agricultural revenue and rent. Prof. Walker treats profit as "rent of ability".

Risk and uncertainty Theory of Profits

This theory envisages that PROFIT is a reward paid to the organisation for undertaking risks. People generally do not want to shoulder risks but some who are prepared to venture in spite of risks involved should be rewarded and the rewards payment is profit. Higher the risk, higher will be the reward. Since business operates under conditions of uncertainty, the risk premium, in the form of profit is to be paid. Risks are not confined only to owners who receive profits and even non entrepreneurial risks, like the risk of vocational specialization are also important. According to Prof. Hawley, risk bearing is the special function of an entrepreneur and it leads to the emergence of profit. Greater the risk, greater will be the expected gain to induce entrepreneur and to start the business. Most businesses are speculative and reward is necessary to the risk bearer. According to Prof. Hawley's concept, enterprise is the only real productive factor - land, labor, and capital are subordinate factors and mere means of production. Prof. FH Knight contends that risks are an inherent factor in any business and they are of two kinds, insurable risks and non-insurable risks.

The business risk include risk of competition, technological risks, business cycle risks and risks arising from governmental action such as tax policy, price control, import and export restrictions, etc. The above risks are not insurable. Prof. Knight advanced the theory that pure economic profit is related to uncertainty. The foreseen risks are insurable. The only unforeseen risks are non-insurable and they are responsible for the emergence of profit. According to him, it is uncertainty-bearing rather than risk-bearing that earns profit for the entrepreneur.

Profit as a Reward for Market Imperfection and Friction in Economy

(Dynamic Theory of Profit)

In a static economy neither demand nor supply changes. The demand for a commodity depends upon the size of population, incomes, consumer's tastes, substitutes of commodities, price and the price of related goods. In a static equilibrium, the supply of the commodity does not change. When demand and supply do not change, the price as well as the cost of

production remain constant. So, to say, in a static equilibrium the price of the product will be equal to the average total unit cost of production including normal profit. But this static equilibrium concept is only theoretical in character.

In a dynamic world, things keep on changing and everything is uncertain. In a dynamic economy all factors that influence demand and supply change continuously resulting in profit or loss. The demand for a commodity or service may increase due to many factors like population, rise in incomes, non-availability of substitutes, changes in tastes, etc. Such a demand may increase price of the product and the cost of production remaining constant, profit will arise. Similarly the supply position may also increase due to improvements in transport facilities, introduction of new production processes, reduction in the cost of raw materials, etc.

According to Prof. Clark, profits belong essentially to economic dynamics and not to economic statics where the economy is frictionless and full competition pervades. In a static economy, pure profit's would be eliminated as fast as they could be created. A war, an inflation a business depression are all factors in a modern economy which lead to profit or losses. During inflation, prices and costs go up but prices increase at a faster rate than costs resulting in larger margins of profit to producers and merchants. During a depression the opposite trend prevails. These consequences are common to all firms and industries and beyond the control and influence of anyone.

At times, individual firms introduce dynamic changes through inventions of science and technology; introduction of new processes of production; introduction of new commodities and changes in advertisements and salesmanship. These changes are the cause for the emergence of profit.

Innovation Theory of Profits

Prof. Schumpeter, in his innovation theory, attributed profits to dynamic changes in the productive process due to the introduction of modern science and technology of production techniques. Risk plays no part in this theory and profits are solely attributed to dynamic development. Innovation may bring about changes in methods of consumer tastes increasing national output more than increase in costs. The increased net output is the profit out of innovation. New organisation, new promotion, new raw material, new markets or new products constitute innovation. According to Schumpeter, profit is both the cause as well as the effect of innovations and thus it is the cause and effect of economic progress also.

Profit accrues not to the innovator, nor to the financier but to the entrepreneur who introduces it into the productive process. When innovation becomes obsolete profit disappears and innovation is always subject to competition. Innovational profits have a tendency to appear, disappear and reappear as the result of emergence of new and more clever innovation.

Profit as a Reward for Organizing other Factors of Production

A proportionate combination of the various infrastructures, men, material, money, machinery, marketing is quite indispensable to produce the desired output. Entrepreneur takes this responsibility to coordinate these infrastructures to produce products. He not only takes unforeseen risks but also, in the midst of uncertainties, combines the factors of production to produce output. A disproportionate combination of factors only increases cost of production and reduces profits. It is here that the entrepreneurial skill and wisdom play a very important part. In owner-managed firms, part of the profit goes to the manager's skill. In large corporations, the responsibility of organizing the infrastructure and their efficient and effective utilization to the optimum point fully rests with the salaried managers and as such the company's profit is to be treated as a payment for organizing and directing activities.

15.4 PROFIT POLICY

It is generally held that the main motive of a firm is to make profits. The volume of profit made by it is regarded as a primary measure of its success. Economic theory advocates profit maximisation as the chief policy of a firm. Modern business enterprises do not accept this view and relegate the profit maximisation theory to the back ground. This does not mean that modern firms do not aim at profits. They do aim at maximum profits but aim at other goals as well. All these constitute the profit policy. The profit policy of business economics is not maximisation of profit but the avoidance of loss. The various factors considered in Profit policy are

- Industry Leadership
- Restricting the Entry
- Political Impact
- Maintaining Consumer Goodwill
- Wage Consideration
- Avoiding high Taxation and Government Intervention
- Obstructing potential Competition

- Liquidity Preference
- Avoid Risk
- Service Motive

Economists have suggested different profit policies which business firms may adopt as an alternative to profit maximisation such as :

- Desire of secured profits through long run survival
- maximisation of sales
- utility maximisation
- long term stability and growth

Problem in Setting a Profit Policy:

The objectives and aims of a business may be different. In fact, most business concerns like to earn a target rate of return on their investment. There are four criteria to judge the target rate of return:

- (i) Rate adequate enough to attract equity capital
- (ii) Rate earned by other companies in the same industry - Competitive Rate
- (iii) Normal or historical profits rate of return
- (iv) Rate sufficient to finance growth from internal sources – Plough back profit rate

15.5 PROFIT MAXIMIZATION AND PLANNING

In the modern dynamic world the attitudes and policies of business firms are entirely different. Economic theory makes an assumption that the maximisation of profit is the sole objective of a business firm. Today profit maximisation refers to the long run periods; to managements rather than to owner's income; to include non-functional income; to restrain competition; to maintain management control, etc. Of late there seems to be same realization on the part of the management and economic theorists that firms do not always aim at profit maximisation in relation to marginal cost and revenue, but set standards and targets of reasonable profits for the following considerations.

- To attain industry leadership
- To forestall potential competition
- To prevent governmental intervention and restraints

- To maintain and foster consumer goodwill
- To control wage increases
- To avoid risks threatening the survival of the business firms and
- To maintain the liquidity of the business firm.

Modern business firms feel that they have a social responsibility and an obligation to society and therefore they are even prepared to sacrifice profits during the short run periods. The executives want to limit profit in order to maximise their own benefits either by non-diluting control over the industry or by the desire to maintain pleasant working conditions. Today firms set “profit standards” through a percentage on sales or a reasonable return on investments.

PROFIT PLANNING

A sound and healthy business should always aim at consistent profit in the midst of risk and uncertainties which are a result of the dynamic nature of consumer needs, peculiar nature of competition and uncontrollable nature of costs. Profit planning is an art as well as science. It is the sign of a good business which can make profit consistent with myriad of risk elements encountered and this is only possible with an appropriate profit planning.

- To earn profit one has to face risks and one who deals with risks successfully can make profit.
- To deal with the risks and to avoid losses one has to plan. It is the essence of profit planning.

Profit planning is an integral part of business policy and planning, Profit policy is programmed through profit planning. Profit planning gives a concrete shape to the profit policy of the firm. Profit policy is an ideal. Profit planning is a time bound action to fulfill this ideal. Profit is the difference between total sales revenue and total cost of production. Thus, in profit planning to regulate the profit sales volume and input quantity (or cost of production) are to be manipulated. In modern business, profits are thus controlled by adopting many sophisticated techniques such as break-even analysis cost control, profit volume analysis and linear programming.

Thus, planning for profit is absolutely necessary, and demands a thorough understanding of the relationship between output, cost and price; and it is the “break even analysis” that can explain this relationship clearly. Through break even analysis it is possible to derive managerial actions to maintain and increase profitability.

Essential Elements in Profit Planning:

The following are the essential elements in profit planning:

1. Objectives and results are established and measured at all management levels.
2. The role of the chief executive is often vital in ensuring success.
3. The system should become the major framework in guiding and controlling management performance.
4. The system should be totally pervasive, especially in framing objectives.
5. The system is recognised as the key method of management in the organisation.
6. Planners have been trained in economics or associated disciplines.
7. Budgeting, cost control, and contribution analysis are the key elements in controlling a profit plan.

Steps in Profit Planning :

Some rudimentary form of planning may already be in existence in most organisations. Many of the techniques used in profit planning may be in use. The following activities will need to be introduced or improved or enhanced if they are undertaken at present.

1. **Establish Suitable Objectives.** Objectives can cover many factors of the business survival, profits or increase in net worth. The way in which objectives are determined is nearly as important as the types that are pursued. It will be essential to take account of past performance, resource availability, management competence, environment changes, competitors' activities and so on. Objectives should not be imposed.
2. **Establish Suitable Control System.** Profit planning and control may have grown out of budgetary control systems. It is necessary to have some form of budgetary cost control, plan monitoring and management information systems which will serve to enable profit planning to be effective.
3. **Establishing Job Responsibilities.** Often job responsibilities are too imprecise to provide the information on which performance standards can be established and then judged. It is necessary to have job breakdowns in such detail that the need for resources can be identified.
4. **Carry Out a Situation Audit.** It entails an audit of all the factors both internal and external that will have an influence on company affairs. It should include establishing the skills of

competition, the economic situation which will impinge on company performance and the potential and actual social, technological and cultural changes to be accommodated.

5. **Gap Analysis.** This is an activity where the desired company objectives are compared with the probable results of continuing current trends. A gap will almost certainly be obvious between the two. Profit planning is largely concerned with how the gap can be closed.

6. **Establishing Base Data.** Often the base data essential for profit planning is either nonexistent or set out in a way that is inappropriate for planning purposes. The data include product and operational costs, production speeds, material utilisation, labour efficiency, etc.

7. **Establish Appropriate Plans and Strategies.** The management should ensure that there is plan integration. Strategies are the results of choosing between alternatives in the use of the company resources through which it is hoped that the corporate objectives will be achieved. They can be highly complex and appropriate alternatives need to be set out.

Need for Profit Planning:

The need for profit planning arises:

- (i) To improve management performance.
- (ii) To ensure that the organisation as a whole pulls in the right direction.
- (iii) To ensure that objectives should be set which will stretch but not overwhelm managers.
- (iv) To encourage strict evaluation of manager's performance in monetary terms.
- (v) To run a company in a more demanding way.

15.6 CLASSIFICATION OF PROFITS

Gross Profit and Net Profit

In ordinary phrasing, profit actually means gross profit. Gross profit is a term in which the following items are included in addition to the net profit due to the entrepreneur:

- (i) Remuneration for factors of production contributed by entrepreneur himself.
- (ii) Depreciation and maintenance charges.
- (iii) Extra personal profits.
- (iv) Net profit.

Net profit is the exclusive reward for the entrepreneur for the following functions performed by him:

- (i) Reward for co-ordination
- (ii) Reward for risk taking
- (iii) Reward for uncertainty bearing, and
- (iv) Reward for innovation.

Gross Profit = Net profit + implicit rent + implicit wages + implicit interest + normal profit + depreciation and maintenance charges + non-entrepreneurial profit.

Net Profit = Gross profit - (implicit rent + implicit wages + implicit interest + normal profit + depreciation and maintenance charges + non-entrepreneurial profit)

In fact, Net Profit = economic profit or pure business profit. It is the net profit which may be positive or negative. A negative profit means a loss.

Accounting Profit and Economic Profit

An accountant looks at profit as a surplus of revenues over costs, as recorded in the books of accounts. An accountant is interested in accounting, auditing, planning and budgeting profit. The accountant does not take care of implicit or opportunity cost. Accounting profit is also called residual profit. For the business firm, accounting profit is very important. Accounting profit is defined as the revenue realized in a given period after providing for expenses incurred during the production of a commodity. A firm while making accounting profits may be incurring economic losses. Such a firm would have to withdraw from business in the long run. In the balance sheet of a firm, accounting profit occupies an important place.

The economist, however, does not agree with the accountant's approach to profit. The accountant would only deduct the explicit or actual costs from the revenues to determine profit. The economist points out that in addition to the deduction of explicit cost, imputed cost, i.e., the cost that would have been incurred in the absence of the employment of self owned factors, should also be deducted. Their examples are:

- (i) Entrepreneur's wages that he could earn by working for someone else,
- (ii) Rental income on self-owned land and building employed in the business, and
- (iii) Interest on self owned capital that could have been earned by investing it elsewhere.

Thus the profit arrived at after deducting both explicit and imputed costs may be

called economic profit. From the managerial point of view, economic profit is very important because this alone shows the viability of a firm.

- Economic profit = total revenue - (explicit costs + implicit costs).
- Accounting profit = total revenue - explicit costs.

Economic profit can be positive, negative, or zero. If economic profit is positive, there is incentive for firms to enter the market. If profit is negative, there is incentive for firms to exit the market. If profit is zero, there is no incentive to enter or exit.

Normal Profits and Supernormal Profits

Normal profits refer to the imputed returns to capital and risk-taking just necessary to prevent the owners from withdrawing from the industry. The normal profits are usually defined as the supply price or opportunity cost of entrepreneurship. Such cost must be covered if the firm is to stay in business in the long run. Normal profit is the minimum to induce the entrepreneur to remain in the business in the long run. It is possible that the entrepreneur may not get normal profit in the short run and may have to sell his product at a loss, but in the long run every entrepreneur must get at least the normal profits. It is assumed to be part of the price. In the words of Mrs. Joan Robinson, "Normal profit is that profit which neither attracts a new firm to enter into the industry nor obligates the existing firm to go out of the industry."

Supernormal profit is defined as the surplus over the normal profit. It is obtained by the super marginal firms. The marginal firm gets only the normal profit, but determines the supernormal profit of the intra marginal firm.

Profit as Functional Reward

Some economists consider profit as a functional reward. According to them, profit is a reward for the entrepreneur for his entrepreneurial functions. Some have said that organising and co-coordinating other factors of production are the main functions of the entrepreneur. Some others have said that risk taking and decision making are the important functions of the entrepreneur. They say that since the entrepreneur takes risks in business, he earns profit.

Monopoly Profit

When a firm possesses monopoly power, it can restrict output and obtain a higher profit than it could under competitive conditions. Profit is the result of continued scarcity.

It can exist only in an imperfect market where output is for various reasons restricted and the consumers are deprived of the opportunity of alternative sources of supply. Sources of such powers are usually found in legal restrictions, sole ownership of raw materials or access of sale to particular markets.

Windfall Profit

Some consider profit as a .windfall gain. According to them, profit is not it reward for any entrepreneurial function or monopoly power. It is merely a windfall gain. It arises due to changes in the general price level in the market. If the producer or trader buys his inputs and raw materials when the prices are low and sells the output when the prices have abruptly gone up due to some unforeseen external factors, we call the profit as windfall profit. This is also included under net profit.

Earning of Management

The entrepreneur having good bargaining power, purchases raw materials at reasonable prices. He makes suitable arrangements to store the raw materials properly. By proper inventory building, he maintains the supply of raw materials regularly. He hires labour at normal wages and borrows working capital at reasonable rates of interest. Thus he manages and controls explicit costs. Ensuring of supply of capital is the most important function of profit.

15.7 DETERMINANTS OF LONG TERM AND SHORT TERM PROFIT

1. Maximising profits is said to be the objective of all firms. Indeed, it's not always easy for the management to find out which are the right decisions that would maximise them. For instance, short-run profits can be easily pumped up by avoiding maintenance, discretionary costs, investments etc..
2. Moreover, what maximises the “overall profits” is not necessary what allows to attain the maximum of “profitability”, i.e. the percentage of profits to turn-over, as you can better understand by using this model of monopoly and comparing two policies: (i) extremely high prices (= high profitability), (ii) a price set from a mark-up of 15% on costs.
3. Proceeding with other determinants of profits, rising prices of competitors, better sales conditions and skills, a higher overall price level allow for higher prices of the considered firm's products, thus increase nominal profits to the extent that costs are inelastic, i.e. they rise less than proportionally to revenues.

