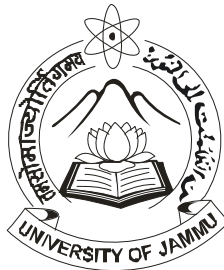


Directorate of Distance & Online Education

**UNIVERSITY OF JAMMU
JAMMU**



**SELF LEARNING MATERIAL
FOR
M.COM SEMESTER-1
MANAGERIAL ECONOMICS**

For the examination to be held in 2023 onwards

SEMESTER - Ist

LESSON NO. 1 - 20

COURSE NO. : MCOMC153

UNIT I-IV

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Directorate of Distance & Online Education
University of Jammu
SYLLABUS
M. COM. First Semester (NON CBCS)
Managerial Economics
(Core Course)

Course : MCOMC153

Credit : 4

Time : 3.00 Hrs

Max Marks :100

External : 80 Marks

Internal : 20 Marks

(Syllabus for the examination to be held in 2023 onwards)

COURSE OBJECTIVES

- 1 To familiarize the students with the conceptual underpinning of managerial economics and demand analysis
- 2 To impart knowledge about the theory of consumer choice
- 3 To provide insight to the students about the product theory and functions
- 4 To aware students about the pricing practices in different market conditions.

COURSE OUTCOMES

After the completion of this course, the student will be able to :

- 1 Understand the role of managerial economics in business contexts
- 2 Understand consumer choices and decisions
- 3 Understand how production theory helps the managers in determining short run and long run costs
- 4 Understand the price setting in varied market conditions and
- 5 Develop managerial insights using economics principles for making decision under various environmental constraints.

SYLLABUS	Page No.
<p>UNIT I NATURE AND SCOPE OF MANAGERIAL ECONOMICS</p> <p>Objectives of the firm, Managerial economist's role and responsibilities : Fundamental economic concepts : Incremental principle, opportunity cost principle , discounting principle, equi-marginal principle, principle of time perspective , Demand Analysis: Individual and Market demand functions ; Law of demand, Determinants of demand : Elasticity of demand; Price elasticity, income elasticity and cross elasticity, Supply functions; Firm theory: Objectives and Theory of the growth of the firm, Marris Model.</p>	4-96
<p>UNIT II THEORY OF CONSUMER CHOICE</p> <p>Consumer Behaviour : Cardinal and Ordinal utility approach, Indifference approach, Revealed preference theory and theory of consumer choice under risk : Demand estimation for major consumer durable and non-durable products; Demand forecasting techniques.</p>	97-187
<p>UNIT III PRODUCTION THEORY</p> <p>Production function - production with one and two variable inputs, Stages of production, Economies of Scale ; Estimation of Production function, cost theory and estimation, Economic value analysis: Short and long run cost functions; Nature, shape and inter-relationship; Laws of return to scale.</p>	188-266
<p>UNIT IV PRICE DETERMINATION UNDER DIFFERENT MARKET CONDITIONS</p> <p>Characteristics of different market structures: Price determination and firms equilibrium in short run and long-run under perfect competition, Monopolistic competition. Duopoly, Oligopoly and Monopoly; Pricing Practices, Methods of price determination in practice , Pricing of multiple products, Price discrimination.</p>	267-333

SUGGESTIVE READINGS

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2. Dominick S, Managerial Economics Oxford University Press New Delhi.
3. Ahuja H.L, Managerial Economics S. Chand Company Delhi.
4. Baumol, W.J, Economics Theory and operations Analysis Prentice Hall London
5. Dwivedi D. N, Managerial Economics Vikas Publishing House Delhi
6. Chopra O.P, Managerial Economics Tata McGraw Hill Delhi.
- 7 Varshney, R.L. and Maheshwari K.L Managerial Economics Sultan Chand & Sons New Delhi
- 8 Joel D, Managerial Economics Prentice Hall of India New Delhi

NOTE FOR PAPER SETTING

The paper consists of two sections . Each section will cover the whole of the syllabus without repeating the question in the entire paper

Section A :It will consists of eight short answer questions selecting two from each unit,A candidate has to attempt any six and answer to each question shall be within 200 words. Each question carries four marks and total weightage to this section shall be 24 marks

Section B: It will consist of six essay questions with answer to each question within 800 words. One question will be set atleast from each unit and the candidate has to attempt four. Each question will carry 14 marks and total weightage shall be 56 marks

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**NATURE AND SCOPE OF
MANAGERIAL ECONOMICS**

STRUCTURE

- 1.1 Introduction
- 1.2 Objectives
- 1.3 Concept of Managerial Economics
- 1.4 Definitions of Managerial Economics
- 1.5 Nature of Managerial Economics
- 1.6 Scope of Managerial Economics
- 1.7 Importance of Managerial Economics
- 1.8 Types of Managerial Economics
- 1.9 Applications of Managerial Economics
- 1.10 Summary
- 1.11 Glossary
- 1.12 Self-Assessment Questions
- 1.13 Suggested Readings

1.1 INTRODUCTION

For most purposes economics can be divided into two broad categories, microeconomics and macroeconomics. Macroeconomics as the name suggests is the study of the overall economy and its aggregates such as Gross National Product, Inflation, Unemployment, Exports, Imports, Taxation Policy etc. Macroeconomics addresses questions about changes in investment, government spending, employment, prices, exchange rate of the rupee and so on. Importantly, only aggregate levels of these variables are considered in the study of macroeconomics. But hidden in the aggregate data are changes in output of a number of individual firms, the consumption decision of consumers like you, and the changes in the prices of particular goods and services. Although macroeconomic issues are important and occupy the time of media and command the attention of the newspapers, micro aspects of the economy are also important and often are of more direct application to the day-to-day problems facing a manager. Microeconomics deals with individual factors in the economy such as firms and individuals. Managerial economics can be thought of as applied microeconomics and its focus is on the interaction of firms and individuals in markets.

One standard definition for economics is the study of the production, distribution, and consumption of goods and services and also the study of choice related to the allocation of scarce resources. The purpose of managerial economics is to provide economic terminology and reasoning for the improvement of managerial decisions in an organization, most of the subject material in managerial economics has a microeconomic focus. However, since managers must consider the state of their environment in making decisions and the environment includes the overall economy, an understanding of how to interpret and forecast macroeconomic measures is useful in making managerial decisions. Managerial economics can be

defined as amalgamation of economic theory with business practices so as to ease decision making and future planning by management. Managerial economics assists the managers of a firm in a rational solution of obstacles faced in the firm's activities. It makes use of economic theory and concepts. It helps in formulating logical managerial decisions. It is also a science dealing with effective use of scarce resources. Study of managerial economics helps in enhancement of analytical skills, assists in rational configuration as well as solution of problems. To sum up, while microeconomics is the study of decisions made regarding the allocation of resources and prices of goods and services, macroeconomics is the field of economics that studies the behavior of the economy as a whole (i.e., entire industries and economies).

1.2 OBJECTIVES

After reading this lesson, you will be able to understand:

- Concept of Managerial Economics
- Scope of Managerial Economics
- Nature of Managerial Economics
- Importance of Managerial Economics
- Types of Managerial Economics

1.3 CONCEPT OF MANAGERIAL ECONOMICS

From the firm's point of view managerial economics may be defined as economics applied to "problems of choice" or "alternatives and allocation of scarce resources" by the firms. Managerial economics is a stream of management studies that emphasizes primarily solving business problems and decision-making by applying the theories and principles of microeconomics and macroeconomics.

It is a specialized stream dealing with an organization's internal issues by using various economic theories. Economics is an indispensable part of any business. All the business assumptions, forecasting, and investments are derived from this single concept. It is a discipline which deals with the application of economic theory to business management and deals with the use of economic concepts and principles of business decision making. Formerly it was known as "Business Economics" but the term has now been discarded in favour of Managerial economics.

Managerial economics may be defined as the study of economic theories, logic and methodology which are generally applied to seek solution to the practical problems of business. It is thus constituted as that part of economic knowledge or economic theories which is used as a tool of analysing business problems for rational business decisions and is often called as Business economics or Economic for the Firms. Managerial economics is a science dealing with effective use of scarce resources. It guides the managers in taking decisions relating to the firm's customers, competitors, suppliers as well as relating to the internal functioning of a firm. It makes use of statistical and analytical tools to assess economic theories in solving practical business problems. Study of managerial economics essentially involves the analysis of certain major subjects like:

- The business firm and its objectives
- Demand analysis, estimation and forecasting
- Production and Cost analysis
- Capital budgeting for investment decisions
- Competition.
- Profit analysis with special reference to break-even point

1.4 DEFINITIONS OF MANAGERIAL ECONOMICS

“Managerial Economics is economics applied in decision making. It is a special branch of economics bridging the gap between abstract theory and managerial practice.” (Haynes, Mote and Paul.)

According to **McNair and Meriam**, “Business Economics consists of the use of economic modes of thought to analyse business situations.”

According to **Prof. Evan J Douglas**, “Managerial economics is concerned with the application of economic principles and methodologies to the decision-making process within the firm or organisation under the conditions of uncertainty”

According to **Spencer and Seegelman**, “Business Economics (Managerial Economics) is the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management.”

Mansfield defined Managerial economics as “it is concerned with application of economic concepts and economic analysis to the problems of formulating rational managerial decision.” According to **E.F. Brigham and J. L. Pappas**, Managerial Economics is “The application of economic theory and methodology to business administration practice.”

In the opinion of **W.W. Haynes**, “Managerial Economics is the study of the allocation of resources available to a firm or other unit of management among the activities of that unit.”

According to **Floyd E. Gillis**, “Managerial Economics deals almost exclusively with those business situations that can be quantified and dealt with in a model or at least approximated quantitatively.”

According to **Hailstones and Rothwel**, “Managerial economics is the application of economic theory and analysis to practice of business firms and other institutions.”

1.5 NATURE OF MANAGERIAL ECONOMICS

Managerial economics applies economic tools and techniques to business and administrative decision making to achieve business goal by effectively using the given business resources. Though we study economics in theory it would be of no use if the art of practical application doesn't exist. Therefore, the subject of managerial economics helps us bridge the gap between the theory and its practical application in economies. Managerial economics lays down rules that help in taking effective managerial decisions and also assist managers to identify how economic forces affect organisations and what could be the economic consequences of managerial behaviour.

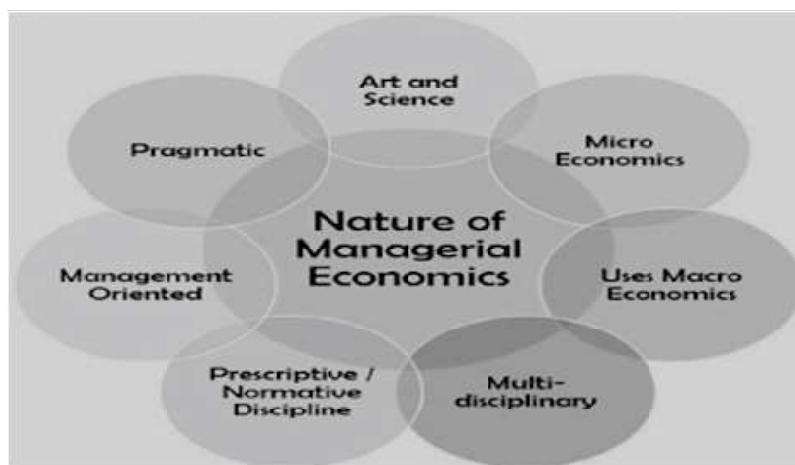


Figure.1.1

It is an essential managerial talent to understand the principles that govern the economic behavior of firms and individuals which finally result in better managerial decisions, higher profits, and an increase in the value of the firm.

1. **Art and Science:** Managerial economics requires a lot of logical thinking and creative skills for decision making or problem-solving. It is also considered to be a stream of science by some economist claiming that it involves the application of different economic principles, techniques and methods, to solve business problems.
2. **Micro Economics:**In managerial economics, managers generally deal with the problems related to a particular organisation instead of the whole economy. Therefore, it is considered to be a part of microeconomics.
3. **Uses Macro Economics:** A business functions in an external environment, i.e., it serves the market, which is a part of the economy as a whole. Therefore, it is essential for managers to analyse the different factors of macroeconomics such as market conditions, economic reforms, government policies, etc. and their impact on the organisation.
4. **Multi-disciplinary:** It uses many tools and principles belonging to various disciplines such as accounting, finance, statistics, mathematics, production, operation research, human resource, marketing, etc.
5. **Prescriptive / Normative Discipline:** It aims at goal achievement and deals with practical situations or problems by implementing corrective measures.
6. **Management Oriented:** It acts as a tool in the hands of managers to deal with business-related problems and uncertainties appropriately. It also provides for goal establishment, policy formulation and effective decision making.
7. **Pragmatic:**It is a practical and logical approach towards the day-to-day business problems.

1.6 SCOPE OF MANAGERIAL ECONOMICS

Managerial economics is widely applied in organisations to deal with different business issues. Both the micro and macroeconomics equally impact the business and its functioning. It provides an essential tool for determining the business goals and targets, the actual position of the organisation, and what the management should do to fill the gap between the two. It provides strategic planning tool that helps in analyzing the problem and formulating rational managerial decisions. Decision making is a crucial aspect in any business problem. It is an evolutionary science which correlates the understanding and application of economic knowledge with the emerging business problems in the economy. The basic business problems that arise in any decision making or forward planning process involves operational and environmental issues.

The following fields may be said to generally fall under scope of Managerial economics:

- Demand Analysis and Forecasting
- Cost and Production Analysis
- Pricing Decisions, Policies and Practices
- Profit Management
- Capital Management

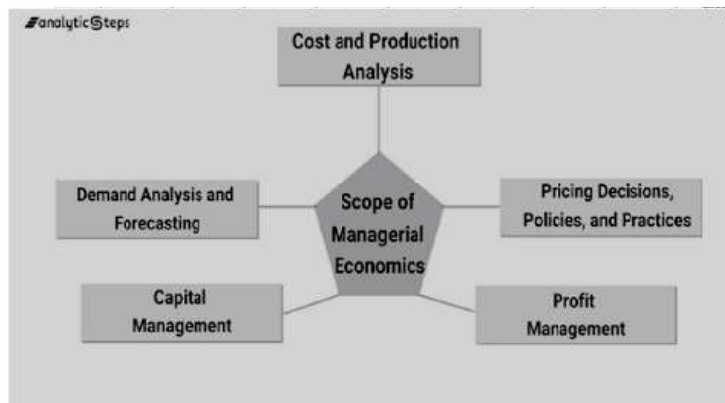


Figure 1.2

1. **Demand Analysis and Forecasting:** A business firm is an economic organisation which is engaged in transforming productive resources into goods that are to be sold in the market. A major part of managerial decision making depends on accurate estimates of demand. A forecast of future sales serves as a guide to management for preparing production schedules and employing resources. It will help management to maintain or strengthen its market position and profit base. Demand analysis also identifies a number of other factors influencing the demand for a product. Demand analysis and forecasting occupies a strategic place in Managerial economics.

2. **Cost and production analysis:** A firm's profitability depends much on its cost of production. A wise manager would prepare cost estimates of a range of output, identify the factors causing variations in cost estimates and choose the cost-minimising output level, also taking into consideration the degree of uncertainty in production. Production processes are under the charge of engineers but the business manager is supposed to carry out the production function analysis in order to

avoid wastages of materials and time. Sound pricing practices depend much on cost control. The main topics discussed under cost and production analysis are: Cost concepts, cost-output relationships, Economics and Diseconomies of scale and cost control.

3. **Pricing decisions, policies and practices:** Pricing is a very important area of managerial economics. In fact, price is the genesis of the revenue of a firm and the success of a business firm largely depends on the correctness of the price decisions taken by it. The important aspects dealt with this area are: price determination in various market forms, pricing methods, differential pricing, product-line pricing and price forecasting.
4. **Profit management:** Business firms are generally organized for earning profit and in the long period, it is profit which provides the chief measure of success of a firm. Economics tells us that profits are the reward for uncertainty bearing and risk taking. A successful business manager is one who can form more or less correct estimates of costs and revenues likely to accrue to the firm at different levels of output. The more successful a manager is in reducing uncertainty, the higher are the profits earned by him. In fact, profit-planning and profit measurement constitute the most challenging area of managerial economics.
5. **Capital management:** The problems relating to firm's capital investments are perhaps the most complex and troublesome. Capital management implies planning and control of capital expenditure because it involves a large sum and moreover the problems in disposing the capital assets off are so complex that they require considerable time and labour. The main topics dealt with

under capital management are cost of capital, rate of return and selection of projects.

1.7 IMPORTANCE OF MANAGERIAL ECONOMICS

Managerial economics has a number of applications; it can be used both for profit and non-profit sectors. For instance, in a limited staff, equipment's, resources if a hospital wants to provide the best facilities and care to its patients it can readily make use of the concepts of managerial economics. Thus, we can see that managerial economics helps in meeting with the organisational goals effectively and efficiently.

For Example: During an economic boom, businesses might invest more, while in downturn, they might cut costs. Similarly, during COVID-19, business contracted production and customers switched to only essential trying.

The points given below will help you to understand the importance of managerial economics in an organisation:

- 1.** Business economics is concerned with those aspects of traditional economics which are relevant for business decision making in real life. These are adapted or modified with a view to enable the manager to take better decisions. Thus, business economic accomplishes the objective of building a suitable tool kit from traditional economics.
- 2.** It also incorporates useful ideas from other disciplines such as psychology, sociology, etc. If they are found relevant to decision making. In fact, business economics takes the help of other disciplines having a bearing on the business decisions in relation to various explicit and implicit constraints subject to which resource allocation is to be optimized.

3. Business economics makes a manager more competent model builder. It helps him to identify the essential elements of businesses for value generation..
4. At the level of firm, where its operations are divided into functional areas, such as finance, marketing, personnel and production, business economics serves as an integrating agent by coordinating the activities in these different areas.
5. Business economics takes cognizance of the interaction between the firm and society, and accomplishes the key role of an agent in achieving its social and economic welfare goals. As business, apart from its obligations to shareholders, has certain social obligations. Thus, Business economics serves as an instrument in furthering the economic welfare of the society through socially oriented business decisions.

1.8 TYPES OF MANAGERIAL ECONOMICS

All managers take the concept of managerial economics differently like some may be more focused on customer's satisfaction while others may prioritize efficient production. So, to fulfill all the aspects of business organisations they adopt different approaches and those various approaches to managerial economics can be seen in detail below:



Figure 1.3

- 1. Liberal Managerialism:** A market is a democratic place where people are liberal to make their choices and decisions. The organisation and the managers have to function according to the customer's demand and market trend; else it may lead to business failures.
- 2. Normative Managerialism:** The normative view of managerial economics states that administrative decisions are based on real-life experiences and practices. They have a practical approach to demand analysis, forecasting, cost management, product design and promotion, recruitment, etc.
- 3. Radical Managerialism:** Managers must have a revolutionary attitude towards business problems, i.e., they must make decisions to change the present situation or condition. They focus more on the customer's requirement and satisfaction rather than only profit maximization.

1.9 APPLICATIONS OF MANAGERIAL ECONOMICS

Managerial economics can be applied by a firm in making its business decisions. These decisions include:

1. **Decision regarding the price:** When a firm is planning on its production, it has to determine the price of the product. This will depend on the structure of the market. If there exists perfect competition, then the firm will be just a price taker. However, if there is a monopoly, then the firm will have some controls over the price, Hence, the determination of the price involves an understanding of the different market structures.
2. **Forecasting and estimation of the demand for the product:** The firm will have to forecast and estimate the demand for the product to be able to decide on the level of output of the product. The managers will have to foresee and provide for the future increases in the demand for the product. This involves an understanding of the nature of the demand and the ability to forecast the demand.
3. **Choice relating to the technique of production:** The manager will have to make the crucial decision whether to use a labor-intensive technology or a capital-intensive technology. The decision will, to some extent, depend on which factor of production is more readily available and is in abundance in the economy. This involves an understanding of the cost and production analysis.
4. **Advertising expenditures:** Under imperfect competition, often, to sell its product, a firm may have to resort to advertising, it will have to decide on the amount of expenditure to incur on advertising, the medium of information to be used; television, newspapers and other such decisions.

This involves an understanding of the optimum advertising expenditure under the monopoly, monopolistic competition and oligopoly.

- 5. Decisions relating to investment:** In the long run, a firm has to decide on expanding the production of the product, hence, it has to incur the capital expenditure, this involves an understanding of the theory of capital budgeting.

1.10 SUMMARY

Managerial economics is thus a tool of analysing business problems for rational business decisions. It is often called as Business economics or economic for firms as it helps to take decisions taking various explicit and implicit constraints into consideration. Thus, it involves using a framework of analysis to arrive at informed decisions to maximize the firm's objectives, often in an environment of uncertainty. So, we can say that managerial economics is used by firms to improve their profitability. It is the economics applied to problems of choices and allocation of scarce resources by the firms. It refers to the application of economic theory and the tools of analysis of decision science to examine how an organisation can achieve its objective most efficiently. Managerial decisions are evaluated through concepts, tools and techniques of economic analysis of various types. It is linked with various fields of study.

1.11 GLOSSARY

- **Vision:** A long term perspective of what is the final destination of the organisation.
- **Economics:** The branch of knowledge concerned with the production, consumption, and transfer of wealth.

- Business Forecasting: The practice of predicting what will happen in the future by taking into consideration events in the past and present.
- Imperfect competition : Where there are many sellers, but they are selling heterogeneous (dissimilar) goods.

1.12 SELF-ASSESSMENT QUESTIONS

Q1. Define the term Managerial economics.

Q2. Write down the importance of managerial economics.

Q3. Discuss the scope of managerial economics.

1.13 SUGGESTED READINGS

- Managerial Economics by D N Dwivedi
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OBJECTIVE OF THE FIRM

STRUCTURE

- 2.1 Introduction
- 2.2 Objectives
- 2.3 Meaning of Firm
- 2.4 Objective of the Firm
- 2.5 Meaning of Managerial Economist
- 2.6 Role of Managerial Economist
- 2.7 Responsibilities of Managerial Economist
- 2.8 Fundamental economic concepts
- 2.9 Principles of Managerial Economics
- 2.10 Summary
- 2.11 Glossary
- 2.12 Self-Assessment Questions
- 2.13 Suggested Readings

2.1 INTRODUCTION

Application of economic concepts and theories alone is not sufficient to make a specific decision. It has to be combined with quantitative methods to find a numerical solution to the problems. For example, once the choice of product is finalized, next question arises 'how much to produce' to optimize the output. To find answer to this question, quantitative methods have to be combined with the theories of production and cost. It means that to make a sound decision, economic concepts and theories have to be integrated with quantitative methods and models. The integration of economic theories and concepts with quantitative methods creates managerial economics and it is a part of the study of economics that applies decision science theory, quantifying the concepts learned in microeconomics, or the study of the firm. The study of economics is based on the tenet that all companies are in the business to maximize the wealth of its owners. Applying this goal requires quantitative methods or measurable objectives, to maximize owner wealth. It helps to assess business goals and strategies on a continuous basis like weekly, monthly and quarterly. Using managerial economics helps to scrutinize the hazards of business choices and evaluate marketing techniques and procedures. The primary function of managers is to take appropriate decisions and implement them effectively to achieve the objective of the organization to maximum possible extent, given the resources. Application of economics contribute a great deal to managerial decision-making as it provides guidance in finding an appropriate solution to the business problem. Just as biology contributes to medical profession and physics to engineering, economics contributes to managerial functions. As such, a working knowledge of economics is essential for managers. Managers are, in fact, practicing economists.

2.2 OBJECTIVES

After reading this lesson, you are able to understand:

- Meaning and objective of the Firm
- Who is Managerial Economist?
- Role of Managerial Economist
- Responsibility of Managerial Economist

2.3 MEANING OF FIRM

A firm is a commercial enterprise, a company that buys and sells products and services to consumers with the aim of making a profit. A business entity such as a corporation, limited liability company, public limited company, sole proprietorship, or partnership that has products or services for sale is a firm. Whenever the word used in a title, “firm” is typically associated with businesses that provide professional law and accounting services, but the term may be used for a wide variety of businesses, including finance, consulting, marketing, and graphic design firms, among others. It typically excludes the sole proprietorship business and generally refers to a for-profit business managed by two or more partners providing professional services, such as a law firm.

Below mentioned definitions make the meaning of firm more clear

1. **According to the Online Etymology Dictionary 1744,**”the term first emerged in the English language with the meaning of ‘business house’. It is believed to have come from the German Firm a meaning ‘a business, name of a business,’ which came from the Italian word Firma, meaning ‘signature’ and Firmare ‘to sign’.

2. Business Dictionary.com defines the word firm as "A commercial organisation that operates on a for-profit basis and participates in selling goods or services to consumers. The management of a business firm will typically develop a set of organisational objectives and a strategy for meeting those goals to help employees understand where the company is headed and how it intends to get there."

On the basis of above definitions some of the important facts about firm are:

- A firm is for-profit business, usually formed as a partnership that provides professional services, such as legal or accounting services.
- The theory of the firm posits that firms exist to maximize profits.
- Not to be confused with a firm, a company is a business that sells goods and services for profit and includes all business structures and trades.
- A business firm has one or more locations which all have the same ownership and report under the same employer identification number.

2.4 OBJECTIVE OF THE FIRM

A firm's basic objective is to produce and distribute goods and services. The firm also earns profit by achieving these objectives. The concept of firm plays a very crucial role in the theory and practice of managerial economics. A management's decision can only be evaluated against the objective that is attempting to achieve. It was assumed that a firm's main objective is to maximize profit. Also, it is assumed that the decisions taken by the managers are for the same. But the issue arises when the period of the decision is taken into account i.e., whether the decision is for next 5 years or 15 years? Usually, the managers reduce the current year profits in order to make future gains. As both the current year and the future year is important, it is assumed that the goal is to

maximize the present or discounted value of all future profits. Thus, formally the goal of the firm is to:

1. Maximize Efficient Use of Labor: In managerial economics, the concept of comparative advantage is used to maximize the output of employees. For example, in a hairstyling salon, Marissa and Joan both work as assistants to the stylists. Their duties are to shampoo clients, clean stylists' work areas, and to answer the telephone. If Marissa takes three minutes to shampoo a client, but in that time, she could have cleaned two work areas, or taken three phone calls, Joan should perform the shampooing to allow Marissa to be efficient on cleaning work areas and taking phone calls.

2. Optimize Price and Output: In a purely competitive firm (assuming many sellers and buyers in the industry), managerial analysis holds that a company should set its price where marginal revenue equals marginal costs. Marginal revenue is the amount of money earned on the last product sold. Similarly, marginal cost is amount of money spent on the last product made. While marginal revenue often stays static, marginal cost tends to increase. This is due to wear and tear on machinery, reduced productivity of the employees and other inputs. This is the law of diminishing returns. For example, if a t-shirt manufacturer sells each t-shirt for \$10, this amount is also the marginal revenue. As marginal costs increase, the t-shirt manufacturer should sell t-shirts as long as the marginal costs are less than or equal to \$10.

3. Minimize Business Uncertainty: In managerial economics, uncertainty is always an unknown input. In our salon example above, the hairstylist may not know how many haircuts she will do in the next month. She reduces her uncertainty by requesting that clients make an appointment for their next haircut to ensure they get the desired

time slot. Other companies may reduce uncertainty by offering discounts if a client signs a long-term contract.

4. Minimize Opportunity Costs: Opportunity costs refer to the sacrifice made when one option is chosen over another. In a firm, the goal is to ensure that the foregone revenue is always less than the chosen option. If a t-shirt manufacturer could use the same machinery to produce jogging shorts that would sell for \$7 each, his opportunity cost is \$7 per t-shirt. The two objectives of reducing uncertainty and minimizing opportunity cost may sometimes seem to be in conflict with each other, but when uncertainty cannot be quantified, it is often preferable to take the less profitable, more certain option.

2.5 MANAGERIAL ECONOMIST : ROLE & RESPONSIBILITIES

Managerial economist is a person who manages business efficiently using various economic theories and methodologies. He supports the management team in better decision making through his analytical skills and specialized techniques. He is also termed as an economic advisor or business economist and is responsible for analyzing various internal and external environmental forces that influence the functioning of business organisations. Managerial economist makes several successful business forecasts and updates the management team regarding the economic trends from time to time as they always remain in touch with all the latest economic developments and environmental changes for informing the management. He has an efficient role in earning reasonable profits on invested capital as it supplies all relevant information which helps in making proper plans and strategies. A managerial economist helps the management by using his analytical

skills and highly developed techniques in solving complex issues of successful decision-making and future advanced planning.

2.6 ROLE OF MANAGERIAL ECONOMIST

A Managerial economist has three important roles in every business organisation i.e., Demand analysis and forecasting, capital management and profit management. On the basis of these three aspects the role of managerial economist can be summarized as follows:

1. He studies the economic patterns at macro-level and analysis it's significance to the specific firm he is working in.
2. He has to consistently examine the probabilities of transforming an ever-changing economic environment into profitable business avenues.
3. He assists the business planning process of a firm.
4. He also carries cost-benefit analysis.
5. He assists the management in the decisions pertaining to internal functioning of a firm such as changes in price, investment plans, type of goods /services to be produced, inputs to be used, techniques of production to be employed, expansion/ contraction of firm, allocation of capital, location of new plants, quantity of output to be produced, replacement of plant equipment, sales forecasting, inventory forecasting, etc.
6. In addition, a managerial economist has to analyze changes in macro- economic indicators such as national income, population, business cycles, and their possible effect on the firm's functioning.

7. He is also involved in advising the management on public relations, foreign exchange, and trade. He guides the firm on the likely impact of changes in monetary and fiscal policy on the firm's functioning.
8. He also makes an economic analysis of the firms in competition. He has to collect economic data and examine all crucial information about the environment in which the firm operates.
9. The most significant function of a managerial economist is to conduct detailed research on industrial market.
10. In order to perform all these roles, a managerial economist has to conduct an elaborate statistical analysis.
11. He must be vigilant and must have ability to cope up with the pressures.
12. He also provides management with economic information such as tax rates, competitor's price and product, etc. They give their valuable advice to government authorities as well.
13. At times, a managerial economist has to prepare speeches for top management.

2.7 RESPONSIBILITIES OF MANAGERIAL ECONOMIST

In order to serve the management a managerial economist has to know his responsibilities. He must keep in mind the main objective of making a reasonable profit on the invested capital in his firm. Firms are not always after profits maximization, but to continue in business every firm has to operate profits therefore business economist has the chief obligation of helping the management to make more profits than before

and he can best serve the management when he recognizes and adhere to his responsibilities towards the management.

- 1. Studies Business Environment:** The managerial economist is responsible for analyzing the environment in which business operates. Proper study of all external factors that affect the functioning of organization is must for proper functioning so he studies various factors like growth of national income, competition level, price trends, phase of the business cycle and economy and updates the management regarding it from time to time.
- 2. Analyse operations of Business:** He analyses the internal operation of business and helps management in making better decisions with regard to internal workings. Managerial economist through his analytical and forecasting skills provides advice to managers for formulating policies regarding internal operations of the business.
- 3. Demand Forecasting and Estimation:** Proper estimation and forecasting of future trends helps the business in achieving desired profitability and growth. Managerial economist through proper study of all internal and external forces makes successful forecasting of future uncertainties or trends.
- 4. Production Planning:** Managerial economist is responsible for scheduling all production activities of business. He evaluates the capital budgets of organizations and accordingly helps in deciding timing and locating of various actions.
- 5. Economic Intelligence:** He provides economic intelligence services by communicating all economic information to management. Managerial economist keeps management always updated of all prevailing economic trends so that they can confidently talk in seminars and conferences.

6. **Performing Investment Analysis:** A managerial economist analyzes various investment avenues and chooses the most appropriate one. He studies and discovers new possible fields of business for earning better returns.
7. **Focuses On Earning Reasonable Profit:** He assists management in earning a reasonable rate of profit on capital employed in the business. Managerial economist monitors activities of organizations to check whether all operations are running efficiently as per the plans and policies.
8. **Maintaining Better Relations:** A managerial economist maintains better relations with all internal and external individuals connected with the business. It is his duty to develop a peaceful and cooperative environment within the organization and aims to reduce any opposition taking place.

2.8 FUNDAMENTAL ECONOMIC CONCEPTS

At the most basic level, economics attempts to explain how and why we make the purchasing choices we do. There are four key economic concepts—scarcity, supply and demand, costs and benefits, and incentives that can help explain many decisions that humans make.

1. Scarcity

Everyone has an understanding of scarcity whether they are aware of it or not because everyone has experienced the effects of scarcity. Scarcity explains the basic economic problem that the world has limited or scarce resources to meet seemingly unlimited wants. This reality forces people to make decisions about how to allocate resources in the most efficient way possible so that as many of their highest priorities are met.

For example, there is only so much wheat grown every year. Some people want bread and some would prefer beer. Only so much of a given good can be made because of the scarcity of wheat. How do we decide how much flour should be made for bread and beer? One way to solve this problem is a market system driven by supply and demand.

2. Supply and Demand

A market system is driven by supply and demand. Taking the example of beer, if many people want to buy beer, the demand for beer is considered high. As a result, you can charge more for beer and make more money on average by using wheat to make beer than by using wheat to make flour. Hypothetically, this could lead to a situation where more people start making beer and, after a few production cycles, there is so much beer on the market the supply of beer increases that the price of beer drops. Although this is an extreme and overly simplified example, on a basic level, the concept of supply and demand helps to explain why last year's popular product is half the price the following year.

3. Costs and Benefits

The concept of costs and benefits is related to the theory of rational choice (and rational expectations) that economics is based on. When economists say that people behave rationally, they mean that people try to maximize the ratio of benefits to costs in their decisions. If demand for beer is high, breweries will hire more employees to make more beer, but only if the price of beer and the amount of beer they are selling justify the additional costs

of their salary and the materials needed to brew more beer. Similarly, the consumer will buy the best beer they can afford to purchase, but not, perhaps, the best-tasting beer in the store. The concept of costs and benefits is applicable to other decisions that are not related to financial transactions. University students perform cost-benefit analyses on a daily basis by choosing to focus on certain courses that they've deemed more important for their success. Sometimes this even means cutting the time they spend studying for courses that they see as less necessary. Although economics assumes that people are generally rational, many of the decisions that humans make are actually very emotional and do not maximize our own benefit. For example, the field of advertising preys on the tendency of humans to act non-rationally. Commercials try to activate the emotional centers of our brain and fool us into overestimating the benefits of a given item.

4. Everything is in the Incentives

Economic incentives explain how the operation of supply and demand encourage producers to supply the goods that consumers want, and consumers to conserve on scarce resources. When consumer demand for a good increase, then the market price of the good rises, and producers have an incentive to produce more of the good because they can receive a higher price. On the other hand, when the increasing scarcity of raw materials or inputs for a given good drive costs up and producers to cut back on supply, then the price they charge for the good rises, and consumers have an incentive to conserve on their consumption of that good and reserve it's use for their most highly valued uses. In the example of a

brewery, the owner wants to increase production so they decide to offer an incentive bonus to the workers that produces the most bottles of beer in a day. The brewery has two sizes of bottles: one 500 milliliter bottle and a one-liter bottle. Within a couple of days, they see production numbers shoot up from 10,000 to 15,000 bottles per day. The problem is that the incentive they provided focused on the wrong thing, i.e. the number of bottles rather than the volume of beer. They begin receiving calls from suppliers wondering when orders of the one-litre bottles are going to come. By offering a bonus for the number of bottles produced, the owner made it beneficial for the competing shifts to gain an advantage by only bottling the smaller bottles. When incentives are correctly aligned with organizational goals the benefits can be exceptional. These practices include profit sharing, performance bonuses, and employee stock ownership. However, these incentives can go awry if the criteria for determining if an incentive has been met falls out of alignment with the original goal.

For example, poorly structured performance bonuses have driven some executives to take measures that improve the financial results of the company in the short-time just enough to get the bonus. In the long-term, these measures have then proven detrimental to the health of the company.

2.9 PRINCIPLES OF MANAGERIAL ECONOMICS

Economic principles assist in rational reasoning and defined thinking. They develop logical ability and strength of a manager. Some important principles of managerial economics are:

1. Incremental Principle: The incremental concept is closely related to the marginal costs and marginal revenues of economic theory. Incremental concept in managerial economics involves two important activities which are as follows:

- Estimating the impact of decision alternatives on costs and revenues.
- Emphasizing the changes in total cost and total revenue resulting from changes in prices, products, procedures, investments or whatever may be at stake in the decision.

Incremental reasoning indicates that this rule may be inconsistent with profit maximization 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. It is basically the analysis of generalization of marginal concept and also refers to changes in cost and revenue due to a policy change like, adding a new business, buying new inputs, processing products, etc. Change in output due to change in process, product or investment is considered as incremental change. Incremental principle states that a decision is profitable if (a) revenue increases more than costs; (b) if costs reduce more than revenues; (c) if increase in some revenues is more than decrease in others; (d) and if decrease in some costs is greater than increase in others.

For Example, suppose HUL (Hindustan Unilever Limited) plans to increase the price of its product, Surf Excel and this decision to increase the price depends on the resulting change in the marginal revenue and the marginal cost. Because in the market there are many more substitutes available so the price rise is a very crucial decision and if it results in the additional revenue generation then definitely it is a very appropriate managerial decision.

- 2. Equi-Marginal Principle:** Equi-marginal principle is one of the widely used concepts in managerial economics. This principle is also known as the principle of maximum satisfaction by allocating available resource to get optimum benefit. This principle provides a basis for maximum utilization of all the inputs of a firm so as to maximize the profitability. Marginal utility is the utility derived from the additional unit of a commodity consumed. The laws of equi-marginal utility states that a consumer will reach the stage of equilibrium when the marginal utilities of various commodities he consumes are equal. According to the modern economists, this law has been formulated in form of law of proportional marginal utility. It states that the consumer will spend his money-income on different goods in such a way that the marginal utility of each good is proportional to its price, i.e.,

$$\mathbf{MU_x / P_x = MU_y / P_y = MU_z / P_z}$$

Where, MU represents marginal utility and P is the price of good.

Similarly, a producer who wants to maximize profit or reach equilibrium will use the technique of production which satisfies the following condition:

$$\mathbf{MRP1 / MC1 = MRP2 / MC2 = MRP3 / MC3}$$

Where, MRP is marginal revenue product of inputs and MC represents marginal cost. Thus, a manager can make rational decision by allocating/hiring resources in a manner which equalizes the ratio of marginal returns and marginal costs of various use of resources in a specific use.

- 3. Opportunity Cost Principle:** The concept of an opportunity cost was first developed by John Stuart Mill. It is one of the prime concepts in Economics which

occupies a very important place in modern economic analysis. The opportunity costs or alternative costs are the return from the second-best use of the firm's resources which the firm forgoes in order to avail itself of the return from the best use of the resources. It expresses the basic relationship between scarcity and choice. Opportunity cost concept ensures the optimum and efficient utilisation of resources. Opportunity cost of a decision refers to the sacrifice of alternatives in order to make the decision. If there are no sacrifices, there is no cost. According to Opportunity cost principle, a firm can hire a factor of production if and only if that factor earns a reward in that occupation equal or greater than its opportunity cost. This cost is the minimum price that would be necessary to retain a factor-service in its given use. It is also defined as the cost of sacrificed alternatives.

For Example, A person chooses to forgo his present lucrative job which offers him Rs. 50000 per month, and organizes his own business. The opportunity lost (earning Rs. 50,000) will be the opportunity cost of running his own business.

4. Time Perspective Principle:

The time perspective principle is very crucial when it comes to decision making by a manager. The manager has to decide upon time frame, may be short run or long run while considering execution or implementation of any policy or plan. Not all the factors of production are variable in the short run. There is a possibility that few factors could be increased or decreased only in the long run. Labor for instance, is considered as variable factor in the short run whereas capital is assumed to be fixed in the short run. Short run is considered as a current period whereas long run is considered as a future period. Short run time periods are very important to notice the producer's response to price changes by using the varying quantities of

variable input. If the business is profitable and the producer can generate more revenue, they will opt for maximum utilization of variable resources to produce maximum output. According to the consumers' perspective, the short run is a period in which they respond to price changes with the prevalent tastes and preferences.

Long run is a time period in which new sellers may enter a market or a seller already existing may leave. In the long run all the factors of production are variable that and could be changed, for instance capital and labor both can be altered per the requirement. Per the consumers' perspective, long run provides enough time to respond to price changes by actually changing their tastes and preferences or their alternative goods and services. According to this principle, a manager or a decision maker should give due emphasis, both to short-term and long-term impact of his decisions, giving apt significance to the different time periods before reaching any decision. Short-run refers to a time period in which some factors are fixed while others are variable. The production can be increased by increasing the quantity of variable factors. While long-run is a time period in which all factors of production can become variable. Entry and exit of seller firms can take place easily. From consumers point of view, short-run refers to a period in which they respond to the changes in price, given the taste and preferences of the consumers, while long-run is a time period in which the consumers have enough time to respond to price changes by varying their tastes and preferences.

- 5. Discounting Principle:** According to this principle, if a decision affects costs and revenues in long-run, all those costs and revenues must be discounted to present values before valid comparison of alternatives is possible. This is essential because

a rupee worth of money at a future date is not worth a rupee today. Money actually has time value. Discounting can be defined as a process used to transform future dollars into an equivalent number of present dollars.

For instance, \$1 invested today at 10% interest is equivalent to \$1.10 next year.

$$FV = PV*(1+r)^t$$

Where, FV is the future value (time at some future time), PV is the present value (value at t_0), r is the discount (interest) rate, and t is the time between the future value and present value.

2.10 SUMMARY

The lesson helps us to know about the objectives of the firm as well as various responsibilities of the economists. Apart from the above information the economists have pointed out some other objectives such as achieving a target growth rate, making a target profit, and making a satisfactory or reasonable profit is also very important. Since it is the responsibility of business managers to achieve the objective of the firm, they need to have a clear perception and understanding of the objective they have to achieve. All the areas of managerial decisions have economic perspective. Therefore, economic theories, concepts and tools of analysis are applied as roadmap to find solution to business problems. It has been found empirically that application of economic theories and tools of analysis makes significant contribution to the process of business decision making in many ways.

2.11 GLOSSARY

- Marginal Cost : Change in cost that comes from making one more unit.
- Marginal Costing : Change in the cost of producing one additional unit of a commodity.
- Marginal Revenue : Increase in Revenue resulting from sale of one additional unit of output.
- Marginal Utility : Added satisfaction a customer gets from one more unit of a good / service.
- Profit: It is a financial benefit that is realized when the amount of revenue gained from a business activity exceeds the expenses, costs and taxes needed to sustain the activity.
- Perspective: A particular attitude towards or way of regarding something; a point of view.
- Uncertainty: It refers to epistemic situations involving imperfect or unknown information.

2.12 SELF-ASSESSMENT QUESTIONS

Q1. How does managerial economics assist in taking business decisions?

Q2. Discuss the role and responsibilities of a managerial economist.

Q3. Explain the concept of:

- (i) Opportunity cost
- (ii) Equi- marginal utility
- (iii) Time Perspective principle

2.13 SUGGESTED READINGS

- Managerial Economics by Vikram Kumar Rai
- Principles of Economics, Seventh Edition. New Delhi: Vikas Publishing House
- The Nature of the Firm, by R.H. Coase, *Economica*, November 1937.
- Managerial Economics by Paul, J., Kaushal, L., & Sebastian, V. J

DEMAND ANALYSIS

STRUCTURE

- 3.1 Introduction
- 3.2 Objectives
- 3.3 Meaning and Definition of Demand
- 3.4 Meaning of Demand Function
- 3.5 Types of Demand Function
 - 3.5.1 Individual Demand Function
 - 3.5.2 Market Demand Function
- 3.6 Law of Demand
- 3.7 Determinants of Demand
- 3.8 Summary
- 3.9 Glossary
- 3.10 Self-Assessment Questions
- 3.11 Suggested Readings

3.1 INTRODUCTION

A market is a place where buyers and sellers meet each other through various modes for buying and selling of goods or services. Further, the market is governed by two important forces of demand and supply. These forces help in determining the price of the product and service and market share.

The market mechanism always works towards bringing equilibrium in the market. Demand refers to the quantities of goods that consumers are willing and able to purchase at various prices during a given period of time. If you want your demand to be meaningful in the marketplace you must be able to make a purchase; that is, you must have enough money to make the purchase. There are, no doubt, many items for which you have a willingness to purchase, but you may not have an effective demand for them because you don't have the money to actually make the purchase. For example, you might like to have a 3600-square-foot resort in Mussoorie, an equally large beach house in Goa, and a private jet to travel between these places on weekends and between semesters. But it is likely that you have a budget constraint that prevents you from having these items. For demand to be effective, a consumer must also have the ability along with willingness to purchase. There are many products that you could afford, but for which you may not be willing to spend your income. Each of us has a unique perspective on our own personal satisfaction and the things that may enhance that satisfaction. The important point is that if you do not expect the consumption of something to bring you added satisfaction, you will not be willing to purchase that good or service. Therefore, you do not have a demand for such things despite the fact that you might be able to afford them. When we discuss demand, we are always referring

to purchases made during a given period of time. The important point here is that when we refer to a person's demand for a product, we usually mean the demand over some appropriate time period, not necessarily over the rest of the person's life.

3.2 OBJECTIVES

In this lesson, you are able to understand:

- Concept of demand
- Determinants of demand
- Meaning and types of demand functions
- Law of demand

3.3 MEANING AND DEFINITION OF DEMAND

Demand in economics means demand backed up by enough money to pay for the goods demanded. This means that the demand becomes effective only if (a) it is backed by purchasing power (b) there is willingness to buy a commodity. Demand conveys wider meaning in economic sense as it is more than the desire to have a good or service. We can say that it is a want supported by affordability, willingness to purchase the product and service at the given price, per unit of time. The demand of a product can be defined as the quantity of a product that a consumer is eager to purchase, can afford at a given price, and is according to his/her preferences and tastes. Demand is an economic principle referring to a consumer's desire to purchase goods and services and willingness to pay a price for a specific good or service. Holding all other factors constant, an increase in the price of a good or service will decrease the quantity demanded, and vice versa.

Market demand is the total quantity demanded across all consumers in a market for a given good. Aggregate demand is the total demand for all goods and services in an economy. It is said that demand is closely related to supply. While consumers try to pay the lowest prices they can for goods and services, suppliers try to maximize profits. If suppliers charge too much, the quantity demanded drops and suppliers do not sell enough product to earn sufficient profits. If suppliers charge too little, the quantity demanded increases but lower prices may not cover suppliers' costs or allow for profits. Some factors affecting demand include the appeal of a good or service, the availability of competing goods, the availability of financing, and the perceived availability of a good or service.

Example: If a person is willing to buy 50 notebooks at a price of Rs.20 each at a given point of time, it is termed as demand for the notebook.

Definition :

According to **Prof. Bober**, "By demand we mean the various quantities of a given commodity or service which consumers would buy in one market in a given period of time at various prices or at various incomes or at various prices of related goods."

Demand is the quantities of a good or service that potential buyers are willing and able to purchase during a certain period.

3.4 MEANING OF DEMAND FUNCTION

A function shows the relationship between two or more variables known as dependent and independent variables. In a given market and in a given time period, the demand function for a commodity is the relation between the amount of the commodity demanded and its determinants like the price of the commodity, price of related goods,

the income of the consumer, taste, and preferences, distribution of income, size and composition of the population and so on. Demand functions is how the functional relationship between quantity demand and various determinants of demand.

There are different types of demand functions showing the relationship between demand and its determinants. It describes the mathematical relationship between the quantity demanded and one or more determinants of the demand, as the price of the good or service, the price of complementary and substitute goods, disposable income, etc. The relationship between demand & price of the good keeping all other factors constant is reflected in the Law of Demand which shows an inverse relationship between the demand of a good & its price.

According to **Mark Hirschey & James L. Pappas**, “The market demand function for a product is a statement of the relation between the aggregate quantity demanded and all factors that affect this quantity”.

It can be expressed in a most general form as the equation:

$$Q_d = a - bP$$

Where Qd is quantity of good demanded

P is the price of the good

a is vertical intercept

b is the slope of demand curve ($b = Q_d / ^3\%P$)

Graphical Representation of the Demand Curve

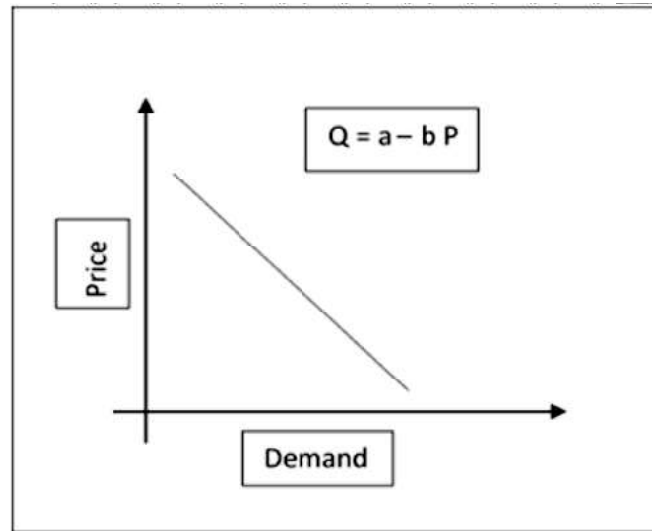


Figure 3.1

3.5 TYPES OF DEMAND FUNCTIONS

Based on whether the demand function is in relation to an individual consumer or to all consumers in the market, the demand function can be categorized as:

3.5.1 Individual Demand Function

Individual demand function refers to the functional relationship between demand made by an individual consumer and the factors affecting the individual demand. It shows how demand made by an individual in the market is related to its determinants such as price, income, price of related goods and tastes preferences. One could map out a schedule for the quantity demanded by the consumer at various prices. Mathematically, individual demand function can be expressed as,

$$D_x = f(P_x, P_r, Y, T, F)$$

Where, D_x = Demand for commodity x;

P_x = Price of the given commodity x;

Pr= Price of related goods;

Y= Income of the individual consumer;

T= Tastes and preferences;

F= Expectation of change in price in the future.

3.5.2 Market Demand Function

Market demand function refers to the functional relationship between market demand and the factors affecting market demand. Market demand is affected by all the factors that affect an individual demand. In addition to this, it is also affected by size and composition of population, season and weather conditions, and distribution of income.

As compared to individual demand function it is the market demand function that is main interest to managers as it deals with the aggregate demand for a good in the market and also the sum of all individual demands of a particular good at a particular price. It refers to the total demand for a good or service of all the buyers taken together.

Mathematically, market demand function can be expressed as,

$$D_x = f(P_x, P_r, Y, T, F, P_o, S, D)$$

Where, D_x = Demand for commodity x;

P_x = Price of the given commodity x; P_r = Price of related goods;

Y= Income of the individual consumer;

T= Tastes and preferences;

F= Expectation of change in price in the future;

P_o = Size and composition of population;

S= Season and weather;

D= Distribution of income.

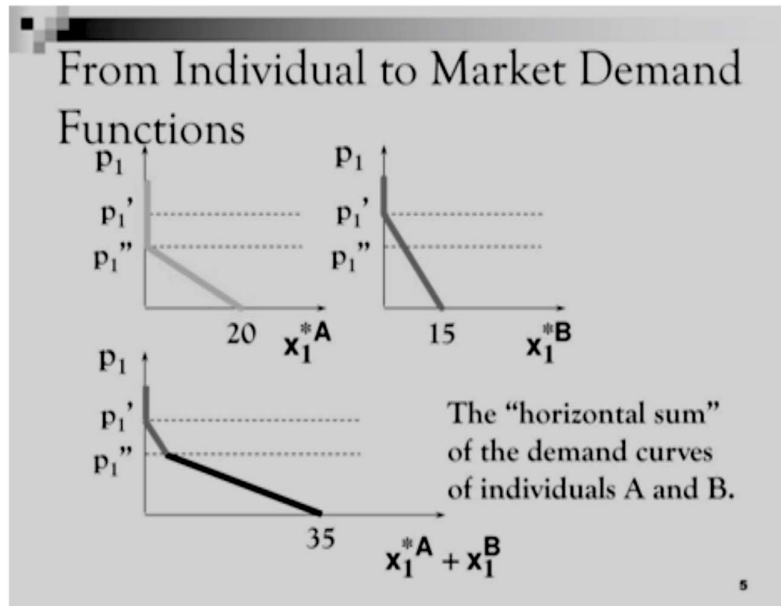


Figure 3.2

The following factors affect the market demand pattern of a commodity:

1. **Price of the Product:** The law of demand states that if other things remain the same when price falls, demand increases and vice-versa.
2. **Standard of living and spending habits:** When people are accustomed to high standard of living their spending on comforts and luxuries also increase, which in turn increases the demand.
3. **Distribution of Income Pattern:** If the distribution pattern of income is fair and equal, the market demand for essential items tends to be greater.
4. **The scale of preferences:** The market demand for a product is also affected by the scale of preference of buyers. If there is a shift in consumers' preference from x to y, the demand for y tends to increase and x decrease.

5. **The growth of population:** The growth of population is also another important factor that affects the market demand. With the increase in population, people naturally demand more goods for their survival.
6. **Social customs and ceremonies:** Social customs and ceremonies are usually celebrated collectively. They involve extra expenditure on certain items and thereby increase the demand.
7. **Future expectation:** People are not sure about their future, because future is uncertain. If the consumers expect a rise in prices of products, they buy more at present and preserve the same for the future, thereby the market demand would be affected.
8. **Tax Rate:** The tax rate also affects the demand. High tax rate would generally mean a low demand for the goods. At certain times the government restricts the consumption of a commodity and uses the tax as a weapon. A highly taxed commodity will have a lower demand.
9. **Inventions and innovations:** Inventions and innovations introduce new goods in the market. The consumers will have a strong tendency to purchase the new product. The preference over the new goods adversely affects the demand for the existing goods in the market.
10. **Weather conditions:** Seasonal factors also affect the demand. The demand for certain items purely depends on climatic and weather conditions. For example, the growing demand for cold drinks during the summer season and the demand for sweaters during the winter season.
11. **Availability of credit:** The purchasing power is influenced by the availability of credit. If there is availability of cheap credit, the consumers try to spend more on consumer durables thereby the demand for certain products increase.

12. Pattern of saving: Demand is also influenced by the pattern of saving. If people begin to save more, their demand will decrease. It means the disposable income will be less to purchase the goods and services. On the contrary, if saving is less their demand will increase.

13. Demonstration effect: Demonstration effect helps to increase human wants. In under developed countries, there is a desire in the minds of the people to imitate other people for conspicuous consumption and that is why they are not able to save. This change in the saving habits of the people is due to “contact effect”. The demonstration effect has a positive effect on the demand for comforts and luxury goods.

14. Circulation of money: An expansion or a contraction in the quantity of money will affect demand. When more money circulates among the people, more of a thing is demanded by the people because they have more purchasing power, and vice versa.

3.6 LAW OF DEMAND

The law of demand is a fundamental principle which states that other factors being constant (*ceteris paribus*), price and quantity demand of any good and service are inversely related to each other. When the price of a product increases, the demand for the same product will fall.

Law of demand explains consumer choice behavior when the price changes. In the market, assuming other factors affecting demand being constant, when the price of a good rises, it leads to a fall in the demand of that good. This is the natural consumer choice behavior. This happens because a consumer hesitates to spend more for the good with the fear of going out of cash.

The law of demand is represented by a graph called the demand curve, with quantity demanded on the x-axis and price on the y-axis. (Figure 3.3) Demand curves are

downward sloping by definition of the law of demand. It also works together with the law of supply where it provides to us the efficient allocation of resources in an economy or in other words - the equilibrium price and quantity. In other words, All else being equal, as the price of a good increases, quantity demanded will decrease; conversely, as the price of a good decreases, quantity demanded will increase”

In the words of **Marshall**, “The greater the amount to be sold, the smaller must be the price at which it is offered in order that it may find purchasers; or in other words, the amount demanded increases with a fall in price and diminishes with a rise in price.”

Demand Schedule: The table below depicts the relationship between Demand for commodity X and its price (Individual and Market Schedule)

Price & Quantity demanded (in Units) by individual A

Price	Quantity demanded (in Units) by individual A	Quantity demanded (in Units) by Individual B	Total Market Demand
10	12	12	24 (12+12)
20	9	10	19 (9+10)
30	6	8	14(6+8)
40	4	6	10(4+6)

Table 3.1

The above table depicts the inverse relationship between demand and price. As the price increase, the demand falls & vice versa.

Demand Curve: Demand curve is the graphical presentation of the law of demand.

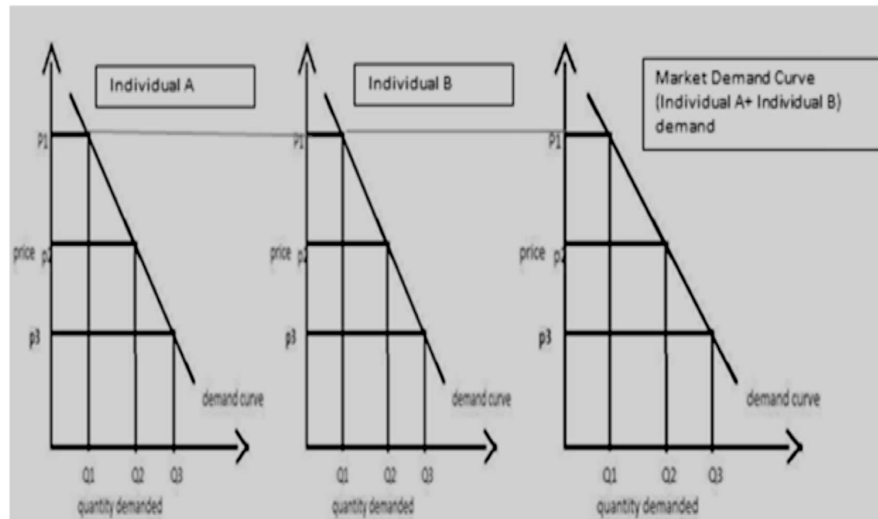


Figure 3.3 Individual & Market Demand Curve

The curve above shows the inverse relationship between the Demand and Price. Initially the price is at p_1 and the quantity demanded is Q_1 and then the price falls to p_2 and the quantity demanded increases to Q_2 . Further the aggregation of individual customer A and B becomes the market demand curve C. The curve displaying the inverse relationship between price and quantity demanded slopes down from left to right.

Causes for Downward Sloping of Demand Curves

The law of demand explains the functional relationship between the price of a commodity and its demand. The most important tool that explains this relationship is the demand curve. This curve is always downward sloping due to an inverse relationship between price and demand.

Following are some of the reasons explaining why demand curves always slope downwards:

- 1) **The law of diminishing marginal utility (MU):** According to this principle, the marginal utility of a commodity reduces when the quantity of goods is more. Consequently, when the quantity is more, the prices will fall and demand will increase. Hence, consumers will demand more goods when prices are less. This is why the demand curve slopes downwards.
- 2) **Substitution effect:** Consumers often classify various commodities as substitutes. For example, many Indian consumers may substitute coffee and tea with each other for various reasons. When the price of coffee rises, consumers may switch to buying tea more as it will become relatively cheaper. Economists refer to this as the substitution effect. Hence, if the price of tea reduces, its demand will increase and the demand curve will be downward sloping.
- 3) **Income effect:** According to this principle, the real income of people increases when the prices of commodities reduce. This happens because they spend less in case of falling prices and end up with more money. With more money, they will, in turn, purchase more and more. Therefore, the demand increases as prices fall.
- 4) **New buyers:** Whenever the price of a commodity decreases, new buyers enter the market and start purchasing it. This is because they were unable to purchase it when the prices were high but now, they can afford it. Thus, as the price falls, the demand rises and the demand curve becomes downward sloping.
- 5) **Old buyers:** This rule is basically a corollary of the new buyer's rule. When the price of a commodity decreases, the old buyers can afford to buy even more quantities of it. This results increase in demand and the demand curve slopes downwards.

Exceptions to the Law of Demand

There are certain cases in which when the price rises, quantity demanded also rises (and vice versa). Thus, the law of demand does not apply in these cases. These are termed as exceptions to the law of demand:

1. **Giffen Goods:** Named after the economist, Robert Giffen (1837-1910), Giffen good is a commodity that is unexpectedly consumed more as its price increases. Thus, it is an exception to the law of demand. In case of Giffen goods, the income effect dominates over the substitution effect. For eg : Coarse grain, Coarse cloth etc.
2. **Articles of distinction/Veblen goods:** Named after economist, Thorstein Veblen, these are the commodities which satisfy the desire of rich class. As the demonstration effect is more than its use that is why it is an exception to the Law of demand. For e.g., Diamonds, Designer Apparels etc.
3. **Consumer Ignorance:** Consumer ignorance is another exception to law of demand. The consumer purchases more at a high price. This happens as sometimes the consumer is biased that costly product is quality product.
4. **Situation of Crisis:** The situation of crisis individuals negates the law of demand. For example, during Covid- 19 people started hoarding the groceries as they feared that things would not be available during crisis.

3.7 DETERMINANTS OF DEMAND

Demand drives economic growth and today businesses want to increase demand so they can improve profits. Governments and central banks boost demand to end recessions. They slow it during the expansion phase of the business cycle to combat inflation. If you offer any paid services, then you are trying to raise demand for them. The demand for a good/commodity is indicated by the desire to purchase the good and

his/her willingness to pay for it at a particular price at a particular time. Price is one of the major factors that influence Demand. However, there are several factors that affect the demand apart from price of the good. In economics, however, the equation is simplified to highlight the five primary determinants of demand.

Some of the important determinants of demand are as follows:

- 1. Price of the Product:** People use price as a parameter to make decisions if all other factors remain constant or equal. According to the law of demand, this implies an increase in demand follows a reduction in price and a decrease in demand follows an increase in the price of similar goods. The demand curve and the demand schedule help determine the demand quantity at a price level. An elastic demand implies a significant change in quantity accompanied by a change in price. Similarly, an inelastic demand implies that volume does not change much even when there is a change in price.
- 2. Income of the Consumers:** With the rise in income, the quantity demanded rises. When income falls, so will demand. But if your income doubles, you won't always buy twice as much of a particular good or service. There's only so many pints of ice cream you'd want to eat, no matter how wealthy you are, and this is an example of "marginal utility". Rising incomes lead to a rise in the number of goods demanded by consumers. Similarly, a drop in income is accompanied by reduced consumption levels. This relationship between income and demand is not linear in nature. Marginal utility determines the proportion of change in the demand levels.
- 3. Prices of Related Goods or Services:** The price of complementary goods or services raises the cost of using the product you demand, so you'll want less. The opposite reaction occurs when the price of a substitute rises. When that happens, people will want more of the good or service and less of its substitute. That's why

Apple continually innovates with its iPhones and iPods. As soon as a substitute, such as a new Android phone, appears at a lower price, Apple comes out with a better product. Then the Android is no longer a substitute.

- **Complementary products** – An increase in the price of one product will cause a decrease in the quantity demanded of a complementary product.

Example: Rise in the price of bread will reduce the demand for butter. This arises because the products are complementary in nature.

- **Substitute Products** – An increase in the price of one product will cause an increase in the demand for a substitute product.

Example: Rise in price of tea will increase the demand for coffee and decrease the demand for tea.

4. **Consumer Expectations:** Expectations of a higher income or expecting an increase in prices of goods will lead to an increase the quantity demanded. Similarly, expectations of a reduced income or a lowering in prices of goods will decrease the quantity demanded. People expected prices to continue falling, so they didn't feel an urgency to buy a home. Record levels of foreclosures entered the market due to the subprime mortgage crisis. Demand for homes didn't increase until people expected future home prices would, too.
5. **Number of Buyers in the Market:** The number of buyers has a major effect on the total or net demand. As the number increases, the demand rises. Furthermore, this is true irrespective of changes in the price of commodities. The number of consumers affects overall, or "aggregate," demand. As more buyers enter the market, demand rises. That's true even if prices don't change, and the U.S. saw this during the housing bubble of 2005. Low-cost and sub-prime mortgages increased the number of people who could afford a house. The total number of

buyers in the market expanded. This increased demand for housing. When housing prices started to fall, many realized they couldn't afford their mortgages. At that point, they foreclosed. That reduced the number of buyers and drove down demand.

6. **Taste and Preference:** It have a positive relation with demand which means that if a person has taste and preference for a particular product then he will demand it otherwise not.
7. **Expectation regarding Future Price:** If the consumer is thinking or expecting rise in price in the coming future then the demand of the product at present will increase as there will be price hike in the future. On the other hand, if the consumer is expecting that the future price will be low then their demand right now will be less.
8. **Climatic Conditions:** The demand of the persons also depends upon the climatic conditions of that place. If the climate over there is hot then there will be no need of woolen clothes in the particular region otherwise there will be need of woolens.

3.8 SUMMARY

This lesson briefly explains the demand function with each aspect weather it may be the determinant, types and factors that affect demand functions. This means the whole range of price quantity relationship and not just the quantity demanded at a given price per unit of time. The demand function expressed above is really just a listing of variables that affect the demand. It must be made explicit and clear for use in managerial decision making. The industry must have reasonably good knowledge and information about its demand function to formulate effective long run planning decisions and short run operating decisions. The basic assumption in demand schedule and demand curve has been the relationship between price and quantity of a commodity signifying a change in price to

bring a change in quantity demanded with all other variables assumed constant and unchanged. In demand function this assumption is relaxed and it is held emphatically that besides change in price there are other variables which influence the demand for a particular commodity. Classical economists were aware of the fact that the price is not the only factor which determines sales but that other factors, too, have an important effect on them. These other factors are the income of the consumer, their tastes, habits, preferences, etc. When these factors influence the demand, the demand is said to shift. But their price-demand relationship is not as important to the management as the shift in demand, which constitutes the demand function. Shifting of demand curve renders the demand analysis difficult.

Therefore, demand function makes use of mathematical formulation to arrive at correct results. Recently more sophisticated methods have been developed for the study like simultaneous equation and mathematical programming which helps in arriving at precise results.

3.9 GLOSSARY

- **Commodity:** A commodity is a basic good used in commerce that is interchangeable with other commodities of the same type.
- **Demand:** It is the quantity of a good that consumers are willing and able to purchase at various prices during a given period of time.
- **Supply:** It is the amount of a resource that firms, producers, labourers, providers of financial assets, or other economic agents are willing and able to provide to the marketplace or to an individual.
- **Aggregate Demand :** Measurement of total amount of demand for all good and services produced in an economy.

- Complementary Goods : Good that are typically used together. For eg. Car and Petrol.
- Substitute Goods : Product that can be used an replacement for another product. For eg. Tea & Coffee.

3.10 SELF-ASSESSMENT QUESTIONS

Q1. What are the factors that affect the market demand?

Q2. Explain various types of demand analysis.

Q3. Is the demand curve of a good always downward sloping?

3.11 SUGGESTED READINGS

- Managerial Economics: Theory, Applications and Cases”, Fifth edition WW. Norton.
- Concept of Demand Function and its Types by Shraddha Bajracharya
- Demand Analysis in Economics/Managerial Economics by Smriti Chand

ELASTICITY OF DEMAND

STRUCTURE

- 4.1 Introduction
- 4.2 Objectives
- 4.3 Elasticity of Demand
- 4.4 Definitions of Elasticity of Demand
- 4.5 Types of Elasticity of Demand
 - 4.5.1 Price Elasticity of Demand
 - 4.5.2 Income Elasticity of Demand
 - 4.5.3 Cross Elasticity of Demand
- 4.6 Meaning of Supply Function
- 4.7 Summary
- 4.8 Glossary
- 4.9 Self-Assessment Questions
- 4.10 Suggested Readings

4.1 INTRODUCTION

Elasticity is a general measure of the responsiveness of an economic variable in response to a change in another economic variable. Economists utilize elasticity to gauge how variables affect each other. Elasticity can be defined as the degree of responsiveness of one variable to the change in another variable. From a business and economic point of view, it is a measure of how sensitive an economic factor is to another. For example, changes in the prices of supply or demand, or changes in demand to changes in income. Examples of elastic goods are clothing and electronics; inelastic goods include items like prescribed drugs, food. It is used to measure the change in quantity demanded of goods or services when compared to the price movements of those goods and services.

4.2 OBJECTIVES

After reading this lesson, you are able to understand:

- Meaning of elasticity of demand
- Types of elasticity of demand
- Supply function

4.3 ELASTICITY OF DEMAND

Elasticity of demand measures the responsiveness of a products demand to changes in determining factors such as its price (own-price), the price of other goods, and income. It is calculated by dividing the percentage change in demand by the percentage change for these factors. Higher demand elasticity for an economic variable indicates that the customers are more conscious of changes in this variable.

Thus, Demand can be classified as elastic, inelastic or unitary. An elastic demand is one in which the change in quantity demanded due to a change in price is large. An inelastic demand is one in which the change in quantity demanded due to a change in price is small.

The formula used here for computing elasticity of demand is:

$$\frac{\text{Percentage change in Quantity Demanded}}{\text{Percentage Change in Determinant (Price)}}$$

or

$$Ed = \frac{(Q1 - Q2) / (Q1 + Q2)}{(P1 - P2) / (P1 + P2)} \text{ or } \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} \text{ or } \frac{\Delta Q}{Q} \times \frac{P}{\Delta P}$$

Ed = 1 = Unitary Elastic

1) Elastic Demand



Figure 4.1 Elastic Demand

Elasticity of demand is illustrated in Figure 1. Note that a change in price results in a large change in quantity demanded. An example of products with an elastic demand is consumer durables. These are items that are purchased infrequently, like a washing machine or an automobile, and can be postponed if price rises.

For example, automobile rebates have been very successful in increasing automobile sales by reducing price.

Close substitutes for a product affect the elasticity of demand. If another product can easily be substituted for your product, consumers will quickly switch to the other product if the price of your product rises or the price of the other product declines.

For example, beef, pork and poultry are all meat products. The declining price of poultry in recent years has caused the consumption of poultry to increase, at the expense of beef and pork. So, products with close substitutes tend to have elastic demand.

2) Inelastic Demand

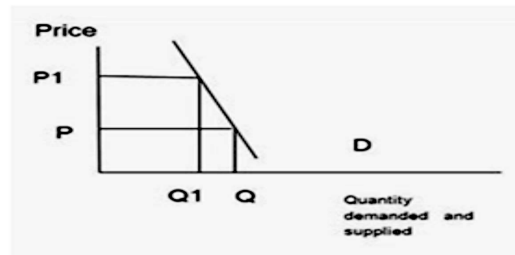


Figure 4.2 Inelastic Demand

Inelastic demand is shown in Figure 2. Note that a change in price results in only a small change in quantity demanded. In other words, the quantity demanded is not very responsive to changes in price. Examples of this are necessities like food and fuel. Consumers will not reduce their food purchases if food prices rise, although there may be shifts in the types of food they purchase. Also, consumers will not greatly change their driving behavior if gasoline prices rise.

3) Unitary Elasticity



Figure 4.3 Unitary Elasticity

If the elasticity coefficient is equal to one, demand is unitarily elastic as shown in Figure 3.

For example, a 10% quantity change divided by a 10% price change is one. This means

that a 1% change in quantity occurs for every 1% change in price. Therefore, the elasticity of demand is the percentage change in the quantity demanded as a result of a percentage change in the price of a product.

4.4 DEFINITIONS

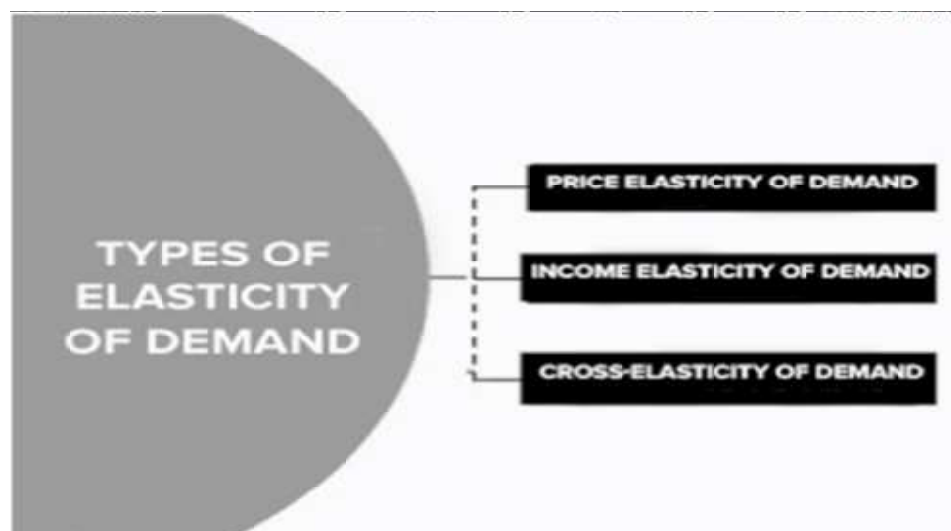
According to **Lipsey**, “Elasticity of demand may be defined as the ratio of percentage change in demand to the percentage change in the price”.

According to **Jone Robinson** defines Elasticity of demand as, “The elasticity of demand is the proportionate change of amount purchased in response to a small change in price, divided by the proportionate change in price”.

According to **Prof. Boulding**, “The elasticity of demand may be defined as the percentage change in the quantity demanded which would result from one percent change in price.

4.5 TYPES OF ELASTICITY OF DEMAND

The three major forms of elasticity are price elasticity of demand, cross-price elasticity of demand, and income elasticity of demand.



4.5.1 Price Elasticity of Demand

The price elasticity of demand is the response of the quantity demanded to change in the price of a commodity. It is assumed that the consumer's income, tastes, and prices of all other goods are steady. Price elasticity of demand is a measure of a change in the quantity demanded of a product due to change in the price of the product in the market. It is measured as a percentage change in the quantity demanded divided by the percentage change in price.

Or,

$$E_p = \frac{\frac{\text{Change in Quantity} \times 100}{\text{Original Quantity}}}{\frac{\text{Change in Price} \times 100}{\text{Original Price}}}$$
$$= \frac{\text{Change in Quantity}}{\text{Original Quantity}} \times \frac{\text{Original Price}}{\text{Change in Price}}$$



Figure 4.4 Price elasticity of demand

Types of Price Elasticity of Demand

There are basically 5 types of price elasticity of demand:

- 1. Perfectly Elastic Demand:** When a small change (rise or fall) in the price results in a large change (fall or rise) in the quantity demanded, it is known as perfectly elastic demand. For eg. Luxury Cars.
- 2. Perfectly Inelastic demand:** When a change (rise or fall) in the price of a product does not bring any change (fall or rise) in the quantity demanded, the demand is called perfectly inelastic demand.
- 3. Relatively Elastic Demand:** When a proportionate or percentage change (fall or rise) in price results in greater than the proportionate or percentage change (rise or fall) in quantity demanded, the demand is said to be relatively elastic demand.
- 4. Relatively Inelastic Demand:** When a percentage or proportionate change (fall or rise) in price results in less than the percentage or proportionate change (rise or fall) in demand, the demand is said to be relatively inelastic demand.
- 5. Unitary Elastic Demand:** Unitary elastic demand occurs when a change (rise or fall) in price results in equivalent change (fall or rise) in demand.

Factors Affecting Price Elasticity of Demand

As discussed earlier, the price elasticity of demand of a product reflects the change in the quantity demanded as a result of a change in price. However, the price elasticity differs for different products as it depends on various factors:

- 1. Relative Need for the Product:** The need of every individual is not the same for the same product. A product that is luxury for an individual may be a necessity for another person.

2. **Availability of Substitute Goods:** The availability of substitutes has major impact on the demand for a product. If substitutes are easily available at relatively low prices, the demand for the product would be more elastic and vice versa.
3. **Impact of Income:** The amount of income that consumers spend on purchasing a particular product also influences the price elasticity of demand. If consumers spend a large sum on a product, the demand for the product would be elastic.
4. **Time under Consideration:** It majorly influences the price elasticity of demand. Demand for a product remains inelastic in the short run due to failure to postpone demand.
5. **Perishability of the Product:** If products are perishable in nature, the demand for such products would be inelastic as their consumption cannot be postponed.
6. **Addiction:** Some products, such as cigarettes and other tobacco-based products, have inelastic demand like smokers may be willing to pay extra for cigarettes even in case of a price rise. Thus, the demand would remain the same.

Importance of Price Elasticity of Demand

1. **Price determination:** The concept of price elasticity of demand is used by organisations in determining prices under various situations like, under monopolistic market conditions, an organisation sets a low price per unit of the product in case of elastic demand. As a result, the demand for the product rises. On the other hand, when the demand for the product is inelastic, the price is set very high. This helps in generating large revenues for organisations due to the high price of a product while demand remains constant.
2. **Price discrimination:** Price discrimination refers to charging different prices from various customers for the same product. The common example of price variation

is petrol. Its demand is inelastic as the change in the price does not affect consumption. Thus, the price of petrol is charged differently in different states of India.

3. **Formulation of taxation policies:** The government takes under consideration the price elasticity of demand before formulating taxation policies. Generally, government levies high taxes on products (for producers) whose demand is elastic. On the contrary, it levies high taxes on products (for customers) having inelastic demand as the consumption remains unaffected.
4. **International trade:** The concept of price elasticity has a significant role in international trade. This is because successful trade transactions between the two countries are dependent on the price elasticity of demand and is used in deciding the level of imports and exports. Like, if the demand for the product is inelastic in the international market, the seller country will have an upper hand in exports.
5. **Formulation of agricultural policies:** The price elasticity of demand also helps the government in formulating agricultural policies by providing insight into the paradox of poverty. The prices of farm products whose demand is inelastic fall due to large supplies as a result of bumper crops. This results in a fall in prices, which leads to low income for farmers. Consequently, poverty among farmers increases. Thus, government sets a minimum suitable price for inelastic farm products so that farmers can generate adequate revenues.

4.5.2 Income elasticity of demand

Income elasticity of demand measures demands responsiveness when income changes, assuming the other factors are constant. As with the previous two demand elasticities, you can calculate this by dividing the percentage change in the demand

quantity for a product by the percentage change in income. The following is the formula for the income elasticity of demand:

$$\text{Income elasticity of demand (IE)} = \frac{\% \text{ Change in the demand quantity of products}}{\% \text{ Change in income}}$$

According to **Watson**, “Income elasticity of demand means the ratio of the percentage change in the quantity demanded to the percentage in income”.

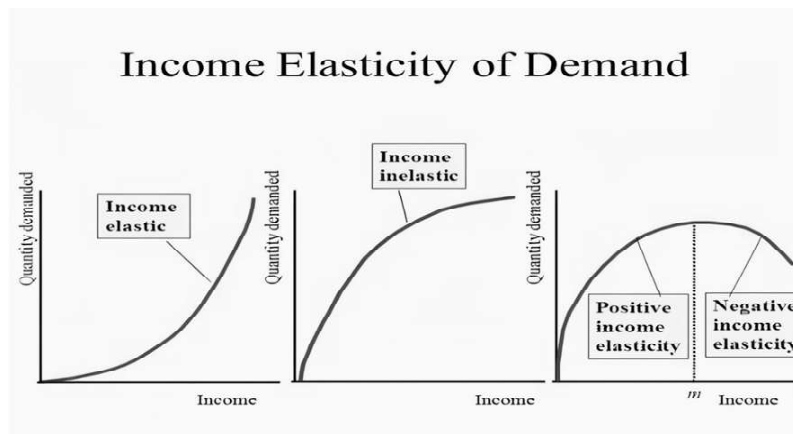


Figure 4.6 Income elasticity of demand

Types of Income Elasticity of Demand

- 1. Positive income elasticity of demand:** When a proportionate change in the income of a consumer increases the demand for a product and vice versa, income elasticity of demand is said to be positive. In case of normal goods, the income elasticity of demand is generally found positive.
- 2. Negative income elasticity of demand:** When a proportionate change in the income of consumer results in a fall in the demand for a product and vice versa, the income elasticity of demand is said to be positive. It generally happens in the case of inferior goods.

For example, consumers may prefer small cars with a limited income. However, with a rise in income, they may prefer using luxury cars.

- 3. Zero income elasticity of demand:** When a proportionate change in the income of a consumer does not bring any change in the demand for a product, income elasticity of demand is said to be zero. It generally occurs for utility goods such as salt, kerosene, electricity.

Factors Affecting Income Elasticity of Demand

- 1. Income of Consumers in a Country:** In any country, the income level of consumers is not the same. Therefore, consumers spend on the basis of not only on their need but also their purchasing capacity. The purchasing capacity of consumers increases with a rise in their income. For example, a consumer with a low income may prefer using public transport for commuting. However, with a rise in income, he/she may buy a two-wheeler for the same purpose.
- 2. Nature of Products:** The nature of products being consumed by consumers also has an important influence on income elasticity. For example, basic goods used on a day-to-day basis, such as salt, sugar, and cooking oil, is elastic. Even with a rise in the income of a consumer, the demand for such products does not change and remain inelastic.
- 3. Consumption Pattern:** With a rise in income, people quickly change their consumption patterns. For example, people may start buying high priced products with an increase in their income. This leads to an increase in the demand for the products in the market. However, once the consumption pattern is established, it becomes difficult to lower the demand in case of a decrease in income.

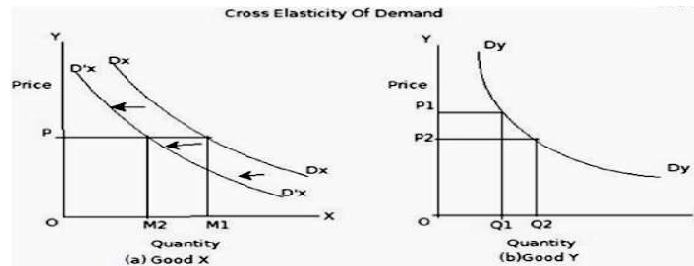
4.5.3 Cross elasticity of demand

The cross elasticity of demand of a commodity X for another commodity Y, is the change in demand of commodity X due to a change in the price of commodity Y. It also measures the responsiveness of a product's demand if the price of an alternative product changes. The alternative product may act as a substitute or complementary. We compare the percentage change in the demand quantity of a product against the percentage change in the alternative product price to calculate this.

According to **Ferguson**, "The cross elasticity of demand is the proportional change in the quantity demanded of good X divided by the proportional change in the price of the related good Y".

The following is the formula for the cross-price elasticity of demand:

Cross price elasticity of demand (CPE) = $\frac{\% \text{Change in demand quantity for Product X}}{\% \text{Change in price of Product Y}}$



Change in the price for Product Y

Figure 4.7 Cross elasticity of demand

Types of Cross Elasticity of Demand

1. **Positive cross elasticity of demand:** When an increase in the price of a related product results in an increase in the demand for the main product and vice versa, the cross elasticity of demand is said to be positive. Cross-elasticity of demand is positive in the case of substitute goods.

For example, the quantity demanded tea has increased from 200 units to 300 units with an increase in the price of coffee from 1 25 to 1 30.

- 2. Negative cross elasticity of demand:** When an increase in the price of a related product results in the decrease of the demand of the main product and vice versa, the negative elasticity of demand is said to be negative. In complementary goods, cross elasticity of goods is negative.

For example, if the price of butter is increased from 20 to 25, the demand for bread is decreased from 200 units to 125 units.

- 3. Zero cross elasticity of demand:** When a proportionate change in the price of a related product does not bring any change in the demand for the main product, the negative elasticity of demand is said to be negative. In simple words, cross elasticity is zero in case of independent goods. In this case, it becomes zero.

4.6 MEANING OF SUPPLY FUNCTION

Supply function is a mathematical description of the connection between the quantity required of a service or product, its value and other associated factors such as input costs and related goods prices. A supply function has many independent variables and a single dependent variable. A supply equation can be formulated by examining the relationship between the supply and the independent variables. It can also be formulated by defining whether the relationship is positively-or negatively related. For example, in general, the market price and supply are inversely correlated. On the other hand, supply and technological development are positively correlated; for example, better technology indicates added supply.

It explains the relationship between the supply of a commodity and the factors determining its supply. We can better represent the supply function in the form of the following equation:

$$S_x = f(P_x, P_I, T, W, GP)$$

Where,

S_x = supply of commodity x

P_x = Price of commodity x

P_I = Price of inputs

T = Technology

W = Weather conditions

GP = Government Policy

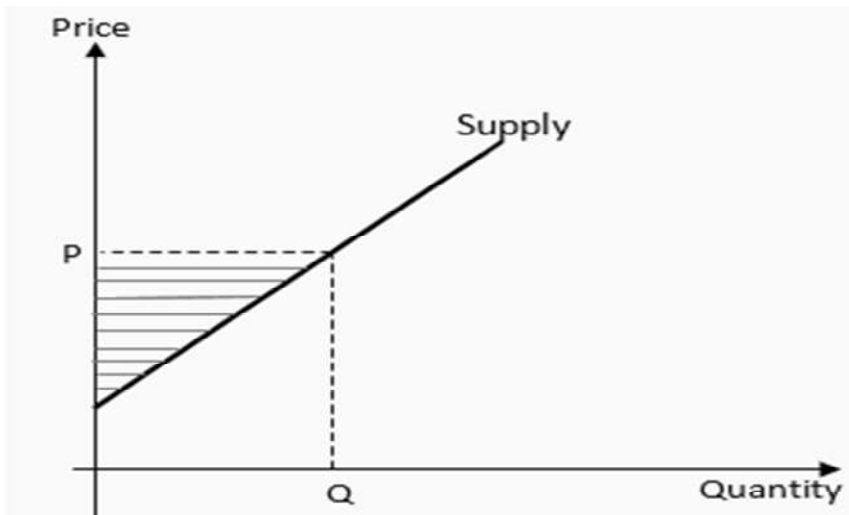


Figure 4.8 Supply Curve

Supply Function in Economics

The supply function in economics is applied to access how much of a given product is provided at a given price. It is used in conjunction with the demand function to identify equilibrium pricing for various markets and products. Supply functions in economics can be calculated in the following steps:

- Defining the price of goods correlated to the product whose supply function is to be calculated.
- Finding out how many producers or suppliers of the given good are there.
- Determining the function based on how the assigned quantities would influence the supply of a product.