4. Cost structure and its general elasticity to production level is thus relevant to profits. Economies of scale increase profits more than proportionally when sales grow. Conversely, a recession with falling sales levels will hit profits particularly hard in industries where there are economies of scales and high fixed costs.
5. Rising wages directly reduce profits. If, however, on a macro-economic level, these wages will be spent on domestic goods, higher consumption will boost business revenues, partially counteracting the previous dynamics. Productivity gains determine rising profits.
6. High trade profits can prompt other people to entry the market and begin to compete with current traders. In manufacture, this effect, although still present, crucially depends on the easy of imitation of product features and production processes. It's often difficult to enter into highly profitable markets.
7. If markets were all perfectly competitive in their long run equilibrium, all firms in the economy would have the same constant level of profits: zero. By contrast, in the real world, firms have different profits with certain sectors and certain firms systematically reaching better profits than others. This is due to ubiquitous imperfect competition, barriers to entry, innovation and product differentiation.

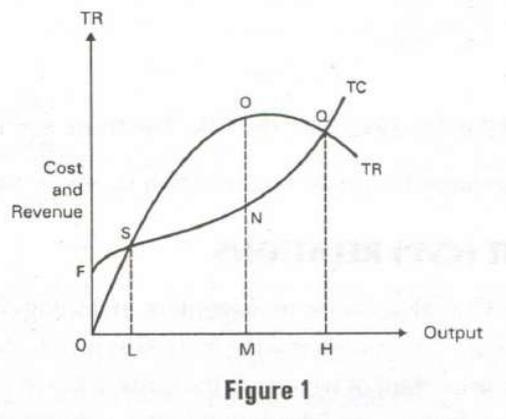
15.8 THE MEASUREMENT OF PROFIT

For most firms, the most practical measure of whether they are making adequate profits is the rate of return on capital which is calculated as

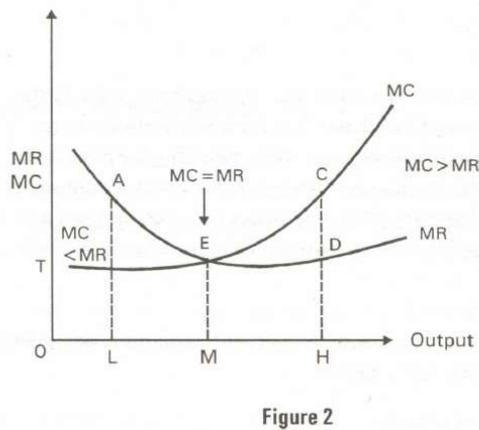
$$\text{Rate of return on capital} = \text{Net profit} / \text{Fixed Capital} \times 100$$

If this figure is too low then the firm would have to question either its profitability and how it could be improved or in extreme cases whether its capital could be invested more effectively elsewhere. Profits are the excess of total revenue over total costs, where total costs include both explicit and implicit costs.

- Equilibrium of the firm by curves of total revenue and total cost profit is the difference between TR and TC. Thus the firm will be at equilibrium at the level of output where the difference between TR and TC is greatest (at OM output in Figure 1). S and Q are breakeven points.



- Equilibrium of the firm by marginal revenue and marginal cost. The firm will be making maximum profits by expanding output to the level where $MR = MC$ (at OM output in Figure 2).



The problem of profit measurement has always been a difficult affair. In the present business world, the tendency is to discard the word ‘profit’ and use a neutral expression as “business income”. In the accounting sense, profit is an ex-post concept. Accountants follow conventions and define their terms by enumeration. Conventional accounting is largely concerned with historical profits rather than anticipated profits. Economists disagree with conventional techniques and they define their terms functionally.

For an economist, profit is an ex-ante concept. It is a surplus in excess of all opportunity costs or the difference between the cash value of an enterprise at the beginning and end of a period. From the management point of view, economic profits are a better reflection of profitability of business. The economist is basically interested in the theoretical analysis of profit.

The most important points of difference between the economist’s and accountant’s approaches centre around:

(i) Inclusiveness of Costs

(ii) Depreciation.

15.9 SUMMARY

Profit is the earning of entrepreneur. To the economist, the most significant point about profit is that it is a residual income. In modern business profit earning is not an easy task. Profitability and success of the business depends on the firm's accurate business planning and operation. Profit planning is essential in the wake of many constraints, limitations and uncertainties of modern business conditions. Profit planning is an art as well as science. It is the sign of a good business which can make profit consistent with myriad of risk elements encountered and this is only possible with an appropriate profit planning.

15.10 KEY WORDS

Profit : The term "profit" means all excess of income over costs

Economic profit = total revenue - (explicit costs + implicit costs).

Accounting profit = total revenue - explicit costs.

Monopoly Profit : Profit is the result of continued scarcity

15.11 SELF ASSESSMENT QUESTIONS

1. Explain the various aims of profit policy.
2. Explain the alternative profit policies.
3. What are the major causes for depreciation?
4. What are the essential elements in profit planning?
5. What are the different steps in profit planning?
6. Why is profit planning essential?
7. What is profit forecasting?
8. Explain the different approaches of profit planning.
9. What is monopoly profit?
10. What is windfall profit?
11. Discuss the different theories of profit.

12. Distinguish between cost and profit in economics.
13. Distinguish between accounting profit and economic profit.
14. Distinguish between normal profit, super normal profit and monopoly profit. What are the functions of profit.

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UNIT - 16 : BREAKING EVEN ANALYSIS

STRUCTURE:

- 16.0 Objectives
- 16.1 Introduction and Meaning
- 16.2 Contribution analysis
- 16.3 The Break Even Chart
- 16.4 Assumptions of Break Even analysis
- 16.5 Limitations of Break Even Analysis
- 16.6 Calculating BEP
- 16.7 Profit Volume ratio and Margin of safety
- 16.8 Uses and application of Break Even analysis in Business decisions
- 16.9 Summary
- 16.10 Key Words
- 16.11 Self-Assessment Questions
- 16.12 References

16.0 OBJECTIVES

After studying this unit, you will be able to ;

- Identify the importance of BEP
- Understand the application of BEP in Business decisions
- Discuss the steps to calculate BEP.

16.1 INTRODUCTION AND MEANING

No business firm or company can run the business if there is no profits earned by them on their fixed investment and variable costs. Every business man would like to know the minimum sales that he has to make to at least get his investment back, so that he doesn't incur loss. Ascertaining this point of sales is not very easy. The technical financial tools used to find out this no loss no profit point is the Break even analysis or the Cost Volume Profit Analysis.

Break-even analysis is of vital importance in determining the practical application of cost functions. It is a function of three factors, i.e. sales volume, cost and profit. It aims at classifying the dynamic relationship existing between total cost and sale volume of a company. Hence it is also known as "cost-volume-profit analysis". It helps to know the operating condition that exists when a company 'breaks-even', that is when sales reach a point equal to all expenses incurred in attaining that level of sales. The break-even point may be defined as that level of sales in which total revenues equal total costs and net income is equal to zero. This is also known as no-profit no-loss point. This concept has been proved highly useful to the company executives in profit forecasting and planning and also in examining the effect of alternative business management decisions.

Break even analysis refers to ascertainment of level of operations where total revenue equals to total costs. It is an analysis used to determine the probable profit or loss at any level of operations. It is method of studying the relationship among sales revenue, variable cost and fixed cost to determine the level of operation at which all the costs are equal to its sales revenue. It is No profit No loss situation. This is an important technique used in profit planning and managerial decision making. Breakeven point is the volume of sales or production where there is neither profit nor loss. Thus, we can say that:

Contribution = Fixed cost at BEP

Break-Even Point

The break-even point (B.E.P.) of a firm can be found out in two ways. It may be determined in terms of physical units, i.e., volume of output or it may be determined in terms of money value, i.e., value of sales.

17.2 CONTRIBUTION ANALYSIS

Marginal Cost and Marginal costing:

The term Marginal cost is defined as the amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit. It is a variable cost of one unit of a product or a service: i.e. a cost which would be avoided if that unit was not produced or provided.

Marginal costing is the ascertainment of marginal cost and the effect on profit of changes in volume or type of output by differentiating between fixed cost and variable cost. The concept of marginal costing is based on the behavior of costs that vary with the volume of output. It is also known as variable costing. Under marginal costing, prices are determined with reference to marginal cost and contribution margin. Profitability of the products or the company is determined with reference to their contribution margin.

Meaning and Concept of Contribution:

In Marginal Costing, costs are classified into fixed and variable costs. From this approach it is possible to identify the amount of contribution per product towards fixed overheads and profits.

Contribution is the difference between sales and marginal or variable costs of sales. Contribution is a pool of amount from which total fixed costs will be deducted to arrive at the profit or loss.

The distinction between Contribution and Profits:

<i>Contribution</i>	<i>Profit</i>
1. It includes Fixed cost and Profit	1. It does not include fixed cost
2. Marginal costing technique used this concept	2. It is the accounting concept to determine profit or loss of a business concern.
3. At Break Even Point Contribution is equal to Fixed Cost	3. Only the sales in excess of Break Even Point results in profit
4. It is used in marginal decision making	4. It is used in ascertaining profitability of a product.

Formulae used in Marginal Costing and Contribution:

Sales = Variable cost + Fixed cost + Profit (1)

Sales – Variable cost = Contribution (2)

Fixed cost + Profit = Contribution (3)

Therefore:

Sales – Variable cost = Fixed cost + Profit (4)

Contribution – Fixed Cost = Profit (5)

This fundamental marginal cost equation plays a vital role in profit projection and has a wider application in managerial decision-making problems.

The sales and variable costs vary directly with the number of units sold or produced. So, the difference between sales and variable cost, i.e. contribution, will bear a relation to sales and the ratio of contribution to sales remains constant at all levels.

Advantages of marginal costing and contribution:

- It is simple to understand variable versus fixed cost concept;
- A useful short term survival costing technique particularly in very competitive environment or recessions where orders are accepted as long as it covers the marginal cost of the business and the excess over the marginal cost contributes toward fixed costs so that losses are kept to a minimum;

- Its shows the relationship between cost, price and volume;
- Under or over absorption do not arise in marginal costing;
- Stock valuations are not distorted with present years fixed costs;
- Its provide better information hence is a useful managerial decision making tool;
- It concentrates on the controllable aspects of business by separating fixed and variable costs
- The effect of production and sales policies is more clearly seen and understood.

Limitations of Marginal costing and contribution:

- Marginal cost has its limitation since it makes use of historical data while decisions by management relates to future events;
- It ignores fixed costs to products as if they are not important to production;
- Stock valuation under this type of costing is not accepted by the Inland Revenue as it ignore the fixed cost element;
- It fails to recognize that in the long run, fixed costs may become variable;
- Its oversimplified costs into fixed and variable as if it is so simply to demarcate them;
- It is not a good costing technique in the long run for pricing decision as it ignores fixed cost. In the long run, management must consider the total costs not only the variable portion;
- Difficulty to classify properly variable and fixed cost perfectly, hence stock valuation can be distorted if fixed cost is classified as variable.

Contribution Analysis and its application in Managerial Decisions

The analysis of the contribution per unit, each product makes towards fixed cost and profit leads to the preparation of statements showing the total contribution each product class has made towards the recovery of period costs.

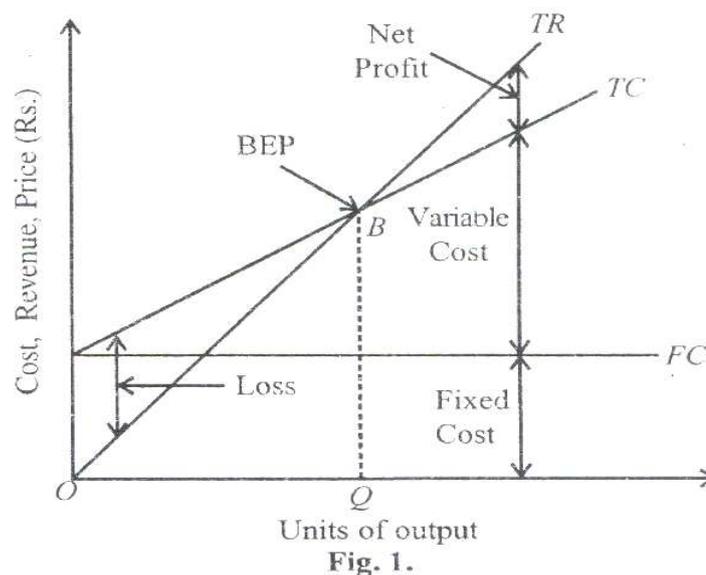
The concept of contribution helps in deciding breakeven point, profitability of products, departments etc. to perform the following activities:

- Selecting the optimum product mix

- Sales mix for profit maximization
- Fixing selling prices under different circumstances such as trade depression, export sales, price discrimination etc.
- Key or limiting factor Analysis
- Ranking the products based on Profitability
- Profit Planning
- Make or buy decisions
- BEP and CVP analysis
- Accept or reject special orders
- Continuing or discontinuing the products or operations

16.3 THE BREAK EVEN CHART

Break even Analysis is made through Graphical Charts. This chart shows fixed and variable cost and sales revenue so that profit or loss at any given level of production or sales can be ascertained. Break-Even charts are being used in recent years by the managerial economists, company executives and government agencies in order to find out the break-even point. In the break-even charts, the concepts like total fixed cost, total variable cost, and the total cost and total revenue are shown separately. The break even chart shows the extent of profit or loss to the firm at different levels of activity. The following Fig. 1 illustrates the typical break-even chart.



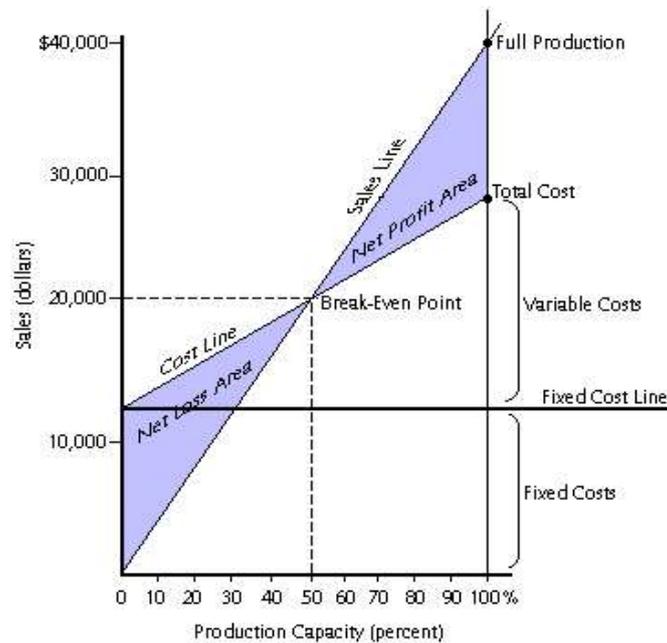
In this diagram output is shown on the horizontal axis and costs and revenue on vertical axis. Total revenue (TR) curve is shown as linear, as it is assumed that the price is constant, irrespective of the output. This assumption is appropriate only if the firm is operating under perfectly competitive conditions. Linearity of the total cost (TC) curve results from the assumption of constant variable cost. It should also be noted that the TR curve is drawn as a straight line through the origin (i.e., every unit of the output contributes a constant amount to total revenue), while the TC curve is a straight line originating from the vertical axis because total cost comprises constant / fixed cost plus variable cost which rise linearly. In the figure, B is the break-even point at OQ level of output.

In the preparation of the break-even chart we have to take the following considerations:

- (a) Selection of the approach
- (b) Output measurement
- (c) Total cost curve
- (d) Total revenue curve
- (e) Break-even point and
- (f) Margin of safety.

Construction of a Breakeven Chart The construction of a breakeven chart involves the drawing of fixed cost line, total cost line and sales line as follows:

1. Select a scale for production on horizontal axis and a scale for costs and sales on vertical axis.
2. Plot fixed cost on vertical axis and draw fixed cost line passing through this point parallel to horizontal axis.
3. Plot variable costs for some activity levels starting from the fixed cost line and join these points. This will give total cost line. Alternatively, obtain total cost at different levels; plot the points starting from horizontal axis and draw total cost line.
4. Plot the maximum or any other sales volume and draw sales line by joining zero and the point so obtained. An example is shown below:



**Figure 1
A Break-Even
Graph**

Uses of Breakeven Chart: A breakeven chart can be used to show the effect of changes in any of the following profit factors:

- Volume of sales
- Variable expenses
- Fixed expenses
- Selling price
- Margin of safety
- Angle of incidence
- No Profit No loss position

16.4 ASSUMPTIONS OF BREAK EVEN ANALYSIS

Assumptions of Break Even Analysis:

- Break-even analysis is only a supply side (ie.: costs only) analysis, as it tells you nothing about what sales are actually likely to be for the product at these various prices.
- It assumes that fixed costs (FC) are constant

- It assumes average variable costs are constant per unit of output, at least in the range of likely quantities of sales. (i.e. linearity)
- It assumes that the quantity of goods produced is equal to the quantity of goods sold (i.e., there is no change in the quantity of goods held in inventory at the beginning of the period and the quantity of goods held in inventory at the end of the period).
- In multi-product companies, it assumes that the relative proportions of each product sold and produced are constant (i.e., the sales mix is constant).
- In Break Even Charts, it is assumed that total cost and total revenue can be presented in a straight line, which is not possible in reality.
- When multiple products are there Break even chart fails to depict the BEP.

That is BEP is based on the following notions:

- The total costs may be classified into fixed and variable costs. It ignores semi-variable cost.
- The cost and revenue functions remain linear.
- The price of the product is assumed to be constant.
- The volume of sales and volume of production are equal.
- The fixed costs remain constant over the volume under consideration.
- It assumes constant rate of increase in variable cost.
- It assumes constant technology and no improvement in labor efficiency.
- The price of the product is assumed to be constant.
- The factor price remains unaltered.
- Changes in input prices are ruled out.
- In the case of multi-product firm, the product mix is stable.

16.5 LIMITATIONS OF BREAK EVEN ANALYSIS

Some important limitations which ought to be kept in mind while using break-even analysis:

1. In the break-even analysis, we keep everything constant. The selling price is assumed to be constant and the cost function is linear. In practice, it will not be so.

2. In the break-even analysis since we keep the function constant, we project the future with the help of past functions. This is not correct.
3. The assumption that the cost-revenue-output relationship is linear is true only over a small range of output. It is not an effective tool for long-range use.
4. Profits are a function of not only output, but also of other factors like technological change, improvement in the art of management, etc., which have been overlooked in this analysis.
5. When break-even analysis is based on accounting data, as it usually happens, it may suffer from various limitations of such data as neglect of imputed costs, arbitrary depreciation estimates and inappropriate allocation of overheads. It can be sound and useful only if the firm in question maintains a good accounting system.
6. Selling costs are specially difficult to handle break-even analysis. This is because changes in selling costs are a cause and not a result of changes in output and sales.
7. The simple form of a break-even chart makes no provisions for taxes, particularly corporate income tax.
8. It usually assumes that the price of the output is given. In other words, it assumes a horizontal demand curve that is realistic under the conditions of perfect competition.
9. Matching cost with output imposes another limitation on break-even analysis. Cost in a particular period need not be the result of the output in that period.
10. Because of so many restrictive assumptions underlying the technique, computation of a breakeven point is considered an approximation rather than a reality.

16.6 CALCULATING BEP

Formulae used in Break Even Analysis:

Breakeven point in units =	Fixed cost/ Contribution per unit
BEP Sales in Rupees =	Fixed cost / PV Ratio
BEP in Rupees =	Break Even Units x Selling Price per unit
BEP =	F.C / S-V

Determination of Break-even Point: The formula for calculating the break-even point is

$$BEP = \frac{\text{Total Fixed Cost}}{\text{Contribution Margin Per Unit}}$$

Contribution margin per unit can be found out by deducting the average variable cost from the selling price. So the formula will be

$$BEP = \frac{\text{Total Fixed Cost}}{\text{Selling Price} - AVC}$$

Example

Suppose the fixed cost of a factory is ₹ 10,000, the selling price is ₹ 4 and the average variable cost is Rs. 2, so the break-even point would be

$$BEP = \frac{10,000}{4 - 2} = 5,000 \text{ units}$$

It means if the company makes the sales of 5,000 units, it would make neither loss nor profit. This can be seen in the analysis.

$$\text{Sales} = ₹ 20,000$$

Cost of goods sold:

$$(a) \text{ Variable cost at } 2 = ₹ 10,000$$

$$(b) \text{ Fixed costs} = ₹ 10,000$$

$$\text{Total Cost} = ₹ 20,000$$

$$\text{Net Profit} = \text{Nil}$$

BEP in term of Sales Value

Multi-product firms are not in a position to measure the break-even point in terms of any common unit of product. They find it convenient to determine the break-even point in terms of total rupee sales. Here again the break-even point would be where the contribution margin (sales value = variable costs) would be equal to fixed costs. The contribution margin,

however, is expressed as a ratio to sales. The formula for calculating the break-even point is

$$BEP = \frac{\text{Fixed Cost}}{\text{Contribution Ratio}}$$

Contribution Ratio

$$\text{Contribution Ratio (CR.)} = \frac{\text{TR} - \text{Total Variable Cost (TVC)}}{\text{TR}}$$

Total Revenue (TR)

For example, if TR is ₹ 600 and TVC is ₹ 450, then the contribution ratio is

$$CR = \frac{600 - 450}{600} = \frac{150}{600} = 0.25$$

$$600 \quad 600$$

The Contribution Ratio is 0.25

Break-Even Analysis: 551

$$BEP = \frac{\text{Total Fixed Cost}}{\text{Contribution Ratio}}$$

Contribution Ratio

$$= \frac{150}{600}$$

$$0.25$$

The firm achieves its *BEP* when its sales are ₹ 600

Total Revenue ₹ 600

Total Cost ₹ 600

Net Profit/loss Nil

Types of Break-Even Point

The above paragraph explains a simple type of break-even point which is based on cost and revenue i.e., the profit and loss break-even. There are two other types of break-even and they are:

(i) Cash break-even, and

(ii) Income break-even.

(i) **The Cash Break-Even:** An industry requires money for two purposes i.e., to acquire capital assets and to meet working capital requirements. These requirements can be partly met by his own investment and partly by loans and advances from financial institutions.

The industry- requires term loans to acquire capital assets like land and building, plant and machinery. In the case of term loans, the financial institutions shall have to find out the probability of the applicant being able to meet the interest and loan repayment schedule. It will be more interested in knowing the level of break-even point where not only total costs are required but also the full debt service. The level of break-even is called the cash break-even. It is based on revenue and cost data involving cash flows. The depreciation, investment allowance reserve and other provision of the cost items should be excluded but at the same time the repayment of installments should be added to fixed cost.

Fixed Cost + Loan instalment - Cash outflow

Cash Break-Even Point = Contribution per unit

(ii) **The Income Break-Even:** The various sources from which the industry is proposed to be financed such as the capital, long term borrowing, deferred payments and other sources. If these sources are inadequate the industry may approach the bank for under writing its shares. If the share market does not respond positively, the equity risk falls on the underwriter. As the shareholder of the bank will expect a certain dividend just to cover the payment of interest for the term loans. In order to calculate income break-even point the equity capital cash earnings should be added.

Multiple-product Firms and Break-Even Point

The multiple products may differ in models, styles or sizes of their output. In the case of multiproduct firms the break-even point for each product can be calculated if the 'product mix' is known. The product mix is the full list of products offered for sale by a company. It may range from one or two product lines to a combination of several product lines or groups.

Suppose an industry is engaged in the production of three items, namely X, Y, and Z. The contribution for items is as follows:

X = ₹ 6 per unit

Y = ₹ 4 per unit

Z = ₹ 2 per unit

The product-mix given by the manufacturer is as follows:

X = 40,000 units

Y = 2,00,000 units

Z = 1,60,000 units.

Then the product-mix proportions are 1:5:4. We can work out the weighted average contribution in the following way:

Product Contribution Unit Proportions Total Contributions

Average Contribution per unit = 10 = ₹ 3.4

Total Fixed Cost = 5,10,000 = 150 000 units

BEP = Average contribution per unit 3.4 “

We will get the break-even output for all the three items by dividing the above figure in the same proportion

X = 15,000

Y = 75,000

Z = 60,000

This reveals that the production manager has to ensure that production in the X line does not go below 15,000 units, in the Y line 75,000 units and in the Z line 60,000 units. If not, he has to sustain loss. The same method can be applied for computing the BEP in cases of multiple product industries producing any number of items.

16.7 PROFIT VOLUME RATIO AND MARGIN OF SAFETY

Profit Volume Ratio:

Reveals the rate of contribution per product as a percentage of total turnover. It indicates the relationship of contribution to sales. It helps in knowing the profitability of the business. A fundamental property of marginal costing system is that P/V ratio remains constant at different levels of activity. A change in fixed cost does not affect P/V ratio. The concept of P/V ratio helps in determining the following:

- Breakeven point
- Profit at any volume of sales
- Sales volume required to earn a desired quantum of profit
- Profitability of products
- Processes or departments

The contribution can be increased by increasing the sales price or by reduction of variable costs. Thus, P/V ratio can be improved by the following:

- Increasing selling price
- Reducing marginal costs by effectively utilizing men, machines, materials and other services
- Selling more profitable products, thereby increasing the overall P/V ratio

Formulae of PV Ratio:

P/V ratio =	$\frac{\text{Sales} - \text{Variable cost}}{\text{Sales}}$	$\frac{\text{Contribution}}{\text{Sales}}$
P/V Ratio =	$\frac{\text{Change in contribution}}{\text{Change in sales}}$	$\frac{\text{Change in Profit}}{\text{Change in sales}}$
P/ V Ratio =	$1 - \text{Variable cost to sales ratio}$	

Margin of safety: It refers to the sales in excess of breakeven volume. It is calculated as the difference between sales or production units at the selected activity and the breakeven sales or production.

The size of margin of safety is an extremely valuable guide to the strength of a business. If it is large, there can be substantial falling of sales and yet a profit can be made. On the other hand, if margin is small, any loss of sales may be a serious matter. If margin of safety is unsatisfactory, possible steps to rectify the causes of mismanagement of commercial activities as listed below can be undertaken.

- Increasing the selling price— It may be possible for a company to have higher margin of safety in order to strengthen the financial health of the business. It should be able to influence price, provided the demand is elastic. Otherwise, the same quantity will not be sold.

- b. Reducing fixed costs
- c. Reducing variable costs
- d. Substitution of existing product(s) by more profitable lines
- e. Increase in the volume of output
- e. Modernization of production facilities and the introduction of the most cost effective technology

Formulae of Margin of safety:

Margin of safety =	$\frac{\text{Total Sales} - \text{Break Even Sales}}{\text{Total Sales}}$
Margin of safety =	$\frac{\text{Profit}}{\text{P/V ratio}}$
Margin of safety =	$\frac{\text{Profit X Selling Price per unit}}{\text{Selling price p. u.} - \text{Variable cost p. u}}$
Margin of safety =	$\frac{\text{Margin of safety}}{\text{Total sales}} \times 100$

Angle of Incidence:

The angle which sales line makes with the total cost line is known as angle of incidence. It is an indicator of profitability above the BEP. If the Margin of Safety and Angle of Incidence are considered and studied together, they will provide significance information to the management about the profitability. A high Margin of safety with wider Angle of Incidence will represent the most profitable position of the business concern and vice versa.

16.8 MANAGERIAL USES OF BREAK-EVEN ANALYSIS

To the management, the utility of break-even analysis lies in the fact that it presents a microscopic picture of the profit structure of a business enterprise. The break-even analysis not only highlights the area of economic strength and weakness in the firm but also sharpens the focus on certain leverages which can be operated upon to enhance its profitability. It

guides the management to take effective decision in the context of changes in government policies of taxation and subsidies. The break-even analysis can be used for the following purposes:

(I) **Safety Margin:** The break-even chart helps the management to know at a glance the profits generated at the various levels of sales. The safety margin refers to the extent to which the firm can afford a decline before it starts incurring losses. The margin of safety may be negative as well, if the firm is incurring any loss. In that case, the percentage tells the extent of sales that should be increased in order to reach the point where there will be no loss.

(ii) **Target Profit:** The break-even analysis can be utilized for the purpose of calculating the volume of sales necessary to achieve a target profit. When a firm has some target profit, this analysis will help in finding out the extent of increase in sales.

(iii) **Change in Price:** The management is often faced with a problem of whether to reduce prices or not. Before taking a decision on this question, the management will have to consider a profit. A reduction in price leads to a reduction in the contribution margin. This means that the volume of sales will have to be increased even to maintain the previous level of profit. The higher the reduction in the contribution margin, the higher is the increase in sales needed to ensure the previous profit.

(iv) **Change in Costs:** When costs undergo change, the selling price and the quantity produced and sold also undergo changes. Changes in cost can be in two ways:

(i) Change in variable cost, and

(ii) Change in fixed cost.

(i) **Variable Cost Change:** An increase in variable costs leads to a reduction in the contribution margin. This reduction in the contribution margin will shift the break-even point downward. Conversely, with the fall in the proportion of variable costs, contribution margins increase and break-even point moves upwards.

(ii) **Fixed Cost Change:** An increase in fixed cost of a firm may be caused either due to a tax on assets or due to an increase in remuneration of management, etc. It will increase the contribution margin and thus push the break-even point upwards. Again to maintain the earlier level of profits, a new level of sales volume or new price has to be found out.

(v) **Decision on Choice of Technique of Production:** A firm has to decide about the most economical production process both at the planning and expansion stages. There are many

techniques available to produce a product. These techniques will differ in terms of capacity and costs. The breakeven analysis is the most simple and helpful in the case of decision on a choice of technique of production. For example, for low levels of output, some conventional methods may be most probable as they require minimum fixed cost. For high levels of output, only automatic machines may be most profitable. By showing the cost of different alternative techniques at different levels of output, the break-even analysis helps the decision of the choice among these techniques.

(vi) Make or Buy Decision: Firms often have the option of making certain components or for purchasing them from outside the concern. Break-even analysis can enable the firm to decide whether to make or buy.

However, certain considerations need to be taken account of in a buying decision, such as

(i) Is the required quality of the product available?

(ii) Is the supply from the market certain and timely?

(iii) Do the supplies of the components try to take any monopoly advantage?

(vii) Plant Expansion Decisions. The break-even analysis may be adopted to reveal the effect of an actual or proposed change in operation condition. This may be illustrated by showing the impact of a proposed plant on expansion on costs, volume and profits. Through the break-even analysis, it would be possible to examine the various implications of this proposal.

(viii) Plant Shut Down Decisions: In the shut down decisions, a distinction should be made between out of pocket and sunk costs. Out of pocket costs include all the variable costs plus the fixed cost which do not vary with output. Sunk fixed costs are the expenditures previously made but from which benefits still remain to be obtained e.g. depreciation.

(ix) Advertising and Promotion Mix Decisions: The main objective of advertisement is to stimulate or increase sales to all customers-former, present and future. If there is keen competition, the firm has to undertake vigorous campaign of advertisement. The management has to examine those marketing activities that stimulate consumer purchasing and dealer effectiveness. The break-even point concept helps the management to know about the circumstances. It enables him not only to take appropriate decision but by showing how these additional fixed cost would influence BEPs. The advertisement cost pushes up the total cost curve by the amount of advertisement expenditure.

(x) Decision Regarding Addition or Deletion of Product Line:

If a product has outlived its utility in the market immediately, the production must be abandoned by the management and examined what would be its consequent effect on revenue and cost. Alternatively, the management may like to add a product to its existing product line because it expects the product as a potential profit spinner. The break-even analysis helps in such a decision.

Thus BEP helps in business decisions as to determine sales volume to earn returns, to forecast the profit, to understand the effect of change in volume, price, production etc., to choose the product alternative, and the product mix, to highlight the increase and decrease in FC and VC, to compare the interfirm profitability, proper planning of cash, capacity utilization and achieving economies.

16.9 SUMMARY

The Break even Analysis is a guide post to firm's economic performance and expansion. It indicates zero profit position which is the start marching point towards profitability of the business venture. BEP is determined when total revenue equates total cost. At this point Marginal cost = Marginal revenue.

16.10 KEY WORDS

CVP analysis: Cost Volume Profit analysis

Margin of safety: It refers to the sales in excess of breakeven volume.

Marginal costing : Marginal costing is the ascertainment of marginal cost and the effect on profit of changes in volume or type of output by differentiating between fixed cost and variable cost.

Contribution : Contribution is the difference between sales and marginal or variable costs of sales. Contribution is a pool of amount from which total fixed costs will be deducted to arrive at the profit or loss.

16.11 SELF-ASSESSMENT QUESTIONS

1. Define the break-even point.
2. How can you determine the break-even point?
3. Explain the various assumptions of break-even point.

4. What are the managerial uses of break-even analysis?
5. What is safety margin?
6. How can you find out the target profit?
7. Explain the various limitations of break-even analysis.
8. What is break-even analysis? State its limitations and uses.
9. What are the objectives of break-even analysis?
10. Write a note on break-even chart.
11. A firm incurs fixed cost of ₹ 4,000 and variable cost of ₹ 10.000 and its total sales receipts are ₹ 15,000. Determine the break-even point.
12. A firm starts its business with fixed expenses of ₹ 60,000 to produce commodity X. Its variable cost is ₹ 2 per unit. Prevailing market price of the product is ₹ 6. How much the firm should produce to earn profit of ₹ 20,000 at this price?
13. A manufacturer buys certain components for producing X at ₹ 20 per unit. If he has to make these components it would require a fixed cost ₹ 15,000 and average variable cost ₹ 5. His present requirement is 1000 units of these components.
14. Advise him whether he should make or buy them, if he intends to double the output.
15. A small firm incurs fixed expenses amounting to ₹ 12,000. Its variable cost of product X is ₹ 5 per unit. Its selling price is ₹ 8. Determine its break-even quantity (*BEQ*) and safety margin for the sales of 5000 units.
16. Given the following total cost and total revenue functions determine the break-even point: $TC = 48 + 10Q$ and $TR = 50Q$ (Here, Q is the units of output sold).