Determinants of Supply

Some factors can impact a producer's readiness to supply the commodity in the market.

These factors are:

- 1. Commodity Price :** Any producers' primary goal is to maximise the increase in profit. That is why producers manage to supply more products in the market when the product's price increases, with all other constituents being constant. In the same process, producers supply fewer goods when the prices drop, and different factors remain constant.
- 2. Price of Related Goods :** Related goods include complementary and substitute goods. As the price of complementary goods increase, their supply also increase. Also, when the price of the substitute good increases, thus supply increase, but that of the original goods falls.
For Eg : If price of Wheat rises, it becomes more profitable for firms to supply it, rather than corn or soya bean.
- 3. Price of the Production Factors:** The production factor refers to the input needed to produce a product economically. Usually, land, labour, capital, and entrepreneurship are considered as the factors of production. Producers have to pay a specific amount in terms of wage, rent and interest in the return of using factors of production.

4. **The Goal of Producers:** The primary objective of every firm is to earn revenue and maximize profit. Companies who prioritize prestige to profit may enhance the supply of the products in the market even when they earn very limited or no profit, just to fit out in the business.
5. **Technology:** It is one of the important elements of industries and firms. Improvement in technology has a great influence on the production rate.

Assumptions of Supply Function

1. **Nature of Goods:** If the assets are perishable and the seller cannot anticipate the price rise. Seller may have to give all of his goods at the current market price because he may not jeopardize getting his belongings perished.
2. **Government Policies:** Government may reinforce the producers and firms to offer products at the regular market price. In such a condition the producer may not be able to wait for the price rise.
3. **Alternative Products:** If a number of alternative commodities are obtainable in the market and customers manage to buy those products to fulfil their requirements, the producer will have to move to convert his sources to the production of those products.
4. **Squeeze in Profit:** Production costs like raw materials, overhead costs, labour expenses and selling may increase along with the rise in cost. Such situations may not allow the producer to offer his commodities at a profit.

Law of Supply

The law of supply states that other factors remaining constant, the quantity of a good produced and offered for sale would increase with an increase in its price and decrease as the price falls. It also acts as a bridge between the supply of a

commodity and its price. Further, we can say that there is a direct relationship between the supply of a commodity and its price. This law is true for a majority of day-to-day occurrences of supply. However, there are some exceptions to the law of supply. The supply of labor at high wages, for example, decreases instead of increasing.

This is because an employer pays more only when you possess a skill which is not so common. Thus, the supply depends upon the phenomenon under consideration and the extent to which supply can be altered.

Further, the behavior of supply is also the slave of time, for obvious reasons. When talking about short-run, we can play with supply only up to a certain extent, permissible under the short time frame. Below, is the graphical representation of the law of supply, the supply curve.

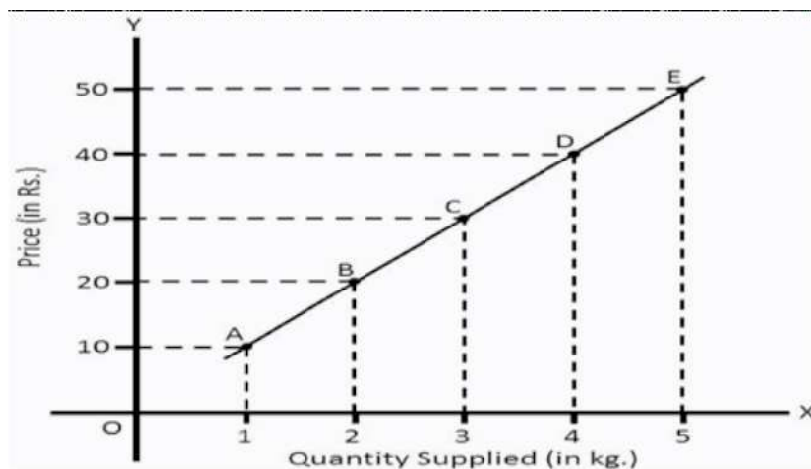


Figure 4.9 Law of supply curve

4.7 SUMMARY

In economics, supply and demand is an economic model of price determination in a market. It postulates that, holding all else equal, in a competitive market, the unit price for a particular good, or other traded item such as labor or liquid financial assets, will vary until it settles at a point where the quantity demanded (at the current price) will equal the quantity supplied (at the current price), resulting in an economic equilibrium for price and quantity transacted. It forms the theoretical basis of modern economics. The aggregate demand-aggregate supply model has been used to depict how the quantity of total output and the aggregate price level may be determined in equilibrium. Supply is the amount of a resource that firms, producers, labourers, providers of financial assets, or other economic agents are willing and able to provide to the marketplace or to an individual. Supply can be in produced goods, labour time, raw materials, or any other scarce or valuable object. Whereas, Demand is the quantity of a good that consumers are willing and able to purchase at various prices during a given period of time. The relationship between price and quantity demanded is also called the demand curve. Demand for a specific item is a function of an item's perceived necessity, price, perceived quality, convenience, available alternatives, purchasers' disposable income and tastes, and many other options.

4.8 GLOSSARY

- Income: It is the consumption and saving opportunity gained by an entity within a specified timeframe, which is generally expressed in monetary terms.
- Elasticity: It measures the percentage change of one economic variable in response to a change in another.
- Perishable: It refers to something that just won't last.

4.9 SELF-ASSESSMENT QUESTIONS

Q1. What are complementary and substitute goods?

Q2. Explain the law of supply?

Q3. What do mean by elasticity of demand?

4.10 SUGGESTED READINGS

- www.extension.iastate.edu/diversity/ext
- www.geektonight.com/income-elasticity-demand
- www.vedantu.com/commerce/supply-function

FIRM THEORY

STRUCTURE

- 5.1 Introduction
- 5.2 Objectives
- 5.3 Meaning of Theory of Firm
- 5.4 Objectives of Business Firm
- 5.5 Marris Model of Growth Maximization and Theory of the Growth of the firm
- 5.6 Summary
- 5.7 Glossary
- 5.8 Self-Assessment Questions
- 5.9 Suggested Readings

5.1 INTRODUCTION

A business firm is a needs-satisfying machine; it is an entity invented and employed by society to better satisfy the society's interests. A society is better off when properly regulated business firms are allowed to carry the bulk of economic activity than when they are not allowed to exist or are severely regulated by the state. The business firm generates consumer satisfaction in return for income that gets distributed to its owners, employees, suppliers and public goods recipients. Any firm of any size is in existence because:

- It identifies a consumer need and develops/invents a recipe on how to satisfy that need.
- It makes the right decisions with respect to making or buying inputs so that it delivers its recipe at the lowest possible cost.
- It provides the best incentives to its stakeholders.
- It constantly and deliberately evolves through the relentless pursuit of competitive, organisation and strategic advantage.

5.2 OBJECTIVES

In this lesson, you are able to understand:

- Theory of Firm
- Objective of Firm
- Marris Model of Growth Maximization

5.3 FIRM THEORY : MEANING

In economics the theory of the firm is a microeconomic concept that states that a firm exists and make decisions to maximize profits which influences decision-making in a variety of areas, including resource allocation, production techniques, pricing adjustments, and the volume of

production. It has been debated and expanded to consider whether a company's goal is to maximize profits in the short-term or long-term. Modern takes on the theory of the firm sometimes distinguish between long-run motivations, such as sustainability, and short-run motivations, such as profit maximization. If a company's goal is to maximize short-term profits, it might find ways to boost revenue and reduce costs. However, companies that utilize fixed assets, like equipment, would ultimately need to make capital investments to ensure the company is profitable in the long-term. The use of cash to invest in assets would undoubtedly hurt short-term profits but would help with the long-term viability of the company. This theory consists of a number of economic theories that explain and predict the nature of the firm, company, or corporation, including its existence, behaviour, structure, and relationship to the market.

Theory of the firm is related to comprehending how firms come into being, what are their objectives, how they behave and improve their performance and how they establish their credentials and standing in society or an economy and so on. The theory of the firm aims at answering the following questions:

- Existence – why do firms emerge and exist, why are not all transactions in the economy mediated over the market?
- Which of their transactions are performed internally and which are negotiated in the market?
- Organisation – why are firms structured in such a specific way? What is the interplay of formal and informal relationships?

- Heterogeneity of firm actions/performances – what drives different actions and performances of firms?

Firms exist as an alternative system to the market-price mechanism when it is more efficient to produce in a non-market environment. For example, in a labor market, it might be very difficult or costly for firms or organizations to engage in production when they have to hire and fire their workers depending on demand/supply conditions. It might also be costly for employees to shift companies every day looking for better alternatives. Similarly, it may be costly for companies to find new suppliers daily. Thus, firms engage in a long-term contract with their employees or a long-term contract with suppliers to minimize the cost or maximize the value of property rights.

The model of business is called the theory of the firm. In its simplest version, the firm is thought to have profit maximization as its primary goal. The firm's owner-manager is assumed to be working to maximize the firm's short-run profits. Today, the emphasis on profits has been broadened to encompass uncertainty and the time value of money. In this more complete model, the primary goal of the firm is long-term expected value maximization. The value of the firm is the present value of the firm's expected future net cash flows. If cash flows are equated to profits for simplicity, the value of the firm today, or its present value, is the value of expected profits or cash flows, discounted back to the present at an appropriate interest rate.

According to **Jensen Meckling**, "The firm is not an individual. It is legal fiction which serves as a focus for a complex process in which the conflicting objectives of individuals (some of whom may represent other organization) are brought into equilibrium within a frame work of contractual relations".

The Corporation is a legal device consisting of these variables



5.4 OBJECTIVES OF BUSINESS FIRM

The business firms and the other business entities are guided by certain objectives. Profit maximization has been one the prime objectives of the private business enterprises. Later on, in recent times new theories of business firms have generated alternative objectives of firms. To be specific, the new theories lay stress on the role of managers and their behavioral pattern in deciding the price and output under Oligopoly. Sales maximization model of Oligopoly is one of the objectives of a business firm apart from profit maximization.

The following points high light the main objectives of the business firm

1. Profit Maximization: In the conventional theory of the firm, the principal objective of a business firm is profit maximization. Under the assumptions of given tastes and technology, price and output of a given product under perfect competition are determined with the sole objective of maximizing profits. The firm is supposed to act as one of a large number of producers which cannot influence the market price of the product. In this theory, maximum profits refer to pure profits which are a surplus above the average cost of production. It is the amount left with the entrepreneur after he has made payments to all factors of production, including his wages of management.

In other words, it is a residual income over and above his normal profits. It is a necessary payment for an entrepreneur to stay in the business. The rules for profit maximization are (1) $MC = MR$ and (2) MC should cut MR from below.

2. Multiple Objectives: The basis of the difference between the objectives of the neo-classical firm and the modern corporation arises from the fact that the profit maximization objective relates to the entrepreneurial behaviour while modern corporations are motivated by different objectives because of the separate roles of shareholders and managers. In the latter, shareholders have practically no influence over the actions of the managers. As early as in 1932, Berle and Means suggested that managers have different goals from shareholders. They are not interested in profit maximization. They manage firms in their own interest rather than in the interests of shareholders. Shareholders cannot have much influence on managers because they do not possess adequate information about companies. The majority of shareholders cannot attend annual general meetings of companies and thus give their proxies to the directors. Thus, modern firms are motivated by objectives relating to sales maximization, output

maximization, utility maximization, satisfaction maximization and growth maximization.

3. **Marris Growth Maximization:** The managers aim at the maximization of the growth rate of the firm and the shareholders aim at the maximization of their dividends and share prices. To establish a link between such a growth rate and the share prices of the firm, Marris develops a balanced growth model in which the manager chooses a constant growth rate at which the firm's sales, profits, assets, etc., grow. If he chooses a higher growth rate, he will have to spend more on advertisement and on R & D in order to create more demand and new products.
4. **Baumol's Sales Maximization:** Baumol's sales revenue maximization model highlights that the primary objective of a firm is to maximize its sales rather than profit maximization. It states that the goal of the firm is maximization of sales revenue subject to a minimum profit constraint. It should be noted that by sales maximization, Baumol does not indicate the maximization of the physical volume of sales but the maximization of the total revenue of sales, i.e., rupee value of the sales. The rationale in this objective is the dichotomy between management and ownership in large business corporations. This existing situation of dichotomy provides managers a chance to set their purpose other than profit maximization goal which most owner-businessmen pursue. Prof. Baumol thinks that the managers are more interested in maximizing sales rather than profits. So far as empirical validity of sales revenue maximization objective is concerned, factual evidences are debatable.
5. **Output Maximization:** Milton Kafolgis suggests output maximization as the objective of a business firm. According to him, "The performance of firms

frequently is measured directly in terms of physical output with revenue occupying a secondary position.” Thus, Kafolgis prefers output maximization both to profit maximization and revenue maximization as the objective of a firm. Given some minimum level of profits, a firm wants to maximize its output. It will spend its funds on increasing its production rather than on advertising. Thus, the firm will produce a larger output and its revenue sales may be less than the sales-maximization firm.

6. **Security Profits:** Rothschild has put forward the view that the firm is motivated not by profit maximization but by the desire for security profits. In his words, “There is another motive which is probably of a similar order of magnitude as the desire for maximum profits, the desire for security profits.” He argues that so far as the objective of profit maximization is concerned, it is valid only under perfect competition or monopolistic competition in which the number of firms is very large, and the individual firm is not faced with the security problem, so is the case with the monopoly firm. But under oligopoly, a firm is not motivated by profit maximization. It is engaged in a constant struggle to achieve and maintain a secure position in the market like a military strategist. The desire to increase its security leads to the struggle for position and to the setting of a price which will not be so low that it provokes retaliation from rivals, nor so high that it encourages new entrants, and it must be within the range which will maintain a protection against the aggressive policies of the rivals and bring about a reasonable profit above its cost of production Rothschild’s security-profits motive is nothing else but profit maximization in a little different garb.
7. **Satisfaction Maximization:** Scitovsky favours maximization of satisfaction in preference to the profit-maximization objective of the firm. He is concerned with managerial effort and the distaste that managers have for work. According to him an entrepreneur would maximize profits only if his choice between more

income and more leisure is independent of his income. In other words, the supply of entrepreneurship should have zero income elasticity. But an entrepreneur does not aim at profit maximization. He wants to maximize satisfaction and keep his efforts and output below the level of maximum profits. This is because as his income (profit) increases, he prefers leisure to effort (output).

5.5 MARRIS MODEL OF GROWTH MAXIMIZATION AND THEORY OF THE GROWTH OF THE FIRM

Robin Marris in his book 'The Economic Theory of Managerial Capitalism' (1964) has developed a dynamic balanced growth maximizing model of the firm. He concentrates on the proposition that modern big firms are managed by managers and the shareholders are the owners who decide about the management of the firms. The managers aim at the maximisation of the growth rate of the firm and the shareholders aim at the maximisation of their dividends and share prices. To establish a link between such a growth rate and the share prices of the firm, Marris develops a balanced growth model in which the manager chooses a constant growth rate at which the firm's sales, profits, assets, etc. grow. If he chooses a higher growth rate, he will have to spend more on advertisement and on R & D in order to create more demand and new products. He will, therefore, retain a higher proportion of total profits for the expansion of the firm. Consequently, profits to be distributed to shareholders in the form of dividends will be reduced and the share prices will fall. The threat of take-over of the firm will loom large among the managers. As the managers are concerned more about their job security and growth of the firm, they will choose that growth rate which maximises the market value of shares, give satisfactory dividends to shareholders, and avoid the take-over of the firm. On the other hand, the owners (share-holders) also want balanced growth of the firm because it ensures fair return on their capital. Thus, the goals of the

managers may coincide with that of owners of the firm and both try to achieve balanced growth of the firm.

Marris's hypothesis is that, executive actions are limited by the need for management to protect itself from dismissal or take-over raids in the event of failure. Marris tried to improve upon Baumol's model. He offered a variation of Baumol's model that stressed the maximization of growth subject to the security of management's position.

Marris's approach is also based on the fact that ownership and control of the firm is in the hands of two different set of people. Like Williamson, Marris suggests that managers have a utility function in which salary, status power, prestige and security are important variables. Owners of the firm (shareholders) are however, more concerned about profits, market share, output etc. The utility function of managers (U_m) and that of the owners (U_o) may, therefore, be defined as:

$$U_m = f(\text{salaries, power, status, job security})$$

$$U_o = f(\text{Profits, market share, output, capital, public esteem}).$$

Robin Marris believes that most of the variables entering into the utility function of managers owners are strongly correlated with single variables: the size of the firm. He, therefore states that the managers would be mainly concerned about the rate of growth of size. In Marris model, there are two constraints:

(a) The managerial team constraint

(b) The job security constraint

(a)The managerial team constraint: Marris is of the view that the capacity of the top management is given at any one time period. Since management is a team work, hiring new managers does not expand the managerial capacity

immediately. New managers take time to get integrated in the team which is extremely essential for the efficient working of the firm.

(b)The Job Security Constraint: Their desire for security is reflected in the preference for service contracts, generous retirement benefits and their dislike for policies which may result in their dismissal. Job security is assumed to be attained by pursuing a prudent financial policy which requires that the three crucial financial ratios must be maintained at optimum levels.

Assumptions of the Model

The Marris model is based on the following assumptions:

1. It assumes a given price structure.
2. Production costs are given.
3. There is no oligopolistic interdependence.
4. Factor prices are constant.
5. Firms are assumed to grow through diversification.
6. All major variables such as profits, sales and costs are assumed to increase at the same rate.

Explanation of the Assumptions:

Given these assumptions, the objective of the firm is to maximize its balanced growth rate, G . The G itself depends on two factors: First, the rate of growth of demand for the firm's product, GD ; and second, the rate of growth of capital supply, GS . Thus $G = GD = GS$. Despite the fact that in big firms' ownership is reorganized from management, owners and managers have a common goal of balanced growth of the firm. According to Marris, there are two different utility functions for the manager and the owner of the firm. The utility function of the manager consists of his emoluments, status, power, job security, etc. On the other hand, the utility function of the owner includes profits,

capital, output, market share, etc. Thus, the manager of a firm aims at maximizing his utility, and his utility depends upon the rate of growth of the firm. Though promoting the growth of the firm is the main aim of the manager, yet he is also motivated by his job security. The manager's job security depends upon the satisfaction of shareholders who are concerned to keep the firm's share prices and dividends as high as possible. Thus, the manager aims at maximizing the rate of growth of the firm and the shareholders (owners) aim at maximizing their profits in the form of dividends and share prices. Marris analyses the means by which the firm tries to achieve its growth maximization goal. The firm may grow in size through the creation of new products which create new demands. Marris calls it differentiated diversification. The introduction of new products depends upon the rate of diversification, advertising expenses, R&D expenditures, etc. Marris establishes the relationship between growth and profits on the demand side through diversification into new products. The links between growth and profits are different at different levels of growth. In this growth-profits relationship, growth determines profits. When the rate of growth of the firm is low, the relationship is a positive one. As new products are introduced, the firm expands (grows) and profits increase. With the further increase in the growth rate due to greater diversification into new products, the growth profits relationship becomes negative. This is because there is the managerial constraint which sets a limit on the rate of managerial growth that restricts the growth of the firm. The firms' managerial ability to cope with a great number of changes at once is limited. It is not possible to develop a larger management team for the development and marketing of new products. The higher rate of diversification requires higher expenditures on advertising and R & D. As a result, beyond a certain growth rate, the higher growth rate leads to a lower rate

of profit. This is illustrated in the given figure where the GD curve first rises, reaches the highest point M and then starts falling.

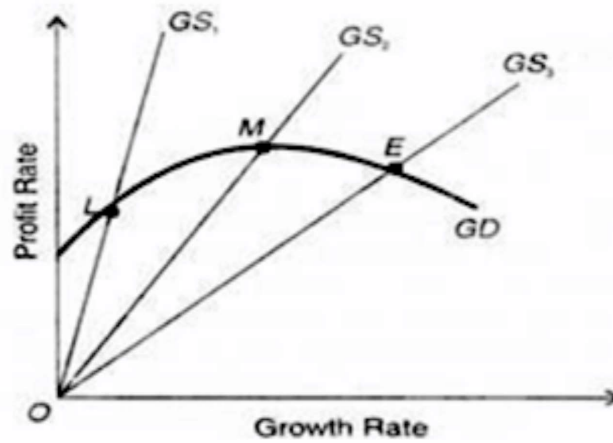


Figure 5.2

The other aspect of the growth profits relationship is the rate of growth of capital supply. The aim of the shareholders is to maximise the growth rate of capital stock. The main source of finance for its growth is profits. Thus, profits determine growth on the supply side. A higher level of profits provides more funds directly for reinvestment. It also allows more funds to be raised on the capital markets. It, therefore, allows a higher rate of growth to be funded. This gives a direct and positive relationship between profits and growth. This is shown in the above figure as a straight-line GS from the origin. For the equilibrium of the firm, the growth demand and growth supply relationship must be satisfied. This is achieved when the two curves GD and GS intersect at a point where the growth-profits combination gives the optimum solution. Suppose in the figure the GS2 curve intersects the GD curve at point M where profits are maximised. This point does not provide an optimum solution because the managers desire more growth than is consistent with long-run profit maximisation. The extent to which they can increase the growth rate beyond point M depends upon their desire

for job security. Their job security is threatened if the shareholders feel that the share prices and dividends are falling and there is the threat of take-over by other firms. This will affect the growth rate of capital supply (GS). Thus, it is the financial constraint which sets a limit to the growth of the firm on the supply side. According to Marris, it is the retention ratio which determines the growth rate of capital supply. The retention ratio is the ratio of retained profits to total profits. If the retention ratio is very low, it means that almost all profits have been distributed to the shareholders. As a result, there are limited funds available with the managers for the growth of the firm and the growth rate will be very low. The growth-supply curve will be very steep as shown by GS1 curve. The firm's equilibrium will be at point L where the GS1 curve intersects the GD curve. This is again not the optimal equilibrium point of the firm because here the growth rate is low and profits are below the maximum level. Larger retained profits are required by managers to invest larger funds for the growth of the firm. These raise the retention ratio which, in turn, leads to higher profits and higher growth rates until point M of maximum profits is reached. This is again not the optimum equilibrium point of the firm because the managers feel that this combination of higher growth rate and higher profits is approved by the shareholders and there is no threat to their job security. They will, therefore, be encouraged to raise the retention ratio further, invest more funds, expand and increase the growth rate of the firm. As a result, the growth supply curve will become flatter and take the shape of GS3 curve as in the figure where it intersects the DS curve at point E. At this point, distributed profits to shareholder's fall. But they are adequate to satisfy the shareholders so that there is no fear of fall in the prices of shares and of the threat of takeovers. There is also job security for managers.

Thus point E is the optimal equilibrium point of the firm. If the managers adopt a higher retention ratio than this, the distributed profits will fall further and the shareholders will not be satisfied which will endanger the job security of managers. The existing shareholders may decide to replace the managers. If the distribution of low profits to shareholders brings a fall in the market prices of shares, it may lead to takeover of the firm.

Criticisms of the Model

Marris's growth-maximisation model has been severely criticised for its over-simplified assumptions by Koutsoyiannis and Hawkins.

1. Marris assumes a given price structure for the firms. He, therefore, does not explain how prices of products are determined in the market. This is a serious weakness of his model.
2. Another defect of this model is that it ignores the problem of oligopolistic interdependence of firms in non-collusive market.
3. This model also does not analyse interdependence created by non-price competition.
4. The model assumes that firms can grow continuously by creating new products. This is unrealistic because no firm can sell anything to the consumers. After all, consumers have their preferences for certain brands which also change when new products enter the market.
5. According to Koutsoyiannis, "Marris's model is applicable basically to those firms which produce consumers' goods. The model is not appropriate for analysing the behaviour of manufacturing businesses or traders."
6. Marris lumps together advertising and R&D expenses in his model. This is a serious shortcoming of the model because the effectiveness of these two variables is not the same in any given period.

7. Marris assumes that firms have their own R&D department on which they spend much for creating new products. But, in reality, most firms do not have such departments. For product diversification, they imitate the inventions of other firms and in case of patented inventions they pay royalties for using them.
8. The assumption that all major variables such as profits, sales and costs increase at the same rate is highly unrealistic.
9. It is also doubtful that a firm would continue to grow at a constant rate, as assumed by Marris. The firm might grow faster now and slowly later on.
10. It is difficult to arrive at the growth rate which maximises the market value of the firm's shares and the rate at which the take-over is likely to take place.

5.6 SUMMARY

According to the theory of the firm, every business organisation is driven by the motive of maximizing profits. This theory influences decisions for allocating resources, methods of production, adjustments in prices, and manufacturing in huge quantum. Both the theory of the firm and the theory of the consumer go hand in hand. As per the theory of the consumer, the customer tends to enhance their total utility to the fullest. In economic terms, utility refers to the estimated value a customer uses for measuring the level of happiness or satisfaction derived from the consumption of a specific product or service. There are a few beliefs such as having less stake in company that are associated with the theory of the firm. Some believe the chief executive officers of public companies not only focus on profit maximization, but also emphasize on increasing sales, maintaining public relations, and having a good market share. If their goal is profit maximization alone, public will be susceptible about their

intentions, and the company's reputation or goodwill in the market will be highly affected. In case, a company follows a single strategy for running its operations, there can be many risks associated with it. In case, a business depends on just one product for building its revenues, and that very product eventually fails to make adequate sales in the market, the whole financial structure of the business will be affected, or at least one department of the company.

5.7 GLOSSARY

- Growth: The process of increasing in amount, value, or importance.
- Security: Procedures followed or measures taken to ensure the security of a state or organisation.
- Firm: It is a for-profit business organisationsuch as a corporation, limited liability company (LLC), or partnership that provides professional services.

5.8 SELF-ASSESSMENT QUESTIONS

Q1. How does the theory of firm work? Explain.

Q2. Discuss the Marris Model of growth Maximization.

Q3. Write down various objectives of business firms?

5.9 SUGGESTED READINGS

- Theories of the firm by Demetri Kantarelis
 - Theory of the firm by Chris b. Murphy
 - Objectives of the firm by Bala Murali
- Growth Maximization Theory of Marris: Assumptions, Explanation and Criticisms by Smriti Chand

THEORY OF CONSUMER CHOICE

STRUCTURE

- 6.1 Introduction
- 6.2 Objectives
- 6.3 Consumer Behaviour:- Meaning
- 6.4 Characteristics of Consumer Behaviour
- 6.5 Various Factors Influencing Consumer Behaviour
- 6.6 Consumer Buying Process
- 6.7 Importance of Consumer Behaviour
- 6.8 Summary
- 6.9 Glossary
- 6.10 Self-Assessment Questions
- 6.11 Suggested Readings

6.1 INTRODUCTION

The theory of consumer choice is the branch of microeconomics that relates preferences to consumption expenditures and to consumer demand curves. It analyzes how consumers maximize the desirability of their consumption as measured by their preferences subject to limitations on their expenditures, by maximizing utility subject to a consumer budget constraint. Consumer choice theory is a hypothesis about why people buy things. Put simply, it says that you choose to buy the things that give you the greatest satisfaction, while keeping within your budget. At the heart of this theory are three assumptions about human nature.

The first assumption is that when you shop, you choose to buy things based on calculated decisions about what will make you happiest. In economics language, this is known as utility maximization.

Secondly, the theory assumes that no matter how much you shop, you will never be completely satisfied. In other words, you will always be happier consuming a little bit more. This is known as the principle of non-satiation.

Thirdly, even though you always get more happiness from more consumption, the amount of pleasure you get from each good decrease with the more you consume. So, if you eat two ice creams rather than one, you get more overall pleasure, but the second ice-cream won't be as satisfying as the first. This is known as decreasing marginal utility.

6.2 OBJECTIVES

After reading this unit, one is able to assess:

- The concept of consumer behaviour
- Importance of consumer behaviour

- Factors influencing consumer behaviour

6.3 CONSUMER BEHAVIOUR :-MEANING

Consumer behavior is the analysis of how consumers make decisions about what to buy, when to buy it, and how to do so. As well as purchasing behavior, it also involves how consumers think about various brands, how they choose between them, how they behave while deciding what to buy and how they are influenced by marketing campaigns, personal preferences, social and economic pressures and the wider culture. So, it can be defined as those acts of individuals (consumers) directly involved in obtaining, using, and disposing of economic goods and services, including the decision processes that precede and determine these acts. Consumer behaviour, also called Buyer Behaviour is the process and act of decision-making of people involved in buying and use products.

Study of consumer buying behavior is most important for marketers as they can understand the expectation of the consumers. It helps to understand what makes a consumer to buy a product. It is important to assess the kind of products liked by consumers so that they can release it to the market. Marketers can understand the likes and dislikes of consumers and design base their marketing efforts based on the findings. Consumer behaviour is the study of individuals, groups, or organisations and all the activities associated with the purchase, use and disposal of goods and services. It consists of how the consumer's emotions, attitudes and preferences affect buying behaviour. Consumer behaviour emerged in the 1940–1950s as a distinct sub-discipline of marketing, but has become an interdisciplinary social science that blends elements from psychology, sociology, social anthropology, anthropology, ethnography, marketing and economics. The study of consumer behaviour formally investigates individual qualities such as demographics, personality lifestyles, and behavioural variables (such as usage rates, usage occasion, loyalty, brand advocacy, and willingness to provide

referrals), in an attempt to understand people's wants and consumption patterns. Consumer behaviour also investigates on the influences on the consumer, from social groups such as family, friends, sports, and reference groups, to society in general (brand-influencers, opinion leaders). Consumer behaviour assumes that the consumers are actors in the marketplace. The perspective of role theory assumes that consumers play various roles in the marketplace. Starting from the information provider, from the user to the payer and to the disposer, consumers play these roles in the decision process. It is a physiological process which is related to the emotions of the consumer. In this process the consumer starts with recognizing the need of the product, and then finds a way or a medium of solving these needs, makes purchase decisions like planning whether he should buy or not buy a certain product, and then he confirms the information, jots down a plan and then implements the plan of making the purchase. It is physiological in nature and it can change with the slightest change in the market, the atmosphere and the trend.

Consumer behavior can be defined as the study of psychological, physical and social actions when individuals buy, use and dispose of products, services, ideas, and practices. In other words, consumer behavior is the study of how consumers will make their buying decision and what those factors which support or influence these decisions.

Definitions

1. **American Marketing Association**, "The dynamic interaction of affect and cognition, behaviour, and environmental events by which human beings conduct the exchange aspects of their lives".
2. According to **Engel, Blackwell, and Miniard**, "Consumer behavior is the actions and the decision processes of people who purchase goods and services for personal consumption".

3. In the words of **Walters and Paul**, “Consumer behavior is the process whereby individuals decide what, when, where, how and from whom to purchase goods and services”.
4. **Peter D. Bennett** defines Consumer behaviour as, “the actions and decision processes of people who purchase goods and services for personal consumption”.

Study of Consumer Behaviour

1. You need to first understand the physiology of the consumer of a specific class, standard and of a specific market. You need to understand how does the customer think, reason, feel, and select between the option of products and services offered.
2. After that understanding the environment of the customer is important which includes the family of the consumer, their social atmosphere, their culture, etc.
3. The consumer psychology is different when they shop and make decisions of spending their money.
4. The knowledge of the consumer about the products, the industry and your competitors can influence the customer with minimum knowledge by educating him about your products and services.
5. How can you motivate the consumer buying behaviour, helping him make a decision in selecting between products, the importance of their product and how will their decision affect them?
6. How should the company improve their marketing strategy and marketing campaigns based on their focused consumer behaviour?

7. How does a single consumer decision effects a group of consumers that is a group of people, this can include their friends, their family, etc.
8. The consumer's behaviour also depends on buying a new product and reusing the old ones. So, the organizations also need to understand how reusing products influences a consumer.
9. The consumers also take their decisions on the basis of after sales services and the service provided by the organization and their distributors. Service offered to a consumer also matters in influencing their behavior
10. How a single or a group of consumer behavior does affect the society and the atmosphere and the economy of the nation.

6.4 CHARACTERSTICS OF CONSUMER BEHAVIOUR

Before opening a business, a smart business owner will study his ideal customer to determine her consumer behavior. Advertising, and business itself, is useless unless they know what behavior you're trying to change or influenceso consumer behaviour is not restricted only to buying the offering. Consumer groups employ elaborate surveys, panels, focus groups and other means of studying consumer behavior, with the goal of finding out exactly what it takes to complete a sale. So there are certain important characteristics of consumer behaviourthat helps to understand the consumer bahaviour and those characteristics are given below:

1. **Consumer Behaviour involves Products, Services, Activities, and Ideas:**In the scope of consumer behaviour, not only products (like toilet soaps), are included but also the services (flying by an airliner), and activities (getting children vaccinated for polio), and ideas (saying no to drugs). Thus, consumer behaviour rotates around offerings.

2. **Consumer Behaviour involves more than Buying:** Consumer behaviour is not restricted only to buying the offering. It includes buying (acquiring the offering), using, and disposing. Usage has many connotations like it has important symbolic implications for the consumer. It can also influence other behaviours like not satisfied the product or services may lead to consumer complaints and protests. Lastly consumer behaviour also evaluates as how do consumers get rid of an offering, they previously acquired.
3. **Consumer Behaviour is a Dynamic Process:** Consumer Behaviour is dynamic because the thinking, feelings, and actions of individual consumers, targeted groups, and the society at large are constantly changing. Maruti Suzuki produces number of cars, as needs and wants may change at different times for different consumer groups. The sequence of acquisition, consumption, and disposition can occur over time in a dynamic sequence. The sequence can be over in a matter of hours to years. Suppose a family has acquired a new Tata Indica car. Its usage will provide the family whether it drives well, is economical, impresses others, and does minimal harm to the ecological environment – all these will affect when, whether, how, and why the family will dispose of the car by selling or junking it. Disposition of the car will affect when, whether, how, and why its members acquire another car in the future. Consumer behaviour is a process which includes issues that influence the consumer before, during, and after a purchase.
4. **Consumer Behaviour involves Interactions among Many People:** Consumer behaviour does not mean action of a single individual. Interactions may take place among a group of friends, a few co-workers, or an entire family. The individuals may take different roles.

For example, to buy a car the adult son may gather the information, the younger daughter may influence the buying decision, parents may finally be the buyers. The car may be used by one or all the members in the family. Similarly, several family members may be involved in disposing the car.

5. **Consumer Behaviour involves Many Decisions:** Consumer behaviour needs understanding whether (to acquire/use/ dispose of an offering), what (to acquire/use/dispose), why (to acquire/use/dispose of an offering or not)), when (time), where (place), how (ways of acquiring, using, and disposing), how much (volume), how often (frequency), and how long (till what time) consumers will buy, use or dispose of an offering.
6. **Consumer Behaviour involves Exchanges:** Consumer behaviour involves exchanges between human beings. People give something of value to receive something of value. Indeed, the role of marketing is to help society to create value through exchanges by formulating and implementing marketing strategies.

6.5 VARIOUS FACTORS INFLUENCING CONSUMER BEHAVIOUR

Today all the business organisations might be wondering as to what is it that influences these consumers, how do we analyze when is their purchase pattern going to change and only the influencing factors will confirm what will change the consumers buying pattern.

I. CULTURAL FACTORS:

1. **Culture:** Cultural factors have a deep influence on buyer behaviour. Culture is the basic determinant of a person's wants. It refers to a set of learned beliefs, values, attitudes, morals, customs, habits and forms of behaviour that are shared by a society. These are transmitted from generation to generation. Culture is always alive, moving, and ever-changing. Culture shapes the pattern of

consumption and pattern of decision-making. Food habits, religious practices, the way we dress are all influenced by culture.

Examples: Toothpowder usage is in line with traditional mouth-washing habits. The person applies toothpowder to his index finger and rubs it on the teeth. Hence, the reason for the popularity of the toothpowder.

2. **Sub-Culture:** Each culture consists of smaller sub-cultures that provide more specific identification and socialization for its members.

There are four types of subcultures:

- (a) Nationality groups such as Chinese, Irish, Polish, etc.,
- (b) Racial groups such as Blacks, Whites, etc.,
- (c) Geographical groups such as North Indian, South Indian, etc.,
- (d) Religious groups such as Christians, Muslims, Hindus, etc.

3. **Social Classes:** These are divisions in the society which are hierarchically ordered and whose members share similar values, interests, and behaviour. There are three distinct social classes upper, middle and lower classes. Lower classes show limited sense of choice making. Each class differs in their patronisation, the reading habits, clothing habits, etc. Upper class consumers want products and brands that depict their social status. Middle-class consumers shop carefully, read advertisements and compare prices before they buy.

Example: A family from a higher class may wish to eat in a five star hotel. A middle class family may opt for a cost effective restaurant.

II. SOCIAL FACTORS:

- 1. Reference Groups:** Reference groups are the social, economic, or professional groups that have a direct or indirect influence on the person's attitudes or behaviours. Consumers accept information provided by their peer groups on the quality, performances, style, etc. These groups influence the person's attitudes; expose them to new behaviours and lifestyles; create pressures on the individual. A family, a circle of friends, a local club, an athletic team and college living groups are examples of small reference groups. When a member is satisfied with a product, he becomes the salesman of the product. He influences other members of the group.
- 2. Family:** Family constitutes the most influential group on one's attitudes. Personal values, attitudes, and buying habits have been shaped by family influences. The members of the family play different role such as influencer, decider, purchaser, and user in the buying process. A person acquires an orientation towards religion, politics, and economics and a sense of personal ambition, does not interact with the parents, still their influence in the unconscious behaviour can be significant. A person's behaviour is also influenced by his/her spouse and children.

Example: Johnson & Johnson products are advertised to mothers and not to small children who actually are the consumers.
- 3. Roles and Status:** Roles and Status are factors which also influence decision making. Roles are the activities of the person in a group. A woman plays the role of wife, mother and sister in a family. She plays the role of an employee in an organisation. She may also play the role of a secretary of an association. Each role carries a status. People will choose products that will communicate their status to the society.

Example: An executive working in a multinational bank may prefer branded shirts/trousers, expensive watches, perfumes and drive a car to reach office.

III. PERSONAL FACTORS:

A buyer's decisions are also influenced by personal characteristics, notably the buyer's age and life-cycle stage, occupation, economic circumstances, lifestyle, and personality and self- concept.

1. Lifecycle: People buy different goods and services over their lifetime. The life-cycle of a person begins with child birth, shifts to dependent infancy, adolescence, teenage, adulthood, middle-age, old age and then ends with death. Under each stage people's buying behaviour is different. Under the first three stages, decisions are not made by the consumer. They are totally dependent on others. In the next stage, buyers not only make their decisions but also influence others' buying decisions. In the later stages of life-cycle, they are back to the early stages.

Example: With exposure to TV, school going children have started influencing buying decisions with regard to biscuits, chocolates, soft drinks, toys and marketers are targeting this segment.

2. Occupation: A person's behaviour depends upon his occupation. A company's Managing Director will prefer expensive suits, air travel, separate cottage, etc. A worker would prefer economic dresses, bus travel, etc. The occupation of a person decides his ability to buy. Hence, his need satisfaction depends on his occupation, which provides him the means.

3. Economic Circumstances: Occupation gives rise to the economic circumstances. A person may have high desire to buy so many things. All his needs do not become wants. This is the result of his purchasing power. People's

economic circumstances refer to their spendable income, savings, assets, borrowing power and attitude towards spending versus saving.

Example: The Indian middle class has grown in prosperity and consumption of items such as kitchen appliances, TV, refrigerators, washing machines, readymade garments, jewellery is growing.

4. Lifestyle: Lifestyle may be defined as the pattern or way of living of a person which will be indicated through the person's activities, interests, and opinions. A person may reside in an HIC flat. He may have costly furniture. He shall buy his clothing's only from Raymond's. He may have his dinner only in five-star hotels. His hobby may be playing billiards. With the above activities, we can understand the lifestyle of a person. Hence, he will choose according to his lifestyle.

5. Personality: Personality is defined as the person's distinguishing psychological characteristics that lead to relatively consistent and enduring responses to his or her environment. Personality is described in terms of such traits as self-confidence, dominance, autonomy, deference, sociability, defensiveness and adaptability. A person to maintain his personality will decide his purchase accordingly. He buys products and services that reflect his image.

Example: Rural youth may buy tea and namkeen and urban youth buy popcorn and soft drinks.

IV. PSYCHOLOGICAL FACTORS:

1. Motivation: Motivation is the driving force which makes the person act. Motivation is the drive to act, to move, to obtain a goal or an objective. A human being is motivated by needs. When these needs are backed by purchasing power it becomes a want. Buyer behaviour, hence, is stimulated by motivation.

2. Perception: A motivated person is ready to act. How the motivated person actually acts is influenced by his or her perception of the situation. To perceive is to see, to hear, to touch, to smell, and to sense something an event or relation and to organise, interpret and find meaning in the experience. Our senses perceive the colour, shape, sound, smell, taste, etc., of this stimulus. Our behaviour is governed by these physical perceptions. Perception has been obtained by social psychologists as the ‘complex process’ by which people select, organise and interpret sensory stimulation into a meaningful and coherent picture of the world. People can emerge with different perceptions of the same object because of three perceptual processes- Selective attention, selective distortion, and selective retention. All persons are not alike. They see the world in their own special ways. For instance, all the members of the family have viewed a particular product advertisement in the television. The members may interpret the same in different ways.

Example: Even today many consumers prefer to deal with Nationalized Banks/ LIC as they feel that private companies may not reliable in the long run.

3. **Learning:** Learning describes changes in an individual’s behaviour arising from experience. Learning refers to changes in behaviour brought about by practice or experience. Almost everything one does or thinks is learned. Learning is the process of acquiring knowledge about products, their benefits and methods of usage and also disposal of product after use.

Example: Product demonstration is a very effective method to convince the consumer. Products like paints, pressure cookers, fertilizers are promoted through demonstration.

4. **Belief:** A belief is a descriptive thought that a person holds about something. These beliefs may be based on knowledge, opinion, or faith. They may or may

not carry emotional change. An attitude describes a person's enduring favourable or unfavourable cognitive evaluations, emotional feelings, and action tendencies towards some object or idea. In simple words, attitude is an emotionalised predisposition or inclination to respond positively or negatively in a consistent way towards similar objects

For example: once a consumer has developed a brand loyalty, it is hard to change his attitudes and beliefs towards the brand. Attitudes are the result of experiences. Attitudes interact with perception, thinking, feeling, and reasoning.

6.6 CONSUMER BUYING PROCESS

In consumer buying process, generally, the purchaser passes through five distinct stages in consumer buying process namely need or problem recognition, information search, alternative evaluation, purchase decision and post-purchase behaviour.

- 1. Stage of Problem Recognition:** The recognition of a need is likely to occur when a consumer is faced with a 'problem'. A buying process starts when a consumer recognizes that there is a substantial discrepancy between his current state of satisfaction and expectations in a consumption situation.
- 2. Stage of Information Search:** After need arousal, the behaviour of the consumer leads towards a collection of available information about various stimuli i.e., products and services in this case from various sources (personal, public, commercial, experiential) for further processing and decision making.
- 3. Stage of Alternative Evaluation:** Once interest in a product(s) is aroused, a consumer enters the subsequent stage of evaluation of alternatives. When evaluating potential alternatives, consumers tend to use two types of information:

- i a list of brands (or models) from which they plan to make their selection (the evoked set)
- ii the criteria they will use to evaluate each brand (or model).

Cognitive evaluation: When the consumer uses objective choice criteria.

Affective evaluation: Using emotional reasons for evaluating the alternatives.

4. **Stage of Purchase Decision:** Finally, the consumer arrives at a purchase decision. Purchase decisions can be one of the three viz. no buying, buying later and buy now. No buying takes the consumer to the problem recognition stage. A postponement of buying can be due to a lesser motivation or evolving personal and economic situation. If positive attitudes are formed towards the decided alternative, the consumer will make a purchase.

There are three more important considerations in taking the buying decision:

- Attitude of others such as wife, relatives and friends.
 - Anticipated situational factors such as expected family income, expected total cost of the product and the expected benefits from the product.
 - Unanticipated situational factors, like accidents, illness etc.
5. **Stage of Post Purchase Behaviour:** Post-purchase behaviour refers to the behaviour of a consumer after his commitment to a product has been made. So post-purchase behaviour leads to three situations, namely customer is satisfied; customer is delighted and the customer is dissatisfied.

6.7 IMPORTANCE OF CONSUMER BEHAVIOUR

Understanding consumer behaviour is essential for a company to find success for its current products as well as new product launches. Every consumer has a

different thought process and attitude towards buying a particular product. If a company fails to understand the reaction of a consumer towards a product, there are high chances of product failure. Due to the changing fashion, technology, trends, living style, disposable income, and similar other factors, consumer behavior also changes. A marketer has to understand the factors that are changing so that the marketing efforts can be aligned accordingly.

- 1. Consumer Differentiation:** In marketing, consumer differentiation is a way to distinguish a consumer from several other consumers. This helps to make a target group of consumers with the same or similar behavior. Though you have a targeted customer demographic in your business, you can still have variations between individual customers. Each group of consumers are different and their needs and wants differ from other groups. When a marketer is knowledge able about differentiation of each group of consumers, he can design separate marketing programs. Consumer differentiation will help to tailor your strategies to the needs of varying customer groups. When consumer differentiation is done, you can expand the width and breadth of your services. You will be able to effectively serve a wider group of people.
- 2. Retention of Consumers:** Consumer behavior is not just important to attract new customers, but it is very important to retain existing customers as well. When a customer is happy about a particular product, he/she will repeat the purchase. Therefore, marketing the product should be done in such a way that it will convince customers to buy the product again and again. Thus, it is very evident that creating customer and retaining them is very important. This can be done only by understanding and paying attention towards the consumer's buying behavior.

- 3. Design Relevant Marketing Program:** Understanding consumer behavior allows you to create effective marketing campaigns. Each campaign can speak specifically to the separate group of consumers based on their behavior. For example, while targeting kids' market, you may have to look out for venues such as TV ads, school programs and blogs targeting young mothers. You will need to take different messaging approaches for different consumer groups. A study of consumer behavior enables the marketers to understand what motives consumers to make purchases. Furthermore, the same motive can be utilized in advertising media to stir the desire to make a purchase. Moreover, marketers should take decisions regarding the brand logo, coupons, packing and gifts on the basis of consumer behavior.
- 4. Predicting Market Trend:** Consumer behavior analysis will be the first to indicate a shift in market trend. For example, the recent trend of consumers is towards environment friendliness and healthy food. This changing market trend was observed by many brands including McDonalds. Based on the consumer behavior, McDonald's brought healthy food options. By conducting consumer behavior study, a company saves a lot of resources that might otherwise be allocated to produce a product that will not be sold in the market. For example, in summer a brand will not waste its resources for producing a product that will not sell in summer. Based on consumer behavior the company decides on production strategy which will save on warehouse costs and marketing costs.
- 5. Competition:** One of the most important reasons to study consumer behavior is to find out answers to some of the questions:

 - Is the customer buying from your competitor?
 - Why is a consumer buying from your competitor?

- What features attracts a consumer to your competitor products?
- What gaps are your consumers identifying in your products when compared to your competitors?

Studying consumer behavior facilitates in understanding and facing competition. Based on consumers' expectations, your brand can offer competitive advantages.

6. **Innovate New Products:** Companies consistently strive hard to improve the success rate of their new products or new ideas. One of the most important ways is to conduct sound and thoughtful consumer behavior study. With the help of consumer behavior analysis, Nike realized that most of its target audience is not professional athletes, but many of them were striving to be more like them.

So, at the 2012 Olympics in London, Nike introduced a campaign to encourage athletics called 'Find Your Greatness'. It aimed to promote the aspirations of being an athlete, not just with high-performing athletes, but wanted to include all people regardless of their physical capability.

7. **Stay Relevant in the Market:** When the world is changing as rapidly as it is happening today, the biggest challenge we all face is staying relevant to our target market. And do you know what is the main reason behind the rapid changes? It is the ever changing behavior of our customers. Today's consumers have greater choices and opportunities, which means they can easily switch to a company that offers better products and services.
8. **Improve Customer Service:** Consumers require different levels of customer service, and understanding the differences within your customer base will help you provide the most appropriate service for individual needs. For example, if you own an electronics store, high school or college students who buy a new

laptop are more likely to understand the features they're looking for than a person buying his first computer. With the first demographic, your service goal will be to provide information about the latest trends in technology, while with the second demographic, you'll need to spend more time educating the customer, finding out what his specific needs are, and even teaching him how to use the features of his new electronic device.

6.8 SUMMARY

In this lesson you are able to know about the Consumer behaviour that it is a comparatively new field of study. The concept 'consumer behaviour' has been gaining importance since 1960. The evolution of marketing concept from a mere selling concept to consumer oriented marketing has resulted in consumer behaviour becoming an independent discipline. The growth of consumerism and consumer legislation emphasizes the importance that is given to the consumers. Consumer behavior analysis has emerged as an important tool to understand your customers. By looking into consumer psychology and the forces behind customer buying behavior, companies can craft new products, marketing campaigns and increase profitability. Companies should talk to consumers, watch out for frustrations, and most importantly, identify their needs and expectations. The study of consumer behaviour helps to understand how the buying decision is made and how they look for a product. Moreover, the understanding consumer behaviour also helps marketers to know the what, where, when, how and why of the consumption of product consumption. The more careful analysis helps in more exact prediction about the behaviour of consumers of any product or services. The study of consumer behaviours helps business manager, sales person and marketers in the following ways :

- To design the best possible product or service that fully satisfies consumer's needs and demands.
- To decide where the service or product would be made available for easy access of consumers.
- To decide the price at which the consumers would be ready to buy that product or service.
- To find out the best method of promotion that will prove to be effective to attract customers to buy a product.
- To understand why, when, how, what and other factors that influence buying decision of the consumers.

6.9 GLOSSARY

- **Consumer:** A consumer is a person or a group who intends to order, orders, or uses purchased goods, products, or services primarily for personal, social, family, household and similar needs, not directly related to entrepreneurial or business activities.
- **Behaviour:** Behaviour is the range of actions and mannerisms made by individuals, organisms, systems or artificial entities in conjunction with themselves or their environment, which includes the other systems or organisms around as well as the physical environment.
- **Culture:** Culture is a term that refers to a large and diverse set of mostly intangible aspects of social life.

6.10 SELF-ASSESSMENT QUESTIONS

Q1. Why one should give importance to consumer behaviour in expanding the business?

Q2. Define the term Consumer behaviour.

Q3. How psychological factor influence the consumer buying behaviour?

6.10 SUGGESTED READINGS

- www.businessmanagementideas.com/consumer-behavior
- Consumer Behaviour by C.L. Tyagi & Arun Kumar
- Consumer Behaviour by M. Khan
- Important Characteristics of Consumer Behaviour by Sam Malhotra

**VARIOUS APPROACHES OF
CONSUMER BEHAVIOUR**

STRUCTURE

- 7.1 Introduction
- 7.2 Objectives
- 7.3 Meaning of Cardinal Utility Approach
- 7.4 Assumptions of Cardinal Utility Approach
- 7.5 Meaning of Ordinal Utility Approach
- 7.6 Assumptions of Ordinal Utility Approach
- 7.7 Difference between Cardinal and Ordinal Utility
- 7.8 Meaning of Indifference approach
- 7.9 Assumptions of indifference approach
- 7.10 Revealed Preference Theory
- 7.11 Assumptions of Revealed Preference Theory
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- 7.13 Assumptions of Consumer Choice Theory

- 7.14 Summary
- 7.15 Glossary
- 7.16 Self-Assessment Questions
- 7.17 Suggested Readings

7.1 INTRODUCTION

As a topic of economics, utility is used to model worth or value. Its usage has evolved significantly over time. The term was introduced initially as a measure of pleasure or happiness as part of the theory of utilitarianism by moral philosophers such as Jeremy Bentham and John Stuart Mill. The term has been adapted and reapplied within neo classical economics, which dominates modern economic theory, as a utility function that represents a single consumer's preference ordering over a choice set but is not comparable across consumers. This concept of utility is personal and based on choice rather than on pleasure received, and so is specified more rigorously than the original concept but makes it less useful for ethical decisions. Consider a set of alternatives among which a person can make a preference ordering. The utility obtained from these alternatives is an unknown function of the utilities obtained from each alternative, not the sum of each alternative. A utility function is able to represent that ordering if it is possible to assign a real number to each alternative in such a manner that alternative 'a' is assigned a number greater than alternative 'b' if and only if the individual prefers alternative 'a' to alternative 'b'. In this situation someone who selects the most preferred alternative is necessarily also selecting the alternative that maximizes the associated utility function.

7.2 OBJECTIVES

After reading this chapter, one is able to assess:

- Concept of cardinal utility
- Concept of ordinal utility
- Assumptions of utility analysis

7.3 MEANING OF CARDINAL UTILITY APPROACH

In economics, a cardinal utility function or scale is a utility index that preserves preference orderings uniquely up to positive affine transformations. The Cardinal Utility approach is propounded by neo-classical economists, who believe that utility is measurable, and the customer can express his satisfaction in cardinal or quantitative numbers, such as 1,2,3 and so on. The neo classical economist developed the theory of consumption based on the assumption that utility is measurable and can be expressed cardinally. And to do so, they have introduced a hypothetical unit called as “Utils” meaning the units of utility. Here, one Util is equivalent to one rupee and the utility of money remains constant. Over the passage of time, it was realized that the absolute measure of utility is not possible, i.e., it was difficult to measure the feeling of satisfaction cardinally. Also, it was difficult to quantify the factors that cause a change in the moods of the consumer, their tastes and preferences and their likes and dislikes. Therefore, the utility is not measurable in quantitative terms. But however, it is being used as the starting point in the consumer behavior analysis.

The idea of cardinal utility is important to rational choice theory. The idea consumers make optimal choices to maximise their utility.

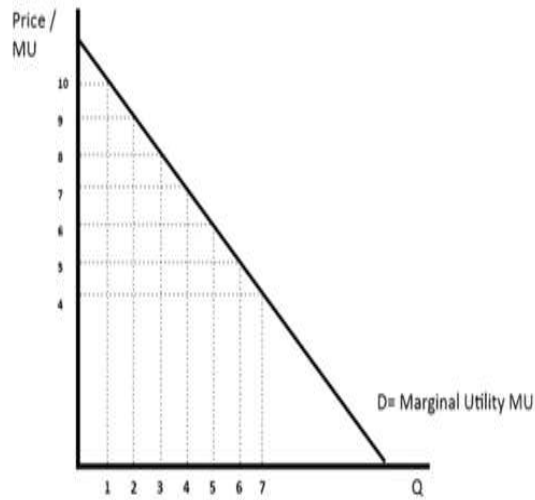


Figure 7.1

The consumption theory is based on the notion that consumer aims at maximizing his utility, and thus, all his actions and doings are directed towards the utility maximization.

The consumption theory seeks to find out the answers to the following questions:

- a. How does a consumer decide on the optimum quantity of a commodity that he/she wishes to consume?
- b. How consumers allocate their disposable incomes between several commodities of consumption, such that utility is maximized?

The cardinal utility approach used in analyzing the consumer behavior depends on the certain assumptions to find answers to the above stated questions.

7.4 ASSUMPTIONS OF CARDINAL UTILITY APPROACH

- 1. Rationality:** It is assumed that the consumers are rational, and they satisfy their wants in the order of their preference. This means they will purchase those commodities first which yields the highest utility and then the second highest and so on.
- 2. Limited Resources:** The consumer has limited money to spend on the purchase of goods and services and thus this makes the consumer buy those commodities first which is a necessity.
- 3. Maximize Satisfaction:** Every consumer aims at maximizing his/her satisfaction for the amount of money he/she spends on the goods and services.
- 4. Utility is cardinally Measurable:** It is assumed that the utility is measurable, and the utility derived from one unit of the commodity is equal to the amount of money, which a consumer is ready to pay for i.e., 1 Util = 1 unit of money.
- 5. Diminishing Marginal Utility:** Diminishing Marginal Utility is simply the theory that consumers tend to value a product or service less the more they consume. This concept can help us understand why some consumers behave in different ways. "Diminishing Marginal Utility is where the consumer values each additional unit less and less the more they consume." This means, with the increased consumption of a commodity, the utility derived from each successive unit goes on diminishing. This law holds true for the theory of consumer behavior.
- 6. Marginal Utility of Money is Constant:** It is assumed that the marginal utility of money remains constant irrespective of the level of a consumer's income.
- 7. Utility is Additive:** The cardinalists believe that not only the utility is measurable but also the utility derived from the consumption of different commodities are added up to realize the total utility.

7.5 MEANING OF ORDINAL UTILITY APPROACH

The Ordinal Utility approach is based on the fact that the utility of a commodity cannot be measured in absolute quantity, but however, it will be possible for a consumer to tell subjectively whether the commodity derives more or less or equal satisfaction when compared to another. The modern economists have discarded the concept of cardinal utility and instead applied ordinal utility approach to study the behavior of the consumers. While the neo-classical economists believed that the utility can be measured and expressed in cardinal numbers, but the modern economists maintain that the utility being the psychological phenomena cannot be measured theoretically, quantitatively and even cardinally.

The modern economist, Hicks, in particular, have applied the ordinal utility concept to study the consumer behavior. He introduced a tool of analysis called “Indifference Curve” to analyze the consumer behavior. An indifference curve refers to the locus of points each showing different combinations of two substitutes which yield the same level of satisfaction and utility to the consumer.

The consumer’s preferences can be shown in a diagram with an indifference curve. The indifference showing nothing about the absolute amounts of satisfaction obtained. It merely indicates a set of consumption bundles that the consumer views as being equally satisfactory.

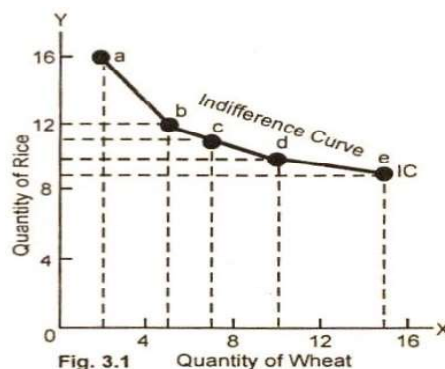


Figure 7.2

In this figure we measure the quantity of wheat along X-axis (in kilograms) and along Y-axis, the quantity of rice (in kilograms). IC is an indifference curve. It is shown in the diagram that a consumer may buy 12 kilograms of rice and 5 kilograms of wheat or 9 kilograms of rice and 15 kilograms of wheat. Both these combinations are equally preferred by him and he is indifferent to these two combinations. When the scale of preference of the consumer is graphed, by joining the points a, b, c, d, e, we obtain an Indifference Curve IC. Every point on indifference curve represents a different combination of the two goods and the consumer is indifferent between any two points on the indifference curve. All the combinations are equally desirable to the consumer. The consumer is indifferent as to which combination he receives. The indifference curve IC thus is a locus of different combinations of two goods which yield the same level of satisfaction.

7.6 ASSUMPTIONS OF ORDINAL UTILITY APPROACH

1. **Rationality:** It is assumed that the consumer is rational who aims at maximizing his level of satisfaction for given income and prices of goods and services, which he wishes to consume. He is expected to take decisions consistent with this objective.
2. **Ordinal Utility:** The utility is measured ordinally by comparing the satisfaction whether higher or lower by consuming different bundles of goods, it is sufficient that the consumer expresses his/her preference for the various bundles of goods commodities. It is not obligatory to undertake that utility is quantitatively quantifiable or we can say that the indifference curve assumes that the utility can only be expressed ordinally. This means the consumer can only tell his order of preference for the given goods and services.

- 3. Transitivity and Consistency of Choice:** The consumer's choice is expected to be either transitive or consistent. The transitivity of choice means, if the consumer prefers commodity X to Y and Y to Z, then he must prefer commodity X to Z. In other words, if $X = Y$, $Y = Z$, then he must treat $X = Z$. The consistency of choice means that if a consumer prefers commodity X to Y at one point of time, he will not prefer commodity Y to X in another period or even will not consider them as equal.
- 4. Non-satiety:** The consumer always prefers more over less if there is a choice available to him. It means the consumer has not reached the saturation point of any commodity and hence, he prefers larger quantities of all commodities.
- 5. Diminishing Marginal Rate of Substitution (MRS):** The marginal rate of substitution refers to the rate at which the consumer is ready to substitute one commodity (A) for another commodity (B) in such a way that his total satisfaction remains unchanged. The MRS is denoted as DB/DA . The ordinal approach assumes that DB/DA goes on diminishing if the consumer continues to substitute A for B.

7.7 DIFFERENCE BETWEEN CARDINAL AND ORDINAL UTILITY

Points	Cardinal Utility	Ordinal Utility
Definition	It explains that the satisfaction level after consuming any goods or services can be scaled in terms of countable numbers.	It explains that the satisfaction level after consuming any goods or services cannot be scaled in numbers. However, these things can be arranged in the order of preference.
Example	Pizza gives Sam 60 utils of satisfaction, whereas burger gives him only 40 utils.	Sam gets more satisfaction from a pizza as compared to that of a burger.
Measurement	The cardinal utility is measured on the basis of utils.	In ordinal utility the measurement is based on satisfaction.
Realistic	It is less practical in nature as compare to ordinal utility.	It is more practical and sensible in nature as compare to cardinal utility.
Used By	This theory was applied by Prof. Marshall	This theory was applied by Prof. J R Hicks
Analysis	The concept of cardinal utility is based on marginal utility analysis.	The concept of ordinal utility is based on indifference curve analysis.

7.8 Meaning of Indifference approach

The indifference approach was devised towards the end of the 19th century by a famous Italian economist, Vilfredo Pareto (1848—1923), and developed further by 20th-century economists such as the Nobel Prize winner Sir John Hicks. The indifference approach has definite advantages over the traditional utility approach in analyzing consumer behaviour. First, many students and economists are not impressed by the notion that consumer satisfaction or utility can be measured and that changes in utility can be compared. Second, indifference curves allow us to distinguish between the income effects and substitution effects of a change in the price of a product. Third, the indifference curve technique is an extremely useful tool which can be used to analyse a variety of other choices, apart from consumers' choices between different goods and services. An indifference curve, with respect to two commodities, is a graph showing those combinations of the two commodities that leave the consumer equally well off or equally satisfied hence indifferent in having any combination on the curve. Indifference curves are heuristic devices used in contemporary microeconomics to demonstrate consumer preference and the limitations of a budget. Economists have adopted the principles of indifference curves in the study of welfare economics. Standard indifference curve analysis operates on a simple two-dimensional graph. Each axis represents one type of economic good. Along the indifference curve, the consumer is indifferent between any of the combinations of goods represented by points on the curve because the combination of goods on an indifference curve provides the same level of utility to the consumer. For example, a young boy might be indifferent between possessing two comic books and one toy truck, or four toy trucks and one

comic book so both of these combinations would be points on an indifference curve of the young boy. The indifference curve analysis measures utility ordinally. It explains consumer behaviour in terms of his preferences or rankings for different combinations of two goods, say X and Y. An indifference curve is drawn from the indifference schedule of the consumer. If the various combinations are plotted on a diagram and are joined by a line this becomes an indifference curve, as I_1 in the Figure 12.1. The indifference curve I_1 is the locus of the points L, M, N, P, Q, and R, showing the combinations of the two goods X and Y between which, the consumer is indifferent. "It is the locus of points representing pairs of quantities between which the individual is indifferent, so it is termed an indifference curve." It is, in fact, an iso-utility curve showing

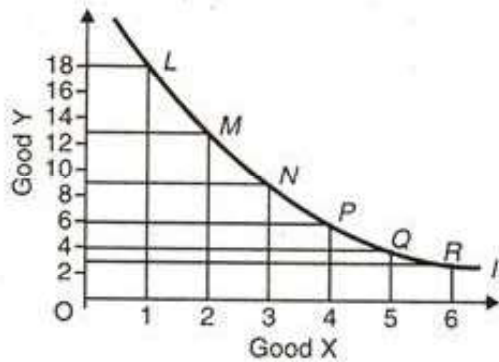


Figure 7.3

equal satisfaction at all its points. A single indifference curve concerns only one level of satisfaction. But there are a number of indifference curves, as shown in Figure 7.3. The curves that are farther away from the origin represent higher levels of satisfaction as they have larger combinations of X and Y. Thus the indifference curve I_4 indicates a higher level of satisfaction than I_3 which, in turn, is indicative of a higher level of satisfaction than I_2 and so on.

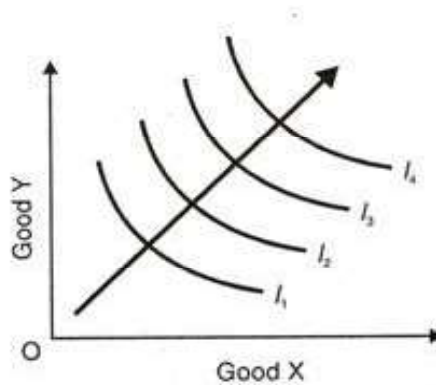


Fig 7.4

Consumers would prefer to move in the direction indicated by the arrow in the figure. Such a diagram is known as an indifference map where each indifference curve corresponds to a different indifference schedule of the consumer. It is like a contour map showing the height of the land above sea-level where instead of height, each indifference curve represents a level of satisfaction.

7.9 Assumptions of Indifference approach

The indifference curve analysis retains some of the assumptions of the cardinal theory, rejects others and formulates its own. The assumptions of the ordinal theory are the following:

1. The consumer acts rationally so as to maximise satisfaction.
2. There are two goods X and Y.
3. The consumer possesses complete information about the prices of the goods in the market.
4. The prices of the two goods are given.

5. The consumer's tastes, habits and income remain the same throughout the analysis.
6. He prefers more of X to less of X or more of Y to less of Y.
7. An indifference curve is negatively inclined sloping downward.
8. An indifference curve is always convex to the origin.
9. An indifference curve is smooth and continuous which means that the two goods are highly divisible and those levels of satisfaction also change in a continuous manner.
10. The consumer arranges the two goods in a scale of preference which means that he has both 'preference' and 'indifference' for the goods. He is supposed to rank them in his order of preference and can state if he prefers one combination to the other or is indifferent between them.
11. Both preference and indifference are transitive. It means that if combination A is preferable to \hat{A} , and \hat{A} to C, then A is preferable to C. Similarly, if the consumer is indifferent between combinations A and B, and \hat{A} and C, then he is indifferent between A and C. This is an important assumption for making consistent choices among a large number of combinations.
12. The consumer is in a position to order all possible combinations of the two goods.

7.10 REVEALED PREFERENCE THEORY

The Revealed Preference Theory states that consumer's preferences can be revealed by the purchases they make under different income and price circumstances. The revealed

preference theory was proposed by an American economist Paul Samuelson in his article ‘Consumption Theory in Terms of Revealed Preference’ in 1948. The revealed preference theory gives a more realistic assessment of consumer’s behaviour. This theory does not take into account utility approaches or indifference curve to explain consumer behaviour. According to the revealed preference theory, the demand for a commodity by a consumer can be determined by observing the actual behaviour of the consumer with the varied levels of income and market price of commodities. The basic hypothesis of the revealed preference theory is that ‘choice reveals preference’. The theory explains the demand curve on the basis of the consumer’s behaviour. Let us understand the theory with the help of Figure.

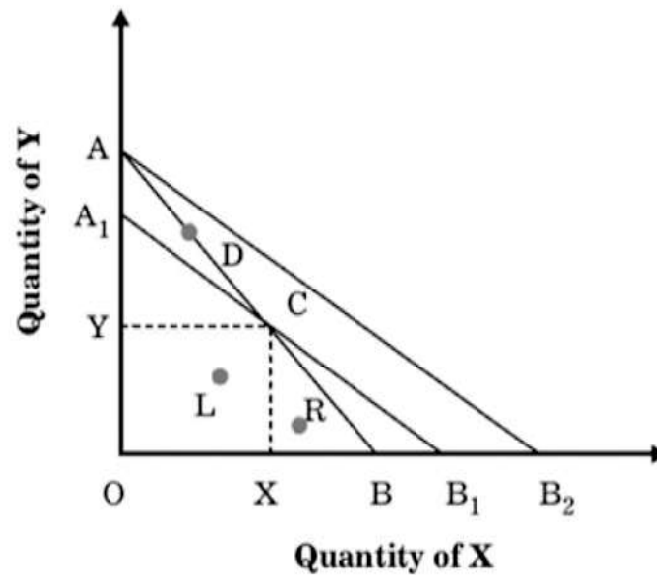


Figure 7.5.

In this Figure, AB is the budget line. Therefore, OAB is the feasible set where all points on or below AB can be attained by the consumer with the given income and market price of commodities. Suppose the consumer chooses C of all the possible

combinations of commodities X and Y. This implies that the consumer has revealed his/her preference for combination Cover all other combinations, which are D, L, and R.

There are three main axioms proposed under the revealed preference theory which are listed below:

Axioms of Revealed Preference Theory

- 1. Weak Axiom of Revealed Preference (WARP):** As per this axiom, a consumer always makes the same choice while purchasing one commodity instead of the other at the given price and income. The consumer makes a different choice if the other commodity provides more benefit in terms of more affordability or better quality. The weak axiom also states that if we buy one particular product, then we will never buy a different product or brand unless it is cheaper, offers increased convenience, or is of better quality, i.e., unless it provides more benefits.
- 2. Strong Axiom of Revealed Preference (SARP):** The SARP applies the concept of transitivity to revealed preferences. This implies that if a consumer chooses commodity A over commodity B and commodity B over commodity C, the consumer would prefer commodity A to commodity C. This one basically generalizes the weak axiom by covering a large number of goods and services. It also rules out some inconsistent chains of choices.
- 3. Generalized Axiom of Revealed Preference (GARP):** This axiom states that more than one combination of two commodities provides the same level of satisfaction to a consumer at a given market price and income level. As per GARP, there is no unique combination of two commodities that provides maximum utility to the consumer.

7.11 ASSUMPTIONS OF REVEALED PREFERENCE THEORY

1. **Rationality:** The consumer is assumed to behave rationally in the sense that he prefers bundle of goods that contains more quantities of the commodities. This assumption of rationality underlies all logical explanations of consumer's behaviour.
2. **Consistency:** The revealed preference theory sets upon this basic assumption, which has been called as consistency postulate. It can thus be stated, "no two observations of choice behaviour are made which provide conflicting evidence to the individual's preference".
3. **Transitivity:** The assumption of transitivity is an application of the logical theory of ordering. The consumer's tastes are transitive, so that if he prefers X to Y and Y to Z, he will prefer X to Z. Symbolically, if in any particular situation $X > Y$ and $Y > Z$, then $X > Z$.

7.12 THEORY OF CONSUMER CHOICE UNDER RISK

The modern utility analysis is the outcome of the failure of the indifference curve technique to explain consumer behaviour among risky or uncertain choices. The traditional utility analysis is also concerned with consumer behaviour among riskless choices. Such choices are certain, based as they are on the principle of diminishing marginal utility and on the proportionality rule. The consumer is certain about his income, tastes and the goods he purchases and maximises his satisfaction by choosing that combination which gives him the highest total utility. But in reality, many goods and services involve risk or uncertainty, such as investments in shares of stock, insurance and gambling. There were many who try to brief this concept in various ways. It was Neumann and Morgenstem who in their Theory of Games and Economic Behaviour studied the behaviour of an individual in risky situations. After that their theory was

refined by Friedman and Savage and by Markowitz then the solution to the problem of risky situations was provided by Daniel Bernoulli who tried to solve St. Petersburg Paradox.

The explanation of these different views on choices involving risk or uncertainty is given below:

1. The Bernoulli Hypothesis

The neo-classical theory assumes that the consumer is a rational being who does not indulge in gambling or even in fair bet with 50-50 odds. The reason why people were unwilling to stake even at fair bets was provided by Daniel Bernoulli in the 18th century theswissmathematician. He was staying in St. Petersburg in 1732 for some time, where he found that Russians were unwilling to make bets even at better than 50- 50 odds knowing fully that their mathematical expectations of winning money in a particular kind of gamble were greater the more money they bet. This contradiction is known as St. Petersburg Paradox. The monetary gain or loss is equal, the loss in utility is greater than the gain in utility in this game. Thus, in Bernoulli's view, rational decisions in the case of risky choices would be made on the basis of expectations of total utility rather than the mathematical expectations of monetary value. The loss or gain in total utility refers to marginal utility. Since the expectation of loss in utility is greater than the gain in utility, this person will not accept a fair bet.

Bernoulli's solution to the St. Petersburg Paradox in terms of expected utility instead of expected monetary value of the game led Neumann and Morgenstem to construct their utility index under risky choices.

2 The Neumann-Morgenstern Method of Measuring Utility

J. Von Neumann and O. Morgenstern in their book 'Theory of Games and Economic Behaviour' evolved the method of cardinal measurement of expected utility from risky choices which are found in gambling, lottery tickets, etc. For this, they constructed a utility index which is called the N-M utility index.

The N-M utility index is based on the following assumptions:

1. The individual behaves in risky situations in order to maximize expected utility.
2. His choices are transitive: if he prefers A prize (win) to \hat{A} prize and \hat{A} to C, then he prefers A to C.
3. There is probability P which lies between 0 and 1 ($0 < P < 1$) such that the individual is indifferent between prize A which is certain and the lottery tickets offering prizes \tilde{N} and \hat{A} with probability P and $1 - P$ respectively.
4. If two lottery tickets offer the same prizes, the individual prefers the lottery ticket with the higher probability of winning.
5. The individual can completely order probability combinations of uncertain choices.
6. Uncertainty or risk does not possess utility or disutility of its own.

3. The Friedman-Savage Hypothesis

The Neumann-Morgenstern method is based on the expected values of utilities and therefore, does not refer to whether the marginal utility of money diminishes or increases. In this respect, this method of measuring utility is incomplete. When a person gets an insurance policy, he pays to escape or avoid risk. But when he buys a lottery

ticket, he gets a small chance of a large gain. Thus, he assumes risk. Some people indulge both in buying insurance and gambling and thus they both avoid and choose risks. Why? The answer has been provided by the Freedman-Savage Hypothesis as an extension of the N-M method. It states that marginal utility of money diminishes for incomes below some level, it increases for incomes between that level and some higher level of income, and again diminishes for all incomes above that higher level. Suppose a person buys insurance for his house against the small chance of a heavy loss from fire and also buys a lottery ticket which offers a small chance of a large win. Such a conflicting behaviour of a person who buys insurance and also gambles has been shown by Friedman and Savage with a total utility curve. Such a curve first rises at a diminishing rate so that the marginal utility of money declines and then it rises at an increasing rate so that the marginal utility of income increases. So, according to Freedman-Savage, people in the middle-income group with increasing marginal utility of income are those who are willing to take risks to improve their lot. If they succeed in their efforts in having more money by taking risks, they lift themselves up into the next higher socio-economic group. They do not want just more consumer goods. Rather, they want to rise in the social scale and to change their patterns of life. That is why, the marginal utility of income increases for them.

4. The Markowitz Hypothesis

Prof. Markowitz found the Friedman-Savage hypothesis contrary to common observations. According to him, it is not correct to say that the poor and the rich are unwilling to gamble and take risks except at favourable odds. Rather, both purchase lotteries and gamble on horse races. They also play the games at casinos and gamble alike in the stock market. Thus, Friedman and Savage failed to observe the actual behaviour of the poor and the rich because they assume that the marginal utility of

income depends on the absolute level of income. Markowitz has modified it by relating the marginal utility of income to changes in the level of present income. According to Markowitz, when income increases by a small increment, it leads to increasing marginal utility of income. But large increases in income lead to diminishing marginal utility of income. That is why at higher levels of income people are reluctant to indulge in gambling even at fair bets and people in slowly rising income groups indulge in gambling to improve their position. On the other hand, when there are small decreases in income, the marginal utility of income rises. But large decreases in income lead to diminishing marginal utility of income. That is why people insure against small losses but indulge in gambling where large losses are involved. The Markowitz hypothesis is an improvement over the Friedman-Savage hypothesis. Instead of the absolute level of income, it takes the present level of income of a person. It suggests that a person's behaviour towards insurance and gambling is the same whether he is poor or rich. The emphasis is on small or large increases or decreases in the present income of a person that determines his behaviour towards insurance and gambling.

5. Critical Appraisal of Modern Utility Analysis

In the modern utility analysis of risk or uncertainty, the Neumann and Morgenstern hypothesis implies measurable utility up to a linear transformation thereby reintroducing diminishing or increasing marginal utility. The Friedman-Savage hypothesis contains an added element. It attempts to explain the shape of the curve of total utility of income. These hypotheses are thus attempts to rehabilitate the measurement of utility. But the N-M theory of risky choices along with its variants like the Friedman-Savage hypothesis and Markowitz hypothesis are still a subject of controversy on two counts; firstly, from the practical standpoint, and secondly, whether it is a cardinal or an ordinal method. In the neo-classical theory the word "cardinal" is used to denote introspective

absolute marginal measurement of utility while in this theory it is used operationally. In the N-M theory, utility numbers are assigned to lottery tickets according to a person's ranking of the prizes and the prediction is made numerically as to which of the two tickets will be chosen. Though the N-M formula is used to derive the utility index, yet it says nothing about diminishing marginal utility. Thus, the N-M utility is not the neo-classical cardinal utility. The refinements made by Friedman-Savage and Markowitz have tendered to drop the neo-classical assumption that the marginal utility of income diminishes for all ranges of income. Thus, the theory of measurement of utility under risky choices is superior to the neo-classical introspective cardinalism of certain choices. Economists like Dorfman, Samuelson and Solow have derived the Paretian indices of utility from the N-M formula. And when the N-M index based on individual ranking is constructed, it conveys information about his preferences. Baumol uses further the N-M measurement in the ordinal sense when he equates the N-M marginal utility with the marginal rate of substitution. He writes: "The N-M marginal utility X of ends up as no more than the marginal rate of substitution between and the probability of winning the pre-specified prize (E) of the standard lottery ticket. This is surely not cardinal measurement in the classical sense."

Consumer choice theory is a hypothesis about why people buy things. It simply says that you choose to buy the things that give you the greatest satisfaction, while keeping within your budget. This theory links the consumer demand curve with consumer preferences. This theory views that consumers fully understand what they choose. In economics, consumer choice depends not only on the satisfaction (utility) of the product but also on their budget lines. Thus, optimum consumer choice is when the selected product provides maximum satisfaction and is affordable with their money. In a graph, the optimum choice occurs at the point of intersection between the indifference curve and the budget constraint line. We call this point consumer's equilibrium. Consumer

choice theory tries to explain such situations when we study consumer choice behavior, we examine how consumers decide which products to buy or consume.

7.13 ASSUMPTIONS OF CONSUMER CHOICE THEORY

There are three assumptions of consumer choice theory about human nature:

The **first** assumption is that when you shop, you choose to buy things based on calculated decisions about what will make you happiest. In economics language, this is known as utility maximization (Economists really like to put quite simple concepts into long complicated terms.)

Secondly, the theory assumes that no matter how much you shop, you will never be completely satisfied. In other words, you will always be happier consuming a little bit more. This is known as the principle of non-satiation.

Thirdly, even though you always get more happiness from more consumption, the amount of pleasure you get from each good decrease with the more you consume. So, if you eat two ice creams rather than one, you get more overall pleasure, but the second ice-cream won't be as satisfying as the first. This is known as decreasing marginal utility.

Axioms of the consumer choice theory:

Three axioms that underlie consumer choice theory are:

1. **Complete preferences:** The theory assumes the consumer fully understands his decision. When dealing with several basket alternatives and must choose one, consumers compare them based on their preferences. That way, they can positively state which basket they prefer. In the previous case, you chose basket B because it contained

6 oranges and 6 apples. It would be best if you had both of them to fill the refrigerator that has run out. So, that choice suits your needs. In other scenarios, you might not choose basket A or B. The reason may be because you still have both in the refrigerator.

2. Transitive Preferences: This assumption involves the conclusion of more than two choices. Suppose, you are given three bundles, A, B, and C. You prefer to bundle A rather than bundle B. And, compared to bundle C, you still prefer bundle B. Therefore, we can conclude, when you face bundles A and C, then you will undoubtedly choose bundle A.

3. Nonsatiation: This axiom says that more is better. If the consumer faces two bundles that are almost identical A and B, but B includes more than one particular item, the consumer will choose B.

For example: in the previous case, you chose basket B, which contained 6 oranges and 6 Apples. It would be best if you had oranges and apples in equal amounts. You don't like basket A because it includes fewer apples (5 pieces).

7.14 SUMMARY

In this lesson we have discussed the concept and assumptions of Cardinal and ordinal utility analysis in brief. Both the approaches have their own pros and cons. The Cardinal utility approach believes that utility can be measured and compared to each other in terms of mathematical numbers like 1, 2, 3..., n. It was initially developed by H.H. Gossen and further developed by the leader of neoclassical economics Alfred Marshall. It is thus well-known as Marshallian Utility Analysis. They define the utility as a

cardinal measurement phenomenon. Cardinal school also believes that an individual can express his satisfaction derives from the consumption of a good in cardinal number and he can make comparisons too. The basic assumptions of cardinal utility analysis are the foundation of cardinal utility analysis and play a key role in economic theories like the law of diminishing marginal utility, and the law of equi-marginal utility. The ordinal utility approach to consumer's utility analysis states that utility or satisfaction cannot be measured in exact numbers but can only be ranked or put into order. This approach argues that pleasure is completely a psychological element and it cannot be expressed in numbers. In the technique of ordinal utility analysis, goods are only ranked in terms of more or less preferred but there is no attempt to determine how much more one good is preferred to another. The ordinal utility can reflect an order only. The ordinal utility theory of consumer behavior is usually called indifference curve analysis as indifference curves are its main analytical tool.

7.15 GLOSSARY

- **Marginal utility:** The marginal utility of a good or service describes how much pleasure or satisfaction is gained from an increase in consumption.
- **Preference:** Preference is a technical term usually used in relation to choosing between alternatives.
- **Consistency:** The quality of achieving a level of performance which does not vary greatly in quality over time.

7.16 SELF-ASSESSMENT QUESTIONS

Q1. What do you mean by diminishing marginal utility?

Q2. Differentiate cardinal utility from ordinal utility.

Q3. Explain revealed preference theory.

7.17 SUGGESTED READINGS

- businessjargons.com/ordinal-utility.
- www.geektonight.com/revealed-preference-theory

**DEMAND ESTIMATION FOR MAJOR CONSUMER
DURABLE AND NON DURABLE PRODUCTS**

STRUCTURE

- 8.1 Introduction
- 8.2 Objectives
- 8.3 Meaning of Durable goods
- 8.4 Importance of Durable goods
- 8.5 Meaning of Non-Durable goods
- 8.6 Characteristics of Non-Durable Goods
- 8.7 Difference between durable and non-durable goods
- 8.8 Demand For Durable and Non-Durable Goods
- 8.9 Summary
- 8.10 Glossary
- 8.11 Self-Assessment Questions
- 8.12 Suggested Readings

8.1 INTRODUCTION

With the continuous inflow of disposable income and the advancement of technology, the consumption is rapidly changing as growing number of people through out the world strive to acquire the greater number and range of products available. This is because global consumer goods industry and the international retail companies are constantly changing. The consumer goods can be categorized as durable and non-durable goods. The consumer goods refer to those goods which can be used for final consumption. The distinction between durable and non-durable goods is purely arbitrary. Both the terms are pretty much self-explanatory. Durable goods are those which can be used several times, whereas non-durable goods are those typically meant for single use only. This in turn is leading to a strong competition among the different consumer durable brands available in the nation. When a new durable is introduced initially a small fraction of the population will purchase it and gradually its potential buyers will increase. This will continue till all the potential buyers own it. This led to the diffusion of durables. This happens because of the outcome of the interaction of a number of quantitative and qualitative factors. Some durables become outdated which are no longer in demand due to availability of better substitutes. Consumer durables refer to those consumer goods that do not quickly wear out and yields utility over a long period of time. Some of the popular and common examples of these kinds of items are electronic goods, kitchen appliances, home furnishings and leisure equipment etc. The demand estimation for major consumer durable and non-durable products under managerial economics is that non-durable products are purchased only for current consumption whereas durable products can be stored. However, their price fluctuates and they are dependent on the

consumer's expectations, change in technology, and changes in their rates in the future.

8.2 OBJECTIVES

In this lesson, you should be able to understand:

- Concept of durable and non-durable goods
- Importance of durable goods
- Difference between both the goods
- Importance of demand for both the goods

8.3 MEANING OF DURABLE GOODS

Durable goods are a category of tangible products with long economic life, usually more than three years. One can use or consume them repeatedly and continuously during their economic life. During that period, you can continue to use them with little or no loss of utility or benefit from the product. Manufactured products such as washing machines and cars are great examples of durable goods. Because they have a longer useful life, durable goods are usually expensive. Some consumers buy it not in cash but on credit. Also, durable goods shopping is a secondary type of purchase. When the budget drops, they are the first option for savings. In economics durable goods are defined as those goods that go on yielding services to the consumers over a number of periods in future. Further, because of their durability they can be stored for longer periods of time. It is due to the use of services of durable goods for a relatively long term that consumers' demand for them is more volatile, that is, fluctuates very much. The use of durable goods is not limited to single use only; in fact, they are long-lasting goods that can withstand the

test of time without losing their functionality. Durable goods can be used several times, usually more than three years, before they start to lose their utility. Durable goods orders give a better understanding of the supply chain than most indicators. It can be very useful in helping investors understand corporate earnings in industries, such as technology manufacturing, machinery, and transportation. Investors and analysts usually use several months of data and average it rather than just using data of a single month. As investment prices are a reflection of economic growth, investors use durable goods orders and other indicators to identify trends in the market. Orders for industrial machinery can indicate how busy industries are likely to be in the future. Orders placed in current months can lead to busy industries over the next few months. Durable goods orders give a thorough understanding of the manufacturing sector, which is a major sector of the economy.