CASE STUDY

The master table of data collected from the two catering managers of Sangeetha Fast Food, at Chennai is as follows. Analyse it through BEP analysis

Three Best selling Dishes at Sangeetha	Mini Tiffin	South Indian Meals	Tandoori Combo
Total units sold per day	350 units	350 units	300 units
Selling Price per unit	Rs. 45	Rs. 50	Rs. 50
Variable cost per unit (Direct Materials, Direct Labor, Other variable costs)	Rs. 18	Rs. 20	Rs. 18
Service Time per unit in minutes	10 minutes	10 minutes	15 minutes
Fixed costs per Annum			
Rent (Rs. 1,75,000 Per month)	Rs. 21,00,000		
Salary to the employees (Rs. 6, 00,000 per month)	Rs. 72,00,000		
Total Fixed cost per Annum	Rs. 93,00,000		
Working days in an year	360 ys		

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KARNATAKA STATE  **OPEN UNIVERSITY**

MUKTHAGANGOTHRI, MYSORE – 570 006.

DEPARTMENT OF STUDIES AND RESEARCH IN MANAGEMENT

M.B.A I Semester

Course – 2

MANAGERIAL ECONOMICS

BLOCK

5

Unit – 17

Grass Domestic Product and inflation 01 - 17

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National Income and Business Cycle 30 - 43

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BLOCK –5:

The block 5 contains 3 units (unit-18 to unit-20) where the unit-18 includes information relating to gross domestic product and inflation, GDP and GNP, real v/s nominal GDP, meaning and definition of inflation, causes and effects of inflation, deflation etc further unit-19 includes information relating to meaning and importance of macroeconomics, tools for macroeconomic policy, goals of monetary and fiscal policy, business forecasting, problems encountered during forecasting etc further unit-20 includes information relating to national income and business, difficulties in measurement of NI, importance of NI, features and phases of a business cycle etc.

UNIT - 17 : GROSS DOMESTIC PRODUCT AND INFLATION

STRUCTURE:

- 17.0 Objectives
- 17.1 Introduction
- 17.2 Meaning and Importance of GDP
- 17.3 GDP and GNP
- 17.4 Measuring of GDP
- 17.5 Real v/s Nominal GDP
- 17.6 Introduction to Inflation
- 17.7 Meaning and Definition of Inflation
- 17.8 Causes of Inflation
- 17.9 Effects of Inflation
- 17.10 Deflation
- 17.11 Check Your Progress
- 17.12 Summary
- 17.13 Key Words
- 17.14 Questions for Self-Study
- 17.15 References

17.0 OBJECTIVES

After studying this unit, you will be able to ;

- Explain the Gross Domestic Product
- Bring out the importance of GDP
- Identify the measures of GDP
- Discuss the effects of Inflation
- Elucidate the meaning of Inflation and Deflation.
- Discuss the Real and Nominal GDP.

17.1 INTRODUCTION

Gross Domestic Product (GDP) is one of the most widely used measures of an economy's output or production. It is defined as the total value of goods and services produced within a country's borders in a specific time period – monthly, quarterly or annually. The monetary value of all the finished goods and services produced within a country's borders in a specific time period, though GDP is usually calculated on an annual basis. It includes all of private and public consumption, government outlays, investments and exports less imports that occur within a defined territory. GDP is commonly used as an indicator of the economic health of a country, as well as to gauge a country's standard of living.

$$\text{GDP}=\text{C}+\text{G}+\text{I}+\text{NX}$$

where:

”C” is equal to all private consumption, or consumer spending, in a nation's economy

“G” is the sum of government spending

”I” is the sum of all the country's businesses spending on capital

”NX” is the nation's total net exports, calculated as total exports minus total imports. (NX = Exports - Imports)

17.2 MEANING AND IMPORTANCE OF GDP

GDP represents the economic health of a country. It presents a sum of a country's production which consists of all purchases of goods & services produced by a country and services used by individuals, firms, foreigners & the governing bodies.

GDP consists of consumes spending, and net exports hence it portrays an all inclusive picture of an economy because of which it provides an insight to investors which highlights

the trend of the economy by comparing GDP levels as an index.

GDP is used as an indicator for most governments & economic decision - makers for planning and policy formulation. GDP helps the investors to manage their portfolios by providing them with guidance about the state of the economy. Calculation of GDP provides with the general health of the economy. A negative GDP growth portrays bad signals for the economy. Economists analyse GDP to find out whether the economy is in recession, depression or boom. The GDP is one of the primary indicators used to gauge the health of a country's economy. GDP is one of the most widely used measures of an economy's output or production. It is defined as the total value of goods & services produced within a country's borders in a specific time period- monthly, quarterly or annually.

GDP is an accurate indication of an economy's size, while GDP per capita has a close correlation with the trend in living standards over time, and the GDP growth rate is probably the single best indicator of economic growth.

Definition: The gross Domestic product (GDP) is the most important economic indicator. It represents a broad measure of economic activity & signals the direction of overall aggregate economic activity.

The total market value of all final goods and services produced in a country in a given year, equal to total consumer, investment and government spending, plus the value of exports, minus the value of imports.

17.3 GROSS DOMESTIC PRODUCT AND GROSS NATIONAL PRODUCT

If the aggregation is over the goods and services produced within the geographical boundaries of a country of who is employed (it could be a foreigner working in a domestic production setup), we arrive at a measure of the gross product called the Gross Domestic Product (GDP). Gross National Product (GNP) measures the total income accruing to the residents of a country for their participation in production, regardless of where it is. If, for instance, an Indian is working in Iraq and earns an income for participating in some production activity in Iraq, that income would, in concept, be included in the GNP of India. Accounting for this is done by adding a component, called net factor income from abroad, to the GDP. This 'net' factor income is measured as factor incomes flowing in from abroad minus factor incomes flowing out from the home country.

Therefore, **GNP = GDP + Net factor income from abroad.**

17.4 MEASURING OF GDP

GDP is the market value of all finished goods and services produced within a country in a give period of time.

“GDP is the market value....”

You have probably heard the adage, “you can’t compare apples and oranges.” Yet GDP does exactly that. GDP adds together many different kinds of products into a single measure of the value of economic activity. To do this, it uses market prices. Because market prices measure the amount people are willing to pay for different goods, they reflect the value of those goods. If the price of an apple is twice the price of an orange, then an apple contributes twice as much to GDP as does an orange.

“....Of All...”

GDP tries to be comprehensive. It includes all items produced in the economy and sold legally in markets. GDP measures the market value of not just apples and oranges, but also pears and grapefruit, books and movies, haircuts and health care, and on and on.

GDP also includes the market value of the housing services provided by the economy’s stock of housing. For rental housing, this value is easy to calculate – the rent equals both the tenant’s expenditure and the landlord’s income. Yet many people own the place where they live and, therefore, do not pay rent. The government includes this owner occupied housing in GDP by estimating its rental value. That is, GDP is based on the assumption that the owner, in effect, pays rent to him self, so the rent is included both in his expenditure and in his income.

There are some products, however, that GDP excludes because measuring them is so difficult. GDP excludes most items produced and sold illicitly, such as illegal drugs. It also excludes most items that are produced and consumed at home and, therefore, never enter the market place. Vegetables you buy at the grocery store are part of GDP; vegetables you grow in your garden are not.

These exclusions from GDP can at times lead to paradoxical results. For example, when Karen pays Doug to mow her lawn, that transaction is part of GDP. If Karen were to marry Doug, the situation would change. Even though Doug may continue to mow Karen’s lawn, the value of the mowing is now left out of GDP because Doug’s service is no longer sold in a market. Thus, when Karen and Doug marry, GDP falls.

“....Final.....”

When international paper makes paper, which Hallmark then uses to make a greeting card, the paper is called an intermediate good, and the card is called a final good. GDP includes only the value of final goods. The reason is that the value of intermediate goods is already included in the prices of the final goods. Adding the market value of the paper to the market value of the card would be double counting. That is, it would (incorrectly) count the paper twice.

An important exception to this principle arises when an intermediate good is produced and, rather than being used, is added to a firm's inventory of goods to be used or sold at a later date. In this case, the intermediate good is taken to be “final” for the moment, and its value as inventory investment is added to GDP. When the inventory of the intermediate good is later used or sold, the firm's inventory investment is negative, and GDP for the later period is reduced accordingly.

“.....Goods and Services...”

GDP includes both tangible goods (food, clothing, cars) and intangible services (haircuts, housecleaning, and doctor visits). When you buy a CD by your favorite band, you are buying a good, and the purchase price is part of GDP. When you pay to hear a concert by the same band, you are buying a service, and the ticket price is also part of GDP.

“...Produced....”

GDP includes goods and services currently produced. It does not include transactions involving items produced in the past. When General Motors produces and sells a new car, the value of the car is included in GDP. When one person sells a used car to another person, the value of the used car is not included in GDP.

“....Within a Country...”

GDP measures the value of production within the geographic confines of a country. When a Canadian citizen works temporarily in the United States, his production is part of U.S GDP. When an American citizen owns a factory in Haiti, the production at his factory is not part of U.S GDP. (It is part of Haiti's GDP.) Thus, items are included in a nation's GDP if they are produced domestically, regardless of the nationality of the producer.

“.....In a given period of Time”

GDP measures the value of production that takes place within a specific interval of

time. Usually that interval is a year or a quarter (three months). GDP measures the economy's flow of income and expenditure during that interval.

17.5 REAL VERSUS NOMINAL GDP

As we have seen, GDP measures the total spending on goods and services in all markets in the economy. If total spending rises from one year to the next, one of two things must be true:

1. the economy is producing a larger output of goods and services, or
2. Goods and services are being sold at higher prices.

When studying changes in the economy over time, economists want to separate these two effects. In particular, they want a measure of the total quantity of goods and services the economy is producing that is not affected by changes in the prices of those goods and services.

To do this, economists use a measure called real GDP. Real GDP answers a hypothetical question: what would be the value of the goods and services produced this year if we valued these goods and services at the prices that prevailed in some specific year in the past? By evaluating current production using prices that are fixed at past levels, real GDP shows how the economy's overall production of goods and services changes over time.

17.6 INTRODUCTION TO INFLATION

Inflation is an economic situation of continuously rising price level and the falling value of money. Inflation is commonly understood as a situation of substantial and rapid general increase in the level of prices and consequent deterioration in the value of money over a period of time. The behavior of general prices is measured through price indices. The trend of price indices reveals the course of inflation or deflation in the economy. Inflation is statistically measured in terms of percentage increase I price index, as a rate per cent per unit of time – usually a year or a month. Usually, the wholesale price index (WPI) numbers are used to measure inflation. Alternatively, the consumer price index (CPI) or the cost of living index number can be adopted in measuring the rate of inflation.

There are several variations on inflation:

1. **Deflation:** is when the general level of prices is falling. This is the opposite of inflation.
2. **Hyperinflation:** is unusually rapid inflation. In extreme cases, this can lead to the breakdown of a nation's monetary system. One of the most notable examples of

hyperinflation occurred in Germany in 1923, when prices rose 2,500% in one month!

3. **Stagflation:** is the combination of high unemployment and economic stagnation with inflation. This happened in industrialized countries during the 1970s, when a bad economy was combined with OPEC raising oil prices.

17.7 MEANING AND DEFINITION OF INFLATION

Inflation refers to the rise in prices. It can be defined as a “state in which the value of money is falling as prices are rising” (Crowther). With the rise in prices, the real value of money in terms of number of goods or the amount of goods and services that can be purchased by one unit of currency or money will fall.

The rate at which the general level of prices for goods and services is rising, and, subsequently, purchasing power is falling. Central banks attempt to stop severe inflation, along with severe deflation, in an attempt to keep the excessive growth of prices to a minimum.

In economics, inflation is a sustained increase in the general price level of goods and services in an economy over a period of time. It can be defined as too much money chasing too few goods. When the general price level rises, each unit of currency buys fewer goods and services. Consequently, inflation reflects a reduction in the purchasing power per unit of money – a loss of real value in the medium of exchange and unit of account within the economy.

Inflation is commonly understood as a situation of substantial and rapid general increase in the level of prices and consequent deterioration in the value of money over a period of time.

The behavior of general prices is measured through price indices. The trend of price indices reveals the course of inflation or deflation in the economy. As Lerner says, a price rise which is unforeseen and uncorrected is inflationary. Thus, inflation is statistically measured in terms of percentage increase in the price index, as a rate per cent per unit of time—usually a year or a month.

Usually, the wholesale price index (WPI) numbers are used to measure inflation. Alternatively, the consumer price index (CPI) or the cost of living index number can be adopted in measuring the rate of inflation.

Inflation Rate:

1. According to prof.Rowan, inflation is the process of price increase.
2. The percentage increase in the price of goods and services, usually annually.
3. “Inflation rate” is a term used in economics which refers to the rise in prices of goods or services over a given time period; as prices rise, the value of the goods or service diminishes.

17.8 CAUSES OF INFLATION

Inflation affects all types of economic activity –consumption, production and distribution. Slowly rising price level culminating in profit-inflation may stimulate investment and production. If inflation is a post-full-employment phenomenon and if full employment is characterized by output inelasticity, price rises instead of stimulating production only end up in galloping (hyper) inflation. It then affects the terms of trade between sectors like agriculture and non-agriculture. Rising prices reduce the real purchasing capacity of the economy and then it narrows down the market for essential goods and services. This is how demand recession resulting from inflation hits business activity. Inflation increases the price of goods exported; exports which have elastic demand suffer and balance of trade and payments get adversely affected. It is through trade, inflation and recessionary effects get internationally transmitted. Ultimately inflation adversely affects the fixed income groups like wage earners; it generates income redistribution effect in favour of entrepreneurs, retirees and profiteers. It encourages anti-social elements and activities of black marketers, hoarders and speculators. When the authority tries to combat inflation through a system of controls, regulation and rationing, we get suppressed inflation. As and when the pent-up demand becomes very high and controls become ineffective, suppressed inflation may turn into unmanageable actual inflation. Inflation, actual or potential, is an economic disaster and asocial evil. Adequate and appropriate public policy must be devised to control it.

Inflation is a complex phenomenon which cannot be attributed to a single factor. The major causes of inflation is summarized as shown below.

Over-Expansion of Money Supply:

Many a times, a remarkable degree of correlation between the increase in money supply and the rise in the price level may be observed.

Expansion of Bank Credit:

Rapid expansion of bank credit is also responsible for the inflationary trend in a country.

Deficit Financing:

The high doses of deficit financing which may cause reckless spending, may also contribute to the growth of the inflationary spiral in a country.

Ordinary Monetary Factors:

Among other monetary factors influencing the price trend in an economy, the major ones are listed here:

- 1. High Non-development expenditure:** The continuous increase in public expenditure, and especially the growth of defense and non-development expenditure.
- 2. Huge plan investment:** The huge planned investment and its high rate of growth in every plan may lead to an excess demand in the capital goods sector, so that industrial prices may rise.
- 3. Black money:** Some economists have condemned black money in the hands of tax evaders and black marketers as an important source of inflation in a country. Black money encourages lavish spending, which causes excess demand and a rise in prices.
- 4. High Direct Taxes:** incidence of high commodity taxation. Prices tend to rise on account of high excise duties imposed by the Government on raw materials and essential goods.

Non-Monetary Factors:

There are various non-monetary and structural factors that may cause a rising price trend in a country. These are:

- 1. A high population growth:** Undoubtedly, the rising pressure of demand, resulting from of population and money income, will cause a high price rise in an over-populated country.
- 2. Natural calamities and bad weather conditions:** Vagaries of monsoon, bad weather conditions, droughts and failure of agricultural crops have been responsible for price spurts, from time to time, in many underdeveloped countries. Agricultural prices are most sensitive to inflationary forces in India. Natural calamities also contribute occa-

sionally to the inflationary boost in a country. Events such as cyclones and floods, which destroy village economies, also aggravate the inflationary pressure.

3. **Speculation and hoarding:** Hoarding and speculative activities, corruption at every level. In both private and public sectors, etc., are also responsible to some extent for aggravating inflation in a country.
4. **High prices of imports:** Inflation has also been inflicted on some countries through the import content used by their industries. Prices of petroleum products have been increased in many countries due to price hikes by the oil-producing countries. Recently, in 2008, since fuel prices have sky-rocked, inflation has accelerated in many countries including India.
5. **Monopolies:** Monopoly profits and unfair trade practices by big industrial houses are also responsible for the price rise in countries like India.
6. **Underutilization of resources:** Non-utilization of installed capacities in large industries is also a contributory factor to inflation.