Examples of durable goods include:

- Consumer electronics: laptops, cellphones, televisions, and radios.
- Home and office equipment and furniture: tables, chairs, washing machine, rice cooker, refrigerator, and air conditioner.
- Garden tools: shovels, weeds, garden hoe, pruning shears
- Motorized vehicles: cars and motorbikes.
- Photographic equipment: cameras and equipment for taking photos.
- Sports equipment: bicycles, helmets, golf sticks.
- Accessories: handbags, wallets, luggage, jewelry, and watches.

8.4 IMPORTANCE OF DURABLE GOODS

1. **Economic indicators:** Expenditures on durable goods are an important economic indicator. This is a signal of optimism and pessimism regarding future economic conditions. Households and businesses are more cautious and require careful planning to buy durable goods. Households consider their current and future financial and employment conditions. Businesses consider their current and future profit condition. And, in general, both have to do with the future prospects for the economy.
2. **Economic cycle:** During the initial recession, spending on durable goods fell. That is the main target for savings. Households delay purchases because they see their financial and employment prospects deteriorate. The businesses will then respond. They are likely to cancel purchases of capital goods considering weak consumer demand.
3. **Stock investment:** Investors often track orders for durable goods to provide guidance on the economic outlook. Purchases of durable goods generally indicate the economy is improving as households and businesses are optimistic about their finances. Investors then start collecting company shares and expect an increase in share prices in the future.

8.5 MEANING OF NON-DURABLE GOODS

Non-durable goods are not meant for repeated use and in fact, they start to wear out after the first use itself. Non durable goods are soft goods that can be used only once and their utility is exhausted after the first use. These are goods that are intended to be used for a very short period of time. According to the United States Bureau of Economic Analysis, non-durable goods are those considered to be used within three years and must be bought again in

succession for use. These are also called consumable goods because they cannot be consumed more than once. Examples of these goods are sweets, packaged foods, cosmetics, beverages, office supplies, tobacco, clothing, footwear, light bulbs, detergent, etc. Unlike durable goods, these are generally not rented and can be only bought. And they have a very limited lifespan of less than three years. Non-durable goods are products that should be consumed immediately or that have a short shelf-life. Non-durable goods are products consumers purchase with the plan to use for a short period of time. Also referred to as consumable goods, most non-durable goods are expected to be consumed or used in three years or less. Because of this basic characteristic, non-durable goods can be a wide variety of products. There are essentially three types of non-durable goods. They may be literally consumed, as with food and drinks. They can also be utilized until they are gone, such as deodorant, toothpaste or dish soap. The third type of non-durable good is a product that is used and no longer needed, intended for one use, or wears out from normal use, such as socks, paper plates and light bulbs. the demand for these goods remains constant throughout economic growth and setback. Consumers normally purchase the same amount of non-durable goods as durable goods, during both recession and growth. Non-durable goods are not meant for repeated use. In fact, they can be used only once and they lose their ability to function after first use. They tend to be useless after first use.

Examples of nondurable goods:

Food: vegetables, fruit, meat, and canned food

Beverages: soft drinks and mineral water.

Household and office products: soap, detergent, shampoo, tissue, ink, and paper.

Personal products: cosmetics and perfumes.

8.6 CHARACTERISTICS OF NON-DURABLE GOODS

- 1.** The useful life of these goods is short, usually less than three years. In fact, for some products, such as food, they are only a few days old and consumed once. Meanwhile, some others are longer, and they are good nondurable.
- 2.** Consumers regularly buy because non-durable goods have a relatively short life span. So, consumers will buy them more frequently, maybe once a week.
- 3.** Prices are relatively cheap. To buy it, consumers usually pay in cash rather than on credit or rely on loans.
- 4.** Nondurable items such as food and beverages are not rented.
- 5.** Consumers usually buy it to meet primary needs of their lives, such as food and beverages as they are essential for survival.
- 6.** Buying non-durable goods fall into the category of demand for consumption goods. This means that consumers spend money to receive the benefits as soon as possible.
- 7.** Consumers are less planning for spending. In fact, for some items, they buy them impulsively. I mean, they buy when they see them without any prior intentions or plans. An example is buying candy when you are near the checkout counter.

8.7 DIFFERENCE BETWEEN DURABLE AND NON-DURABLE GOODS

Durable goods	Non-durable goods
These are tangible products that can withstand the test of time and can be used several times before they start to deteriorate. These are long-lasting products that last for a really long time (more than three years) without losing its ability to function.	These are consumable goods with a limited life span which means they last no longer than three years. These are goods that are intended to be used for a very short period of time.
The use of durable goods is not limited to single use only, in fact, they are long lasting goods that can with stand the test of time without losing their functionality. They can be used several times, usually more than three years, before they start to lose their utility.	Non-durable goods can be used only once and they lose their ability to function after first use. They tend to be useless after first use.
The demand for durable goods usually during economic and goes down recession.	The demand for non-durable remains constant through out economic growth and set back.
Examples include cars, furniture, appliances consumer electronics, tools supplies and equipment, sporting goods, jewellery, etc.	Example include packaged foods, cosmetics, beverages, office supplies, tobacco, clothing, footwear, light bulbs, detergent, etc.

8.8 DEMAND FOR DURABLE AND NON-DURABLE GOODS

Demand is often classified under demand for durable and non-durable goods. Durable goods are those goods whose total utility is not exhausted in single or short-run use. Such goods can be used continuously over a period of time. Durable goods may be consumer goods as well as producer goods. Durable consumer goods include clothes, shoes, house furniture, refrigerators, scooters, and cars. The durable producer goods include mainly the items under fixed assets, such as building, plant and machinery, office furniture and fixture. The durable goods, both consumer and producer goods, may be further classified as semi-durable goods such as, clothes and furniture and durable goods such as residential and factory buildings and cars. On the other hand, non-durable goods are those goods, which can be used only once such as food items and their total utility is exhausted in a single use. This category of goods can also be grouped under non-durable consumer and producer goods. All food items such as drinks, soap, cooking fuel, gas, kerosene, coal and cosmetics fall in the former category whereas, goods such as raw materials', fuel and power, finishing materials and packing items come in the latter category. The demand for non-durable goods depends largely on their current prices, consumers' income and fashion whereas the expected price, income and change in technology influence the demand for the durable goods. The demand for durable goods changes over a relatively longer period. There is another point of distinction between demands for durable and non-durable goods. Durable goods create demand for replacement or substitution of the goods whereas non-durable goods do not. Also, the demand for non-durable goods increases or decreases with a fixed or constant rate whereas the demand for durable goods increases or decreases exponentially, i.e., it may depend upon some factors such as obsolescence of machinery, etc. For example, let us suppose that

the annual demand for cigarettes in a city is 10 million packets and it increases at the rate of half-a-million packets per annum on account of increase in population when other factors remain constant. Thus, the total demand for cigarettes in the next year will be 10.5 million packets and 11 million packets in the next-to-next year and so on. This is a linear increase in the demand for a non-durable goods like cigarette.

8.9 SUMMARY

It is understood that the determinants like income, the number of durables possessed, level of education of household head has significant positive effect on the demand for most of the major durables. Income is one of the important determinants which has significant positive effect on the demand for the major durables. The level of education of the household head has positive significant effect on the demand for major durables. Similarly, the number of durables possessed by a household also has positive effect on the demand for durable goods. In a nutshell, durable goods are those goods that can be utilized several times whereas non-durable goods are those that cannot be used after the first use. The average life span of non-durable goods is no longer than three years or they are to be immediately consumed in one use. Durable goods, on the contrary, have an average lifespan of much more than just three years; in fact, durable goods can be used several times because they are highly resistant to wear, decay, etc. When compared to other types of goods, the manufacturing lead time on capital goods takes longer. New orders in the durable goods orders are therefore used to understand the long-term potential for sales and earnings by the companies that have placed the orders. The demand estimation for major consumer durable and non-durable products under managerial economics is that non-durable products are purchased only for current consumption whereas durable products can be stored. However, their price

fluctuates and they are dependent on the consumer's expectations, change in technology, and changes in their rates in the future.

8.10 GLOSSARY

- Durable: which is able to exist for a long time without significant deterioration in quality or value.
- Indicators: An economic indicator is a macroeconomic measurement used by analysts to understand current and future economic activity and opportunity.
- Appliances: It is a device or piece of equipment designed to perform a specific task.

8.11 SELF-ASSESSMENT QUESTIONS

Q1. Differentiate between durable goods and non-durable goods

Q2. Why there is demand for durable goods and non-durable goods? Explain.

Q3. Write down some of the characteristics of non-durable goods.

8.12 SUGGESTED READINGS

- Consumer durables segment, EY and FICCI, April 2014.
- Demand for Durable and Non-durable Goods by BMS Team
- Khillar, S. (2021, October 29). Difference Between Durable and Non-Durable Goods. Difference Between Similar Terms and Objects.
- Cooper, Tim. Longer Lasting Products: Alternatives to the Throwaway Society. Florida, United States: CRC Press, 2016.

DEMAND FORECASTING TECHNIQUES

STRUCTURE

- 9.1 Introduction
- 9.2 Objectives
- 9.3 Concept of Demand Forecasting
- 9.4 Importance of Demand Forecasting
- 9.5 Components of Demand Forecasting
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9.1 INTRODUCTION

Forecasting provides an estimate of future demand and the basis for planning and sound business decisions. Since all organizations deal with an unknown future, some error between a forecast and actual demand is to be expected. Thus, the goal of a good forecasting technique is to minimize the deviation between actual demand and forecast. Since a forecast is a prediction of the future, factors that influence demand, the impact of these factors, and whether these factors will continue to influence future demands must be considered in developing an accurate forecast. In addition, buyers and sellers should share all relevant information to generate a single consensus forecast so that the correct decision on the supply and demand can be made. The benefits of a better forecast are lower inventories, reduce stock outs, smoother production plans, reduced costs and improved customer service. (Wisner, Tan, & Leong, 2008). The impact of poor communication and inaccurate forecast resonates all along the supply chain and results the bull whip effects causing stock outs, lost sales, high cost of inventory and obsolesce, material shortages, poor responsiveness to market dynamics, and poor profitability.

In order to mitigate risks, it is of paramount importance for organisations to determine the future prospects of their products and services in the market. This knowledge of the future demand for a product or service in the market is gained through the process of demand forecasting. It can be defined as a process of predicting the future demand for an organisation's goods or services. It is also referred to as sales forecasting as it involves anticipating the future sales figures of an organisation.

9.2 OBJECTIVES

In this lesson, one can understand:

- Meaning of demand forecasting
- Importance of demand forecasting
- Components of demand forecasting
- Advantages and limitations of demand forecasting

9.3 CONCEPT OF DEMAND FORECASTING

Demand forecasting is a combination of two words; the first one is Demand and another forecasting. Demand means outside requirements of a product or service. In general, forecasting means making an estimation in the present for a future occurring event. It is a technique for estimation of probable demand for a product or services in the future and is based on the analysis of past demand for that product or service in the present market condition. Demand can be forecasted by organisations either internally by making estimates called guess estimate or externally through specialized consultants or market research agencies. Demand forecasting should be done on a scientific basis and facts and events related to forecasting should be considered. Therefore, in simple words, we can say that after gathering information about various aspect of the market and demand based on the past, an attempt may be made to estimate future demand. This concept is called forecasting of demand.

For example: Suppose we sold 200, 250, 300 units of product X in the month of January, February, and March respectively. Now we can say that there will be a demand for 250 units approx. of product X in the month of April, if the market condition remains the same.

Demand forecasting is a process of predicting the demand for an organisation's

products or services in a specified time period in the future. Demand forecasting is helpful for both new as well as existing organizations in the market and enables an organisation to arrange for the required inputs as per the predicted demand, without any wastage of materials and time. It also helps an organisation to take various business decisions, such as planning the production process, purchasing raw materials, managing funds, and deciding the price of its products.

Definitions

Some of the popular definitions of demand forecasting are as follows:

According to **Evan J. Douglas**, “Demand estimation (forecasting) may be defined as a process of finding values for demand in future time periods”.

In the words of **Cundiff and Still**, “Demand forecasting is an estimate of sales during a specified future period based on proposed marketing plan and a set of particular uncontrollable and competitive forces.”

9.4 IMPORTANCE OF DEMAND FORECASTING

Demand forecasting is vital to the management of every business. It enables an organisation to mitigate business risks and make effective business decisions. Moreover, demand forecasting provides insight into the organisation’s capital investment and expansion decisions. So, it is very important for every business to forecast their demand. Certain important points of demand forecasting are given below:

- 1. Producing the desired output:** Demand forecasting enables an organisation to produce the pre-determined output. It also helps the organisation to arrange for the various factors of production (land, labour, capital, and enterprise) before hand so that the desired quantity can be produced without any hindrance.

2. **Assessing the probable demand:** Demand forecasting enables an organisation to assess the possible demand for its products and services in a given period and plan production accordingly. In this way, demand forecasting avoids dependence on merely making assumptions for demand.
3. **Forecasting sales figures:** Sales forecasting refers to the estimation of sales figures of an organisation for a given period. Demand forecasting helps in predicting the sales figures by considering historical sales data and current trends in the market.
4. **Better control:** In order to have better control on business activities, it is important to have a proper understanding of cost budgets, profit analysis, which can be achieved through demand forecasting.
5. **Controlling inventory:** As discussed earlier, demand forecasting helps in estimating the future demand for an organisation's products or services. This, in turn, helps the organisation to accurately assess its requirement for raw material, semi-finished goods, spare parts, etc.
6. **Assessing manpower requirement:** Demand forecasting helps in accurate estimation of the manpower required to produce the desired output, thereby avoiding the situations of under-employment or over-employment.
7. **Ensuring stability:** Demand forecasting helps an organisation to stabilise their operations by initiating the development of suitable business policies to meet cyclical and seasonal fluctuations of an economy.
8. **Planning import and export policies:** At the macro level, demand forecasting serves as an effective tool for the government in determining

the import and export policies for the nation. It helps in assessing whether import is required to meet the possible deficit in domestic supply.

9.5 COMPONENTS OF DEMAND FORECASTING

The systematic component measures the expected value of demand and consists of what we will call level, the current deseasonalized demand; trend, the rate of growth or decline in demand for the next period; and seasonality, the predictable seasonal fluctuations in demand.

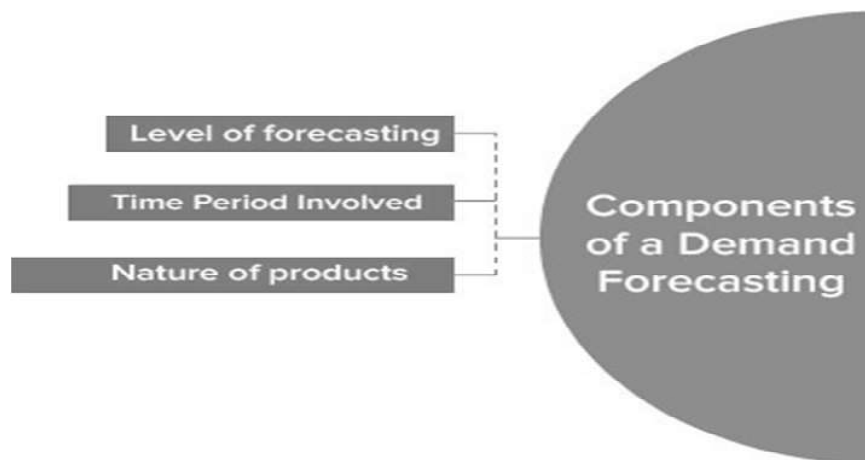


Figure 9.1

Let us discuss the basic components of demand forecasting in detail:

- 1. Level of forecasting:** Demand forecasting can be done at the firm level, industry level, or economy level. At the firm level, the demand is forecasted for the products and services of an individual organisation in the future. At the industry level, the collective demand for the products and services of all organisations in a particular industry is forecasted. On the other hand, at the

economy level, the aggregate demand for products and services in the economy as a whole is anticipated.

2. Time period involved: On the basis of the duration, demand is forecasted in the short run and long term, which is explained as follows:

(a) Short-term forecasting: It involves anticipating demand for a period not exceeding one year. It is focused on the short-term decisions (for example, arranging finance, formulating production policy, making promotional strategies, etc.) of an organisation.

(b) Long-term forecasting: It involves predicting demand for a period of 5-7 years and may extend for a period of 10 to 20 years. It is focused on the long-term decisions (for example, deciding the production capacity, replacing machinery, etc.) of an organisation.

3. Nature of products: Products can be categorised into consumer goods or capital goods on the basis of their nature. Demand forecasting differs for these two types of products, which is discussed as follows:

(a) Consumer goods: The goods that are meant for final consumption by end users are called consumer goods. These goods have a direct demand. Generally, demand forecasting for these goods is done while introducing a new product or replacing the existing product with an improved one.

(b) Capital goods: These goods are required to produce consumer goods; for example, raw material. Thus, these goods have a derived demand. The demand forecasting of capital goods depends on the demand for consumer

goods. For example, prediction of higher demand for consumer goods would result in the anticipation of higher demand for capital goods too.

9.6 FACTORS INFLUENCING DEMAND FORECASTING

Demand forecasting has a huge importance in planning. It helps to arrange the various factors of production and helps an entity to estimate the future demand for its products and plan its production. The factors involved in demand forecasting are discussed below:

- 1. Prevailing Economic Conditions:** Demand forecasting can be affected by the changing price levels, national and per capita income, consumption pattern of consumers, saving and investment practices, employment level, etc. of an economy. Thus, it is important that existing economic conditions should be assessed in order to align demand forecasting with current economic trends.
- 2. Existing conditions of the industry:** The assessment of demand for an organisation's products and services is also affected by the overall conditions of the industry in which the organisation operates. For example, concentration of an industry increases the level of competition, which directly affects the demand for products and services of different organisations in the industry. In such a case, demand forecasted by organisations may falter.
- 3. Existing Condition of an Organisation:** Apart from industry conditions, the internal state of an organisation also affects demand forecasting. Within the organisation, demand forecasting is affected by various factors, such

as plant capacity, product quality, product price, advertising and distribution policies, financial policies, etc.

- 4. Prevailing Market Conditions:** In market conditions, such as change in the prices of goods; change in consumers' expectations, tastes and preferences; change in the prices of related goods; and change in the income level of consumers also influence the demand for an organisation's products and services. Sociological factors, such as size and density of population, age group, size of family, family life cycle, education level, family income, social awareness, etc. largely impact demand forecasts of an organisation. For example, markets having a large population of youngsters would have a higher demand for lifestyle products, electronic gadgets, etc.
- 5. Psychological Conditions:** Psychological factors, such as changes in consumer attitude, habits, fashion, lifestyle, perception, cultural and religious beliefs, etc. affect demand forecast of an organisation to a large extent.
- 6. Competitive Conditions:** A market consists of several organisations offering similar products. This gives rise to competition in the market, which affects demand forecasted by organisations. For example, reduction in trade barriers increases the number of new entrants in a market, which affects the demand for products and services of existing organisations.
- 7. Import – Export policies:** The demand for export-import goods gets directly affected by changes in factors, such as import and export control,

terms and conditions of import and export, import/export policies, import/export conditions, etc.

9.7 STEPS IN DEMAND FORECASTING

To achieve the desired results, it is important that demand forecasting is done systematically. Demand forecasting involves a number of steps, which are given below:

1. **Specifying the objective:** The purpose of demand forecasting needs to be specified before starting the process. The objective can be specified on the following basis:
 - Short-term or long-term demand for a product
 - Industry demand or demand specific to an organisation
 - Whole market demand or demand specific to a market segment
2. **Determining the time perspective:** Depending on the objective, the demand can be forecasted for a short period (2-3 years) or long period (beyond 10 years). If an organisation performs long-term demand forecasting, it needs to take into consideration constant changes in the market as well the economy.
3. **Selecting the method for forecasting:** There are various methods of demand forecasting, which have been discussed later in the chapter. However, not all methods are suitable for all types of demand forecasting. Depending on the objective, time period, and availability of data, the organisation needs to select the most suitable forecasting method. The

selection of demand forecasting method also depends on the experience and expertise of the demand forecaster.

4. **Collecting and analysing data:** After selecting the demand forecasting method, the data needs to be collected. Data can be gathered either from primary sources or secondary sources or both. As data is collected in the raw form, it needs to be analysed in order to derive meaningful information out of it.
5. **Interpreting outcomes:** After the data is analysed, it is used to estimate demand for the predetermined years. Generally, the results obtained are in the form of equations, which need to be presented in a comprehensible format.

9.8 ADVANTAGES OF DEMAND FORECASTING

Demand forecasting is essentially a process of analyzing the past and present business movements and trends to obtain some idea or clues regarding future trends and business movements. So, it has certain benefits that helps the business organizations to look into the future so that they can accordingly plan for it. These benefits are given below:

1. **Assists in Planning:** One of the biggest advantages of forecasting is that it enables the manager to plan for the future of the organization. Planning and forecasting actually go hand in hand. Without an idea of what the future goals for the company, we cannot plan for it. Thus, forecasting plays a very important role in planning.

2. **Environmental Changes:** When done correctly, forecasts should be able to point out the upcoming changes in the environment. This means that it can allow the company to benefit from such environmental changes. When the changes are favorable to the company it can expand and grow its business. And in conditions that are adverse, it can plan and prepare to protect itself.
3. **Identifying Weak Spots:** Another advantage of forecasting is that it will help the manager identify any weak spots, or ignored areas that the organization may have. Once attention has been drawn to these areas, the manager can put into effect effective controls and planning techniques to rectify them.
4. **Improves Co-ordination and Control:** Forecasting requires information and data from a lot of external and internal sources. This information is collected by the various managers and staff from various internal sources. So almost all units and verticals of the organization are involved in the process of forecasting. This allows for better communication and coordination amongst them.

9.9 LIMITATIONS OF DEMAND FORECASTING

Along with the benefits, there are also some limitations of demand forecasting which can create certain doubts in the mind while planning for the future goals. A few of them are given below:

1. **Lack of historical sales data:** Past sales figures may not always be available with an organisation. For example, in case of a new

commodity, there is unavailability of historical sales data. In such cases, new data is required to be collected for demand forecasting, which can be cumbersome and challenging for an organisation.

- 2. Unrealistic assumptions:** Demand forecasting is based on various assumptions, which may not always be consistent with the present market conditions. In such a case, relying on these assumptions may produce incorrect forecasts for the future.
- 3. Cost incurred:** Demand forecasting incurs different costs for an organisation, such as implementation cost, labour cost, and administrative cost. These costs may be very high depending on the complexity of the forecasting method selected and the resources utilized. Owing to limited means, it becomes difficult for new startups and small-scale organisations to perform demand forecasting.
- 4. Change in fashion:** Consumers' tastes and preferences continue to change with a change in fashion. This limits the use of demand forecasting as it is generally based on historical trend analysis.
- 5. Lack of expertise:** Demand forecasting requires effective skills, knowledge and experience of personnel making forecasts. In the absence of trained experts, demand forecasting becomes a challenge for an organisation. This is because if the responsibility of demand forecasting is assigned to untrained personnel, it could bring huge losses to the organisation.

6. Psychological factors: Consumers usually prefer a particular type of product over others. However, factors, such as fear of war and changes in economic policy, could affect consumers' psychology. In such cases, the outcomes of forecasting may no longer remain relevant for the time period.

9.10 SUMMARY

Demand plays a vital role in the decision making of a business. In competitive market conditions, there is a need to take correct decision and make planning for future events related to business like a sale, production, etc. The effectiveness of a decision taken by business managers depends upon the accuracy of the decision taken by them. Demand is the most important aspect for business for achieving its objectives. Many decisions of business depend on demand like production, sales, staff requirement, etc. Forecasting is the necessity of business at an international level as well as domestic level.

For various needs for demand forecasting in business organisations, a new organisation needs to anticipate demand to expand its scale of production. On the other hand, an existing organisation requires demand forecasts to avoid problems, such as overproduction and under production. This lesson helps us to understand that the demand forecasting helps an organisation to reduce risks involved in business activities and make important business decisions. Apart from this, demand forecasting provides an insight into the organisation's capital investment and expansion decisions.

9.11 GLOSSARY

- Forecasting: It is the process of making predictions based on past and present data and most commonly by analysis of trends.
- Consumer goods: It is a final product ready for sale that is used by the consumer to satisfy current wants or needs, unlike intermediate goods which is utilized to produce other goods.
- Capital goods: A series of heterogeneous commodities, each having specific technical characteristics in the form of a durable good that is used in the production of goods or services.
- Bull whip effect : Small level of change in demand at one level, having large change in demand at other circle.

9.12 SELF-ASSESSMENT QUESTIONS

Q1. What is the need of demand forecasting?

Q2. Explain various factors influencing demand forecasting.

Q3. Write a short note on the concept of demand forecasting?

9.13 SUGGESTED READINGS

- Introduction To Demand Forecasting Business Essay.” ukessays.com. 11 2018.
UK Essays. 12 2021
- Fundamentals of Demand Planning and Forecasting by Chaman L. Jain
- Demand forecasting: A Practical Guide by Gerard Blokdyk

**TECHNIQUES OF DEMAND
FORECASTING**

STRUCTURE

- 10.1 Introduction
- 10.2 Objectives
- 10.3 Techniques of Demand Forecasting
 - 10.3.1 Qualitative Techniques
 - 10.3.2 Quantitative Techniques
- 10.4 Significance of Forecasting Techniques
- 10.5 Summary
- 10.6 Glossary
- 10.7 Self-Assessment Questions
- 10.8 Suggested Readings

10.1 INTRODUCTION

Forecasting may be for a short period of time which is known as short run forecasting or it may be for a long period of time which is then known as long run forecasting. Short run forecasting is usually defined for any period up to one year. Such forecasting is necessary to cope with seasonal variations in demand. Which period is chosen for short run forecasting depends upon the nature of business.

Long run forecasting covers a period of more than one year. How far ahead can the long run forecast go also depends on the nature of the business. But for a very long period future becomes so uncertain that the forecasting becomes subject to considerable errors due to change in so many factors that are assumed to remain unchanged during the period under consideration. Long term forecasts are necessary for taking decisions about the expansion of the scale of the firm. forecasting problems and methods of forecasting are different for established products and for new products. For established products sales trends are known and past results can be the guide to future performance. But for new products no such past trends are available. Demand forecasting is the activity in which the demand for a product or service is estimated for a future period of time. There are several methods of demand forecasting applied in terms of:

- Purpose of forecasting
- Data required
- Data availability
- The time frame for forecasting.

Each method varies from one another and to invest money and other factors in business, we require a reasonably accurate forecast of demand. Hence, the forecaster must select that method that best suits the requirement. There is no particular method that enables organisations to anticipate risks and uncertainties in the future.

10.2 OBJECTIVES

In this lesson, one can understand:

- Various techniques of demand forecasting
- Pros and Cons of these techniques
- Significance of these techniques

10.3 TECHNIQUES OF DEMAND FORECASTING

The main challenge to forecast demand is to select an effective technique. There is no particular technique that enables organisations to anticipate risks and uncertainties in future. Different organisations rely on different techniques to forecast demand for their products or services for a future time period depending on their requirements and budget technique of demand forecasting are broadly categorised into two types. The first technique involves forecasting demand by collecting information regarding the buying behavior of consumers from experts or through conducting surveys. On the other hand, the second technique is to forecast demand by using the past data through historical data.

Thus:

1. Qualitative forecasting technique, is based on opinion

2. Quantitative forecasting technique, is based on historical data

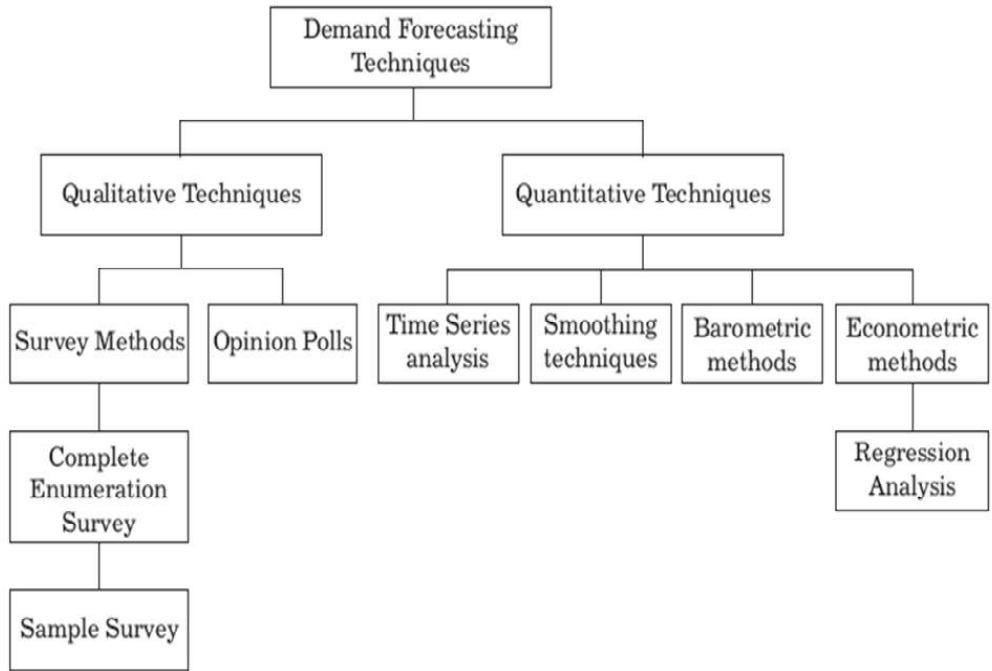


Figure 10.1

10.3.1 QUALITATIVE TECHNIQUES

Qualitative techniques rely on collecting data on the buying behaviour of consumers from experts or through conducting surveys in order to forecast demand. These techniques are generally used to make short term forecasts of demand. These techniques are especially useful in situations when historical data is not available; for example, introduction of a new product or service. These techniques are based on experience, judgment, intuition, conjecture, immeasurable data such as opinions and intuition. Designed to analyze the human element of sales, market demand, and market trends, qualitative

forecasting techniques include documenting expert opinion, surveying in-house sales teams, and even performing market research to understand buyer opinions and behavior and how they may shift in the months and years to come. These techniques invoke the human element of sales, relying on experts' opinions, gut feelings, and analytical judgment. Qualitative, opinion-driven techniques are thought of as the oldest form of forecasting but still provide valuable sales predictions. When a sales rep ends a promising sales call and just knows, without any concrete reason, that the client is ready to move forward, that salesperson is using qualitative forecasting techniques. When a competitor unveils a new product and a business leader calls it a "game changer," that leader is using qualitative forecasting. Expert opinions carry a lot of weight in how invested parties may shift or maneuver within the industry. If a new product set to release next quarter is given that "game changer" label, competing businesses may jump-start product development for their competing product. Qualitative techniques are important for helping executives make decisions for a company. Performing qualitative forecasting can inform decisions like how much inventory to keep, whether a company should hire new staff members and how they can adjust their sales operations. It is also crucial for developing projects like marketing campaigns, as it can provide information about a company's service that can highlight which elements of the business to feature in advertisements. Some benefits of these techniques include the flexibility to use sources other than numerical data, the ability to predict future trends and phenomena in business and the use of information from experts within a company's industry.

Let us discuss different types of qualitative methods:

A) SURVEY TECHNIQUES

Survey techniques are the most commonly used technique of forecasting demand in the short run. This technique relies on the future purchase plans of consumers and their intentions to anticipate demand. Thus, in this method, an organisation conducts surveys with consumers to determine the demand for their existing products and services and anticipate the future demand accordingly. The two types of survey technique are explained as follows:

- i) Complete enumeration survey:** This method is also referred to as the census method of demand forecasting. In this technique, almost all potential users of the product are contacted and surveyed about their purchasing plans. Based on these surveys, demand forecasts are made. The aggregate demand forecasts are attained by totaling the probable demands of all individual consumers in the market.
- ii) Sample survey:** A survey is a general term that refers to the collection of data by means of interviews, questionnaires, or observations. A sample survey is a study involving a subset (or sample) of individuals selected from a larger population by accepted statistical methods. In this method, only a few potential consumers (called sample) are selected from the market and surveyed. In this technique, the average demand is calculated based on the information gathered from the sample.

(B) OPINION POLLS

Opinion poll methods involve taking the opinion of those who possess knowledge of market trends, such as sales representatives, marketing experts, and consultants.

The most commonly used opinion polls methods are explained as follows:

- i) Expert opinion technique :** In this method, sales representatives of different organisations get in touch with consumers in specific areas. They gather information related to consumers' buying behaviour, their reactions and responses to market changes, their opinion about new products, etc. It can also be a treasure trove of qualitative insight useful in preparing sales forecasts. Industry analysts, academics, and tastemakers with their fingers on the pulse of a company's target market can offer perspectives that internal teams lack on what the competition is up to, how macroeconomic movements may impact buyer behavior, and other short-term trends. Sellers can access these opinions in the public sphere by staying up-to-date with industry publications, or they could invite experts to conduct market research or present their findings to sellers and other leadership within the company.
- ii) Delphi technique :** In this technique , market experts are provided with the estimates and assumptions of forecasts made by other experts in the industry. Experts may reconsider and revise their own estimates and assumptions based on the information provided by other experts. This method is almost like the Supreme Court of qualitative forecasting; experts work together to make informed predictions about future outcomes. The Delphi technique typically involves multiple rounds: Each round ends with a peer review of the questionnaire results and then an open discussion so the experts can entertain unique considerations and little-known information. The goal for the Delphi technique is to draw consensus among the experts and build a forecast based on that.

iii) Market studies and experiments: This technique is also referred to as market experiment technique. In this technique, organisations initially select certain aspects of a market such as population, income levels, cultural and social background, occupational distribution, and consumers' tastes and preferences. When forecasting for customer demand, the opinions of past, present, and prospective clients can tell a business everything it needs to know about what's coming down the pipeline. Collecting data and feedback from those customer touchpoints, such as social media and customer service departments, could produce important insights into the customer experience and their wants and needs.

Among all these aspects, one aspect is selected and its effect on demand is determined while keeping all other aspects constant.

10.3.2 QUANTITATIVE TECHNIQUES

Quantitative techniques for demand forecasting usually make use of statistical tools. In these techniques, demand is forecasted based on historical data. These techniques are generally used to make long-term forecasts of demand. Unlike survey technique, statistical methods are cost effective and reliable as the element of subjectivity is minimum in these techniques. Quantitative techniques focus on hard data instead of focus on group to predict sales for the accounting tool. When looking at quantitative forecasting technique, it is important to make sure that the technique selected is actually based on data, such as historical sales numbers or economic indicators, not human instinct. It includes using simple math, advanced formulas, and statistical analysis to get an idea of future sales. Quantitative techniques must have high reliability so

that other researchers have the ability to replicate the studies with the previous data collection or a similar one and check the validity of the results. They must also follow a carefully constructed research design that eliminates the possibility of contamination from outside factors that potentially affect the phenomenon under investigation. Valid results mean that researchers have the ability to see causation or predict future results of the phenomenon.

Let us discuss different types of quantitative technique :

(A) TIME SERIES ANALYSIS

Time series analysis or trend projection method is one of the most popular technique used by organisations for the prediction of demand in the long run. The term time series refers to a sequential order of values of a variable (called trend) at equal time intervals. Using trends, an organisation can predict the demand for its products and services for the projected time. There are four main components of time series analysis that an organisation must take into consideration while forecasting the demand for its products and services. These components are:

- i) Trend component:** The trend component in time series analysis accounts for the gradual shift in the time series to a relatively higher or lower value over a long period of time.
- ii) Cyclical component:** The cyclical component in time series analysis accounts for the regular pattern of sequences of values above and below the trend line lasting more than one year.

- iii) **Seasonal component:** The seasonal component in time series analysis accounts for regular patterns of variability within certain time periods, such as a year.
- iv) **Irregular component:** The irregular component in time series analysis accounts for a short term, unanticipated and non-recurring factors that affect the values of the time series.

B) SMOOTHING TECHNIQUES

In cases where the time series lacks significant trends, smoothing techniques can be used for demand forecasting. Smoothing techniques are used to eliminate a random variation from the historical demand. This helps in identifying demand patterns and demand levels that can be used to estimate future demand. The most common technique used in smoothing techniques of demand forecasting are simple moving average method and weighted moving average technique .

The simple moving average technique is used to calculate the mean of average prices over a period of time and plot these mean prices on a graph which acts as a scale. For example, a five-day simple moving average is the sum of values of all five days divided by five.

The weighted moving average technique uses a predefined number of time periods to calculate the average, all of which have the same importance. For example, in a four-month moving average, each month represents 25% of the moving average.

C) BAROMETRIC TECHNIQUE

Barometric methods are used to speculate the future trends based on current

developments. This method is also referred to as the leading indicators approach to demand forecasting. Many economists use barometric methods to forecast trends in business activities. The basic approach followed in barometric methods of demand analysis is to prepare an index of relevant economic indicators and forecast future trends based on the movements shown in the index.

The barometric techniques make use of the following indicators:

- i) **Leading indicators:** When an event that has already occurred is considered to predict the future event, the past event would act as a leading indicator.

For example, the data relating to working women would act as a leading indicator for the demand of working women hostels.

- ii) **Coincident indicators:** These indicators move simultaneously with the current event.

For example, a number of employees in the non-agricultural sector, rate of unemployment, per capita income, etc., act as indicators for the current state of a nation's economy.

- iii) **Lagging indicators:** These indicators include events that follow a change. Lagging indicators are critical to interpret how the economy would shape up in the future. These indicators are useful in predicting the future economic events.

For example, inflation, unemployment levels, etc. are the indicators of the performance of a country's economy.

D) **ECONOMETRIC TECHNIQUES**

Econometric methods make use of statistical tools combined with economic theories to assess various economic variables (for example, price change, income level of consumers, changes in economic policies, and so on) for forecasting demand. The forecasts made using econometric methods are much more reliable than any other demand forecasting method. An econometric model for demand forecasting could be single equation regression analysis or a system of simultaneous equations.

- i) **Regression Analysis:** The regression analysis method for demand forecasting measures the relationship between two variables. Using regression analysis, a relationship is established between the dependent (quantity demanded) and independent variable (income of the consumer, price of related goods, advertisements, etc.).

For example, regression analysis may be used to establish a relationship between the income of consumers and their demand for a luxury product. In other words, regression analysis is a statistical tool to estimate the unknown value of a variable when the value of the other variable is known. After establishing the relationship, the regression equation is derived assuming the relationship between variables is linear.

The formula for a simple linear regression is as follows:

$$Y = a + bX$$

Where Y is the dependent variable for which the demand needs to be forecasted; b is the slope of the regression curve; X is the independent variable;

and a is the Y-intercept. The intercept a will be equal to Y if the value of X is zero.

10.4 SIGNIFICANCE OF FORECASTING TECHNIQUES

Forecasting helps decision making by informing how many units need to be ordered, preventing companies from spending money on inventory that won't sell. It is a powerful tool for businesses that are expanding into new territories, new products and demand fluctuations. There are many reasons why demand forecasting techniques are important for companies:

1. Businesses have information to assist with planning, goal setting, and budgeting. With a good understanding of what your future sales may look like, it's possible to build and inform procurement strategy to ensure your supply matches customer demand, at the specific product level.
2. Organisations can more effectively optimize their inventory levels, increase inventory turnover rate, and reduce holding costs.
3. Businesses are able to identify and rectify any issues in the sales pipeline ahead of time to keep business performance steady throughout the entire period. In terms of inventory management, most e-commerce business owners know that too little or too much inventory can be detrimental to operations.
4. They provide insight into your upcoming cash flow so businesses can more accurately budget payments for suppliers and other operational costs, while still investing in the growth of the business.
5. Helps in knowing when to increase staff and allocate other resources to ensure operations run smoothly during peak activity periods.

10.5 SUMMARY

Forecasting attempts to predict the future. There are several methods available for forecasting and they all fall into two general categories. These are called “quantitative” and “qualitative.” The choice of technique for a forecast depends on the purpose of the forecast. This lesson helps in understanding various techniques of forecasting that are used in business organisations for the better results how different methods would be used to predict demand for a product, and thus plan production capacity, to those that would be used for setting policies of a political party. Whatever method you use, you will need to base the forecast on source data. One can easily able to know that demand forecasting is a great way to anticipate what customers want from your business in the future so that you can adequately prepare inventory and resources to meet that demand. By improving demand forecasting and optimizing your supply chain, you can effectively increase profits and mitigate unnecessary costs. Establishing this system improve your inventory flow and give you the resources needed to bring your ecommerce business to the next level. Forecasting demand allows you to cut down on holding costs and other operational expenses when they’re not needed while assuring you have everything you need to handle peak periods as they occur. When demand forecasting is correctly implemented, businesses have valuable information about their potential in the current market as well as other markets so managers can make informed decisions about business growth strategies, pricing, and Market potential. Failing to use demand forecasting puts businesses at risk for making poor decisions about their target markets and products. These ill-informed decisions can have far reaching effects on customer satisfaction, supply chain management, inventory holding cost, and ultimately profitability.

10.6 GLOSSARY

- Regression: A measure of the relation between the mean value of one variable and corresponding values of other variables.
- Sample: It means a small manageable group of individuals (it can be humans, animals, products and industries) which shows full characteristics of whole population.
- Opinion: An opinion is a judgement, viewpoint, or statement that is not conclusive, rather than facts, which are true statements.

10.7 SELF-ASSESSMENT QUESTIONS

Q1. What are the various techniques of demand forecasting?

Q2. How qualitative techniques are different from the quantitative techniques?

Q3. Write short note on:

(a) Barometric Methods

(b) Econometric Methods

10.8 SUGGESTED READINGS

- D N Dwivedi, *Managerial Economics*, 8th ed, Vikas Publishing House
- www.geektonight.com/methods-of-demand-forecasting-techniques
- *Forecasting: Methods and Applications* by Rob J Hyndman
- *Demand forecasting Methods* by Babasab Patil

PRODUCTION THEORY AND PRODUCTION FUNCTION

STRUCTURE

11.1 Introduction

11.2 Objectives

11.3 Production Theory

11.4 Production Function

11.4.1 Features of Production Function

11.5 Production with one and two variable inputs

11.5.1 Production Functions with One Variable Input

11.5.2 Production Functions with Two Variable Input

11.5 Summary

11.6 Glossary

11.7 Self Assessment questions

11.8 Lesson end Exercise

11.9 Suggested Readings

11.1 INTRODUCTION

Production is the process of combining various material inputs and immaterial inputs (plans, know-how) in order to make something for consumption (output). It is the act of creating an output, a good or service which has value and contributes to the utility of individuals. The area of economics that focuses on production is referred to as production theory, which is intertwined with the consumption (or consumer) theory of economics.

The production process and output directly result from productively utilizing the original inputs (or factors of production), known as primary producer goods or services, land, labour, and capital are deemed the three fundamental production factors. These primary inputs are not significantly altered in the output process, nor do they become a whole component in the product. Under classical economics, materials and energy are categorized as secondary factors as they are bi-products of land, labour and capital. Further, primary factors encompass all of the resourcing involves, such as land, which includes the natural resources above and below the soil. However, there is a difference in human capital and labour. In addition to the common factors of production, in different economic schools of thought, entrepreneurship and technology are sometimes considered evolved factors in production. It is common practice that several forms of controllable inputs are used to achieve the output of a product. The production function assesses the relationship between the inputs and the quantity of output.

The Production function signifies a technical relationship between the physical inputs and physical outputs of the firm, for a given state of the technology.

11.2 OBJECTIVES

After reading this lesson, you will be able to understand the concepts of the following:

- Production theory
- Production function
- Production with one and two variable inputs

11.3 PRODUCTION THEORY

In economics, production theory explains the principles in which the business has to take decisions on how much of each commodity it sells and how much it produces and also how much of raw material i.e., fixed capital and labor it employs and how much it will use. It defines the relationships between the prices of the commodities and productive factors on one hand and the quantities of these commodities and productive factors that are produced on the other hand.

Production is a process of combining various inputs to produce an output for consumption. It is the act of creating output in the form of a commodity or a service which contributes to the utility of individuals. In other words, it is a process in which the inputs are converted into outputs.

11.4 PRODUCTION FUNCTION

Production Function describes the technological relationship between inputs and outputs. It is a tool that analysis the qualitative input - output relationship and also represents the technology of a firm or the economy as a whole. In simple words, production function refers to the functional relationship between the quantity of a good produced (output) and factors of production (inputs). In this way, production function reflects how much output we can expect if we have so much of labour and

so much of capital as well as of labour etc. In other words, we can say that production function is an indicator of the physical relationship between the inputs and output of a firm. The reason behind physical relationship is that money prices do not appear in it. However, here one thing that becomes most important to quote is that like demand function a production function is for a definite period.

It shows the flow of inputs resulting into a flow of output during some time. The production function of a firm depends on the state of technology. With every development in technology the production function of the firm undergoes a change. The new production function brought about by developing technology displays same inputs and more output or the same output with lesser inputs. Sometimes a new production function of the firm may be adverse as it takes more inputs to produce the same output. Mathematically, such a basic relationship between inputs and outputs may be expressed as:

$$Q = f(L, C, N)$$

Where Q = Quantity of output

L = Labour

C = Capital

N = Land.

Hence, the level of output (Q), depends on the quantities of different inputs (L, C, N) available to the firm. In the simplest case, where there are only two inputs, labour (L) and capital (C) and one output (Q), the production function becomes.

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

Definitions:

"The production function is a technical or engineering relation between input and output. As long as the natural laws of technology remain unchanged, the production function remains unchanged." Prof. L.R. Klein.

"Production function is the relationship between inputs of productive services per unit of time and outputs of product per unit of time." Prof. George J. Stigler

"The relationship between inputs and outputs is summarized in what is called the production function. This is a technological relation showing for a given state of technological knowledge how much can be produced with given amounts of inputs." - Prof. Richard J. Lipsey "The production function is purely a technical relation which connects factor inputs and output."

Prof. Koutsoyiannis defined production function as "the relation between a firm's physical production (output) and the material factors of production (inputs)." Prof. Watson.

Thus, from the above definitions, we can conclude that production function shows for a given state of technological knowledge, the relation between physical quantities of inputs and outputs achieved per period of time. To produce these goods the basic inputs are classified into two divisions -

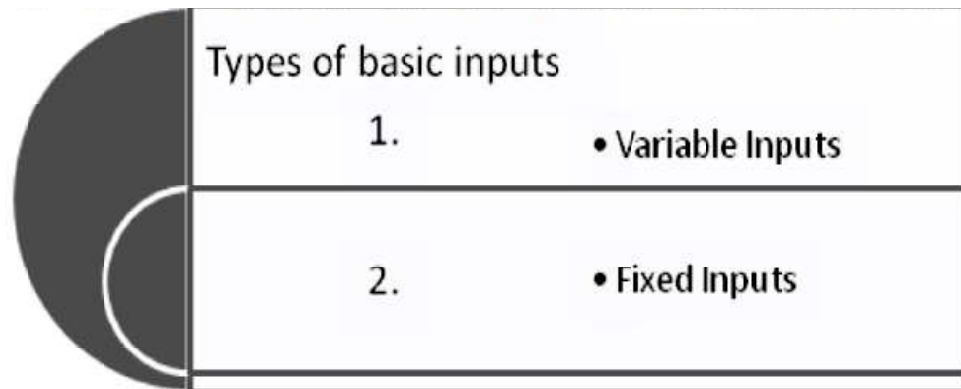


Figure No. 11.1

Variable Inputs: Inputs those change or are variable in the short run or long run are variable inputs.

Fixed Inputs: Inputs that remain constant in the short term are fixed inputs.

Cost function defined as the relationship between the cost of the product and the output.

Cost function is divided into two types :-

1. Short Run Cost

Short run cost is an analysis in which few factors are constant which won't change during the period of analysis. The output can be changed i.e., increased or decreased in the short run by changing the variable factors.

Following are the basic three types of short run cost

Table 11.1

Short Run Fixed Cost	Variable Cost	Short Run Total Cost
<ul style="list-style-type: none"> Fixed cost is a cost which won't change with the changes in the output. For example Building, rent, Insurance etc 	<ul style="list-style-type: none"> Variable cost is the cost which changes with the change in the output. For example cost of raw material, wages, electricity, telephone charges etc. 	<ul style="list-style-type: none"> The total actual cost that is supposed to be incurred to produce a given output is short run total cost. Total cost= Total Fixed Cost + Total Variable cost

2. Long Run Cost

Long-run cost is variable and a firm adjusts all its inputs to make sure that its cost of production is as low as possible.

Long run cost = Long run variable cost

In the long run, firms don't have the liberty to reach equilibrium between supply and demand by altering the levels of production. They can only expand or reduce the production capacity as per the profits. In the long run, a firm can choose any amount of fixed costs it wants to make short run decisions. Production is the result of co-operation of four factors of production viz., land, labour, capital and organization. This is evident from the fact that no single commodity can be produced without the help of any one of these four factors of production. Therefore, the producer combines all the four factors of production in a technical proportion. The aim of the producer is to maximize his profit. For this sake, he decides to maximize the production at minimum cost by means of the best combination of factors of production. The producer secures the best combination by applying the principles of equi-marginal returns and substitution. According to the principle of equi-marginal returns, any producer can have maximum production only when the marginal returns of all the factors of production are equal to one another. For instance, when the marginal product of the land is equal to that of labour, capital and organisation, the production becomes maximum.

11.4.1 Features of Production Function

Following are the main features of production function

1. Substitutability

The factors of production or inputs are substitutes of one another which make it possible to vary the total output by changing the quantity of one or a few inputs, while the quantities of all other inputs are held constant. It is the substitutability of the factors of production that gives rise to the laws of variable proportions.

2. Complementarily

The factors of production are also complementary to one another, that is, the two or more inputs are to be used together as nothing will be produced if the quantity of either of the inputs used in the production process is zero. The principles of returns to scale is another manifestation of complementarily of inputs as it reveals that the quantity of all inputs are to be increased simultaneously in order to attain a higher scale of total output.

3. Specificity

It reveals that the inputs are specific to the production of a particular product. Machines and equipment's, specialized workers and raw materials are a few examples of the specificity of factors of production. The specificity may not be complete as factors may be used for production of other commodities too. This reveals that in the production process none of the factors can be ignored and in some cases ignorance to even slightest extent is not possible if the factors are perfectly specific. Production involves time hence, the way the inputs are combined is determined to a large extent by the time period under consideration. The greater the time period, the greater the freedom the producer has to vary the quantities of various inputs used in the production process. In the production function, variation in total output by varying the quantities of all inputs is possible only in the long run whereas the variation in total output by varying the quantity of single input may be possible even in the short run.

11.5 PRODUCTION WITH ONE AND TWO VARIABLE INPUTS

In economic theory, we are concerned with three types of production functions, viz.:-

1. Production Functions with One Variable Input
2. Production Function with Two Variable Inputs
3. Production Function with all Variable Inputs.

But here we are going to discuss the first two only

11.5.1 Type 1 Production Functions with One Variable Input

If one input is variable and all other inputs are fixed, the firm's production function exhibits **the law of variable proportions**. If the number of units of a variable input is increased, keeping other inputs constant, how output changes is the concern of this law. Suppose land, plant, and equipment are the fixed factors, and labor the variable factor. When the number of laborers is increased successively to have larger output, the proportion between fixed and variable factors is altered and the law of variable proportions sets in.

The law states that as the quantity of a variable input is increased by equal doses, keeping the quantities of other inputs constant, total product will increase, but after a point, at a diminishing rate. This principle can also be defined thus - When more and more units of the variable factor are used, holding the quantities of fixed factors constant, a point is reached beyond which the marginal product, then the average, and finally the total product will diminish.

The law of variable proportions (or the law of non-proportional returns) is also known as the law of diminishing returns. But, as we shall see below, the law of diminishing returns is only one phase of the more comprehensive law of variable proportions.

Let us illustrate the law with the help of Table 11.2, where on the fixed input land

of 4 acres, units of the variable factor labor are employed and the resultant output is obtained.

Table 11.2 Output of wheat in physical units from 4 acres of land

No. of workers	Total product	Average product	Marginal product	
1	8	8	8	Stage I
2	20	10	12	
3	36	12	16	
4	48	12	12	Stage II
5	55	11	7	
6	60	10	5	
7	60	8.6	0	Stage III
8	56	7	-4	

An analysis of Table 11.2 shows that the total, average, and marginal products increase at first, reach a maximum when seven units of labor are used and then it declines. The average product continues to rise till the fourth unit while the marginal product reaches its maximum at the third unit of labor, then they also fall.

The marginal product starts declining first, then the average product, and finally the total product. It should be noted that the point of falling output is not the same for total, average, and marginal product. This observation points out that the tendency to diminishing returns is ultimately found in the three productivity concepts.

In between Stages I and III is the most important stage of production that of **the law of diminishing returns**. Stage II starts when the average product is at its maximum to the zero point of the marginal product. At the latter point, the total product is the highest.

For example land is scarce and is used intensively. More and more workers are employed in order to have a larger output. Thus, the total product increases at a

diminishing rate and the average and marginal products decline. Throughout this stage, the marginal product is below the average product. This is the only stage in which production is feasible and profitable.

The law of diminishing returns is based on the following assumptions:

1. It is possible to vary the proportions in which the various productive services (inputs) are combined.
2. Only one input is variable while others are held constant.
3. All units of the variable inputs are homogeneous.
4. There is no change in technology. If the technique of production undergoes a change, the product curves will be shifted accordingly but the law will ultimately operate.
5. It assumes a short-run situation, for in the long-run all productive services are variable.
6. The product is measured in physical units, i.e., in quintals, tonnes, etc. The use of money in measuring the product may show increasing rather than decreasing returns if the price of the product rises, even though the output may have declined.

Marshall applied the operation of the law to agriculture, mining, forests, fisheries, and the building industry.

The last segment of the theory of production is the problem of determining **the least- cost combination** of factors for a given output. The aim of every producer is to get maximum profits, and to achieve this he combines the various resources in such a proportion that a given output is manufactured at the least cost.

This problem is similar to the problem faced by the consumer who allocates his money income among several commodities for obtaining maximum satisfaction. The consumer is in equilibrium when the marginal utilities and the price ratios of the goods bought become equal.

To achieve this equilibrium position, the consumer acts on the principle of substitution. Similarly, the producer will be in equilibrium when the marginal productivities of the various factor units employed by him are equal to their prices. To achieve the least-cost combination of a given output, he substitutes a cheap input for a costly input.

If he finds that the marginal product of a rupee's worth of factor A is greater than that of factor B, he will spend less on B and more on A. He will continue to spend like this with the consequence that the marginal product of a rupee's worth of factor B will steadily rise, while that of factor A will fall, until the least-cost combination is achieved.

Suppose that a producer uses three inputs A, B, and C in the production of commodity X. The price of A is Rs.3 per unit, of B Rs.2 per unit, and of C Rs.1 per unit. The cost outlay on the three factors is Rs.61 per day. The daily marginal productivities of the different units of these factors resources are shown in Table 11.3.

(1)Factor A (Units)	(2)MP (Units of X)	(3)Factor B(Units)	(4)MP (Units of X)	(5)Factor C(Units)	(6)MP (Units of X)
6	15	8	12	9	10
7	14	9	11	10	9
8	12	10	9	11	7
9	9	11	6	12	3
10	5	12	2	13	1
11	0	13	0	14	0

Table 11.3 Daily Marginal Productivity

The price (P_a) of A being Rs.3 per unit, of B (P_b) Rs.2 per unit, and that of C (P_c) Rs.1 per unit, in equilibrium the marginal product of A ($M P_a$) should be 1.5 of B ($M P_b$) and twice that of C ($M P_c$). When the consumer continues to use more units of factors A, B, and C to produce a fixed quantity of X (columns 1, 3, 5 of the table, their marginal productivities continue to decline (columns 2, 4, 6).

Ultimately, the equilibrium position is reached when the marginal productivity of factor A ($M P_b^{1/2} = 6$) and the marginal productivity of B is twice that of C ($M P_c = 3$). This position is attained at 9 units of A, 11 units of B, and 12 units of C, where the marginal product per rupee's worth of each input is equalized.

The principle of least-cost combination also implies that each factor unit will be so employed as to equate its marginal product per rupee's worth in every use or occupation. If the marginal product of labor is greater in cotton textile industry than in the jute industry, labor will move from the latter to the former till marginal productivity of labor becomes equal in both the industries. Equality between different units of capital, labor, etc., is also established in a similar manner.

Assumptions:

The analysis given above is based on the following assumptions:

1. There is perfect competition in the factor market.
2. There is perfect mobility of factor units.
3. The prices of factor services are given and constant.
4. The marginal productivity of each factor is independent of the other.

To conclude, the principle of least-cost combination is an important tool in

production theory. It points out that the efficient combination of variable factors which the producer should use depends upon the marginal productivities and prices of the respective factors.

Types 2 Production Function with Two Variable Inputs:

To understand a production function with two variable inputs, it is necessary to explain what an isoquant is. An isoquant is also known as Iso-product curve or equal-product curve or a production-indifference curve. These curves show the various combinations of two variable inputs resulting in the same level of output. Table 11.4 shows how different pairs of labor and capital result in the same output.

Labor (units)	Capital (units)	Output (units)
1	5	10
2	3	10
3	2	10
4	1	10
5	0	10

Table 11.4 Production function with two variable Inputs

It will be seen that output is the same either by employing $4L + 1C$ or by $5L + 0C$ (and so on). This relationship, when shown graphically, results in an isoquant.

Thus, by graphing a production function with two variable inputs, one can derive the isoquant tracing all the combinations of the two factors of production that yield the same output. An isoquant is defined as the curve passing through the plotted points representing all the combinations of the two factors of production which will produce a given output.

Substitutability of Input:

An important assumption in the isoquant diagram is that the inputs can be substituted for each other. Let us take a particular combination of X and Y resulting in an output Q 600, one finds other quantities of the inputs resulting in the same output. Let us suppose that X represents labor and Y, machinery. If the quantity of the labor (X) is reduced, the quantity of machinery (Y) must be increased in order to produce the same output.

Marginal Rate of Technical Substitution (MRTS) :

The slope of the isoquant has a technical name- Marginal Rate of Technical Substitution (MRTS), or sometimes, the marginal rate of substitution in production. Thus, in terms of inputs of capital services K and labor L.

(MRTS is similar to MRS, i.e., Marginal Rate of Substitution, which is the slope of an indifference curve.)

11.5 SUMMARY

Production is the process of combining various material inputs and immaterial inputs (plans, know-how) in order to make something for consumption (output). The production process and output directly result from productively utilizing the original inputs (or factors of production). The production function assesses the relationship between the inputs and the quantity of output.

11.6 GLOSSARY

- Consumption : An amount of something which is used up or ingested.
- Productive : Achieving a significant amount or result.
- Average : Constituting the result obtained by adding together several amounts and then dividing this total by the number of amounts.

- Marginal products : Change in total output as one additional unit of input is added to production

11.7 SELF ASSESSMENT QUESTIONS

Q1. What is production function?

Q2. Explain the relationship between input and output of production process.

Q3. Explain the difference between short run and long run cost.

Q4. Explain the production Functions with One Variable Input.

Q5. Explain the production Functions with two Variable Input.

11.8 LESSON END EXERCISE

Q1. Explain in detail the different forms of short run cost.

Q2. Briefly define the features of the production function.

Q3. Explain in detail the production Functions with one and two Variable Input

11.9 SUGGESTED READINGS

- Production Function Type: 3 Main Types of Production Functions | Managerial Economics (microeconomicsnotes.com)
- Production Function: Meaning, Definitions and Features (economicsdiscussion.net)
- Theory of Production (tutorialspoint.com)
- Ahuja, H.L *Managerial economics*, S Chand Company, Delhi
- Dwivedi D.N *Managerial Economics*, Vikas Publishing House, Delhi
- Chopra O.P *Managerial Economics*, Tata McGraw Hill, Delhi

STAGES OF PRODUCTION

STRUCTURE

12.1 Introduction

12.2 Objectives

12.3 Stages of Production

12.4 Economies of Scale

12.4.1 Types of Economies of Scale

12.5 Summary

12.6 Glossary

12.7 Self Assessment questions

12.8 Lesson end Exercise

12.9 Suggested Readings

12.1 INTRODUCTION

When a manufacturing company begins production of a new material, it has a choice to select the manufacturing process it uses. The type of process depends on the facility, the staff, and the information systems available. Each process has its advantages and When the decision is being considered about which manufacturing process to use, there are a number of questions that should be asked; what are the volumes to be produced,? what are the requirements to make the product,? and does the company manufacture a similar product?

There are a number of basic manufacturing processes that they can select from production line, continuous flow, custom manufacturing, and fixed position manufacturing.

12.2 OBJECTIVES

After studying this lesson, you shall be able to understand the concepts of the following:

- Stages of production
- Economies of scale
- Types of economic of scale

12.3 STAGES OF PRODUCTION

Before understanding the three stages of production, it is integral to analyze the three product curves involved in economic production. The three curves are known as:

1. The average product curve- it details about the quantity of the total output produced per unit of a variable input (hours of labor may be termed as

variable input).

2. The marginal product curve- it has varied characteristics because it measures the change which is obtained in the output with every unit of variable input.
3. The total product curve- it reflects the overall production of a firm on the basis of above two curves.

For example, based on an overall number of employees, when the average curve depicts the number of units produces the number of additional units produced with every addition of employees will be shown by the marginal curve.

For a simplified interpretation of production function it is divided into three simple stages.

Stage 1: Stage one is the period of most growth in a company's production. In this period, each additional variable input will produce more products. This signifies an increasing marginal return; the investment on the variable input outweighs the cost of producing an additional product at an increasing rate. As an example, if one employee produces five cans by himself, two employees may produce 15 cans between the two of them. All three curves are increasing and positive in this stage.

Stage 2: Stage two is the period where marginal returns start to decrease. The output increases at a decreasing rate, and the average and marginal physical product are declining. In other words we can say that each additional variable input will still produce additional units but at a decreasing rate due to the law of diminishing returns. However, the average product of fixed inputs (not shown) is still rising, because output is rising while fixed input usage is constant. In this stage, the employment of additional variable inputs increases the output per unit of fixed input but decreases the output per unit of the variable input. For example, if a previous employee added nine more cans to production, the next employee may only add eight more cans to production. The total product curve is still rising in this stage, while the average and marginal curves both start to drop. The optimum input/output combination for the price-taking firm will be in stage 2, although a firm facing a

downward-sloped demand curve might find it most profitable to operate in Stage 1. **Stage 3:** In stage three, marginal returns start to become negative. Adding more variable inputs becomes counterproductive; an additional source of labor will lessen overall production. For example, hiring an additional employee to produce cans will actually result in fewer cans produced overall. This may be due to factors such as labor capacity and efficiency limitations. In this stage, the total product curve starts to trend down, the average product curve continues its descent and the marginal curve becomes negative. In Stage 3, too much variable input are being used relative to the available fixed inputs: variable inputs are over-utilized in the sense that their presence on the margin obstructs the production process rather than enhancing it. The output per unit of both the fixed and the variable input declines throughout this stage. At the boundary between stage 2 and stage 3, the highest possible output is being obtained from the fixed input. (Kung, 2014).

No. of workers (N)	Total product (TP _L) (tonnes)	Marginal Product (MP _L)	Average Product (AP _L)	Stage of production
(1)	(2)	(3)	(4)	(5)
1	24	24	24	I (Increasing and constant returns)
2	72	48	36	
3	138	66	46	
4	216	78	54	
5	300	84	60	
6	384	84	64	
7	462	78	66	II Diminishing returns
8	528	66	66	
9	576	48	64	
10	600	24	60	
11	594	-6	54	III Negative returns
12	552	-42	46	

Table 12.1

be clearly understood with the help of a numerical explanation given in Table 12.1 Average Physical Product under different stages of production is briefly explained in Table 12.2.

Total Physical Product	Marginal Physical Product	Average Physical Product
Stage 1 : Increases at an increasing rate	increases, reaches its maximum & then declines till, $MR=AP$	increases & reaches its maximum
Stage 2 : Increases at a diminishing rate till it reaches maximum	is diminishing and becomes equal to zero	starts diminishing
Stage 3 Starts declining	becomes negative	continues to decline

Table 12.2

In stage 1, it is profitable for the firm to keep on increasing the use of labour. From the above table only stage 2 is rational which means relevant range for a rational firm to operate. In stage 3, MP is negative and hence it is inadvisable to use additional labour. To understand the three stages of the production process let's take example where we can differentiate all the stages based on the output received from the input provided as follows:

Talking about the total production that is increasing at an initial stage, then after become constant after a specific period of time and then after starts declining. This is clearly observed in Table 12.3.

Number of Mechanics	Total Output
0	0
1	100
2	250
3	360
4	440
5	500
6	550
7	550
8	540

Table 12.3

12.4 ECONOMIES OF SCALE

Economies of scale are cost reductions that occur when companies increase production. The fixed costs, like administration, are spread over more units of production. Sometimes, a company that enjoys economies of scale can negotiate to lower its variable costs, as well. Any time a company can decrease costs by increasing the volume of goods they produce, that's an example of an economy of scale. There are several reasons why the costs of production would decrease as volume increases. For example, by keeping a production line focused on one product, companies may save on the costs associated with swapping out raw materials and tools to produce different products. The most basic examples are managerial and administrative costs you don't have to hire more managers just because your workers start producing more items per day. Along with studying the economies of scale, it is also noteworthy to understand the concept of diseconomies of scale. Sometimes a company chases economies of scale so much that it becomes too large. This overgrowth is called a diseconomy of scale. There comes a point at which maximum

efficiency has been reached. Any units produced after that will increase production costs per unit, rather than decrease them. Diseconomies of scale aren't always tied to physical production efficiencies. For example, it might take longer to make decisions, making the company less flexible. Miscommunication could occur, especially if the company becomes global. Acquiring new companies could result in a clash of corporate cultures. This clash will slow progress if they don't learn to manage cultural diversity.

The specific way an economy of scale works depends on the goods or services being produced. It may be as simple as extending operating hours to get more use out of expensive machinery. Any way that a company can improve the per-unit cost by producing more units, that is how economies of scale work. Economies of scale not only benefit the organization that produces the goods. Consumers can enjoy lower prices. The economy grows as lower prices stimulate increased demand. Economies of scale also give a competitive advantage to large entities over smaller ones. The larger the business, non-profit, or government, the lower its per-unit costs. Think of it like how larger families typically buy in bulk. Each box of detergent costs less per wash because you can buy it in bulk. The manufacturer saves on packaging and distribution. It then passes the savings onto you. You also save on travel costs by making fewer trips to the store. Governments and non-profits can also benefit from economies of scale. These benefits occur whenever an entity produces more, becomes more efficient, and lowers costs as a result.

Economies of Scope

Economies of scope are similar to economies of scale, but they occur when a company branches out into multiple product lines to combine efficiencies and business functions. For example, most newspapers diversified into similar product lines, such as magazines and online news. In other words, economies of scale focus on one product (volume), while economies of scope involve many products (variety).

12.4.1 Types of Economies of Scale:

Types of economies of scale are classified into different categories explained below:

i) Internal economies of scale :

There are two main types of economies of scale i.e. internal and external. Internal economies are controllable by management because they are internal to the company. External economies depend upon external factors. These factors include the industry, geographic location, or government. Internal economies result from a larger volume of production. There are five types of internal economies of scale. You'll typically see them in large organizations. For example, large companies can buy in bulk. This economy lowers the cost per unit of the materials they need to make their products. They can use the savings to increase profits. Or they can pass the savings to consumers and compete on price.

ii) Technical economies of scale

Technical economies of scale result from efficiencies in the production process itself. Manufacturing costs fall 70% to 90% every time the business doubles its output.³ Larger companies can take advantage of more efficient equipment. For example, data mining software allows the firm to target profitable market niches. Large shipping companies cut costs by using super-tankers. Finally, large companies achieve technical economies of scale because they learn by doing. They're far ahead of their smaller competition on the learning curve.

iii) Monopoly Power

Monopoly power is when a company buys so much of a product that it can reduce its per-unit costs. For example, Wal-Mart can undercut smaller competitors by wielding its huge buying power.

iv) Managerial Economies of Scale

Managerial economies of scale occur when large firms can afford specialists. They more effectively manage particular areas of the company. For example, a seasoned sales executive has the skill and experience to take care of big orders. They demand a high salary, but they're worth it.

v) Financial Economies of Scale

Financial economies of scale mean the company has cheaper access to capital. A larger company can get funded from the stock market with an initial public offering. Big firms have higher credit ratings and can offer lower interest rates on their bonds.

vi) Network Economies of Scale

Network economies of scale occur primarily in online businesses. It costs almost nothing to support each additional online customer with existing digital infrastructure. So, any revenue from the new customer is all profit for the business.

vii) External Economies of Scale

A company has external economies of scale if its size creates preferential treatment. That most often occurs with governments. For example, a state often reduces taxes to attract the companies that provide the most jobs. Big real estate developers convince cities to build roads to support their buildings, and this saves developers on those infrastructure costs. Large companies can also take advantage of joint research with universities to reduce research expenses. Small companies don't have the leverage to benefit from external economies of scale, but they can band together. Small companies can cluster similar businesses in a small area. That allows them to take advantage of geographic economies of scale. For example, artist lofts, galleries,

and restaurants benefit by being together in a downtown art district.

Important Points

- Economies of scale occur when a company's production increases in a way that reduces per-unit costs.
- Internal economies of scale can result from technical improvements, managerial efficiency, financial ability, monopony power, or access to large networks.
- External economies of scale are ones in which companies can influence economic priorities, often leading to preferential treatment by governments.
- Diseconomies of scale can occur when a company increases production past the peak level of efficiency and the per-unit costs begin increasing.

12.5 SUMMARY

The type of process depends on the facility, the staff, and the information systems available. Each process has its advantages and some are best at certain tasks, for example, large batches of finished goods, or small numbers of custom items. To understand the stages of production, it is integral to analyze the three product curves involved in economic production.

12.6 GLOSSARY

- Product curve : Represents the total amount of output that a firm can produce with a given amount of labor.
- Optimum : Most conducive to a favourable outcome
- Diminishing : Make or become less

- Production : The creation of utility or the creation of wants - satisfying goods' and services.

12.7 SELF ASSESSMENT QUESTIONS

Q1. Briefly explain the different stages of production.

Q2. What do you mean by economies of scale?

Q3. How to Make Economies of Scale Work for You?

Q4. Explain in detail the different types of Economies of Scale

12.8 LESSON END EXERCISE

Q1. Explain in detail the economies of scale with suitable examples.

Q2. What do you mean by diseconomies of scale?

Q3. What do you mean by Technical Economies of Scale?

12.9 SUGGESTED READINGS

- What Are Economies of Scale? (thebalance.com)
- Manufacturing Production Process Introduction (thebalancesmb.com)
- Ahuja, H.L *Managerial economics*, S Chand Company, Delhi
- Dwivedi D.N *Managerial Economics*, Vikas Publishing House, Delhi
- Chopra O.P *Managerial Economics*, Tata McGraw Hill, Delhi

**ESTIMATION OF PRODUCTION FUNCTION:
COST THEORY AND ESTIMATION**

13.1 Introduction

13.2 Objectives

13.3 Estimation of production function : cost theory and estimation

13.4 Economic value Analysis

13.5 Summary

13.6 Glossary

13.7 Self Assessment questions

13.8 Lesson end Exercise

13.9 Suggested Readings

13.1 INTRODUCTION

Production of goods requires resources or inputs. These inputs are called factors of production named as land, labor, capital and organization. A rational producer is always interested that he should get the maximum output from the set of resources or inputs available to him. He would like to combine these inputs in a technical and efficient manner so that he obtains maximum desired output of goods. The relationship

between the inputs and the resulting outputs are described as production function.

"A production function shows the relationship between the amounts of factors used (input) and the amounts of output generated per period of time"

13.2 OBJECTIVES

After going through the lesson, you will be able to understand the concepts of the following:

- Estimation of production function
- Cost theory and estimation
- Economic value analysis
- Type of cost

13.3 ESTIMATION OF PRODUCTION FUNCTION: COST THEORY AND ESTIMATION

PRODUCTION FUNCTION

In order to understand the estimation of production function first of all we are required to understand what does production function means, in economics, equation that expresses the relationship between the quantities of productive factors (such as labour and capital) used and the amount of product obtained. It states the amount of product that can be obtained from every combination of factors, assuming that the most efficient available methods of production are used. The production function can thus answer a variety of questions. It can, for example, measure the marginal productivity of a particular factor of production (i.e., the change in output from one additional unit of that factor). It can also be used to determine the cheapest combination of productive factors that can be used to produce a given output.

Production function can be expressed in algebraic formula as under:

$$X = f(a_1, a_2, \dots, a_n)$$

Production function formula (equation) tells us the quantity of the product X which can be produced by the given quantities of inputs (lands labor, capital) that are used in the process of production. Here it may be noted that production function shows only the maximum amount of output which can be produced from given inputs. It is because production function includes only efficient production process. The analysis of production function is generally carried with reference to time period which is called short period and long period.

In the short run, production function is explained with one variable factor and other factors of productions are held constant. We have called this production function as the law of variable proportions or the law of diminishing returns.

In the long run, production function is explained by assuming all the factors of production as variable. There are no fixed inputs in the long run. Here the production function is called the law of returns according to the scale of production. As it is difficult to handle more than two variables in a graph, we therefore, explain the law of returns according to scale of production by assuming only two inputs i.e., capital and labor and study how output responds to their use.

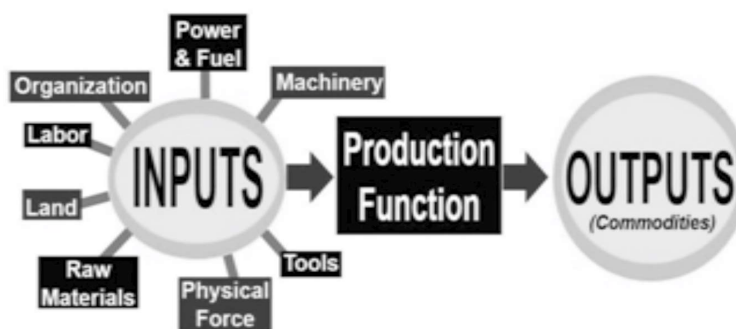


Figure 13.1

COST THEORY AND ESTIMATION

Costs are very important in business decision-making. Cost of production provides the floor to pricing. It helps managers to take correct decisions, such as what price to quote, whether to place a particular order for inputs or not whether to abandon or add a product to the existing product line and so on. Ordinarily, costs refer to the money expenses incurred by a firm in the production process. But in economics, cost is used in a broader sense. Here, costs include imputed value of the entrepreneur's own resources and services, as well as the salary of the owner-manager. There are various concepts of cost that a firm considers relevant under various circumstances. To make a better business decision, it is essential to know the fundamental differences and uses of the main concepts of cost. The **different types of costs** are explained below:

1) ***Accounting and Economic Costs:*** Money costs are the total money expenses incurred by a firm in producing a commodity. They include wages and salaries of labour; cost of raw materials; expenditures on machines and equipment; depreciation and obsolescence charges on machines; buildings and other capital goods; rent on buildings; interest on capital borrowed; expenses on power, light, fuel, advertisement and transportation; insurance charges, and all types of taxes. There are the accounting costs which an entrepreneur takes into consideration in making payments to the various factors of production. These money costs are also known as explicit costs that an accountant records in the firm's books. But there are other types of economic costs called implicit costs. Implicit costs are the imputed value of the entrepreneur's own resources and services. Thus economic costs include accounting costs plus implicit costs, that is, both explicit and implicit costs.

2) ***Production Costs:*** The total costs of production of a firm are divided into total variable costs and total fixed costs. The total variable costs are those expenses

of production which change with the change in the firm's output. Larger output requires larger inputs of labour, raw materials, power; fuel, etc. which increase the expenses of production. When output is reduced, variable costs also diminish. They cease when production stops altogether. Marshall called these variable costs as prime costs of production. The total fixed costs, called supplementary costs by Marshall, are those expenses of production which do not change with the change in output. They are rent and interest payments, depreciation charges, wages and salaries of the permanent staff, etc. Fixed costs have to be incurred by the firm, even if it stops production temporarily. Since these costs are over and above the usual expenses of production, they are described as overhead costs in business parlance.

3) *Actual Costs and Opportunity Costs:* Actual costs refer to the costs which a firm incurs for acquiring inputs or producing a good and service such as the cost of raw materials, wages, rent, interest, etc. The total money expenses recorded in the books of accounts are the actual costs. Opportunity cost is the cost of sacrifice of the best alternative foregone in the production of a good or service. Since resources are scarce, they cannot be used to produce all things simultaneously. Therefore, if they are used to produce one thing, they have to be withdrawn from other uses. Thus the cost of the one is the alternative foregone. It is the opportunity missed or alternative foregone in having one thing rather than the other or in putting a factor-service to one use instead of the other. The cost of using land for wheat growing is the value of alternative crop that could have been grown on it. The real cost of labour is what it could get in some alternative employment. The cost of capital to the capitalist is the amount of interest he could earn elsewhere. The normal earnings of management are what an entrepreneur could earn as a manager in some other joint stock company. In this way, opportunity cost is the cost of the opportunity missed or alternative foregone.

The concept of opportunity cost is very important in the following areas of managerial decision making:

(i) Decision-Making and Efficient Resource Allocation:

The concept of opportunity cost is very important for rational decision-making by the producer. Suppose, a producer has to decide whether he should produce black and white T.V. or colour T.V. from his given resources. He can come to rational decision only by measuring opportunity cost of production of both types of T.V. and by comparing these products with existing market prices. As a result, efficient allocation of resources will also be possible. A resource will always be used in that business where it will have the highest opportunity cost. For example, if a graduate is receiving Rs. 3,000 as a shop assistant but can earn Rs. 5,000 as a clerk, then he will join the job of a clerk leaving the shop because his opportunity cost is high.

(ii) Determination of Relative Prices of Goods:

If the same group of resources can produce either a colour T.V. or four black and white T. V.s, the price of a colour T.V. will be kept equal to at least a four-fold price of a black and white T.V.

Hence, the concept of opportunity cost is useful in the determination of relative prices of various goods.

(iii) Determination of Normal Remuneration of a Factor:

Opportunity cost determines the price for the best alternative use of a factor of production. Suppose a manager can earn Rs. 20,000 per month as a lecturer in a management school, the firm will have to pay him at least Rs. 20,000 for continuing his service as a manager. Hence, it is obvious that the concept of opportunity cost has special importance in management.

Types of Cost: Cost of production is classified into different categories. The detailed explanation is given below:

- 4 Direct Costs and Indirect Costs:** Direct costs are the costs that have direct relationship with a unit of operation, i.e., they can be easily and directly identified or attributed to a particular product, operation or plant. For example, the salary of a branch manager, when the branch is a costing unit, is a direct cost. Direct costs directly enter into the cost of production but retain their separate identity. On the other hand, indirect costs are those costs whose source cannot be easily and definitely traced to a plant, a product, a process or a department, such as electricity, stationery and other office expenses, depreciation on building, decoration expenses, etc. All the direct costs are variable because they are linked to a particular product or department. Therefore, they vary with changes in them. On the contrary, indirect costs may or may not be variable.
- 5 Private and Social Costs:** Private costs are the costs incurred by a firm in producing a commodity or service. These include both explicit and implicit costs. However, the production activities of a firm may lead to economic benefit or harm for others. For example, production of commodities like steel, rubber and chemicals, pollutes the environment which leads to social costs. On the other hand, production of such services as education, sanitation services, park facilities, etc. leads to social benefits. Take for instance, education which not only provides higher incomes and other satisfactions to the recipients but also more enlightened citizens to the society. If we add together the private costs of production and economic damage upon others such as environmental pollution, etc., we arrive at social costs.

- 6 ***Incremental Costs and Sunk Costs:*** Incremental costs denote the total additional costs associated with the marginal batch of output. These costs are the additions to costs resulting from a change in the nature and level of business activity, e.g., change in product line or output level, adding or replacing a machine, changes in distribution channels, etc. In the long-run, firms expand their production, employ more men, materials, machinery and equipment. All these expenses are incremental costs. Sunk costs are the costs that are not affected or altered by a change in the level or nature of business activity. It cannot be altered, increased or decreased by varying the level of activity or the rate of output. All past or actual costs are regarded as sunk costs. Thus, sunk costs are irrelevant for decision making as they do not vary with the changes expected for future by the management, whereas incremental costs are relevant to the management for business making.
- 7 ***Explicit Costs and Implicit Costs:*** Explicit costs are those payments that must be made to the factors hired from outside the control of the firm. They are the monetary payments made by the entrepreneur for purchasing or hiring the services of various productive factors which do not belong to him. Such payments as rent, wages, interest, salaries, payment for raw materials, fuel, power, insurance premium, etc. are examples of explicit costs. Implicit costs refer to the payments made to the self-owned resources used in production. They are the earnings of owner's resources employed in their best alternative uses. For example, a businessman utilises his services in his own business leaving his job as a manager in a company. Thus, he foregoes his salary as a manager. This loss of salary becomes an implicit cost of his own business. Implicit costs are also known as imputed costs. They are important for calculation of profit and loss account. They play a crucial role in the analysis of business decisions.

- 8 ***Historical and Replacement Costs:*** The historical cost is the actual cost of an asset incurred at the time the asset was acquired. It means the cost of a plant at a price originally paid for it. In contrast, replacement cost means the price that would have to be paid currently for acquiring the same plant. So historical costs are the past costs and replacement costs are the present costs. Price changes over time cause a difference between historical costs and replacement costs. For example, suppose that the price of a machine in 1995 was Rs. 1, 00,000 and its present price is Rs. 2, 50,000, the actual cost of Rs. 1, 00,000 is the historical cost while Rs. 2, 50,000 is the replacement cost. The concept of replacement cost is very useful for the management. It projects a true picture while the historical cost gives poor projection to the management. Historical cost of assets is used for accounting purposes, in the assessment of net worth of the firm, while the replacement cost is used for business decision regarding the renovation of the firm.
- 9 ***Past Costs and Future Costs:*** Past costs are the costs which have been actually incurred in the past. They are beyond the control of the management because they are already incurred. These costs can be evaluated with retrospective effect. On the contrary, future costs refer to the costs that are reasonably expected to be incurred in some future periods. They involve forecasting for control of expenses, appraisal of capital expenditure decisions on new projects as well as expansion programs and profit-loss projections through proper costing under assumed cost conditions. The management is more interested in future costs because it can exercise some control over them. If the management considers the future cost too high, it can either plan to reduce them or find out sources to meet them. These costs are also called avoidable costs or controllable costs.

- 10 ***Business Costs and Full Costs:*** Business costs are the costs which include all the payments and contractual obligations made by the firm together with the book cost of depreciation on plant and equipment. They are relevant for the calculation of profits and losses in business, and for legal and tax purposes. In contrast, full costs consist of opportunity costs and normal profit. Opportunity costs are the expected earnings from the next best use of the firm's resources. Normal profit is the minimum profit required for the existence of a firm.
- 11 ***Common Production Costs and Joint Costs:*** Sometimes, two or more than two products emerge from a common production process and from a single raw material. For example, the same piece of leather may be used for slippers or shoes. Such products present some peculiar and important problems for the management. They are identifiable as separate products only at the end of the process. So the costs incurred upto this point are common costs. Thus, common costs are the costs which cannot be traced to separate products in any direct manner. When an increase in the production of one product results in an increase in the output of another product, such products are joint products and their costs are joint costs. For example, when gas is produced from coal, coke and other products also emerge automatically. Likewise, wheat and straw, cotton and cotton seeds may be its other examples.
- 12 ***Shutdown Costs and Abandonment Costs:*** Shutdown costs are the costs that are incurred in the case of a closure of plant operations. If the operations are continued, these costs can be saved. These costs include all types of fixed costs, the costs of sheltering plant and equipment, lay-off expenses, employment and training of workers when the operation is restarted. On the other hand, abandonment costs are the costs which are incurred because of retiring altogether a plant from use. These costs are related to the problem of disposal

of assets. For example, the costs are related to the discontinuance of tram services in Delhi. These concepts of costs are very important for the management when they have to make decisions regarding the continuance of existing plant, suspension of its operations or its closure.

- 13 ***Out-of-Pocket Costs and Book Costs:*** The costs which include cash payments or cash transfers that may be recurring or non-recurring are called out-of-pocket costs. All the explicit costs such as rent, wages, interest, transport charges, etc. are out-of-pocket costs. They are also called explicit costs. Book costs are the actual business costs which enter into book accounts but are not paid in cash. They are considered while finalising the profit and loss accounts. For example, depreciation which does not require current cash payments. They are also called imputed costs. Book costs may be converted into out-of-pocket costs. If a factor of production is owned, that is book cost. But, if it is hired, that is out-of-pocket cost.
- 14 ***Urgent Costs and Postponable Costs:*** Urgent costs are those costs that are necessary for the continuation of the firm's activities. The cost of raw materials, labour, fuel, etc. may be its examples which have to be incurred if production is to take place. The costs which can be postponed for some time, i.e., whose postponement does not affect the operational efficiency of the firm are called postponable costs. For example, maintenance costs which can be postponed for the time-being. This distinction of cost is very useful during war and inflation.
- 15 ***Escapable Costs and Unavoidable Costs:*** Escapable costs are the costs which can be reduced by contraction in business activities. Here, net effect on costs is important. However, it is difficult to estimate indirect effects such as the closure of an unprofitable business unit which will reduce costs but will

increase the other related expenses like transportation charges, etc. On the other hand, unavoidable costs are the costs which do not vary with changes in the level of production, but they are unavoidable such as fixed costs.