17.9 EFFECTS OF INFLATION

1. Inflation erodes the value of money and is invisible tax, which is imposed by the government on the public. The profligacy and unproductive expenditures of the government lead to additional burden of lower purchasing power on the public and tax payers.
2. It leads to social evils of hoarding, profiteering and black money.
3. Fixed income people lose in real standard of living while businessmen and producer may gain.
4. Social discontent and income inequalities will increase and the poor people will be more adversely affected than others by these trends.
5. If inflation is mild, it is favorable to producers to have expectations of profit and to increased production.
6. Whether inflation is mild or galloping then investment will be affected due to rise in costs leading to cost over-runs and delay in productive process.
7. The inflationary effects in income distribution will be unfair and discriminatory. Businessmen and traders gain more by super profits while fixed income classes, wage earners, pensioners will all suffer by fall in their real income and standard of living.

17.10 DEFLATION

A general decline in prices, often caused by a reduction in the supply of money or credit. Deflation can be caused also by a decrease in government, personal or investment spending. The opposite of inflation, deflation has the side effect of increased unemployment since there is a lower level of demand in the economy, which can lead to an economic depression. Central banks attempt to stop severe deflation, along with severe inflation, in an attempt to keep the excessive drop in prices to a minimum.

Definition: When the overall price level decreases so that inflation rate becomes negative, it is called deflation. It is the opposite of the often-encountered inflation.

Description: A reduction in money supply or credit availability is the reason for deflation in most cases. Reduced investment spending by government or individuals may also lead to this situation. Deflation leads to a problem of increased unemployment due to slack in demand.

Central banks aim to keep the overall price level stable by avoiding situations of severe deflation/inflation. They may infuse a higher money supply into the economy to counter-balance the deflationary impact. In most cases, a depression occurs when the supply of goods is more than that of money. Deflation is different from disinflation as the latter implies decrease in the level of inflation whereas on the other hand deflation implies negative inflation.

17.11 CHECK YOUR PROGRESS

1. What is hyper inflation?

- a) Usual deflation b) usually rapid inflation
- c) Unusual deflation d) unusually rapid inflation

2. What is the meaning of Deflation?

- a) A general swing in prices b) A general decline in prices
- c) A general uptrend in prices d) A general increase in prices

3. Give the full form of CPI

- a) Consumer Price Index b) Consumer Price Stock
- c) Customer Price Index d) Customer Price Stock

Answer to check your progress:

1. d,
2. b,
3. a

17.12 SUMMARY

Inflation is a sustained increase in the general level of prices for goods and services. When inflation goes up there is a decline in the purchasing power of money. Variations on inflation include deflation, hyper inflation and stagflation. Two theories has to the cause of inflation are demand pull inflation and cost pull inflation. When there is a unanticipated inflation, creditors lose, people on a fixed income lose, menu costs go up, uncertainty reduces, spending and exporters aren't as competitive. Lack of inflation is not necessarily a good thing.

Inflation is measured with a price index. The two main groups of price indexes that measure inflation are the consumer price index and the producer price index. Inflation is a serious problem for fixed income investors. It's important to understand the difference between nominal interest rates and real interest rates. Inflation indexed securities offer protection against inflation but offer low returns.

17.13 KEY WORDS

GDP: Monetary value of all the finished goods and services produced within a country's borders within a specific time period, calculated on annual basis.

GNP: Measure of country's economic performance or what its citizen produced that is goods and services whether they produced this items within its borders.

Deflation: Declining prices, if they persist, generally create a vicious spiral of negatives such as falling profits, closing factories, shrinking employment and incomes, and increase in defaults on loans by companies and individuals.

Inflation: The rate at which the general level of prices for goods and services is rising, and subsequently purchasing power is falling. Central banks attempt to stop severe inflation, along with severe deflation. In an attempt to keep the excessive growth of prices to a minimum.

17.14 QUESTIONS FOR SELF STUDY

1. What are the importances of GDP?
2. What do you mean by real GDP?
3. Define inflation and deflation.
4. Discuss the effects and causes of inflation.

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UNIT - 18 : MACRO-ECONOMICS

STRUCTURE:

- 18.0 Objectives
- 18.1 Introduction to Macroeconomics
- 18.2 Meaning and Definition Macroeconomics
- 18.3 Importance of Macroeconomics
- 18.4 Tools of Macroeconomic Policy
- 18.5 Goals of Monetary and Fiscal Policy
- 18.6 Meaning and Definition of Forecasting
- 18.7 Business Forecasting
- 18.8 How does Forecasting Work?
- 18.9 Problems encountered during Forecasting
- 18.10 Forecasting System
- 18.11 Check Your Progress
- 18.12 Summary
- 18.13 Key words
- 18.14 Questions for Self Study
- 18.15 References

18.0 OBJECTIVES

After studying this unit, you will be able to ;

- Give the meaning of Macroeconomics
- Bring out the importance of Macroeconomics
- Explain the goals of Fiscal and Monetary policy
- Identify the significance of Forecasting
- Highlight the problems in forecasting

18.1 INTRODUCTION TO MACRO-ECONOMICS

Macroeconomic system is highly synchronized and interconnected in nature, no one part of the system can be considered in isolation from others. Macroeconomics was consequently developed to describe the typical nature of aggregate economic behavior as distinct from isolated individual activities. Macroeconomics concerns itself with aggregates relating to the economy as a whole. In macroeconomics, economic phenomena are studied in their aggregate size, shape and behavior. Macroeconomics is concerned with the behavior of macro variables such as national income, price levels, national output, total investment, total consumption; total savings in the economy, etc Macroeconomics pertains to the problems of the size of national income, economic growth and the general price level. Macro economics uses aggregates which relate to the entire economy or to a large sector of the economy and when it considers industrial output, it refers to the whole of output produced by the industrial sector and similarly, agricultural output for the entire agricultural sector.

18.2 MEANING AND DEFINITION OF MACRO-ECONOMICS

Macroeconomics is the branch of economics that studies the behavior and performance of an economy as a whole. It focuses on the aggregate changes in the economy such as unemployment, growth rate, gross domestic product and inflation.

The field of economics that studies the behavior of the aggregate economy. Macroeconomics examines economy-wide phenomena such as changes in unemployment, national income, rate of growth, gross domestic product, inflation and price levels. Macroeconomics is focused on the movement and trends in the economy as a whole, while in microeconomics the focus is placed on factors that affect the decisions made by firms and individuals. The factors that are studied by macro and micro will often influence each

other, such as the current level of unemployment in the economy as a whole will affect the supply of workers which an oil company can hire from, for example.

Macro means large or aggregate (total). Macroeconomics is a branch of economics which deals with the aggregate behavior of the economy as a whole. Macroeconomics is essentially an aggregate economics. It makes a study of the economic system in general. It perceives the overall dimensions of economic affairs of a country. It looks at the total size, shape and functioning of the economy as a whole, rather than working of articulation or dimensions of the individual parts. To use Marshall's metaphorical language, macroeconomics views the forest as a whole, independently of the individual trees composing it.

Macroeconomics analyzes all aggregate indicators and the microeconomic factors that influence the economy. Government and corporations use macroeconomic models to help in formulating of economic policies and strategies.

18.3 IMPORTANCE OF MACROECONOMICS

Macroeconomics has its unique importance:

1. It explains the working of the economic system as a whole.
2. It examines the aggregate behavior of the macroeconomic entities like firms, households and the government.
3. Its knowledge is indispensable for the policy makers for formulating macro-economic policies such as monetary policy, fiscal policy, industrial policy, exchange control, income policy etc.
4. It is very useful to the planner for preparing economic plans for the country's development.
5. It is helpful in international comparison. For example, microeconomic data like national income, consumption, saving-income ratio, etc., are required for a comparative study of different countries.
6. It explains economic dynamism and intricate interrelationships among macroeconomic variables, such as price level, income, output and employment.
7. Its study facilitates overall purposes of control and prediction.

18.4 TOOLS OF MACROECONOMIC POLICY

Governments have certain instruments that they can use to affect macroeconomic activity. A policy instrument is an economic variable under the control of government that can affect one or more of the macroeconomic goals. By changing monetary, fiscal, and other policies, governments can avoid the worst excesses of the business cycle or increase the growth of potential output. The major instruments of macroeconomic policy are listed below.

Fiscal Policy:

Fiscal policy denotes the use of taxes and government expenditures. Government expenditures come in two distinct forms. First there are government purchases. These comprise spending on goods and services- purchases of tanks, construction of roads, salaries for judges, and so forth. In addition, there are government transfers payments, which increase the incomes of targeted groups such as the elderly or the unemployment. Government spending determines the relative size of the public and private sectors, that is, how much of our GDP is consumed collectively rather than privately. From a macroeconomic perspective, government expenditures also affect the overall level of spending in the economy and thereby influence the level of GDP.

The other part of fiscal policy, taxation, affects the overall economy in two ways. To begin with, taxes affect the people's incomes. By leaving households with more or less disposable or spendable income, taxes affect the amount people spend on goods and services as well as the amount of private saving. Private consumption and saving have important effects on investment and output in the short and long run.

In addition to this the taxes affect the prices of goods and factor of production and thereby affect incentives and behavior. The United States has often employed special tax provisions (such as an investment tax credit or accelerated depreciation) as ways of increasing investment and boosting economic growth. Many provisions of the tax code have an important impact on economic activity through their effect on the incentives to work and to save.

Monetary Policy:

The second major instrument of macroeconomic policy is **monetary policy**, which the government conducts through managing the nation's money, credit and banking system. You may have read how our central bank, the Federal Reserve System, affects the economy by determining short-term interest rates. How does the Federal Reserve or any other central

bank actually accomplish this? It does so primarily by setting short-run interest-rate targets and through buying and selling government securities to attain those targets. Through its operations, the Federal Reserve influences many financial and economic variables, such as interest rates, stock prices, housing prices, and foreign exchange rates. These financial variables affect spending on investment, particularly in housing, business environment, consumer durables, and exports and imports.

Historically, the Fed has raised interest rates when inflation threatened to rise too high. This led to reduced investment and consumption, causing a decline in GDP and lower inflation. In the most recent slowdown, which started in 2007, the Fed acted quickly to lower interest rates, provide credit, and extend its lending facilities outside traditional banking institutions.

The central bank is a key macroeconomic institution for every country. Japan, Britain, Russia, and the countries of the European Union all have powerful central banks. In an “open economy” that is, one whose borders are open to goods, services, and financial flows – the exchange-rate system is also a central part of monetary policy.

Monetary policy is the tool that countries most often rely on to stabilize the business cycle, although it becomes less potent in deep recessions.

A nation has two major kinds of policies that can be used to pursue its macroeconomic goals: Fiscal policy and monetary policy.

1. Fiscal policy consists of government expenditure and taxation. Government expenditure influences the relative size of collective spending and private consumption. Taxation subtracts from incomes, reduces private spending, and affects private saving. In addition, it affects investment and potential output. Fiscal policy is primarily used to affect long-term economic growth through its impact on national saving and investment; it is also used to stimulate spending in deep or sharp recessions.
2. Monetary policy, conducted by the central bank, determines short-run interest rates. It thereby affects credit conditions, including asset prices such as stock and bond prices and exchange rates. Changes in interest rates, along with other financial conditions, affect spending in sectors such as business investment, housing, and foreign trade. Monetary policy has an important effect on both actual GDP and potential GDP.

18.5 OBJECTIVES OR GOALS OF MONETARY POLICY AND FISCAL POLICY

The following are the principal objectives of monetary policy:

1. Full Employment:

Full employment has been ranked among the foremost objectives of monetary policy. It is an important goal not only because unemployment leads to wastage of potential output, but also because of the loss of social standing and self respect.

2. Price Stability:

One of the policy objectives of monetary policy is to stabilize the price level. Both economists and laymen favour this policy because fluctuations in prices bring uncertainty and instability to the economy.

3. Economic Growth:

One of the most important objectives of monetary policy in recent years has been the rapid economic growth of an economy. Economic growth is defined as “the process whereby the real per capita income of a country increases over a long period of time.

4. Balance of payments:

Another objective of monetary policy since the 1950’s has been to maintain equilibrium in the balance of payments.

Objectives of Fiscal Policy:

The following are the objectives of fiscal policy:

1. To maintain and achieve full employment
2. To stabilize the price level
3. To stabilize the growth rate of the economy
4. To maintain equilibrium in the balance of payments
5. To promote the economic development of underdeveloped countries.

18.6 MEANING AND DEFINITION OF FORESCATING

The use of historic data to determine the direction of future trends. Forecasting is used by companies to determine how to allocate their budgets for an upcoming period of time. This is typically based on demand for the goods and services it offers, compared to the cost of producing them. Investors utilize forecasting to determine if events affecting a company, such as sales expectations, will increase or decrease the price of shares in that company. Forecasting also provides an important benchmark for firms which have a long-term perspective of operations.

Stock analysts use various forecasting methods to determine how a stock's price will move in the future. They might look at revenue and compare it to economic indicators, or may look at other indicators, such as the number of new stores a company opens or the number of orders for the goods it manufactures. Economists use forecasting to extrapolate how trends, such as GDP or unemployment, will change in the coming quarter or year. The further out the forecast, the higher the chances that the estimate will be less accurate.

18.7 BUSINESS FORECASTING

It is not unusual to hear a company's management speak about forecasts: "Our sales did not meet the forecasted numbers," or "we feel confident in the forecasted economic growth and expect to exceed our targets." In the end, all financial forecasts, whether about the specifics of a business, like sales growth, or predictions about the economy as a whole, are informed guesses. Let us observe some financial forecasting methods.

Various Financial Forecasting Methods are given below:

There are a number of different methods by which a business forecast can be made. All the methods fall into one of two overarching approaches: qualitative and quantitative.

Qualitative Models:

Qualitative models have generally been successful with short-term predictions, where the scope of the forecast is limited. Qualitative forecasts can be thought of as expert-driven, in that they depend on market mavens or the market as a whole to weigh in with an informed consensus. Qualitative models can be useful in predicting the short-term success of companies, products and services, but meets limitations due to its reliance on opinion over measurable data.

The Qualitative models include:

1. **Market Research:** polling a large number of people on a specific product or service to predict how many people will buy or use it once launched.
2. **Delphi Method:** Asking field experts for general opinions and then compiling them into a forecast.

Quantitative Models:

Quantitative models discount the expert factor and try to take the human element out of the analysis. These approaches are concerned solely with data and avoid the fickleness of the people underlying the numbers. They also try to predict where variables like sales, gross domestic product, housing prices and so on, will be in the long-term, measured in months or years. Quantitative models include:

1. **The Indicator Approach:** The indicator approach depends on the relationship between certain indicators, for example GDP and unemployment rates, remaining relatively unchanged over time. By following the relationships and then following indicators that are leading, you can estimate the performance of the lagging indicators, by using the leading indicator data.
2. **Econometric Modeling:** This is a more mathematically rigorous version of the indicator approach. Instead of assuming that relationships stay the same, econometric modeling tests the internal consistency of data sets over time and the significance or strength of the relationship between data sets. Econometric modeling is sometimes used to create custom indicators that can be used for a more accurate indicator approach. However, the econometric models are more often used in academic fields to evaluate economic policies.
3. **Time Series Methods:** This refers to a collection of different methodologies that use past data to predict future events. The difference between the time series methodologies is usually in fine details, like giving more recent data more weight or discounting certain outlier points. By tracking what happened in the past, the forecaster hopes to be able to give a better than average prediction about the future. This is the most common type of business forecasting, because it is cheap and really no better or worse than other methods.

18.8 HOW DOES FORECASTING WORK?

There is a lot of variation on a practical level when it comes to business forecasting. However, on a conceptual level, generally all forecasts follow the same process.

- 1. A problem or data point is chosen:** This can be something like “will people buy a high-end Air Conditioner?” or “what will our sales be in December next year?”
- 2. Theoretical variables and an ideal data set are chosen:** This is where the forecaster identifies the relevant variables that need to be considered and decides how to collect the data.
- 3. Assumption time:** To cut down the time and data needed to make a forecast, the forecaster makes some explicit assumptions to simplify the process.
- 4. A model is chosen:** The forecaster picks the model that fits the data set, selected variables and assumptions.
- 5. Analysis:** Using the model, the data is analyzed and a forecast made from the analysis.
- 6. Verification:** The forecaster compares the forecast to what actually happens to tweak the process, identify problems or in the rare case of an absolutely accurate forecast, pat himself on the back.

18.9 PROBLEMS ENCOUNTERED DURING FORECASTING

In this dynamic business environment business forecasting is very essential for any organization, as it allows the organization to plan production, financing, marketing, R&D and so on. However, there are some problems with relying on forecasts:

1. The data required for forecasting is always going to be old. Historical data is all we have to rely on and there is no guarantee that the conditions in the past will persist into the future also.
2. It is impossible to factor in unique or unexpected events, or externalities. Assumptions are dangerous, such as the assumptions that banks were properly screening borrows prior to the subprime meltdown, and black swan events have become more common as our dependence on forecasts has grown.
3. Forecasts can't integrate their own impact. By having forecasts, accurate or inaccurate, the actions of businesses are influenced by a factor that can't be included as a variable. This is a conceptual knot. In a worst case scenario, management becomes a slave to historical data and trends rather than worrying about what the business is doing now.