16 Incremental Costs and Marginal Costs: There is close relation between marginal cost and incremental cost. But they have difference also. In reality, incremental cost is used in a broad sense in relation to marginal cost. Marginal cost is the cost of producing an additional unit of output, while incremental cost is defined as the change in cost resulting from a change in business activities. In other words, incremental cost is the total additional cost related to marginal quantity of output. The concept of incremental cost is very important in the business world because, in practice, it is not possible to use every unit of input separately.

The Cost Function

The cost function expresses a functional relationship between total cost and factors that determine it. Usually, the factors that determine the total cost of production (C) of a firm are the output (Q), the level of technology (T), the prices of factors (Pf) and the fixed factors (F). Symbolically, the cost function becomes

$$C=f(Q, T, P_f, F)$$

Such a comprehensive cost function requires multi-dimensional diagrams which are difficult to draw. In order to simplify the cost analysis, certain assumptions are made. It is assumed that a firm produces a single homogeneous good (q) with the help of certain factors of production. Some of these factors are employed in fixed quantities whatever the level of output of the firm in the short run. So they are assumed to be given. The remaining factors are variable whose supply is assumed to be known and available at fixed market prices. Further, the technology which is

used for the production of the good is assumed to be known and fixed. Lastly, it is assumed that the firm adjusts the employment of variable factors in such a manner that a given output Q of the good q is obtained at the minimum total cost, C .

13.4 ECONOMIC VALUE ANALYSIS

Economic value is the value that person places on an economic good based on the benefit that they derive from the good. It is often estimated based on the person's willingness to pay for the good, typically measured in units of currency. The economic value should not be confused with market value, which is the market price for a good or service which can be higher or lower than the economic value that any particular person puts on a good. Economic value consider the following points

- Economic value is the value that a person places on a good or service, based on the benefit they get from it.
- Economic value is subjective and difficult or impossible to measure, though there are approaches to estimating it.
- Producers use estimates of economic value to set prices for their products taking into consideration tangible and intangible factors such as brand name.

The preferences of a given person determine the economic value of a good or service and the trade-offs that they will be willing to make to obtain it. For example, if a person has an apple, then the economic value of that apple is the benefit that they receive from their use of the apple. If they intend to eat the apple, then the economic value is the enjoyment and nutrition they expect to receive from eating the apple. The economic value of the apple does not exist as any objective quality of the apple, but is entirely dependent on the subjective intention of the person valuing

the apple and their relationship to it. While the qualities of the apple might influence the use that the person has for the apple the sole source of economic value for the apple is the person's expectation of how well an apple of that given quality will suit their use. The following factor will affect the economic value analysis:

- ***Economic Value of Consumer Goods:*** Because economic value is subjective and dependent on a person's intentions it cannot be directly measured. Various methods have been devised in order to try to quantify or estimate economic value however. Some of the methods are explained below:
- ***Willingness to Pay:*** The classic method that economists use to estimate how much people value an economic good is to look at the price they pay for it. When an individual buys a good, they give up a given amount of money in return. Because they value both the good they receive and the money they give up based on their subjective, intended use (for the good or the money) it is obvious from their choice to purchase the good, that they must place a higher economic value on the good than on that amount of money. Thus, the price that a person pays for a good provides one way to quantify the economic value of that good.
- ***Hedonic Pricing:*** Hedonic pricing is another way of estimating the economic value of a good. Hedonic pricing uses statistical regression analysis to estimate the economic value the people attach to the various specific attributes of a good based on past transactions. Because these attributes, or qualities, of the good are what determine how well the good will suit an individual's intended use for the good, they will indirectly influence the economic value of the good. Economists can create statistical models of how the attributes of similar goods have influenced the price of similar goods in past transactions, and use these to estimate the economic value of a given good based on its attributes.

- **Economic Value in Marketing:** companies use the economic value to the customer to set prices for their products or services. EVC is not derived from a precise mathematical formula, but it considers the tangible and intangible value of a product. The tangible value is based on the product's functionality, and the intangible value is based on consumer sentiment toward product ownership. For example, a consumer places a tangible value on a durable pair of sneakers that provide protection and support during athletic activity. However, the sneaker's brand label or affiliation with a celebrity can add intangible value to the sneakers. Marketer can use surveys, focus groups, or other tools, so get an idea of how much value consumers will place on the sneakers based on their characteristics. Economic value analysis is a wealth metric company's use as opposed to accounting income or profit. The most common analysis tool for this process is economic value added, a standard form created several years ago. The use of economic formulas to value a company helps stakeholders determine the true physical value of a business. In short, the balance sheet is often the more important financial statement than the income statement. Consultants are often necessary to help a company complete economic value analysis.

Accounting is a method companies use to keep score, tracking the movement of dollars in the company. The higher the dollars in terms of profit the better the score for the business in the current market. The biggest issue here, however, is that accounting profit is simply a made-up number. It only represents the difference between sales revenue, cost of goods sold, and expenses, with the final figure having no physical representation. A company's true wealth can only be measured from the use of this type of analysis. No single formula exists to compute a company's economic wealth. A basic formula may be total assets less total liabilities; the difference is the actual wealth a

company retains for itself. Other formulas or metrics may apply to other parts of the physical assets of the business. In fact, a company's economic wealth as determined by economic value analysis may be closely related to its market value. The market value of a company is often the figure that a willing party would buy the company for in the open market. Cash flow is typically a big part of a company's economic value analysis. Not only is cash king in business, but it is also the biggest wealth factor a company generates through normal operations. Economic profit uses cash flow as its primary measurement tool for keeping score. Discounted cash flow models, net present value formulas, and free cash flow all work their way into economic value analysis. Those who compute economic profit or wealth attempt to value all cash flows in current value to assess a company's true value.

13.5 SUMMARY

Production of goods requires resources or inputs. These inputs are called factors of production named as land, labor, capital and organization. A production function shows the relationship between the amounts of factors used (input) and the amounts of output generated per period of time. Costs are very important in business decision-making. It helps managers to take correct decisions, such as what price to quote, whether to place a particular order for inputs or not whether to abandon or add a product to the existing product line and so on. The economic value should not be confused with market value, which is the market price for a good or service which can be higher or lower than the economic value that any particular person puts on a good.

13.6 GLOSSARY

- Rational : Based on or in accordance with reason or logic.
- Productivity : Tthe state or quality of being productive
- Entrepreneur : a person who sets up a business or businesses, taking on financial risks in the hope of profit.
- Opportunity Costs : The loss of other alternatives when one alternative is chosen.

13.7 SELF ASSESSMENT QUESTIONS

Q1. What is production function?

Q2 Explain the production function in short run.

Q3. What is economic value analysis?

Q5. Differentiate between direct and indirect cost.

13.8 LESSON END EXERCISE

Q1. What is the difference between the production function in short run and long run?

Q2. How does an estimation of cost of production helps in decision making process?

Q3. What is the difference between Actual Costs and Opportunity Costs?

Q4. What is sunk cost?

13.9 SUGGESTED READINGS

- Economic Value Definition (investopedia.com)
- Production function | economics | Britannica
- Ahuja, H.L *Managerial economics*, S Chand Company, Delhi
- Dwivedi D.N *Managerial Economics*, Vikas Publishing House, Delhi
- Chopra O.P *Managerial Economics*, Tata McGraw Hill, Delhi

COST FUNCTIONS

STRUCTURE

14.1 Introduction

14.2 Objectives

14.3 Short and Long Run cost functions

14.4 Nature

14.5 Shape

14.6 Inter-relationship

14.7 Summary

14.8 Glossary

14.9 Self Assessment questions

14.10 Lesson end Exercise

14.11 Suggested Reading

14.1 INTRODUCTION

A cost function is a mathematical formula used to chart how production expenses will change at different output levels. In other words, it estimates the total cost of production given a specific quantity produced. Management uses this model to run different production scenarios and help predict what the total cost would be to produce a product at different levels of output. The cost function equation is expressed as $C(x) = FC + V(x)$, where C equals total production cost, FC is total fixed costs, V is variable cost and x is the number of units. Understanding a firm's cost function is helpful in the budgeting process because it helps management understand the cost behavior of a product. This is vital to anticipate costs that will be incurred in the next operating period at the planned activity level. Also, this allows management to evaluate how efficiently the production process was at the end of the operating period. Let's look at an example: The management of Duralex Companies, a manufacturer of toys, has asked for a new cost study to improve next year's budget forecasts. They pay rent of \$300 a month and they pay an average of \$30 a month for electricity. Each toy requires \$5 in plastic and \$2 in cloth.

- A. How much will it cost them to manufacture 1200 toys annually?
- B. How much will it cost them to manufacture 1500 toys annually?

First thing to do is to determine which costs are fixed and which ones are variable. Remember, fixed costs are incurred whether or not we manufacture, whereas variable costs are incurred per unit of production. That means rent and electricity are fixed while plastic and cloth are variable costs.

14.2 OBJECTIVES

After reading this lesson, you will be able to understand the concept of the following:

- Short and long run cost functions:
- Economic of Scale
- Nature and shape
- Inter-relationship

14.3 SHORT AND LONG RUN COST FUNCTIONS

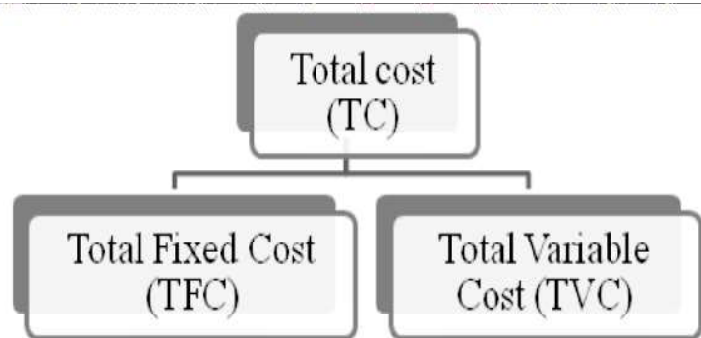


Figure 14.1

To understand short and long run cost functions, it is important to understand the concept of cost. A cost is the value of inputs that are used to produce output. Total cost (TC) is the total cost of producing a given level of output and is divided into total fixed cost (TFC) and total variable cost (TVC). Total fixed cost does not change with the level of output and total variable cost does change with the level of output. A cost function $C(q)$ is a function that shows what the minimum cost for producing q units of output is. Labour is denoted as (L) and Capital as (K) . So, with w as the cost of labour per unit and r as the cost per unit of capital, the production cost is:

$$w * L + r * K$$

Total cost can be divided into fixed cost, which is independent of quantity, and

variable cost, which is dependent on quantity:

$$C(q) = FC + VC(q)$$

In the short run, at least one input is fixed and cost curves are defined as operating curves. In the short run, the level of output that correlates to the minimum average total cost is called the capacity of the firm. Since firms cannot change capital. When a firm produces less output than the minimum average total cost, it has excess capacity. In the long run, all inputs are variables and cost curves are defined as planning curves. The long-run average cost curve shows the lowest cost of producing at a certain level of output.

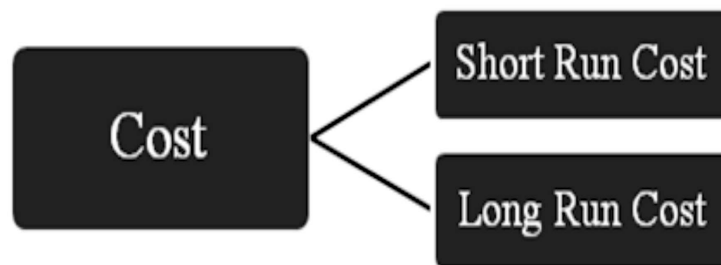


Figure: 14.2

Short and long run cost functions are an integral part of mathematical economics and important to understanding and representing the role of technology in the production process.

- **Cost in Short Run**

It may be noted at the outset that, in cost accounting, we adopt functional classification of cost. But in economics we adopt a different type of classification, viz., behavioural classification-cost behaviour is related to output changes. In the short run the levels of usage of some input are fixed and costs

associated with these fixed inputs must be incurred regardless of the level of output produced. Other costs do vary with the level of output produced by the firm during that time period.

The sum-total of all such costs-fixed and variable, explicit and implicit- is short-run total cost. It is also possible to speak of semi-fixed or semi-variable cost such as wages and compensation of foremen and electricity bill. For the sake of simplicity we assume that all short run costs to fall into one of two categories, fixed or variable.

- ***Short-Run Total Cost***

Short-Run total cost is also called unavoidable contractual costs. Such costs remain contractually fixed and so cannot be avoided in the short run. This curve indicates the firm's total cost of production for each level of output when the usage of one or more of the firm's resources remains fixed. When output is zero, cost is positive because fixed cost has to be incurred regardless of output. Examples of such costs are rent of land, depreciation charges, license fee, interest on loan, etc. The only way to avoid such costs is by going into liquidation. The total fixed cost (TFC) curve is a horizontal straight line. Total variable is the difference between total cost and fixed cost. The total variable cost curve (TVC) starts from the origin, because such cost varies with the level of output and hence are avoidable. Examples are electricity tariff, wages and compensation of casual workers, cost of raw materials etc. A typical short-run total cost curve (STC) is shown in Fig. 14.3 showing the total cost (OC) of producing Q units of output is total fixed cost (OF) plus total variable cost (FC).

- ***Average and Marginal Cost***

One can gain a better insight into the firm's cost structure by analysing the behaviour of short-run average and marginal costs. We may first consider average fixed cost (AFC). Average fixed cost is total fixed cost divided by output,

$$\text{i.e., } AFC = TFC / Q$$

Since total fixed cost does not vary with output average fixed cost is a constant amount divided by output. Average fixed cost is relatively high at very low output levels. However, with gradual increase in output, AFC continues to fall as output increases, approaching zero as output becomes very large. The Average Total Cost curve, illustrated, is U-shaped in Fig. 14.4 because the AVC cost curve is U-shaped. This is accounted for by the Law of Variable Proportions. It first declines, reaches a minimum (at Q3 units of output) and subsequently rises. The minimum point on ATC is reached at a larger output than at which AVC attains its minimum. This point can easily be proved.

$$ATC = AFC + AVC$$

We know that and that average fixed cost continuously falls over the whole range of output. Thus, ATC declines at first because both AFC and AVC are falling. Even when AVC begins to rise after Q2, the decrease in AFC continues to drive down ATC as output increases. However, an output of Q3 is finally reached, at which the increase in AVC overcomes the decrease in AFC, and ATC starts rising.

Since $ATC = AFC + AVC$, the vertical distance between average total cost and average variable cost measures average fixed cost. Since AFC declines

over the entire range of output. AVC becomes closer and closer to ATC as output increases. We may finally consider short-run marginal cost (SMC). Marginal cost is the change in short-run total cost attributable to an extra unit of output: or

$$\begin{aligned}
 SMC &= \frac{\Delta STC}{\Delta Q} \\
 \text{However, since } STC &= TFC + TVC, \\
 SMC &= \frac{\Delta TFC}{\Delta Q} + \frac{\Delta TVC}{\Delta Q} \\
 &= 0 + \frac{\Delta TVC}{\Delta Q} \\
 &= \frac{\Delta TVC}{\Delta Q}
 \end{aligned}$$

Short-run marginal cost refers to the change in cost that result from a change in output when the usage of the variable factor changes. As Fig. 14.4 shows, marginal cost first declines, reaches a minimum at Q_x (note that minimum marginal cost is attained at a level of output less than that at which AVC and ATC attain their minimum) and rises thereafter. The marginal cost curve intersects AVC and ATC at their respective minimum points. This result follows from the definitions of the cost curves. If marginal cost curve lies below average variable cost curve the implication is clear: each additional unit of output adds less to total cost than the average variable cost. Thus average variable cost has to fall. So long as MC is above AVC, each additional unit of output adds more to total cost than AVC. Thus, in this case, AVC must rise. Thus when MC is less than AVC, average variable cost is falling. When MC is greater than AVC, average variable cost is rising. Thus MC must equal AVC at the minimum point of AVC. Exactly the same reasoning would apply

to show MC crosses ATC at the minimum point of the latter curve.

- **Long-Run Costs**

We may recall from our discussion of production theory that the long run does not refer to 'some date in the future. Instead, the long run simply refers to a period of time during which all inputs can be varied. Therefore, a decision has to be made by the owner and/or manager of the firm about the scale of operation, that is, the size of the firm. In order to be able to make this decision the manager must have knowledge about the cost of producing each relevant level of output. We shall now discover how to determine these long-run costs.'

Derivation of Cost Schedules from a Production Function:

For the sake of analysis, we may assume that the firm's level of usage of the inputs does not affect the input (factor) prices. We also assume that the firm's manager has already evaluated the production function for each level of output in the feasible range and has derived an expansion path. For the sake of analytical simplicity, we may assume that the firm uses only two variable factors, labour and capital, that cost Rs. 5 and Rs. 10 per unit, respectively.

The characteristics of a derived expansion path are shown in Columns 1, 2 and 3 of Table 14.1. In column (1) we see seven output levels and in Columns (2) and (3) we see the optimal combinations of labour and capital respectively for each level of output, at the existing factor prices. These combinations enable us to locate seven points on the expansion path. Column (4) shows the total cost of producing each level of output at the lowest possible cost. For example, for producing 300 units of output, the least cost combination of inputs is 20 units of labour and 10 of capital. At existing factor prices, the total cost is Rs. 200. Here, Column (4) is a

least-cost schedule for various levels of production. In Column (5), we show average cost which is obtained by dividing total cost figures of Column (4) by the corresponding output figures of Column (1). Thus, when output is 100, average cost is Rs. $120/100 = \text{Rs. } 1.20$. All other figures of Column (5) are derived in a similar way. From column (5) we derive an important characteristic of long-run average cost: average cost first declines, reaches a minimum, then rises, as in the short-run. In Column (6) we show long-run marginal cost figures. Each such figure is arrived at by dividing change in total cost by change in output. For example, when output increases from Rs. 100 to Rs. 200, the total cost increases from Rs. 120 to Rs. 140. Therefore, marginal cost (per unit) is Rs. $20/100 = \text{Re. } 0.20$. Similarly, when output increases from 600 to 700 units, MC per unit is $720-560/100 = 160/100 = 1.60$. Column (6) depicts the behaviour of per unit MC: marginal cost first decreases then increases, as in the short run. We may now show the relationship between the expansion path and long-run cost graphically. In Fig. 14.6 two inputs, K and L, are measured along the two axes. The fixed factor price ratio is represented by the slope of the isocost lines and so on. Finally, the known production function gives us the isoquant map, represented by Q1, Q2 and so forth.

Table 14.1

Output (Units)	Labour (Units)	Least-cost usage of Capital of labour	Total cost at Rs. 5 per unit Rs. 10 per unit of capital	Average cost	Marginal cost
100	11	7	120	1.20	1.20
200	12	8	140	0.70	0.20
300	20	10	200	0.67	0.60
400	30	15	300	0.75	1.00
500	40	22	420	0.84	1.20
600	52	30	560	0.93	1.40
700	60	42	720	1.03	1.60

Economies of Scale

Various factors may give rise to economies of scale, that is, to decreasing long-run average costs of production. The following factors are helpful in providing the economies of scale:

1. Greater Specialization of Resources

With an expansion of a firm's scale of operation, its opportunities for specialization-whether performed by men or by machines-are greatly enhanced. It is because a large-scale firm can often divide the tasks and work to be done more readily than a small-scale firm.

2. More Efficient Utilization of Equipment

In some industries, the technology of production is such that a large unit of costly equipment has to be used. The production of automobiles, steel and refined petroleum are obvious examples.

In such industries, companies must be able to afford whatever equipment is necessary and must be able to use it efficiently by spreading the cost per unit over a sufficiently large volume of output. A small-scale firm cannot ordinarily do these things.

3. Reduced Unit Costs of Inputs

A large-scale firm can often buy its inputs-such as its raw materials-at a cheaper price per unit and thus gets discounts on bulk purchases. Moreover, for certain types of equipment, the price per unit of capacity is often much less than larger sizes purchased. For instance, the construction cost per square foot for a large factory is usually less than that for a small one. Again, the price per horsepower of various electric motors varies inversely with the amount of horsepower.

4. Utilization of by-products

In certain industries, larger-scale firms can make effective use of many by-products that would go waste in a small firm. A typical example is the sugar industry, where by-products like molasses and bagasse are made use of.

5. Growth of Auxiliary Facilities

In certain places, an expanding firm often benefits from, or encourages other firms to develop, ancillary facilities, such as warehousing, marketing, and transportation systems, thus saving the growing firm considerable costs. For example, commercial and industrial establishments often benefit from improved transportation and warehousing facilities.

6. Diseconomies of Scale

With continuous expansion of the scale of operation of a firm, a point may ultimately be reached when diseconomies of scale begin to exercise a more than offsetting effect on the firm's cost curve. As a result, the long-run average cost curve starts to rise.

14.4 NATURE

In economics, it's extremely important to understand the distinction between the short run and the long run. As it turns out, the definition of these terms depends on whether they are being used in a microeconomic or macroeconomic context. There are even different ways of thinking about the microeconomic distinction between the short run and the long run. The following points explain the nature of production function and its cost:

a) Production Decisions

The long run is defined as the time horizon needed for a producer to have flexibility

over all relevant production decisions. Most businesses make decisions not only about how many workers to employ at any given point in time (i.e. the amount of labor) but also about what scale of an operation (i.e. size of factory, office, etc.) to put together and what production processes to use. Therefore, the long run is defined as the time horizon necessary not only to change the number of workers but also to scale the size of the factory up or down and alter production processes as desired.

In contrast, economists often define the short run as the time horizon over which the scale of an operation is fixed and the only available business decision is the number of workers to employ. (Technically, the short run could also represent a situation where the amount of labor is fixed and the amount of capital is variable, but this is fairly uncommon.) The logic is that even taking various labor laws as a given, it's usually easier to hire and fire workers than it is to significantly change a major production process or move to a new factory or office. (One reason for this likely has to do with long-term leases and such.) As such, the short run and the long run with respect to production decisions can be summarized as follows:

- Short run: Quantity of labor is variable but the quantity of capital and production processes are fixed (i.e. taken as a given).
- Long run: Quantity of labor, the quantity of capital, and production processes are all variable (i.e. changeable).

b) Measuring Costs:

The long run is sometimes defined as the time horizon over which there are no sunk fixed costs. In general, fixed costs are those that don't change as production quantity changes. In addition, sunk costs are those that can't be recovered after they are paid. A lease on a corporate headquarters, for example, would be a sunk cost if

the business has to sign a lease for the office space. Furthermore, it would be a fixed cost because, after the scale of the operation is decided on, it's not as though the company will need some incremental additional unit of headquarters for each additional unit of output it produces.

Obviously the company would need a larger headquarters if it decided to make a significant expansion, but this scenario refers to the long-run decision of choosing a scale of production. There are no truly fixed costs in the long run since the firm is free to choose the scale of operation that determines the level at which the costs are fixed. In addition, there are no sunk costs in the long run, since the company has the option of not doing business at all and incurring a cost of zero.

In summary, the short run and the long run in terms of cost can be summarized as follows:

" Short run: Fixed costs are already paid and are unrecoverable (i.e. "sunk").

" Long run: Fixed costs have yet to be decided on and paid, and thus are not truly "fixed."

The two definitions of the short run and the long run are really just two ways of saying the same thing since a firm doesn't incur any fixed costs until it chooses a quantity of capital (i.e. scale of production) and a production process.

c) *Market Entry and Exit:*

Economists differentiate between the short run and the long run with regard to market dynamics as follows:

" Short run: The number of firms in an industry is fixed (even though firms can "shut down" and produce a quantity of zero).

" Long run: The number of firms in an industry is variable since firms can enter and exit the marketplace.

d) *Microeconomic Implications:*

The distinction between the short run and the long run has a number of implications for differences in market behavior, which can be summarized as follows:

The Short Run:

" Firms will produce if the market price at least covers variable costs, since fixed costs have already been paid and, as such, don't enter the decision-making process.

" Firms' profits can be positive, negative, or zero.

The Long Run:

" Firms will enter a market if the market price is high enough to result in positive profit.

" Firms will exit a market if the market price is low enough to result in negative profit.

" If all firms have the same costs, firm profits will be zero in the long run in a competitive market. (Those firms that have lower costs can maintain positive profit even in the long run.)

e) *Macroeconomic Implications:*

In macroeconomics, the short run is generally defined as the time horizon over which the wages and prices of other inputs to production are "sticky," or inflexible, and the long run is defined as the period of time over which these input prices have time to adjust. The reasoning is that output prices (i.e. prices of products sold to

consumers) are more flexible than input prices (i.e. prices of materials used to make more products) because the latter is more constrained by long-term contracts and social factors and such. In particular, wages are thought to be especially sticky in a downward direction since workers tend to get upset when an employer tries to reduce compensation, even when the economy overall is experiencing a downturn. The distinction between the short run and the long run in macroeconomics is important because many macroeconomic models conclude that the tools of monetary and fiscal policy have real effects on the economy (i.e. affect production and employment) only in the short run and, in the long run, only affect nominal variables such as prices and nominal interest rates and have no effect on real economic quantities.

14.5 SHAPE

To understand the short run Total Cost (STC), Total Variable Cost (TVC) and Total Fixed Cost (TFC) it is important to understand its diagrammatic (shape) presentation.

(A) Shape of Short-Run Total Cost (STC)

A typical short-run total cost curve (STC) is shown in Fig. 14.3. This curve indicates the firm's total cost of production for each level of output when the usage of one or more of the firm's resources remains fixed. When output is zero, cost is positive because fixed cost has to be incurred regardless of output

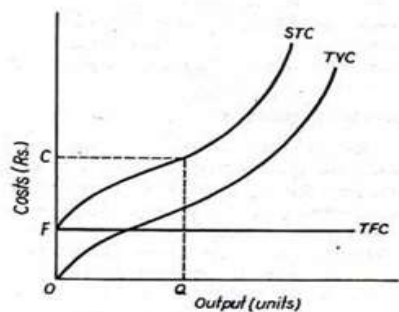


Fig 14.3 Short run costs

The figure shown that variable cost and total cost must increase with an increase in output. We also see that variable cost first increase at a decreasing rate (the slope of STC decreases) then increase at an increasing rate (the slope of STC increases). This cost structure is accounted for by the law of Variable Proportions.

Short-Run Total Cost:

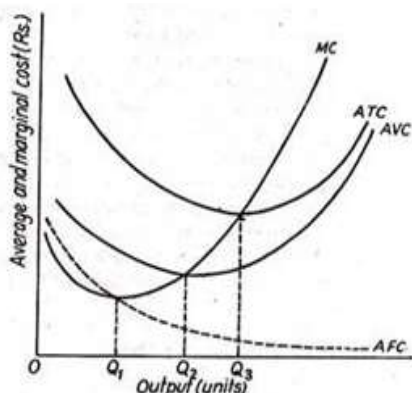


Fig 14.3 Short run average and marginal cost curve costs

In Fig. 14.4, we observe that the AFC curve takes the shape of a rectangular hyperbola. We now consider average variable cost (AVC) which is arrived at by dividing total variable cost by output,

$$\text{i.e., } AVC = \frac{TVC}{Q}$$

In Fig. 14.4, AVC is a typical average variable cost curve. Average variable cost first falls, reaches a minimum point (at output level Q2) and subsequently increases. The next important concept is one of average total cost (ATC). It is calculated by dividing total cost by output,

$$\text{i.e., } ATC = \frac{TC}{Q}$$

$$\text{Alternatively, } TC = TFC + TVC$$

$$\text{and } ATC = \frac{TFC}{Q} + \frac{TVC}{Q}$$

$$= AFC + AVC$$

It is, therefore, total cost is the sum of average fixed cost and average variable cost

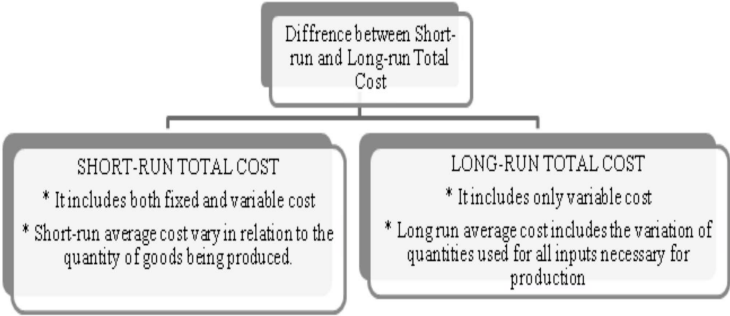


Figure 14.5

(B)Shape of Long-Run Cost (The expansion path and long-run cost)

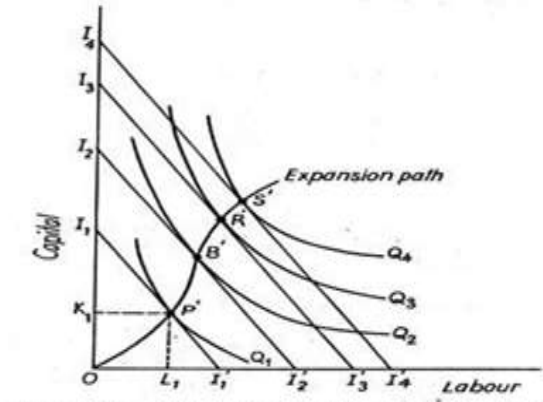


Fig 14.6 The expansion path and long run cost

From our earlier discussion of long-run production function we know that, when all inputs are variable (that is, in long-run), the manager will choose the least cost combinations of producing each level of output. In Fig. 14.6, we see that the locus of all such combinations is expansion path $OP' B'R'S'$. Given the factor-price ratio and the production function (which is determined by the state of technology), the

expansion path shows the combinations of inputs that enables the firm to produce each level of output at the lowest cost

14.6 INTER-RELATIONSHIP

The following points elobrates the factorialation b/w different types of costs in short run:-

Short Run Cost Curves:

We initiate our discussion on the short run cost curves. We start with the understanding of marginal cost.

(i) Marginal Cost:

Marginal cost (MC) is the extra cost of producing one more unit of output. To make our observations clear, Let us assume that fixed costs are of the value of \$40. This amount will remain constant throughout the act of production. Let the variable cost be \$ 10 per unit. Moreover, as the variable units go on increasing this cost will continuously increase as a multiple of 10.

I	II	III	IV	V	VI	
Production	Fixed Cost	Variable	Marginal	Total	Marginal Cost	
Units		Cost	Output	Cost II + III	(MVC / M output)	
1	40	-	-	40	-	
2	40	10	4	50	DMC	2.5 (10 / 4)
3	40	20	7	60		1.42 (10 / 7)
4	40	30	7	70	CMC	1.42 (10 / 7)
5	40	40	5	80		2.00 (10 / 5)
6	40	50	2	90	IMC	5.00 (10 / 2)
7	40	60	1	100		10.00 (10 / 1)

Table 14.2

Column I depicts the Units of Production in the hypothetical example (Table 14.2). In column II exhibits the \$ 40 as Fixed Cost. This remains constant throughout the act of production. Column III explains Variable Cost of production at the rate of \$ 10 per unit of variable inputs. Column IV portrays Marginal Output that changes. In column V we have the Total Cost which is the sum of fixed and variable costs. Column VI includes the Marginal Cost per unit of output produced. This is a ratio of marginal or additional variable cost (which is 10) divided by marginal units of output produced. Accordingly marginal cost is $10, 4 = 2.5$, $10, 7 = 1.42\dots$ etc.

We can observe that, the marginal cost behavior exhibits three phases of change. To begin with from 2 units of production to 3 units of production the marginal cost decreases from 2.5 to 1.42. Then between 3 to 4 units of production it remains constant. Finally, from unit 4 onwards marginal cost continuously increases from 1.42 to 10. The three phases marked as Diminishing Marginal Cost, Constant Marginal Cost and Increasing Marginal Cost exactly correspond with Increasing Marginal Returns, Constant Marginal Returns and Diminishing Marginal Returns on the output or returns side, where returns diminish, costs increase and both are constant for the same units of output.

(ii) Average Costs:

Average cost is expressed as a ratio of Total Cost to Total Output units produced. Since total cost has fixed and variable costs as two components, we would have three types of average costs. These are average fixed cost, average variable cost and average total cost.

I	II	III	IV	V
Production	Total	(TFC/ TO)	(TVC/ TO)	(TC/TO) = (III+IV)
units	output	= AFC	= AVC	= ATC
1	-	-	-	-
2	4	10	2.5	12.5
3	11	3.63	1.82	5.45
4	18	2.22	1.67	3.89
5	23	1.73	1.73	3.46
6	25	1.6	2	3.6
7	26	1.54	2.3	3.84

Table 14.3

We need to look carefully that in the table 14.3, production units are shown in Column I, 7 units are produces. Total Output is shown in column II. Column III exhibits Average fixed cost which is a ratio of Total Fixed Cost to Total Output. Column IV includes the Average Variable Cost. It is a ratio of Total Variable Cost to Total Output. Finally, column V has Average Total Cost for different units. It is a ratio of Total Cost to Total Output. It must be observed that ATC is exactly equal to AFC+AVC.

The behavior of the three average cost varieties is an interesting and significant part of Cost Analysis. We are mainly interested in the behavior of Average Total Cost (column V) which is composed of two components, Average fixed cost and Average Variable Cost. The behavior of Average Total Cost (ATC) is jointly determined by AFC and AVC. AFC continuously falls.

Therefore AFC tends to pull ATC in its own direction and causes its fall. AFC falls sharply in the initial stage from 10 to 3.63 but it slows down in its rate of fall towards the end such as from 1.60 to 1.54. The effect of the fall in AFC is the progressive reduction in the value of ATC. AVC initially decreases from 2.5 to 1.82 to 1.7 but it subsequently rises from 1.67 to 1.73 to 2 to 2.30. The effect of AVC on ATC is initially reductive but when it starts rising, it attempts to pull ATC in its own direction.

(iv) Total Cost Curves:

Now, we need to have an understanding of the total cost curves. We begin our observation the help of the figure 14.7. The figure 14.7 depicts Total Cost (TC), Total Fixed Cost (TFC) and Total Variable Cost Curves (TVC). Total Fixed Cost remains constant at \$40. Total Variable Cost increases proportionately as 10, 20, 30, 40, 50 and 60. The Total Cost as a sum of the two (Total Fixed and Total Variable Costs) increases as 50, 60, 70, 80, 90 and 100. In the figure 14.7 three cost curves have been drawn portrayed.

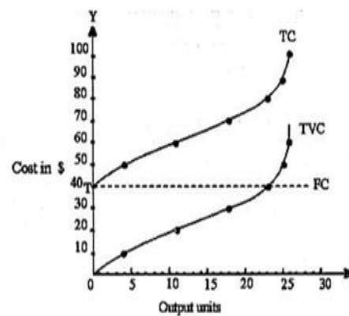


Figure 14.7

Long Run Cost Curves:

In the long run the division between fixed and variable factors becomes futile. Long run of a firm is a period sufficiently long during which at least one (or more) of the fixed factors become variable and can be replaced.

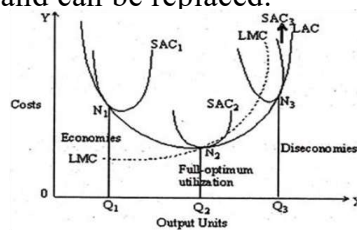


Figure 14.8

Long run is an analytical concept. As far as time is concerned there is no specified limit on the number of years to distinguish between short run and long run period. The life span of the fixed factors affects the determination of long run period of the

factor. Depending upon length of the long period, the long run cost curve will behave in one way or the other. If all the factors are perfectly variable and there are no fixed factors at all then the Long Run Average Cost Curve will be a horizontal line parallel to X axis.

If some of the fixed factors have an unlimited capacity to produce then the long run Average Cost Curve will continuously fall downward. If some of the factors are variable while a few other factors continue to be fixed even in the long run then LAC will be 'U' shaped but flatter than SAC. The diagram 14.8 shows the LAC.

Besides internal economies that a firm enjoys in the short run, it has the benefit of the scale economies in the long run. Every fixed factor with its given life span constitutes a scale of production which in the short run cannot be altered. In the long run each of these factors can be altered and replaced. This allows change in the scale of production. An old machine can be changed by a new one which has better capacity, a manager can be replaced at the end of the contract period with another more qualified and experienced person.

14.7 SUMMARY

A cost function is a mathematical formula used to chart how production expenses will change at different output levels. In other words, it estimates the total cost of production given a specific quantity produced. A cost is the value of inputs that are used to produce output. Total cost (TC) is the total cost of producing a given level of output and is divided into total fixed cost (TFC) and total variable cost (TVC). Total fixed cost does not change with the level of output and total variable cost does change with the level of output.

14.8 GLOSSARY

- Budgeting : Allow or provide a particular amount of money in a budget
- Fixed costs : Business costs, such as rent, that are constant whatever the amount of goods produced
- Variable costs : A cost that varies with the level of output
- Average cost : Per unit cost of production obtained by dividing the total cost by the total output

14.9 SELF ASSESSMENT QUESTIONS

Q1. Define the cost function.

Q2. What is the difference between fixed cost and variable cost?

Q3. Briefly explain the short and long run cost functions.

14.10 LESSON END EXERCISE

Q1. What is marginal cost of production?

Q2. What is an average cost?

Q3. Do explain the long run cost curve with the help of a graph.

Q4. Briefly explain the cost function with suitable examples.

14.11 SUGGESTED READINGS

- Short Run and Long Run Cost Curves
- The Short Run and the Long Run in Economics (thoughtco.com)
- Ahuja, H.L *Managerial economics*, S Chand Company, Delhi
- Dwivedi D.N *Managerial Economics*, Vikas Publishing House, Delhi
- Chopra O.P *Managerial Economics*, Tata McGraw Hill, Delhi

LAW OF RETURNS TO SCALE

STRUCTURE

15.1 Introduction

15.2 Objectives

15.3 Law of Returns of scale

15.4 Summary

15.5 Glossary

15.6 Self Assessment questions

15.7 Lesson End Exercise

15.8 Suggested Reading

15.1 INTRODUCTION

Before we discuss what the law of returns to scale states, let's be sure we understand the concept of production function. The production function is a highly abstract concept that has been developed to deal with the technological aspects of the theory of production. A production function is an equation, table or graph, which specifies the maximum quantity of output, which can be obtained, with each set of inputs. An input is any good or service that goes into production, and an output is any good or service that comes out of the production process. Prof. Richard H. Leftwich attributes that production function refers to the relationship between inputs and outputs at a given period. Here inputs mean all the resources such as land, labor, capital and organization used by a firm, and outputs mean any goods or services produced by the firm.

Suppose we want to produce apples. We need land, water, fertilizers, workers and some machinery. These are called inputs or factors of production. The output is apples. In abstract terms, it is written as $Q = F(X_1, X_2, \dots, X_n)$. Where Q is the maximum quantity of output and X_1, X_2, \dots, X_n are the quantities of the various inputs. If there are only two inputs, labor L and capital K , we write the equation as $Q = F(L, K)$. From the above equation, we can understand that the production function tells us the relationship between various inputs and outputs. However, it does not say anything about the combination of inputs. The optimal combination of inputs can be derived from the technique of isoquant and isocost line.

The concept of production function stems from the following two things:

1. It must be considered with reference to a particular period.
2. It is determined by the state of technology. Any change in technology may alter output, even when the quantities of inputs remain fixed.

15.2 OBJECTIVES

After reading this lesson, you shall be able to understand the concept of

- Law of returns to scale
- Three phases of Return to scale
 - Increasing Return to scale
 - Constant Return to scale
 - Diminishing Return to scale

15.3 LAW OF RETURNS TO SCALE

In the long- run the dichotomy between fixed factor and variable factor ceases. In other words, in the long-run all factors are variable. The law of returns to scale examines the relationship between output and the scale of inputs in the long-run when all the inputs are increased in the same proportion.

Assumptions

This law is based on the following assumptions:

1. All the factors of production (such as land, labor and capital) but organization are variable
2. The law assumes constant technological state. It means that there is no change in technology during the time considered.
3. The market is perfectly competitive.
4. Outputs or returns are measured in physical terms.

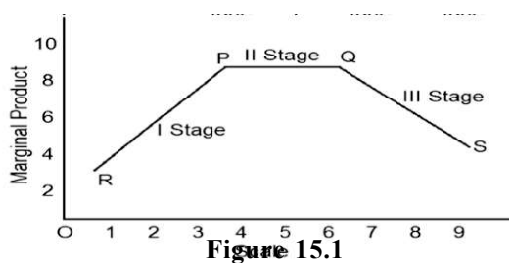
Three phases of returns to scale

There are three phases of returns in the long-run which may be separately described as (1) the law of increasing returns (2) the law of constant returns and (3) the law of decreasing returns. Depending on whether the proportionate change in output equals, exceeds, or falls short of the proportionate change in both the inputs, a production function is classified as showing constant, increasing or decreasing returns to scale. Let us take a numerical example to explain the behavior of the law of returns to scale.

Table 15.1

Unit	Scale of Production	Total Returns	Marginal Returns
1	1 Labor + 2 Acres of Land	4	4 (Stage I - Increasing Returns)
2	2 Labor + 4 Acres of Land	10	6
3	3 Labor + 6 Acres of Land	18	8
4	4 Labor + 8 Acres of Land	28	10 (Stage II - Constant Returns)
5	5 Labor + 10 Acres of Land	38	10
6	6 Labor + 12 Acres of Land	48	10
7	7 Labor + 14 Acres of Land	56	8 (Stage III - Decreasing Returns)
8	8 Labor + 16 Acres of Land	62	6

The data of table 15.1 can be represented in the form of figure 15.1



RS = Returns to scale curve

RP = Segment; increasing returns to scale

PQ = segment; constant returns to scale

QS = segment; decreasing returns to scale

Stage I: Increasing Returns to Scale

In figure 15.1, stage I represents increasing returns to scale. During this stage, the firm enjoys various internal and external economies such as dimensional economies, economies flowing from indivisibility, economies of specialization, technical economies, managerial economies and marketing economies. Economies simply mean advantages for the firm. Due to these economies, the firm realizes increasing returns to scale. Marshall explains increasing returns in terms of "increased efficiency" of labor and capital in the improved organization with the expanding scale of output and employment factor unit. It is referred to as the economy of organization in the earlier stages of production.

Stage II: Constant Returns to Scale

In figure 15.1, the stage II represents constant returns to scale. During this stage, the economies accrued during the first stage start vanishing and diseconomies arise. Diseconomies refer to the limiting factors for the firm's expansion. Emergence of diseconomies is a natural process when a firm expands beyond certain stage. In the stage II, the economies and diseconomies of scale are exactly in balance over a particular range of output. When a firm is at constant returns to scale, an increase in all inputs leads to a proportionate increase in output but to an extent. A production function showing constant returns to scale is often called 'linear and homogeneous' or 'homogeneous of the first degree.' For example, the Cobb-Douglas production function is a linear and homogeneous production function.