18.10 FORECASTING SYSTEM

A forecasting system consists of two primary functions: forecast generation and forecast control. Forecast generation includes acquiring data to revise the forecasting model, producing a statistical forecast and presenting results to the user. Forecast control involves monitoring the forecasting process to detect out-of-control conditions and identifying opportunities to improve forecasting performance. The below figure shows a visualization of a forecasting system and process.

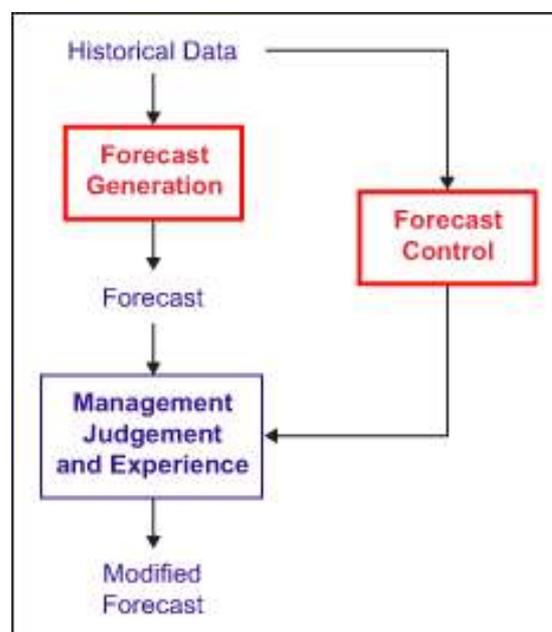


Figure 1: Forecasting System

18.11 CHECK YOUR PROGRESS

1. What is the full form of R&D?

- a) Research and Decay
- b) Research and Development
- c) Research and Digestion
- d) Research and Advancement

2. Which are the macroeconomic variables?

- a) National Income
- b) Inflation
- c) Total debt
- d) Management

3. What is Delphi method?

- a) Forecasting technique
- b) Asking field experts for general opinion
- c) Risk management
- c) Predicting the future

Answer to check your progress:

1. b) 2. a) 3. a)

18.12 SUMMARY

Macroeconomics is the study of the behavior of the entire economy. It analyzes long-run growth as well as the cyclical movements in total output, unemployment and inflation, and international trade and finance. This contrasts with microeconomics, which studies the behavior of individual markets, prices, and outputs.

Business Forecasting can be a dangerous art to the business, because the forecasts become a focus for companies and governments, mentally limiting their range of actions, by presenting the short to long-term future as already being determined. Moreover, forecasts can easily breakdown due to random elements that can't be incorporated into a model, or they can be just plain wrong from the beginning. But if used properly, forecasting allows businesses to plan ahead of their needs, raising their chances of keeping healthy through all markets. This one function of business forecasting that all the investors can appreciate.

18.13 KEY WORDS

Forecasting: Is the process of making statements about events whose actual outcomes have not yet been observed.

Historical data: Past information about a company, used to help forecast the company's future.

Qualitative data: Subjective in nature, means it is open to interpretation.

Quantitative data: It is the data that has numerical significance.

18.14 QUESTIONS FOR SELF STUDY

1. Explain the various problems encountered during forecasting.
2. Define the importance of Macroeconomics.
3. Discuss different types of forecasting methods.
4. Mention the objectives of Monetary and Fiscal policy.

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UNIT - 19 : NATIONAL INCOME AND BUSINESS CYCLE

STRUCTURE:

- 19.0 Objectives
- 19.1 Introduction to National Income (NI)
- 19.2 National Income and Business
- 19.3 Difficulties in the measurement of NI
- 19.4 The importance of NI
- 19.5 Introduction to Business Cycle
- 19.6 Features of Business Cycle
- 19.7 Phases of a Business Cycle
- 19.8 Check Your Progress
- 19.9 Summary
- 19.10 Key Words
- 19.11 Questions for Self-Study
- 19.12 References

19.0 OBJECTIVES

After studying this unit, you will be able to ;

- Explain the difficulties in the measurement of national income
- Bring out the importance of national income
- Identify the features of business cycle
- Explain the phases of business cycle
- Elucidate the factors causing swings in business cycle

19.1 INTRODUCTION:NATIONAL INCOME: AN ECONOMIC INDICATOR

The most comprehensive indicator of the level of economic activity of an economy is its aggregate output, i.e., the total annual output of finished goods and services, known as gross national product (GNP), which is defined as the total market value of all finished goods and services produced in an economy during a given time period (usually a year). GNP is a monetary measure of total output. It excludes transfer payments (like buying and selling of bonds and securities, gifts, taxes or welfare payments) and second sale of goods, as these are a part of current production. In order to avoid double counting, GNP excludes transactions involving intermediate goods that are still in the process of being transformed into final goods (e.g., timber in a saw mill, wheat in a bakery, etc.). Further, GNP also does not include the production contribution of housewives, the efforts of self-help in a productive process by members of households, or improvement in product quality not reflected in price changes. Similarly, social cost of environmental pollution is not deducted from total output. Yet, GNP is still the best measure of nation's total output.

There are three ways to look at the level of economic activity. viz., the output, income and expenditure. Depending upon the way we look at them, we call them gross national product (GNP), gross national income (GNI) and gross national expenditure (GNE), where GNP- Sum of the market value of all final goods and services produced in an economy during a period of time.

GNI – Sum of the money incomes derived from activities involving current production in an economy during a given period of time and

GNE – Sum of all that is spent of currently produced goods and services by all types of buyers in an economy during a given period of time.

Thus, national income can be measured by any of the three ways:

1. As an aggregate of goods and services produced during a year;
2. As an aggregate cost of factor services in the economy during a year; or
3. As an aggregate of expenditure on consumption, saving and investment during a year.

Choice of a method in a particular case basically depends on the nature of data available and the purpose of the study.

1. Net product (or, value – added) method:

This is basically the production method. According to this method, the sum of net value of goods and services produced at market prices is found. Three steps are involved in calculation of national income through this method:

- (i) Gross product is calculated by summing up the money value of output in the different sectors of economy, like industry, agriculture, transport, etc.;
- (ii) The money value of raw material and services used and the amount of depreciation of physical assets involved in the production process are summed up; and
- (iii) The net output or value added is found by subtracting the aggregate of the cost of raw material, services and depreciation from the gross product found in (i).

In every economy output is classified into various categories depending on the nature of activities from which it originates. These categories of output are known as sectors. From the gross sectoral output the sectoral cost (of material, depreciation, etc.) Is subtracted to get the sectoral value added. Aggregate of the value added of all the sectors in the economy during a year is called net national product or national income by product method.

2. Income method:

This method is also known as the factor-share or income distributed method. According to this method, the incomes received by all the ‘basic’ factors of production used in the production process are summed up. The basic factors for the purpose of national income estimation are categorized as labour and capital, for the simple reason that it is highly difficult to make a distinction between the contribution of land and capital and of labour and entrepreneurship. In those cases where both labour and capital are supplied by the same individual, it is not possible to know what part of the income of the individual is on

account of labour services and what part on account of capital services. The income in such cases is, therefore, termed as mixed income. Thus, there are three components of national income in this method.

- (i) Labour Income - consists of wages, salaries, bonus and social security and welfare contributions;
- (ii) Capital Income – includes dividends, pre-tax retained earnings, interest on savings and bonus, rent, royalties and profit of government enterprises; and
- (iii) Mixed income- comprises the earnings from professions, farming enterprises, etc.

These three components of income are added together to get national income.

3. Expenditure Method:

This method is known as the final product method. According to this method, the total national expenditure is the sum of the expenditure incurred by the society in a particular year. The expenditures are broadly classified as the personal consumption expenditure, net domestic investment, government expenditure on goods and services, and the net foreign investment (i.e., imports-exports).

It is not easy to find the expenditure data. Moreover, reliability of expenditure data is often in doubt. It is, therefore, that the expenditure method for calculating national income is not popular in practice, whereas the income and product methods are often employed for calculating national income. Generally, both these methods are used simultaneously- product method to calculate the contribution of agriculture and industry sectors, while income method to find the contribution of services sector.

19.2 NATIONAL INCOME AND BUSINESS

The national income data can also be quite helpful for business. In order to undertake long-term investments and to formulate business policies it is quite essential for a dynamic management to do a thorough analysis of changes occurring in the national income. Since national income reveals, on the one hand, the structure of the economy and, on the other, the possible directions of change in the future economic policy of the government, national income data in the hands of an expert managerial economist can prove a life line for business. It is quite vital for a firm aspiring to capture or retain leadership in business, as it is perhaps one of the most essential ingredients for any business forecasting exercise. The national income data can also be successfully used for determining the product diversification

programme and undertaking technological innovations. National income statistics is, thus, a wealth of information, but its usefulness depends on keenness to observe and probe as well as patience to analyze.

19.3 DIFFICULTIES IN THE MEASUREMENT OF NATIONAL INCOME

There are many difficulties when it comes to measuring national income; however these can be grouped into conceptual difficulties and practical difficulties:

Conceptual Difficulties:

1. **Inclusion of Services:** There has been some debate about whether to include services in the counting of national income, and if it counts as output. Marxian economists are of the belief that services should be excluded from national income, most other economists though are in agreement that services should be included.
2. **Identifying Intermediate Goods:** The basic concept of national income is to only include final goods, intermediate goods are never included, but in reality it is very hard to draw a clear cut line as to what intermediate goods are. Many goods can be justified as intermediate as well as final goods depending on their use.
3. **Identifying Factor Incomes:** Separating factor incomes and non factor incomes is also a huge problem. Factor incomes are those paid in exchange for factor services like wages, rent, interest etc. Non factor are sale of shares selling old cars property etc., but these are made to look like factor incomes and hence are mistakenly included in national income.
4. **Services of Housewives and other similar services:** National income includes those goods and services for which payment has been made, but there are scores of jobs, for which money as such is not paid, also there are jobs which people do themselves like maintain the gardens etc., so if they hired someone else to do this for them, then national income would increase, the argument then is why are these acts not accounted for now, but the bigger issue would be how to keep a track of these activities and include them in national income.

Practical Difficulties

1. **Unreported Illegal Income:** Sometimes, people don't provide all the right information about their incomes to evade taxes so this obviously causes disparities in the counting of national income.
2. **Non Monetized Sector:** In many developing nations, there is this issue that goods and services are traded through barter, i.e. without any money. Such goods and services should be included in accounting of national income, but the absence of data makes this inclusion difficult.

19.4 THE IMPORTANCE OF NATIONAL INCOME

Measuring national income is crucial for various purposes:

1. The measurement of the size of the economy and level of country's economic performance;
2. To trace the trend or the speed of the economic growth in relation to previous year(s) also in other countries;
3. To know the composition and structure of the national income in terms of various sectors and the periodical variations in them.
4. To make projections about the future development trend of the economy.
5. To help government formulate suitable development plans and policies to increase growth rates.
6. To fix various development targets for different sectors of the economy on the basis of the earlier performance.
7. To help businesses to forecast future demand for their products.
8. To make international comparison of people's living standards.

19.5 INTRODUCTION TO BUSINESS CYCLE

The fluctuations in economic activity that an economy experiences over a period of time. A business cycle is basically defined in terms of periods of expansion or recession. During expansions, the economy is growing in real terms (i.e. excluding inflation), as evidenced by increases in indicators like employment, industrial production, sales and personal incomes. During recessions, the economy is contracting, as measured by decreases

in the above indicators. Expansion is measured from the trough (or bottom) of the previous business cycle to the peak of the current cycle, while recession is measured from the peak to the trough. In the United States, the National Bureau of Economic Research (NBER) determines the official dates for business cycles.

Fluctuations in economic activity are a feature of every economy and pose a persistent problem, especially in the short run. These short run fluctuations in economic activity, which are reflected in output and employment levels, are called business cycles. Business cycles typically go through a phase of low levels of economic activity called recession which, if not remedied, will deteriorate into a depression. After this phase, the economy begins to look up with the economic activity gradually peaking. This phase is called boom. This is followed by a downturn in economic activity, spurred by some panic factor. Recession then sets in and the cycle continues. While these upturns and downturns exist in every business cycle, what cannot be predicted at all is the period for which each phase would last. Recessions could last for a few weeks or a few years.

19.6 FEATURES OF A BUSINESS CYCLE

The term “business cycle” or “trade cycle” in economics refers to the wave like fluctuations in the aggregate economic activity, particularly in employment, output and income. In other words, trade cycles are ups and downs in economic activity. A trade cycle is defined in various ways by different economists. For instance, Mitchell defined a trade cycle as a fluctuation in aggregate economic activity. According to Haberler, “The business cycle in the general sense may be defined as an alteration of periods of prosperity and dispersion, of good and bad trade.”

The business cycle refers to the cyclical variation in economic activity. Economic activity is empirically captured in terms of the rate of growth of gross domestic product (GDP), per capita income, level of employment, inflation rate and interest rates referred to as macro-economic variables. These variables are not constant, but fluctuate over time.

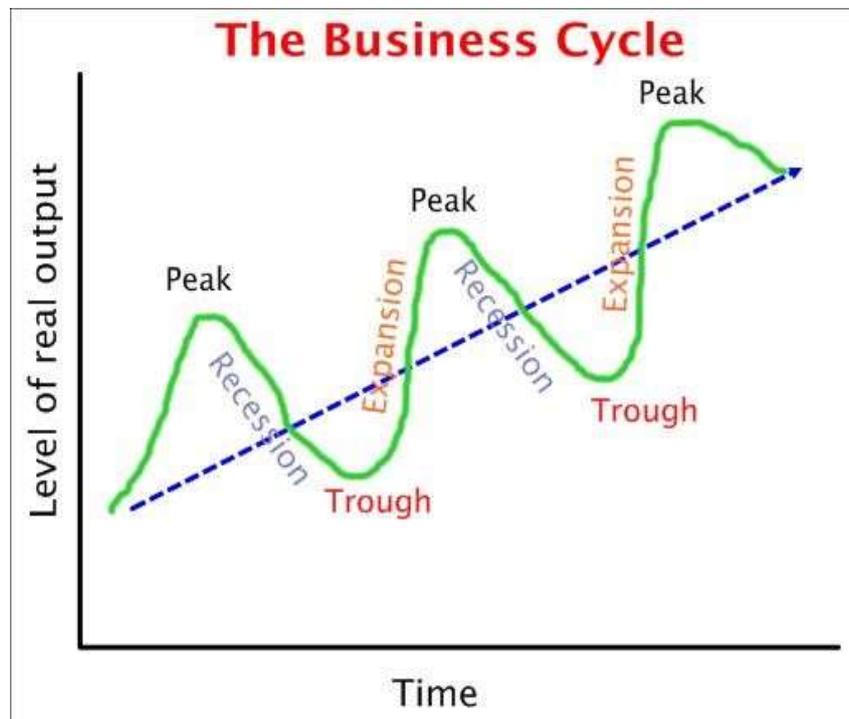
19.7 PHASES OF A BUSINESS CYCLE

A business cycle is typically divided into four phases

- The recovery or revival of economic activity
- The prosperity or expansion of the activity

- The recession or downturn in the economic activity and
- The depression or contraction in the economic activity

These phases of business cycle recur with some sort of regularity and are uniform in case of different cycles. For example, a cycle may have a periodicity of about 4.5 years in case of certain advanced economies. The time interval of each phase also accordingly differs. Though the periodicity and time interval between cycles may differ, the underlying features of different trade cycles (as reflected in the regular appearance of the four phases) are the same.



Recovery:

This is the phase of revival of demand for goods and services. The economic activity as a whole increases slowly. Although the general prices start rising. The upward movement of business activity is slow, picks up, construction activity is revived and there is a gradual rise in employment. This is a period when the industrialists and businessmen repay the loans taken by them from the banks earlier and the frozen stocks held by the banks are released. Stocks of goods remain below the normal with the shopkeepers. Once the recovery starts, it results in a snowballing process for investment. The result is that demand orders pour in and

the producers get stimulus and encouragement to produce more. The sellers stop their conservative buying and plan building larger stock of goods to take advantage of an anticipated rise in prices. This is a period in general favouring expansion in business activity. The capital equipment is replaced. Banks are liberal in the matter of advances. The prices recover and tend to reach normal. The speed, with which the expansion of business activity takes place in response to a given initial increase in investment, would depend upon the multiplier effect.

Prosperity:

During this phase there is a rapid cumulative movement of prices, employment, income and production. The prices and general business activity is above the normal. Total output starts growing at a rapid pace due to higher investment and employment. Prices of finished products rise faster than the increase in wage-rate, raw material prices and interest rate. Consequently, producers stand to gain. Prices of all the commodities do not rise to the same extent. The sequence of general price rise generally begins with increase in security prices, which then passes on to raw material prices, whole sale prices, wages of unskilled labour, retail prices and finally the interest rates.

During this phase there is great incentive for new investment, even though interest rates, wage rates and raw material prices are higher. Since sales show a tendency to increase, the dealers increase their stocks to satisfy new customers, keeping existing customers satisfied and to further attract new customers. The dealers start acting more on the basis of anticipated than the actual demand. There is a general optimism in business. Retailers buy more than their present demand and wholesalers buy more than what is demanded by retailers at present. Consequently, the producers tend to produce more than the amount they can sell at present. Therefore, producers start procuring additional capital goods to expand production according to their anticipated future demand. The capital goods industry also, thus, experiences a sharp upturn in its business activity.

The peak of prosperity may lead to over-optimism in business psychology resulting in over-full employment of resources and raw material, and therefore, leading to inflationary rise in prices. If it happens it signifies the end of prosperity phase and the advent of recession in the very near future.

Recession:

When the business cycles take a down word turn from the state of prosperity, the state of recession is said to have set in. During the phase of prosperity, production increases with every increase in commodity prices. As more and more of unemployed labour, capital

and raw material are employed, interest rate, wages and other costs rise with increasing rapidity. Simultaneously, the banks suddenly discover that they have expanded their deposits a little too far. The ratio of cash reserves to total deposits falls. The banks become reluctant to advance loans in the interest of their safety and statutory requirements. In order to meet their obligations, the sellers would, therefore, have to unload their stocks in the market. Due to unloading of stocks by many firms, the prices start declining. Profit margin decline further because costs start overtaking prices. Business psychology becomes depressed and the boom bursts. There is a struggle for solvency among the businessmen. Some firms close down while others reduce production, leading to reduction in investment, employment, income and demand. This process is cumulative. This phase of business cycle is characterized by fall in prices, commercial panic, Restriction and calling back loans by banks, a sharp increase in interest rate and fall in investment. Soon the production falls, unemployment increases and inventory stocks get accumulated. There is a collapse of confidence. If not controlled in the beginning by timely monetary and fiscal measures by government which can sustain investment at a high level, recession may give way to even a more grave situation, called depression.

Depression:

If unchecked, depression is a natural consequence of the recessionary crisis. Gradually, the process of falling prices, demand and employment gather momentum. Decrease in price follows the same sequence as does the price increase in case of the state of boom. In this phase, general demand for goods and services falls faster than the production of goods, though this is more in case of capital goods than consumer goods. Producers find selling prices falling faster than their costs. Producers suffer losses because by the time the goods are ready for sale the prices are found to have fallen further, with the result that producers are not able to recover their full cost. Businessmen get panicky, and start releasing their stocks, which hastens the decline in prices. The phenomenon of over-production appears and workers in large numbers are thrown out of work. There are accumulated reserves with banks. Demand for credit is at its lowest, resulting in idle funds with the banks. In general, the bottom of depression is reached when liquidation of accumulated stocks is completed. Depression is, thus, characterized by low prices, idle funds with banks, mass unemployment and slack trade.

It must, however, be remembered that the depression also had its end. Gradually, the accumulated stocks are disposed of and cleared; here the fall of price will be checked. Similarly, bad debts are closed. Capitalization which had become excessive is reduced and

the volume of investments has fallen. All these, coupled with fresh orders from the dealers, reduce the cost and increase the possibilities of sales and profit. Prices stop falling and tend to stabilize. And, then as production is expanded the prices begin to revive. Side by side through the paying back or cancellation of loans and curtailment of demand for fresh loans, the ratio of cash reserves to bank deposits rises. The banks feel that they are now in a position to resume lending again. So, the depression breaks and recovery sets in. The important features to be noted in this connection are that the different phases follow each other in a regular sequence; cycles continue one after another. Secondly, the cycle shows fluctuations in total output and not of any single commodity or a group of commodities. Lastly, within the movement of total output, production of capital goods and durable consumer goods reveal greater fluctuations than the production of other goods.

19.8 GENERAL FACTOR CAUSING SWINGS IN BUSINESS ACTIVITY

The main causes of business cycle are:

1. Banking operations play a vital role. By expanding and contracting credit creation, changing discount rates, and the ratio between deposits and cash reserves, the banks can change the volume of money supply in the economy, and thus, contribute to the cyclical phenomenon.
2. Changes in the proportion between capital goods and consumer goods production in the economy can also lead to shortages or surpluses in commodity supply in the short run. This results in business cycles.
3. If the purchasing power does not correspond to the expansion or contraction of production, the market suffers from maladjustments and, therefore, cyclical fluctuations.
4. The profit mania of producer is also a contributory cause of the business cycles. This makes the producer too optimistic. He is under a constant illusion regarding the exact nature and volume of demand. The result is that if the retail trade is a little brisk, the producer magnifies the tendency by expanding production considerably and himself causing a mild boom in the raw material and the labour markets. If the retail trade slackens the over-cautious producer immediately tends to reduce his output and cancels some of the orders placed by him for raw materials, plant, etc. this behavior tends to intensify the processes of rise or fall in prices.
5. The human psychology also contributes to the occurrence of business cycles. Human

psychology has a tendency to undergo frequent changes almost in a cyclical manner- from exuberance to depression. Optimism and pessimism 'give birth to one another in an endless chain'. If the boom develops, psychology takes a turn at the peak and tilts in the opposite direction. The turn in the reverse direction occurs at the bottom of the depression. It is not possible to give any generalized explanation of these psychological changes.

6. The cyclical changes in weather also contribute to the emergence of trade cycles. These changes affect agricultural production and the prices of those basic goods which the working class in a society consumes. This, in turn, affects the wage rate, cost of raw material. Etc., thereby contributing to the fluctuations in the economic activity.

19.9 CHECK YOUR PROGRESS

- 1) In the below given option which not the phase of business cycle.
 - a) Prosperity
 - b) Recession
 - c) Upside
 - d) Recovery
- 2) What is the full form of NBER?
 - a) National Bureau of political Research
 - b) National Bureau of Economic Research
 - c) National Bureau of scientific Research
 - d) National Bureau of academic Research
- 3) How is the data of national income is useful to business?
 - a) Product Diversification
 - b) To undertake long term decisions
 - c) Foreign portfolio investment
 - d) Technological Innovation

Answers to check your progress:

- 1) c, 2) b, 3) a, b, d

19.10 SUMMARY

National income is the indicator of economic activity. It is the total market value of all finished goods and services produced in an economy during a year. It can be measured through three methods: net product method, income method and expenditure method. The level of economic activity of a society is influenced mainly by seven parameters: aggregate demand and aggregate supply, leakages and injections, marginal propensities to consume and save, investment, marginal efficiency of capital, the multiplier and the accelerator.

Business cycles refer to the fluctuations in economic activity occurring regularly in the capitalist societies. The sequence of fluctuations in business cycle is: recovery, prosperity, depression and recession. Recovery is the phase of revival of economic activity as a whole which starts increasing slowly. During prosperity, prices and general business activity is above normal, and, consequently, there is a rapid cumulative movement of prices, income, production and employment. In case of recession, there is downturn in business activity, leading to reduction in output, employment and income. Recessionary process leads to depression where rate of decline in prices, income, employment and output gathers momentum.

19.11 KEY WORDS

National Income: It is the total value a country's final output of all new goods and services produced in one year.

Recession: A period of general economic decline.

Economy: The large set of interrelated economic production and consumption activities which aid in determining how scarce resources are allocated.

19.12 QUESTIONS FOR SELF STUDY

1. Discuss the importance of national income.
2. Briefly explain the different phases of business cycle.
3. Bring out the difficulties in the measurement of national income.
4. Explain the factor which causes swings in business activity.
5. Discuss the features of business cycle.

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UNIT - 20 : MICRO-ECONOMICS

STRUCTURE:

- 20.0 Objectives
- 20.1 Introduction
- 20.2 Basic Micro-Economic Concepts
- 20.3 Microeconomics vs. Macroeconomics
- 20.4 Importance of Micro-Economics
- 20.5 Difference between Micro-Economics and Macro-Economics
- 20.6 Basic Micro-Economic Issues
- 20.7 Efficient Allocation of Resources
- 20.8 Opportunity Cost
- 20.9 Summary
- 20.10 Key words
- 20.11 Self Assessment Questions
- 20.12 References

20.0 OBJECTIVES

After studying this unit, you will be able to:

- Give the meaning Micro-Economics
- Describe the scope of Financial Management
- Analyze the Importance of Micro-Economics
- Identify the Opportunity Cost
- Highlight the Efficient Allocation of Resources

20.1 INTRODUCTION

Microeconomics is the social science that studies the implications of individual human action, specifically about how those decisions affect the utilization and distribution of scarce resources. Microeconomics shows how and why different goods have different values, how individuals make more efficient or more productive decisions, and how individual's best coordinate and cooperate with one another. Generally speaking, microeconomics is considered a more complete, advanced and settled science than macroeconomics.

Microeconomics is the study of economic tendencies, or what is likely to happen when individuals make certain choices or when the factors of production change. Individual actors are often broken down into microeconomic subgroups, such as buyers, sellers and business owners. These actors interact with the supply and demand for resources, using money and interest rates as a pricing mechanism for coordination.

According to Edwin Mansfield – “Micro economics deals with the economic behaviour of individual units such as consumers, firms, and resource owners; while macro economics deals with behaviour of economic aggregates such as gross national product and the level of employment. The term micro was originated from Greek word ‘Mikros’ which means small. Hence, microeconomics is concerned on small economic units like as individual consumer, households, firms, industry etc.

Microeconomics may be defined as the branch of economic analysis which studies about the economic behaviour of individual economic unit may be a person, particular households, a particular firm and an industry.

The main objective of micro – economics is to explain the principles, problems and policies related to the optimum allocation of resources. According to K. E. Boulding, “Microeconomics is the study of particular firm, particular households, individual price, wage, income of the industry and particular commodity.” According to Mc. Connel –” In micro economics we examine the trees not the forests.” Similarly according to A.P. Lerner – “Micro economics consists of looking at the economy through a microscope.”

Further it is the study of individual tree not a whole forest. Hence, microeconomics tries to explain how an individual allocates his money income among various needs as well as how an individual maximize satisfaction level from the consumption of available limited resources. Microeconomics also explains about the process of determination of individual price with interaction of demand and supply. It helps to determine the price of the product and factor inputs. Therefore, it is also called as price theory or demand and supply theory. Simply microeconomics is microscopic study of the economy.

Definitions:

Microeconomics is a branch of economics that studies the behavior of individuals and firms in making decisions regarding the allocation of scarce resources and the interactions among these individuals and firms.

Microeconomics is the study of individuals, households and firms’ behavior in decision making and allocation of resources. It generally applies to markets of goods and services and deals with individual and economic issues.

Description:

Microeconomic study deals with what choices people make, what factors influence their choices and how their decisions affect the goods markets by affecting the price, the supply and demand.

20.2 BASIC MICROECONOMIC CONCEPTS

Microeconomics also encompasses a variety of concepts and variables related to the individual, household or business. We will focus on the three central topics for microeconomic research: preference relations, supply and demand, and opportunity cost.

Preference Relations

Preference relations are defined simply as a set of different choices that an entity can make. Preference refers to the set of assumptions related to ordering some alternatives, based on the degree of satisfaction, enjoyment, or utility they provide; a process which results in an optimal choice. Completeness is taken into consideration, where “completeness” is a situation in which every party is able to exchange every good, directly or indirectly, with every other party without transaction costs. In order to analyze the problem further, the assumption of transitivity, a term for how preferences are transferred from one entity to another is considered. These two assumptions of completeness and transitivity that are imposed upon the preference relations together compose rationality, the standard by which a choice is measured.

Supply and Demand

In microeconomics, supply and demand is an economic model of price determination in a market. It concludes that in a competitive market, the unit price for a particular good will vary until it settles at a point where the quantity demanded by consumers (at current price) will equal the quantity supplied by producers (at current price), resulting in an economic equilibrium for price and quantity.

Opportunity Cost

Opportunity cost of an activity (or goods) is equal to the best next alternative uses. Opportunity cost is one way to measure the cost of something. Rather than merely identifying and adding the costs of a project, one may also identify the next best alternative way to spend the same amount of money. The forgone profit of this next best alternative is the opportunity cost of the original choice.

Careers

Macroeconomics research and analyze data on national and global economies. They gather information from longitudinal studies, surveys and historical statistics, and use it to make predictions in the economy or even offer solutions to problems. Specific aspects of an economy, like the manufacture and distribution of raw materials, poverty rates, inflation, or the success of trade are also a prime focus for macroeconomists, who are frequently consulted by politicians and civic authorities when making public policy decisions.

Micro-economists focus on specific industries or businesses. An expert micro-economist conducts thorough research on the financial matters of a business, and offers advice on how to scale or make improvements. They often construct supply and demand ratio graphs to determine the budget and resources to be allocated to production. A micro-economist can help business owners and CFOs set pay scales based on industrial trends and the availability of funds.

Education

Macroeconomics and Microeconomics are, in the college world, generally relegated to specific higher level courses that fall under the parent subject of Economics. Most of the time, an actual degree program will simply be in economics, though a student majoring in this subject may then choose to specialize in the micro or macro areas as electives. All economics majors regardless of the area will be required to take multiple math courses, particularly calculus, and, typically, a few statistics courses as prerequisites to higher level economics courses. Business students as well as a few other potential majors will often be required to take a basic economics course or two as a part of their core coursework for foundation, and some students will simply choose to take Economics 101 for what it offers to their education. A student can also minor in economics, a practice which is often done to provide a good background for students seeking careers in law, business, government, journalism, and teaching.

Opinions on Economic Change

Macroeconomists tend to be all about economic stimulus and what accompanies it, though there is a lack of unity even among macroeconomists on this particular issue. From the macroeconomist point of view, what it takes to fix the economy of a given country today is to pour money into it. This action is done in order to provide economic growth, and is then analyzed in terms of how much growth is produced, how much unemployment is caused or prevented, and when the government will get its money back, if at all. Most macroeconomists are Keynesians, or economists who support government intervention and steering of the economy, and so measure success primarily by the above factors when considering what to do with government money.

Micro-economists, on the other hand, are often not as positive about stimulus action by the government. They believe that macroeconomists tend to ignore the most basic microeconomic question: Where are the incentives? Who has an incentive to improve the economy? Micro-economists believe it is a mistake to look at the country

as an entity, because it is not the actual country which decides where stimulus money will be spent. Rather, it is the politicians who are governing the country. So, instead of looking at what would be best for the country, we need to look at what politicians would have an incentive to do. Instead of assuming that politicians would choose based on what is best for a country's economic health, micro-economists believe people need to recognize at the microeconomic level that a politician is choosing based entirely on his own incentives.

The issue is such that at the very basic framework level, micro-economists are looking at entirely different factors than macroeconomists when they analyze the health of our attempts at economic recovery.

20.3 MICROECONOMICS VS. MACROECONOMICS

What's the difference between micro and macro economics? These two economic disciplines can seem confusing at first glance, but once you learn their focus it's easy to differentiate microeconomic issues and questions from macroeconomic ones.

The difference between micro and macro economics is simple. Microeconomics is the study of economics at an individual, group or company level. Macroeconomics, on the other hand, is the study of a national economy as a whole. Microeconomics focuses on issues that affect individuals and companies. This could mean studying the supply and demand for a specific product, the production that an individual or business is capable of, or the effects of regulations on a business.

Macroeconomics focuses on issues that affect the economy as a whole. Some of the most common focuses of macroeconomics include unemployment rates, the gross domestic product of an economy, and the effects of exports and imports. Does this make sense? While both fields of economics often use the same principles and formulas to solve problems, microeconomics is the study of economics at a far smaller scale, while macroeconomics is the study of large-scale economic issues.

Both fields of economics are interdependent

At first glance, micro and macro economics might seem completely different from one another. In reality, these two economic fields are remarkably similar, and the issues they study often overlap significantly.

For example, a common focus of macroeconomics is inflation and the cost of living for a specific economy. Inflation is caused by a variety of factors, ranging from low interest rates to expansion of the money supply.

While this might seem like a purely macroeconomic field of study, it's actually one that's very important in microeconomics. Since inflation raises the price of goods, services and commodities, it has serious effects for individuals and businesses.

On a microeconomic level, this has several effects. Businesses are forced to raise their prices in response to the increased cost of materials. They also need to pay their employees more over the long term to account for the higher cost of living.

This is just one example of a macroeconomic phenomenon – in this case, inflation and a rising cost of living – affecting a microeconomic one. Other macroeconomic decisions, such as the creation of a minimum wage or tariffs for certain goods and materials, have significant microeconomic effects.

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Examples of microeconomic issues

Microeconomics seeks to solve problems on a small level. Some economists like to describe microeconomics as the study of economics and behavior from the bottom up, since it's focused on the effects of low-level decisions on the economy. An example of a microeconomic issue could be the effects of raising wages within a business. If a large business raises its wages by 10 percent across the board, what is the effect of this policy on the pricing of its products going to be?

Since the cost of producing products has increased, the price of these products for consumers is likely to follow suit. Likewise, what will happen if a company raises wages for its most productive employees but fires its least productive workers? These are the type of questions microeconomics aims to solve. Microeconomics is also useful for studying the effects of your own decisions. One of the most common principles in microeconomics is opportunity cost.

Opportunity cost is the value of making one decision over another. A decision that involves economy cost is the choice of one meal instead of another: by choosing a certain food, you miss out on the benefits offered by another. Choices involving

opportunity cost could relate to your career. By choosing one job over another, you may gain opportunities but lose others. In addition to factors like supply and demand, opportunity cost is one of the principles of microeconomics.

Learn more about opportunity cost, including several examples of the opportunity cost of career choices and buying decisions, in our blog post on the opportunity cost formula. Due to the narrow focus of macroeconomics, it's an incredibly valuable skill set for making decisions in your own life. Learn more about intelligent decision making in our Cognitive Biases: Learn to Master Decision Making course.

20.4 IMPORTANCE OF MICRO – ECONOMICS

The importance of micro – economics can be analyzed on the basis of following headings:

1) Efficient allocation of resources: Microeconomics also concern about how a consumer and producers allocate available limited resources in various aspects so that the consumer will be able to maximize the level of satisfaction and the producers will be able to maximize output. As for example, the consumer will be able to maximize satisfaction.

When, $MU_x/P_x = MU_y/P_y$ or, $MU_x/MU_y = P_x/P_y$ Similarly, the process will be also to maximize output when, $MU_x/P_x = MPL/PL$ or, $MU_x/MPL = P_x/PL$

Where, MU_x = Marginal utility of commodity x MU_y = Marginal utility of commodity y P_x = Price of commodity x, P_y = price of commodity y MP_x = Marginal productivity of capital MPL = Marginal productivity of labor P_x = price of capital (interest rate), PL = Price of labor (wage)

2) To understand the working of market economy: We know that in case of market economy there is very less role of the government and the market forces i.e. demand and supply are responsible for determining every economic variable. Micro economics also believe that in market economy demand and supply play vital role. Hence, with the study of microeconomics, we will be able to understand how an economy without the role of government will run.

3) To provide tools for economic policies: Microeconomics is highly helpful in the formulation of economic policies that will promote the welfare of the society. It gives tool and foundations for analysis of economic policy. The economic

policy directly affects the economy and which leads to change in allocation of resources. Thus, the policy related to tax, loans, price, demand and production etc. are based on the microeconomic analysis. The price theory provides analytical tools for economic policies affecting price and production. In this way, microeconomics assists private sectors as well as government to make best use of scarce resources.

4) **To examine the condition of social and economic welfare:** The normative price theory is called welfare economics. Welfare economics studies welfare of the people as producers and consumers. It suggests possible ways of improving welfare of people. It helps to avoid waste and bring more social welfare. It defines and analysis the rules of economic efficiency or micro economics help in suggesting ways and means of eliminating wastages in order to bring maximum social welfare.

5) **Helpful in international trade:** Every economy depends on the economy either for goods, services, technical knowledge or marginal skills. Micro economics tells us how two or more than two economies can gain from international trade. It is the relative elasticity's of demand and supply between the two countries which are the basis of determining trade. Moreover, the exchange rate determination between the two countries also depends upon the micro economic instruments of demand and supply.

6) **Useful in Business Decision –Making:** It helps business executives in the attainment of maximum production by the given amount of resources. With the help of microeconomics, business firm can make decisions in demand analysis, cost analysis and methods of calculating prices.

The main areas in which microeconomics are helpful in business decision making are:

a) **Pricing Policy:** Microeconomics examines the basic economic policies. It analyze the condition of demand, supply, elasticity of demand, consumer behaviour etc. which are the main variables of price determination. Thus, with the help of these variables businessman determine the price of product.

b) **Optimal allocation of resources:** Microeconomics studies about the optimum allocation of scarce resources and which helps to the business firm to select efficient and least cost production technique. Similarly, it helps to determine what to produced, how to produced and for whom to produced.

c) **Optimal production decision:** Business firm use the various methods and technique of production. However, they have continuously faced the problem of appropriate technique and method of production. Because, the resources like, labor, capital is limited. Microeconomics provides powerful tool for managerial decision making in the solution of such problems and maximization of output in the production process.

d) **Demand analysis and forecasting:** Demand analysis theory can be a source of many useful insights for business decision making. The fundamental objective of demand theory is to identify and analyze the basic determinants of consumer needs or wants. On the basis of this analysis a businessman forecast a future sales or demand which is essential before making production schedules of employing resources. The forecast helps the manager to expand the market and raise profits.

e) **Analysis of cost of production:** Microeconomics analyzes the different types of cost, factors determining cost and way of minimizing the cost of production.

20.5 DIFFERENCE BETWEEN MICROECONOMICS AND MACROECONOMICS

1) **Nature of the study of Economic Units:** Microeconomics studies the individual or small economic variables of the economy such as individual's consumption, saving investment and income, but macroeconomics deals with aggregates like national income, full employment and price level.

2) **Objectives:** Microeconomics studies principles, problems and policies concerning the optimum allocation of resources whereas macroeconomics studies the problems, policies and principles relating to full employment and growth of resources.

3) **Subject Matter:** The subject matter of microeconomics deals with the determination of price, consumer's equilibrium, distribution and welfare, etc, whereas the subject matter of macroeconomics studies full employment, price level, national income, trade cycles, etc.

4) **Methodology:** Laws of microeconomics are formulated on assumptions such as, full employment, constant production and income, ceteris paribus (other things being equal). With the help of these assumptions, micro laws establish relationship between the causes and effects of economic variables. In other words, micro laws such as the

law of demand and the law of supply become valid on assumptions i.e. other things being equal. This method of study is also known as the ‘partial equilibrium analyses.

Macroeconomics assumes how the factors of production are distributed. On the basis of the assumption of the factors distribution, it explains how full employment can be achieved. In macroeconomics, economic variables are categorized into aggregate units like aggregate demand, aggregate supply, total consumption, price level, total saving, etc. The total effect of an economic factor on the economy is taken in to account in macroeconomic analysis. This method of study is called ‘general equilibrium analyses.

5) Components of Equilibrium: Microeconomics studies the equilibrium between the forces of market demand and supply. Hence, the basis of microeconomics is the price mechanism. On the other hand, macroeconomic analysis deals with the national income output, employment, etc, and such economic variables are determined at the point of equilibrium established between the forces of the whole economy (i.e. aggregate demand and aggregate supply).

6) Static and Dynamic Analysis: Microeconomics studies the equilibrium at a particular point of time. It does not explain the time factor. Hence, microeconomics is regarded as the static analysis. On the other hand, macroeconomics is based on time lag, rate of change, past and expected value of variables. Hence, macroeconomics is regarded as the dynamic analysis. In microeconomics, the economic basis is explained under the assumption of ‘ceteris paribus’ to ignore the time lag. Macroeconomics does not make such unrealistic assumptions.

7) Solution of Current Issues and Problems: The study of microeconomics does not help to solve the important current issues and problems such as decline in national income, hyper inflation, wide spread unemployment and so on. On the other hand, macroeconomics studies the causes, effects and possible measures for the solution of these issues and problems. Thus, macroeconomics helps to solve these problems.

20.6 BASIC MICROECONOMIC ISSUES

Scarcity and Choice: Scarcity and choice are the basic problems in economics. This concept was introduced by Prof. Lionel Robins, a British economist in the decade of 1930s.

Scarcity:

The common meaning of scarcity refers to unavailability (i.e. not easily found) in the market of a certain commodity. The conceptual meaning of scarcity, in economics, is however different. A commodity is scarce because it commands value. It commands price. We have to pay for any goods and services we want to consume. In addition, the resources that we have are also always limited.

A commodity is scarce, in economic sense, not because it is rare or unavailable in the market, but because the means to have it are limited. We have limited resources at our disposal, so there is a problem of scarcity. Human wants are unlimited, but the means or resources to satisfy them are always limited. Scarcity explains this relationship between limited resources and unlimited wants and the problem therein. Economic problems arise because the goods we need are scarce. These scarce goods have many uses. Again, these uses are tempting and competing with each other. There is a problem of choice- choice between alternative uses. Therefore, scarcity and choice guide the whole course of economic activities.

Let us have a clear concept of these two important terms:

It is not just an individual problem. It is the problem of national economy as well. Its dimension changes when it is applied to national economy. In other words, scarcity of resources gives birth to national economic problems. Scarcity brings broad human problems in to our notice. There is a poverty and human misery because of scarcity of resources. A poor man is poor because the resources accessible to him are scarce. A country is poor because there is scarcity of resources. Scarcity, in deeper sense, tells the story of human misery and unhappiness around the earth.

To understand and analyze the problem of poverty of a man and a country, and to eradicate it, proper understanding of the problem of scarcity is of utmost importance. Scarcity tells us about the importance of a commodity as well. It tells us how valuable a good is because a lot of scarce resources is being spent to get it. If the resources were not used for the specific purpose, these could be used elsewhere. The resources are not only scarce but they have also alternative uses. These uses produce different results – some use result into high values and others low.

The resources are better used if it results into higher return. Higher return signifies two meanings. For an individual consumer, it means higher level of satisfaction and for producers it means higher level of profits. In other words, all the economic units will

aim at optimization of their objectives. By using available resources the aim of the consumers, producers and government will be to optimize satisfaction, profit and welfare of the people.

Choice:

The optimization objectives of the economic actors necessitate making knowledgeable choice in the use of available resources. Choice is involved in economic activities at both consumption and production level. It also concerns individual and the state. The problem of choice begins with an individual's liking of how much time he would allot for work and how much for leisure. The more time he assigns for work, lesser time is available for leisure. At the same time the more he works, the more he earns.

On the income earned, the choice is between how much to consume now and how much to save for the future. Choice in consumption means what to buy – food or clothes, sweets or toys, or a combination of both in limited quantity, etc. Similarly, choice in the income saved is between where to deposit the saving – in bank or hold idle cash at home. The bank to make choices about where to invest the deposits it receives. It invests, of course, in such sectors where it is more profitable. That is the chain of choice goes on deeper and deeper referring to the profitable use of resources at the hand of economic actors.

The meaning of scarcity is in relation to the nature of goods that always command value and the relatively limited availability of resources. Similarly, there is always a problem of choice because of scarce resources and their alternative uses.

The problems which arise due to the scarcity of resources and the areas where the choice is needed are as follows:

1) Problem of Production: The availability of the factors of production is less in comparison to their needs for production. This creates the problem that what and how much is to be produced by using these resources. In such cases, choice is needed to use the factors in high yielding sector.

2) Problem of choosing production method: After the determination of the commodity to be produced, the problem arises to choose the appropriate method of its production. Any of the methods between labor intensive and capital intensive techniques can be used in the production process. But the choice is needed to determine the economic and useful method for the available condition of resources in the economy.

3) Problem of distribution: The production of goods and services is the return of the factors of production. So, the income derived from the sell of these commodities distributes among these factors. When the problem of determining the remuneration of the factors of production is created, then the economic problem arises.

The choice is needed to solve this problem by providing remuneration according to their contribution. Except this, the choice is needed to choose the sector of distribution of income to decrease inequality for social welfare.

4) Problem of economic efficiency:

Economic efficiency is the process of utilizing the resources in such a way that the satisfaction or utility can be maximized. The choice is needed to determine how the limited resources should be used in efficient sector among different areas of its use.

5) Problem of full utilization of resources:

The availability of the factors of production is limited and its alternative use is possible. Thus, choice is necessary to determine how and in which sector these scarce resources must be used so that they are fully employed.

6) Problem of economic growth:

In developing countries, the level of economic development is very low. The necessity of these countries is to reach in high level by increasing the level of development. But due to the scarcity of resources for development works, the economic problem arises. To employ these limited resources in more return providing sector, the choice is needed. In this way, the problem of scarcity of resources for every sector of economic activities and to choose them for optimum utilization is the basic economic problem.

20.7 EFFICIENT ALLOCATION OF RESOURCES (EFFICIENCY AND ALTERNATIVE USES OF RESOURCES)

The productive resources (like land, labor, raw materials, machinery equipments etc.) are not adequately available. Because these resources are scarce, their use must be carefully thought out. Besides, they have alternative uses; that is, only one use can be chosen and all other uses have to satisfied. The pressure on appropriate use of such important factor is naturally high. The allocation of resources discusses principles of right sharing of resources among competing sectors. Allocation is related to the choice

of how much of resources to be allocated in what sector. It is the basic problem of every economy. The whole body of planning, programming, and even budgeting are nothing, but statements of allocation of resources. The objective is the achievement of optimal use of scarce resource. The criterion is maximization of returns.

Resource allocation occupies central position in economics. Sometimes economics is defined in terms of resource allocation, too. According to Prof. Stigler, “economics is the study of principles governing the allocation of scarce means among competing ends. The key issues in economic problems are the issues of allocation of resources. There are various types of human needs. Not all of them can be satisfied simultaneously. We try to cover the maximum number at one time. “The allocation is best if it satisfies the most “is it’s guiding principles. It is, therefore, closely related with economic functions like production, exchange, etc.

Where the demand for more resources never ceases (stopped). Its base themes are as follows:

1) What to produce: The first concern is related with “what to produce? How much to produce? “Because resources are scarce, production of all goods and services needed by a society are beyond its capacity. It is simple not possible for any economy no matter how developed it might be. So, it has to select a set among various alternatives. Production must need the maximum social need. The first priority goes to basic needs. However, production is guided by profit and profit knows no social justice. An economy should follow social efficiency while reallocation resources. The social norms and values should guide to maximize social satisfaction. So, allocation is best which satisfies the most. The problem of what to produce and how much to produce depends on the necessity of the citizens of the country.

2) How to produce: The second question is concerned with the method of production. In some cases, labor may play a major role. It is called labor – intensive technology. In others, capital may play a major role. It is called capital – intensive. Labor intensive method creates more jobs favoring more employment. It helps in mitigating unemployment problem. Capital –intensive production goes for large volume of production. It commands rapid growth rate. The right decision depends on the current state of the economy.

3) For whom to produce: Production for masses or productions for profit are two major choices that every economy has to decide. As the development level goes

higher, production of superior goods proceeds towards super profit. This issue is also related with maintaining social justice. Meeting the basic requirements of all segments of population is the main criterion of resource allocation.

4) Promotion of efficiency in economy: “How to run an economy efficiently” is the first concern of resource allocation. Economic efficiency is measured in additional welfare achieved without worsening any result. It means that new reallocation of resource must not only be able to maintain the existing level but also achieving new heights. Alternatively, reallocation may be profitable somewhere but incurring losses elsewhere. The main objective is to increase aggregate profitability of the economy. Beside needs of common people cannot be ignored. Of course, the priority goes to wage goods production.

5) Balance in the economy: Another purpose of resource allocation is the maintenance of balance among different sectors of the economy. The balance between rural and urban sectors, between home consumption and export promotion, between consumer goods and capital goods production and regional balance are the healthy signs of any economy. ? Investment in these different sectors are very important. How much to invest in what sector? This is the major question, which is studied in this topic.

20.8 OPPORTUNITY COST

The opportunity cost of an item is what you give up to get that item or the second best alternative forsaken to produce or consume a commodity is known as opportunity cost. Limited resources and unlimited wants lead to the compulsion of choice. So, to produce or consume a commodity a numbers of others has to be forsaken. The ability to fulfill desire is limited by scarcity of resources, stage of technology, techniques of production, limited income, and so on. The resources available can be used to produce or consume some commodities at the cost of some others.

Opportunity cost arises due to the presence of alternative use of resources. If resources had limited uses, opportunity cost would be out of question or if there were infinite resources, these could be used to produce everything and nothing had to be given up to produce a commodity. Though there may be a number of alternative uses of the resources, only the best option forsaken is the opportunity cost. The value of the second best commodity forsaken for the production or consumption of some other is opportunity cost and this arises due to the scarcity of resources and their possible alternative uses.

For example, in a plot of land, various crops can be planted. If rice is planted, the yield is worth Rs. 1000. If millet and wheat are planted the yield per month is Rs. 800 and Rs. 900 respectively. In this case, the opportunity cost of planting rice is the yield of wheat. This is because wheat is the best option forsaken for planting rice in that plot of land. Similarly the opportunity cost of planting wheat or millet is planting rice.

20.9 SUMMARY

20.10 KEY WORDS

20.11 SELF ASSESSMENT QUESTIONS

1. Distinguish between micro and macro economics.
2. Explain the importance of micro economics.
3. Define micro and macro economics.
4. Explain the scarcity definition of economics.
5. What is proper allocation of resources?
6. Define opportunity cost.

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