Stage III: Diminishing Returns to Scale

In figure 1, the stage III represents diminishing returns or decreasing returns. This situation arises when a firm expands its operation even after the point of constant returns. Decreasing returns mean that increase in the total output is not proportionate according to the increase in the input. Because of this, the marginal output starts decreasing (see table 1). Important factors that determine diminishing returns are managerial inefficiency and technical constraints.

15.4 SUMMARY

A production function is an equation, table or graph, which specifies the maximum quantity of output, which can be obtained, with each set of inputs. In the long-run the dichotomy between fixed factor and variable factor ceases. In other words, in the long-run all factors are variable. The law of returns to scale examines the relationship between output and the scale of inputs in the long-run when all the inputs are increased in the same proportion.

15.5 GLOSSARY

- Proportionate : Corresponding in size or amount to something else.
- Diseconomies : An economic disadvantage such as an increase in cost arising from an increase in the size of an organization
- Economies : Careful management of available resources Linear arranged in or extending along a straight or nearly straight line
- Homogeneous : Consisting of parts all of the same kind

15.6 SELF ASSESSMENT QUESTIONS

Q1. Briefly explain the three stages of law of returns to scale.

Q2. What is law of returns to scale?

15.7 LESSON END EXERCISE

Q1. Briefly mention the various assumptions of the law of returns to scale.

Q2. Gives the graphical presentation of law of returns to scale.

15.8 SUGGESTED READINGS

- Law of Returns to Scale - Owlcation
- Ahuja, H.L *Managerial economics*, S Chand Company, Delhi
- Dwivedi D.N *Managerial Economics*, Vikas Publishing House, Delhi
- Chopra O.P *Managerial Economics*, Tata McGraw Hill, Delhi

**PRICE DETERMINATION UNDER
DIFFERENT MARKET CONDITIONS**

STRUCTURE

16.1 Introduction

16.2 Objectives

16.3 Characteristics of Different Market structure

16.4 Summary

16.5 Glossary

16.6 Self Assessment Questions

16.7 Lesson End Exercise

16.8 Suggested Reading

16.1 INTRODUCTION

The market structure depends upon the degree of competition prevailing in the market. How much is to be produced and at what price is to be sold are the two decisions taken by an individual firm or producer. Both of these are affected by the market structure. The nature of the commodity determines the market structure. The commodity may be either homogeneous or identical and heterogeneous or differentiated. The number of buyers and sellers or few sellers and large buyers or mutual interdependence of buyers and seller also determine the market structure. Thus, there are two extremes of market structure. On the one hand, we have perfect competition or pure competition and monopoly on the other hand. In between these two extremes have imperfect competition consisting of monopolistic competition, oligopoly, and duopoly.

16.2 OBJECTIVES

After reading this lesson, you shall be able to understand the concepts of the following:

- Different market structure
- Characteristic of different Market Structure

16.3 CHARACTERISTICS OF DIFFERENT MARKET STRUCTURE

The main characteristics that determine a market structure are as following

1. ***The number of organizations in the market (selling and buying):*** In a monopoly market there is one seller and large number of buyers whereas, in a perfectly competitive market, the forces of supply and demand determine the number of goods and services produced as well as market prices set by

the companies in the market. The companies under oligopoly market structures can be small or large.

2. ***Relative negotiation power in relation to the price setting:*** In a perfectly competitive market sellers are the price takers whereas in monopoly market, sellers are price makers.
3. ***The level product of differentiation and uniqueness:*** The companies under a monopolistic competition structure sell very similar products with slight differences they use as the basis of their marketing and advertising. Sellers are selling the homogeneous product under perfect competition market.
4. ***The entry and exit barriers in a particular market:*** There is free entry and exit under perfect competition whereas, under monopoly there are restrictions on entry and exit.

The four types of market structure economics differ because of the following characteristics:

1. The number of producers is huge in the perfect and monopolistic competition.
2. There are only few in oligopoly, and one in monopoly.
3. The degree of product differentiation.
4. The barriers to entry of new producers
5. The pricing power of the producer
6. The level of non-price competition (e.g., advertising) are all low in perfect competition, highest in monopoly, moderate in monopolistic competition and high in oligopoly.

The detailed explanation of different types of market is given below along with examples. So, the structure of the market affects how firm price and supply their goods and services, the entry and exit barriers, and how efficiently a seller carries out its business operations. A mix of the above-mentioned characteristics determines several market structures, from which we feature the most important ones. The purpose is to build an understanding of the importance of market structure. Such market structures refer to the level of competition in a market. Four types of market structures are perfect competition, monopolistic competition, oligopoly, and monopoly. One thing we should remember is that not all these types of market structures exist. Some of them are just theoretical concepts. There are other determinants of market structures such as the nature of the goods and products, the number of sellers, the number of consumers, the nature of the product or service, economies of scale, etc.

The different types of market structures are explained as follows:

1. ***Perfect competition market structure:*** In a perfectly competitive market, the forces of supply and demand determine the number of goods and services produced as well as market prices set by the companies in the market.

Examples of Perfect Competition Market Structure:

- Foreign exchange markets.
- Agricultural markets.
- Internet-related industries.

2. ***Monopolistic competition market structure:*** Unlike perfect competition, monopolistic competition does not assume the lowest possible cost production. That little difference in the definition leaves room for huge differences in how the companies operate in the market. The companies under a monopolistic competition structure sell very similar products with slight differences they use as the basis of their marketing and advertising.

Examples of Monopolistic Competition Market Structure:

- Restaurants
 - Hairdressers
 - Clothing
 - TV programmes
3. ***Monopoly competition market structure:*** Monopolies and completely competitive markets sit at either end of market structure extremes. However, both minimize cost and maximize profit. Where there are many competitors in perfect competition, in monopolistic markets, there's just one supplier. High barriers to entry into the monopoly market leave a "mono-" or lone company standing so there is no price competition. The supplier is the price-maker, setting a price that increases profits.

Examples of Monopoly Competition Market Structure:

- Microsoft and Windows
- DeBeers and diamonds
- Your local natural gas company.

4. ***Oligopoly competition market structure:*** Not all companies aim to sit as a single building in a city. Oligopolies have companies that collaborate, or work together, to limit competition and dominate a different market or industry. The companies under oligopoly market structures can be small or large. However, the most powerful firms often have patents, finance, physical resources which control over raw materials that create barriers to entry for new firms.

Following are the examples of oligopolies competition market structure:

- Steel industry
- Aluminium
- Film
- Television
- Cell phone
- Gas

So, these were the four types of market structure and examples.

16.4 SUMMARY

The market structure depends upon the degree of competition prevailing in the market. How much is to be produced and at what price is to be sold are the two decisions taken by an individual firm or producer. Both of these are affected by the market structure. The nature of the commodity determines the market structure. The commodity may be either homogeneous or identical and heterogeneous or differentiated. There are other determinants of market structures such as the nature of the goods and products, the number of sellers, the number of consumers, the nature of the product or service, economies of scale, etc.

16.5 GLOSSARY

- Monopoly : A company or group having exclusive control over a commodity or service
- Perfect competition : The situation prevailing in a market in which buyers and sellers are so numerous
- Price maker : Power to influence the price it charges

16.6 SELF ASSESSMENT QUESTIONS

Q1. What are the factors that affect the market structure?

Q2. Explain the different types of market structure.

Q3. What do you mean by monopoly?

16.7 LESSON END EXERCISE

Q1. Give the suitable examples of different structures of market?

Q2. What is monopolistic competition?

Q3. What is perfect competition?

16.8 SUGGESTED READINGS

- Types of Market Structures - Four Types of Market Structures, Solved Examples and FAQs (vedantu.com)
- Ahuja, H.L *Managerial economics*, S Chand Company, Delhi
- Dwivedi D.N *Managerial Economics*, Vikas Publishing House, Delhi
- Chopra O.P *Managerial Economics*, Tata McGraw Hill, Delhi

PRICE DETERMINATION AND FIRM'S EQUILIBRIUM

STRUCTURE

- 17.1 Introduction
- 17.2 Objectives
- 17.3 Price determination in short run and long run under Perfect competition
- 17.4 Firm's Equilibrium in short run and Long Run under Perfect Competition
- 17.5 Monopolistic Competition
- 17.6 Duopoly
- 17.7 Oligopoly
- 17.8 Monopoly
- 17.9 Summary
- 17.10 Glossary
- 17.11 Self Assessment Questions
- 17.12 Lesson End Exercise
- 17.13 Suggested Readings

17.1 INTRODUCTION

Price is the worth that buys a finite amount, weight, or another match of goods or services. In other words, it also expresses the value of the goods produced and the services rendered by factors of production such as land, labor, and capital. Thus, the determination of prices is of great significance in an economy. Determination of Prices means to determine the cost of goods sold and services rendered in the free market. In a free market, the forces of demand and supply determine the prices. The Government does not interfere in the determination of the prices. However, in some cases, the Government may intervene in determining the prices. For example, the Government has fixed the minimum selling price for the wheat.

17.2 OBJECTIVES

After reading this lesson, you shall be able to understand the concept of the following;

Price determination in short and long run under perfect competition
monopolistic competition

Firm's equilibrium in short and long run under perfect competition monopolistic
competition

Monopolistic competition

Duopoly

Oligopoly

Monopoly

17.3 PRICE DETERMINATION IN SHORT AND LONG RUN UNDER PERFECT COMPETITION MONOPOLISTIC COMPETITION

In monopolistic competition, the market has features of both perfect competition and monopoly. A monopolistic competition is more common than pure competition or pure monopoly. Here we will understand monopolistic competition and look at the features and price-output determination. In order to understand monopolistic competition, let's look at the market for soaps and detergents in India. There are many well-known brands like Lux, Rexona, Dettol, Dove, Pears, etc. in this segment. Since all manufacturers produce soaps, it appears to be an example of perfect competition. However, on close scrutiny, we find that each seller varies the product slightly to make it different from its competitors. Hence, Lux focuses on making beauty soaps, Liril on freshness, Dettol on antiseptic properties, Dove on smooth skin, etc. This allows each seller to attract buyers to itself based on some factor other than price. This market has a mix of both perfect competition and monopoly and is a classic example of monopolistic competition.

Price-output determination under Monopolistic Competition

In monopolistic competition, since the product is differentiated between firms, each firm does not have a perfectly elastic demand for its products. In such a market, all firms determine the price of their own products. Therefore, it faces a downward sloping demand curve. Overall, we can say that the elasticity of demand increases as the differentiation between products decreases.

17.4 FIRM'S EQUILIBRIUM IN SHORT AND LONG RUN UNDER PERFECT COMPETITION MONOPOLISTIC COMPETITION

The equilibrium of the firm under monopolistic competition follows the usual analysis in the short- run and long-run.

(a) Short-run Equilibrium:

Assumptions

The short-run analysis of the firm under monopolistic competition is based on the following assumptions:

- (1) That the number of sellers is large and they act independently of each other. Each is a monopolist in his own sphere;
- (2) That the product of each seller is differentiated from the other products;
- (3) That the firm has a determinate demand curve (AR) which is elastic;
- (4) That the factor-services are in perfectly elastic supply for the production of the product in question
- (5) That the short-run cost curves of each firm differ from each other; and
- (6) No new firms enter the industry.

Given these assumptions, each firm fixes such price and output which maximises its profits. The equilibrium price and output is determined at a point where the short-run marginal cost (SMC) equals marginal revenue (MR). Since costs differ in the short-run, a firm with lower unit costs will be earning only normal profits. In case, it is able to cover just the average variable cost, it incurs losses.

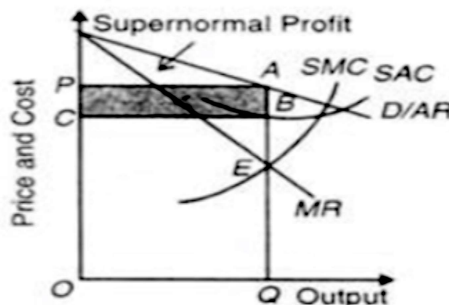


Figure 17.1

Super-normal Profit

In Figure 17.1 the short-run marginal cost curve (SMC) cuts the MR curve at E. This equilibrium point establishes the price QA (= OP) and output OQ. As a result, the firm earns supernormal profit represented by the area PABC.

Normal Profit

Figure 17.2 indicates the same equilibrium points of price and output. But in this case, the firm just covers the short-run average unit cost as represented by the tangency of demand curve D and the short-run average unit cost curve SAC at A. It earns normal profit.

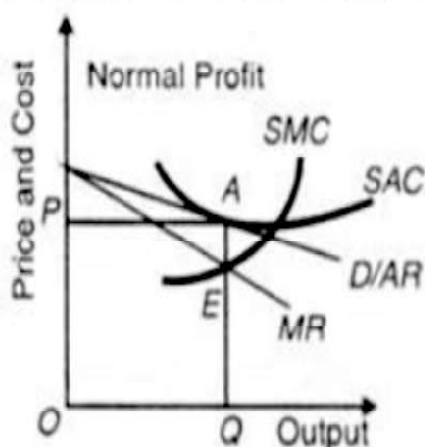


Figure 17.2

It is not essential that during the short-run all firms charge identical prices and produce the same quantity as shown above. This is to simplify our geometrical presentation. There being product differentiation, identity of prices and quantities cannot be expected. Each firm acts in accordance with its own short-run costs and equates its SMC curve with the MR curve. However, this does not mean that the firm fixes a very different price from the other producers. Since its product has

close substitutes, its price will have to approximate to the prices of the other firms producing a similar product.

(b) Long-Run Equilibrium

In the long run, there is entry and exit of firms in a monopolistic competitive industry and the adjustment process will ultimately lead to the existence of only normal profits. This is a realistic assumption for in the long-run no firm can earn either super-normal profits or incur losses because each produces a similar product. If firms in the monopolistic competitive industry are earning super-normal profits, new firms will be attracted into the group. With the entry of new firms, the existing market is divided among more sellers so that each firm will sell lesser quantities of the product than before. As a result, the demand curves faced by individual firms shift down to the left. At the same time, the entry of new firms will increase the demand and hence the price of factor-services which will shift the cost curves of individual firms upward. This two-way adjustment process of lowering the demand curve and raising the cost curves will squeeze out super-normal profits. Thus, each firm will be earning only normal profits in the long-run as shown in Fig. 4. In the figure, all firms are in long-run equilibrium at point E where (1) $LMC = MR$, and (2) LMC cuts MR from below and the LAC curve is tangent to the $DIAR$ curve at point A. Since price $QA = LAC$ at point A, each firm is earning normal profits and no firm has the tendency to enter or leave the industry. This long-run equilibrium analysis under monopolistic competition reveals that each firm and the entire industry will not produce optimum output. There will always be excess capacity. For the firms are not in a position to operate their plants to the maximum capacity and thus enjoy the economies of large scale production fully.

17.5 MONOPOLISTIC COMPETITION

A monopolistic market is a theoretical condition that describes a market where only one company may offer products and services to the public. A monopolistic market is the opposite of a perfectly competitive market, in which an infinite number of firms operate. In a purely monopolistic model, the monopoly firm can restrict output, raise prices, and enjoy super-normal profits in the long run.

The followings are the features of monopolistic competition:

1. **Large number of sellers:** In a market with monopolistic competition, there are a large number of sellers who have a small share of the market.
2. **Product differentiation:** In monopolistic competition, all brands try to create product differentiation to add an element of monopoly over the competing products. This ensures that the product offered by the brand does not have a perfect substitute. Therefore, the manufacturer can raise the price of the product without having to worry about losing all its customers to other brands. However, in such a market, while all brands are not perfect substitutes, they are close substitutes for each other. Hence, the seller might lose at least some customers to his competitors.
3. **Freedom of entry or exit:** Like in perfect competition, firms can enter and exit the market freely.
4. **Non-price competition:** In monopolistic competition, sellers compete on factors other than price. These factors include aggressive advertising, product development, better distribution, after sale services, etc. Sellers don't cut the price of their products but incur high costs for the promotion of their goods. If the firms indulge in price-wars, which is the possibility under perfect competition, some firms might get thrown out of the market.

17.6 DUOPOLY

Duopoly is a market structure in which only two sellers (producers). This is the basic form of oligopoly competition. The two players serve multiple buyers and sell competing goods and services. In this market, players have a high strategic dependence, especially in making business decisions such as pricing and production. Competition output depends on a competitive basis in the market. For example, under the Cournot model, a competitive basis is the quantity of output, producing prices and outputs between the monopoly and the perfectly competitive markets. To increase market power and profits, the two players may engage in collusive cooperation.

Following are the examples of duopoly:

- ***Indofood (Indomie) with Wings Food (Mie Sedaap)***: for the instant noodle market in Indonesia. Both of them control almost 90% of the market share.
- ***Intel and Advanced Micro Devices (AMD)***: in the global semiconductor chip market. Intel controls a market share of around 66.7%, and AMD controls around 33.2% between the first quarter of 2015 and 2020.
- ***Airbus and Boeing***: in the commercial aircraft manufacturing market. Airbus and Boeing respectively control about 45% and 43% of single-aisle passenger aircraft shipments.
- ***MasterCard and Visa***: in the international payment service business. Visa holds a 60% share of the credit and debit card market. Meanwhile, Mastercard controls a market share of around 30%.

- ***Pepsi and Coca Cola:*** in the carbonated drink market. In the United States market, Coca-Cola Company's market share was 42.7%, and PepsiCo was 30.8% in 2008.
- ***Android and iOS:*** in the mobile phone operating system. Android controls a market share of around 86.1% and ios 13.9% for global smart phone shipments in 2019.

In some of the examples above, the competition actually consists of several players. However, I categorize them in a duopoly because two companies stood out and had a significant market share. Besides, smaller players usually target a niche market or serve only the local market.

Duopoly

A duopoly is a specific form of oligopoly. The oligopoly market consists of several players with considerable market power. Barriers to entry are also high so that the threat of new entrants is low. Few companies control a large market share, enabling them to influence market supply. Besides, the source of market power also comes from a differentiation strategy, allowing companies to charge premium prices. Meanwhile, under duopoly, market power is concentrated between two firms. Both have significant monopoly power and high strategic dependence. One manufacturer's strategic decisions have a significant impact on other producers. For this reason, the market is likely to introduce collusive behavior. And when that happens, the two companies act as though they are monopolists.

Duopoly characteristics

The followings are the characteristics of monopoly:

- **Market consists of two producers:** Both producers serve a large number of buyers, so their bargaining power is high.
- **Producers have a high strategic dependence:** Strategic actions and decisions by one company have a significant impact on the competitor.
- **Chances of collusive behavior are high:** Since both of them are highly interdependent, they are likely to collude to secure high market profits.
- **The level of competition may be fierce:** This happens when the two do not collude. Regulators usually keep a close eye on this market to avoid anti-competitive practices. Therefore, the strict supervision of regulators means that the two cannot collude.
- **Monopoly power is significant:** Apart from controlling the market supply, the two companies may also adopt a differentiation strategy. As long as each adopts a differentiation strategy, each product will have several loyal customers, presenting significant monopoly power.
- **Entry barriers are high:** It can stem from structural barriers inherent in natural characteristics of markets such as economies of scale. Or, both companies have deliberately built entry barriers such as low-price strategies and brand loyalty.
- **Economies of scale are high:** Each of the companies enjoyed high sales because the market was split between only two companies.

Types of Duopoly :

The two main models for explaining duopoly markets are:

Cournot duopoly

Bertrand duopoly

1. Cournot duopoly

As the name suggests, this model comes from Antoine Cournot, a French mathematician and philosopher. Under the Cournot model, quantity determines market competition and, thus, the output of competition. Both firms will produce at a rate that maximizes profits and selects output simultaneously. Each company produces according to the output of competitors and market supply. Both assume that the competitor's output does not change. The model also assumes that players do not collude. When the market reaches equilibrium, each firm has no incentive to change output or prices. The change will not make any company better. Therefore, in the long run, output and prices are stable. The outcome of Cournot competition (output and price) will be between the perfect competition and monopolistic competition equilibrium.

2. Bertrand duopoly

Joseph Bertrand, a French mathematician and economist, criticized the basis of competition in the Cournot model. According to him, price is a determining factor for competition, not the quantity of output. Under Bertrand's model, each company views that consumers will choose the company that provides the best (cheapest) price because the products on the market are identical. So when one company lowers its price, other players will take similar steps to avoid losing market share. A price cut by one company then creates a price war in the market. The price war continues. While the price is still above the marginal cost, each company will still make a profit, and there is still potential to further cut the price. Thus, the market will reach equilibrium when the two firms' prices are equal, which is at the marginal

cost. As in the Cournot model, the Bertrand model assumes a homogeneous product.

Implications for competition

In a duopoly market, every firm has a strategic dependence. It affects how individual companies operate, how they produce goods, how to advertise products, and set prices. Competition outcomes depend on the strategies adopted by each company. Both of them may adopt a pricing strategy like in the Bertrand model. Or, both of them base a competitive strategy based on quantity. Furthermore, different from the above two models, the firm may take collusive or differentiation steps to generate better profits in the following manner.

1. Competition through price

When the two firms compete via price, it can lead to price wars, especially when products are homogeneous. Because of homogeneity, the products of each company substitute each other perfectly. Thus, the consumer's consideration in buying is a lower price. They have no reason to prefer or be loyal to one product over another. When one firm lowers its price, it eliminates a competitor's market share because consumers will switch. Not wanting to lose market share, competitors will also lower prices. Price wars arise, and they continue until prices equal marginal cost, eliminating profit opportunities. For this reason, both firms feel profitable if they form a silent monopoly (collusion). The two can work together to set a price that will allow them to take half of the market profits. But, indeed, such tactics are tricky and often clash with anti-monopoly regulations.

2. Competition through quantity

Duopolies tend to function better when the basis of competition is quantity rather than price. Each company shares market share and profit. When it reaches equilibrium, output and prices will stabilize, as in the Cournot model. The profits of

each company will also be high. Both firms can charge a price above the perfectly competitive price (although still under the monopoly market), which is higher than the marginal cost. In other words, both of them have monopoly power.

3. Competition through quality

Quality is another dimension of competition in a duopoly market. Each company differentiates its offerings to build loyalty. Differentiation presents an element of monopoly in the market. Each product will have a loyal customer base, increasing the company's monopoly power. Take the case of Android and iOS in the smart phone software market. Google launched Android to target the mass market and monopolize this market. Likewise, Apple's iOS is targeting a more premium market and monopolizing this market.

17.7 OLIGOPOLY

The term Oligopoly derives from the Latin 'oligoi' meaning "few", and 'poleo' meaning "to sell". So, translated, it means 'few sellers'. This is one of the main characteristics of an oligopoly.

In economics, an oligopoly is defined as a type of market structure where two or more firms have market control. Combined, they are able to dictate prices and supply. Yet, they are unable to influence the market on their own.

Firms in an oligopoly can have varying degrees of market share. This could be as significant as 50 percent, or, as little as 5 percent. The point is that the oligopoly is characterised by a few firms no matter their size as long as a handful of them have enough power to dictate supply and demand.

Oligopolies are also characterised by their interdependence. In other words, they are highly responsive to competitor's actions. For instance, if one firm reduces

prices, all the others will follow suit to maintain their position in the market. The following are the characterised of Oligopoly.

1. A Few Firms with Large Market Share

A market may have thousands of sellers, but if the top 5 firms have a combined market share of over 50 percent, it can be classified as an oligopolistic market. This is because the power is concentrated between a few sellers who are able to exercise power over the market.

2. High Barriers to Entry

Oligopolistic firms maintain their position through a number of barriers to entry. For instance, brand loyalty, patents, and high start-up costs are but to name a few. These make it difficult for new entrants to build a presence in the market and attract customers. In industries such as retail - brand loyalty is a significant barrier to overcome.

These barriers to entry make it difficult for new firms to join and sets it apart from perfect competition. As a result, these barriers to entry allow oligopolies to make higher profits due to limited competition.

3. Interdependence

Any action a firm takes in an oligopolistic market will strongly affect the actions of its competitors. As a result, we have what is often referred to as the 'Prisoners Dilemma', under Game Theory. For those who are not familiar with these terms: an oligopolistic firm will operate based on how they believe competitors will react. In other words, Company A expects Company X to reduce its prices, so will do so as well.

This can be sub-optimal as it reduces the power of a competitive market. For

example, if Apple was to reduce the price of its iPhone by \$200, Samsung would likely follow suit. So when Apple looks to take that decision, they will consider how they will benefit. They won't receive a boost in demand because the competition is also the same price, so any initial benefit is lost. Often this can lead oligopolistic firms to just maintain the status quo and keep prices constant.

4. Each Firm Has Little Market Power In Its Own Right

Leading on from interdependence; each firm has little market power, because other firms are quick to take advantage. For example, an oligopolistic firm cannot raise prices in fear that customers will flee to its competitors. One oligopolistic firm cannot dictate prices or supply because competitors are equally as 'powerful'. On an individual basis, this keeps the firm in check. Yet it equally incentivises collusion as one firm is unable to get ahead.

5. Higher Prices than Perfect Competition

Under perfect competition, prices are just above marginal cost, leaving firms with small profits - if any. As oligopolies have combined market power, they tend to keep prices higher to obtain larger profits.

If any firms were to reduce prices, others would also follow suit, thereby reducing profits for all. This is where it becomes tricky in distinguishing between collusion and a natural state of oligopolistic competition. Do firms naturally keep prices higher due to fear that their actions will reduce their profits? Or, do they collude to keep prices and profits high?

6. More Efficient

Oligopolistic firms benefit from high levels of market share. At the same time, they benefit from economies of scale. It means, it can produce at a lower cost. For

instance, there are markets that have high fixed costs such as car manufacturers. If new competitors want to enter, they have to spend millions on new factories and other infrastructure.

Consequently, this would increase costs for existing firms as the benefit they receive from economies of scale would decline. This means higher prices for customers and it is for this reason that such markets are better served under an oligopolistic market structure.

There are many oligopoly examples in today's society. In fact, the device you are using now may very well be part of an oligopoly. With that said, it is important to realise that an oligopoly is generally defined by its market concentration. In other words, a few firms control the market.

Key points:

1. An oligopoly is a type of market structure where two or more firms have significant market power. Collectively, they have the ability to dictate prices and supply.
2. Generally, a market is considered an oligopoly when 50 percent of the market is controlled by the leading 4 firms.
3. An oligopoly can be identified using either the concentration ratio, or the Herfindahl-Hirschman Index.

17.8 MONOPOLY

A monopoly is a market structure with only one seller and serving many buyers. The seller is called a monopolist. Unlike in perfectly competitive markets, the monopolist has absolute control over market supply and prices. Since there is only one company, individual supply is the same as the market supply. Likewise, the

demand faced by the monopolist is effectively the same as market demand. Monopolists maintain their dominance over time for several reasons. First, it is because of government policy. Second, it is because of the low threat of new entrants due to the high barriers to entry. Third, the monopolist does not face the threat of substitution.

(i) Characteristics of Monopoly

We can recognize the features of monopoly competition from various aspects, including:

- The number of sellers and buyers
- Barriers to entry
- Threats of substitution
- Firm market power.

Such aspects distinguish a monopoly market from other market structures such as perfect competition, monopolistic competition, and oligopoly.

The following are the characteristics of a monopoly:

- The market consists of one producer. Firm supply is the same as the market supply. Therefore, price and quantity depend on the monopolist's strategy.
- Barriers to entry are high. It may come from economies of scale, regulatory constraints, or control of scarce resources. As a result, the threat from newcomers is low.
- The market has no substitutions. Consumers have no alternative products to buy.

- The monopolist has absolute market power. That's because the company is the sole producer and doesn't face threats from new entrants and product substitutions.
- The monopolist is the price maker. The company determines the market price for the products it sells.
- The monopolist has the power to discriminate against prices. Companies can set different prices to different consumers for the same product. It may be based on the buyer's reservation price, purchase volume, or other aspects.

(ii) Examples of Monopoly

Examples of monopolies vary between countries. But, usually, it is for strategic industries such as electricity, telecommunication, and utilities. A monopoly is a viable option for such an industry. Fixed costs are significant, so to achieve economies of scale and lower selling prices, the market needs only one firm.

In Indonesia, examples of monopolists are:

- PT Perusahaan Listrik Negara (PLN) in the electricity industry
- PT Kereta Api Indonesia (Persero) in the railway industry
- PT Pindad in the military products industry

In the **United States**, examples are:

- Carnegie Steel Company
- Standard Oil Company
- American Tobacco Company

In India, examples are:

- Indian Railway Catering and Tourism Corporation (IRCTC)
- " Hindustan Aeronautics India Limited (HAL)

(iii) Causes of monopoly

The next question is how monopoly came about. There are various arguments for why monopoly power emerged, including:

- Control over critical and scarce production sources. For example, a diamond mining company.
- Legal barriers. Patents, copyrights, and licenses grant monopolistic rights to their owners to commercialize within a certain period. During that period, no one else may use or copy it.
- Economies of scale. A large company has significant economies of scale and can charge lower prices than its smaller competitors. It can set prices so low, at which competitors cannot compete and are forced to exit the market. The low price also acts as an entry barrier for new entrants.
- Network effect. An example is the Windows computer operating system by Microsoft. Many people use it. They become more familiar and challenging to switch to alternative products such as Linux. Various companies also use it. They don't need to train employees because everyone knows how to use it.
- Authorization by the government. The government only allows one company to operate in the market as in most cases the natural monopoly in the electricity and railway industry.

- Non-price differentiation. That leads to the power of pricing. Companies produce unique and superior products, making consumers unwilling to switch to substitute products.

(iv) Profit maximization under a monopoly market

The monopolist faces a downward-sloped demand curve. Meanwhile, it does not have a well-defined supply function to determine optimal prices and output. Instead, it is determined by the entire demand curve it faces. To maximize profit, the monopolist will produce at the quantity point where marginal revenue equals marginal cost. And, profit is not affected by changes in quantity. Say the firm produces lower output where marginal revenue is higher than marginal cost. In this case, the company can get a higher profit by increasing output.

(v) Natural monopoly

What is a natural monopoly? A natural monopoly is when costs fall if the market comprises fewer players, even just one firm. It happens because of significant fixed costs. Thus, companies need higher economies of scale to lower average costs and selling prices. The higher the quantity sold, the lower the average cost. If two or more companies operate, each must share market share and output. It is not sufficient to achieve higher economies of scale because of lower output, resulting in higher average costs. For this reason, the government only allows one company to operate in the market. To avoid abuse of market power and avoid detrimental behavior for consumers, the government then regulates it, for example, by setting a limit on selling prices.

(vi) Price discrimination in the monopoly market

Because it has absolute market power, the monopolist will maximize its profits by discriminating against prices. Companies charge different prices to different

consumers for the same product. Three alternatives to price discrimination:

- First-degree price discrimination or perfect price discrimination. The monopolist sets the price according to the reservation price of each consumer, that is, the price they are willing and able to pay. In this case, the monopolist converts all consumer surplus into producer surplus.
- Second-degree price discrimination. The monopolist sets the price differently according to the volume purchased by each consumer. Purchase volume indicates whether the consumer highly appreciates the product or not.
- Third-degree price discrimination. The monopolist differentiates prices based on aspects other than reservation price and sales volume. It may be based on geographic variables or other characteristics.

(vii) Advantages and disadvantages of monopoly

In some cases, monopoly is desirable for several reasons, including:

- a) First, it is essential to finance large-scale research and development projects. Companies can use their economic profit to innovate as a way to maintain dominance in the long run.
- b) Second, the price of the product is lower. As in the case of natural monopolies, one firm can achieve higher economies of scale. The monopolist can produce at a low average cost, which cannot be achieved if two or more firms operate. It should also be supported by greater efficiency and innovation.

However, monopoly is also undesirable for several reasons:

- a) Abuse of market power. The monopolist can produce a low quantity of output, of poor quality but sell it at a high price. There is no pressure to do

so unless it is regulated by the government. If that happens, it only benefits the company and harms consumers.

- b) Converting consumer surplus. By discriminating against prices, the monopolist converts the consumer surplus into its own, provided the monopolist produces allocative efficiency (the total surplus is maximum). But, it must be able to apply first-degree price discrimination. That way, the total surplus will equal the producer surplus. But that's hard to do in the real world.
- c) X-inefficiency. Monopolists are reluctant to set prices at minimum average cost because there is no incentive to do so. I mean, there is no regulation or competitive pressure to force it to achieve minimum average costs.
- d) Rent-seeking. The monopolist seeks to dominate and incurs costs such as lobbying and law to defend its privileges.

Monopoly vs. perfect competition

Monopoly is the extreme pole for market structure. It is the opposite of perfect competition. Compared to perfect competition, the quantity sold by the monopolist is usually smaller. Therefore, the monopolist can charge a price higher than the price charged by firms in perfect competition. A monopolist is a price maker, while a perfectly competitive firm is a price taker. As a price taker, the company only takes the market price as the selling price of its products. Since the monopolist is the only seller of the product in the market, it does not have to worry about competitors. It can increase the price of a product without worrying about the actions of other competitors, the threat of substitution, or the threat of new entrants. Conversely, in a perfectly competitive market, if the company unilaterally increases its price, it will only lose market share. Consumers immediately turn to competitors.

17.9 SUMMARY

Determination of prices means to determine the cost of goods sold and services rendered in the free market. In a free market, the forces of demand and supply determine the prices. The Government does not interfere in the determination of the prices. In monopolistic competition, the market has features of both perfect competition and monopoly. A monopolistic competition is more common than pure competition or pure monopoly

17.10 GLOSSARY

- Monopolistic : Combination of perfect and monopoly
- Monopoly : The exclusive possession or control of the supply of or trade in a commodity or service
- Duopoly : A situation in which two suppliers dominate the market for a commodity or service.
- Oligopoly : A state of limited competition, in which a market is shared by a small number of producers or sellers

17.11 SELF ASSESSMENT QUESTIONS

Q1. Explain in detail the features of monopolistic market?

Q2. Briefly explain the characteristics of monopoly?

Q3. What is oligopoly?

Q4. Explain Price determination in short and long run under perfect competition monopolistic competition.

Q5. Explain in detail the advantages and disadvantages of monopoly.

17.12 LESSON END EXERCISE

Q1. What do you mean by monopoly?

Q2. What is the difference between perfect market and monopoly?

Q3. What is duopoly?

Q4. Explain Firm's equilibrium in short and long run under perfect competition monopolistic competition.

1. Which of the following is correct about product cost?

- a. Product cost refers to a distribution system.
- b. Product cost refers to the total of fixed costs, variable costs and semi-variable costs
- c. It refers to the total cost of the product.
- d. Product cost refers to the sales of the product.

Ans: While calculating the cost of a product, the sum of all costs associated with the production of a specific quantity of a good or service is included. So the correct option is B.

17.13 SUGGESTED READINGS

- Determination of Prices: Introduction, Factors, Equilibrium Price etc. (toppr.com)
- Short-Run and Long-Run Price Determination of a Firm | Monopolistic Competition (yourarticlelibrary.com)

- Monopolistic Competition: Features, Price Determination, Examples (toppr.com)
- Duopoly: Examples, Characteristics, Types, Implications- Penpoin.
- Monopoly: Meaning, Examples, Characteristics, Causes, Advantages, Disadvantages- Penpoin.
- Ahuja, H.L *Managerial economics*, S Chand Company, Delhi
- Dwivedi D.N *Managerial Economics*, Vikas Publishing House, Delhi
- Chopra O.P *Managerial Economics*, Tata McGraw Hill, Delhi

PRICING PRACTICES

STRUCTURE

18.1 Introduction

18.2 Objectives

18.3 Pricing Practice

18.4 Summary

18.5 Glossary

18.6 Self Assessment Questions

18.7 Lesson End Exercise

18.8 Suggested Reading

18.1 INTRODUCTION

Pricing is a process of fixing the value that a manufacturer will receive in the exchange of services and goods. Pricing method is exercised to adjust the cost of the producer's offerings suitable to both the manufacturer and the customer. The pricing depends on the company's average prices, and the buyer's perceived value of an item, as compared to the perceived value of competitor's product.

18.2 OBJECTIVES

After studying this lesson, you shall be able to understand the concept of the following:

- Pricing practice
- Pricing Methods
- Factor affecting Determination of Prices

18.3 PRICING PRACTICE

Every businessperson starts a business with a motive and intention of earning profits. This ambition can be acquired by the pricing method of a firm. While fixing the cost of a product and services the following point should be considered:

- The identity of the goods and services
- The cost of similar goods and services in the market
- The target audience for whom the goods and services are produces
- The total cost of production (raw material, labour cost, machinery cost, transit, inventory cost etc).
- External elements like government rules and regulations, policies, economy, etc.,

(i) Objectives of Pricing

The following are the objectives of pricing:

- **Survival-** The objective of pricing for any company is to fix a price that is reasonable for the consumers and also for the producer to survive

in the market. Every company is in danger of getting ruled out from the market because of rigorous competition, change in customer's preferences and taste. Therefore, while determining the cost of a product all the variables and fixed cost should be taken into consideration. Once the survival phase is over the company can strive for extra profits.

- ***Expansion of current profits-*** Most of the company tries to enlarge their profit margin by evaluating the demand and supply of services and goods in the market. So the pricing is fixed according to the product's demand and the substitute for that product. If the demand is high, the price will also be high.
- ***Ruling the market-*** Firm's impose low figure for the goods and services to get hold of large market size. The technique helps to increase the sale by increasing the demand and leading to low production cost.
- ***A market for an innovative idea-*** Here, the company charge a high price for their product and services that are highly innovative and use cutting-edge technology. The price is high because of high production cost. Mobile phone, electronic gadgets are a few examples.

(ii)Pricing Method

Pricing method is a technique that a company apply to evaluate the cost of their products. This process is the most challenging challenge encountered by a company, as the price should match the current market structure and also compliment the expenses of a company and gain profits. Also, it has to take the competitor's product pricing into consideration so, choosing the correct pricing method is essential.

Types of Pricing Method:

The pricing method is divided into two parts:

(1) Cost Oriented Pricing Method- It is the base for evaluating the price of the finished goods, and most of the company apply this method to calculate the cost of the product. This method is divided further into the following ways.

- *Cost-Plus Pricing-* In this pricing, the manufacturer calculates the cost of production sustained and includes a fixed percentage (also known as mark up) to obtain the selling price. The mark up of profit is evaluated on the total cost (fixed and variable cost).
- *Markup Pricing-* Here, the fixed number or a percentage of the total cost of a product is added to the product's end price to get the selling price of a product.
- *Target-Returning Pricing-* The company or a firm fix the cost of the product to achieve the Rate of Return on Investment.

(2) Market-Oriented Pricing Method- Under this category, the is determined on the base of market research

- *Perceived-Value Pricing-* In this method, the producer establish the cost taking into consideration the customer's approach towards the goods and services, including other elements such as product quality, advertisement, promotion, distribution, etc. that impacts the customer's point of view.
- *Value pricing-* Here, the company produces a product that is high in quality but low in price.
- *Going-Rate Pricing-* In this method, the company reviews the competitor's rate as a foundation in deciding the rate of their product. Usually,

the cost of the product will be more or less the same as the competitors.

- *Auction Type Pricing*- With more usage of internet, this contemporary pricing method is blooming day by day. Many online platforms like OLX, Quikr, eBay, etc. use online sites to buy and sell the product to the customer.
- *Differential Pricing*- This method is applied when the pricing has to be different for different groups or customers. Here, the pricing might differ according to the region, area, product, time etc.

(iii) Factors affecting Determination of Prices

Price determination of the product affected by the following factors:

- ***Product Cost***

Product cost is one of the most important factors which affect the price. It includes the total of fixed costs, variable costs and semi-variable costs incurred through the production, distribution, and selling of the product. Fixed costs refer to those costs which remain fixed at all the levels of production or sales. For instance, rent, salary, etc. Variable costs attribute to the costs which are directly related to the levels of production or sales. For example, the costs of basic material, apprentice costs, etc. Semi-variable costs take into account those costs which change with the level of activity but not in direct proportion.

- ***The Utility and Demand***

Habitually, end user demands more units of a product when its price is low and vice versa. On the other hand, when the demand for a product is elastic, little variation in the price may result in large changes in quantity demanded. While, when it is inelastic a change in the prices does not affect the demand significantly. In

addition, the buyer is ready to pay up to that point where he perceives utility from the product to be at least equal to the price paid.

- ***The extent of Competition in the Market***

The next consistent factor affecting the price of manufactured goods is the nature and degree of competition in the market. A firm can fix any price for its product if the degree of competition is low. However, when there is competition in the market, the price is fixed after keeping in mind the price of the substitute goods.

- ***Government and Legal Regulations***

The firms which have a monopoly in the market, habitually charge a high price for their products. In order to protect the interest of the public, the government intervenes and regulates the prices of the commodities. For this purpose, it declares some products as indispensable products. For example, Life-saving drugs, etc.

- ***Pricing Objectives***

Another consistent factor, affecting the price of an item for consumption or service is the pricing objectives. Profit Maximization, Obtaining Market Share Leadership, Surviving in a Competitive Market and Attaining Product Quality Leadership are the pricing objectives of an enterprise. By and large, firm charges higher prices to cover high quality and high cost if it's backed by the above objective.

- ***Marketing Methods Used***

A range of marketing methods such as circulation system, quality of salesmen, marketing, type of wrapping, patron services, etc. also affects the price of manufactured goods. For instance, an organization will charge sky-scraping revenue if it is using the classy material for wrapping its product.

Determination of Equilibrium Price

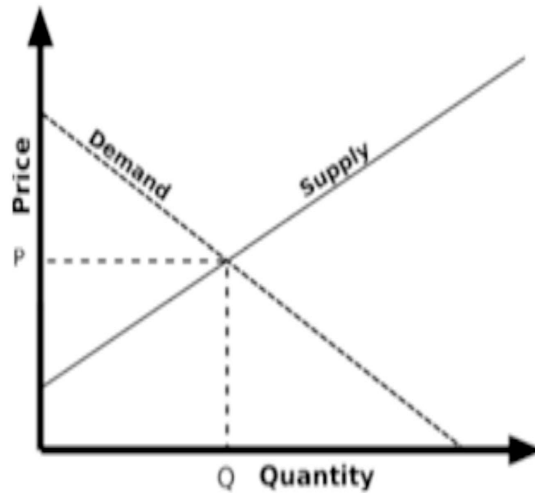


Figure 18.1

18.4 SUMMARY

Pricing method is exercised to adjust the cost of the producer's offerings suitable to both the manufacturer and the customer. The pricing depends on the company's average prices, and the buyer's perceived value of an item, as compared to the perceived value of competitor's product. Every businessperson starts a business with a motive and intention of earning profits. This ambition can be acquired by the pricing method of a firm. . A firm can fix any price for its product if the degree of competition is low. However, when there is competition in the market, the price is fixed after keeping in mind the price of the substitute goods.

18.5 GLOSSARY

- Perceived : Become aware or conscious of (something)
- Utility : The state of being useful, profitable, or beneficial
- Market : An area or arena in which commercial dealings are conducted

18.6 SELF ASSESSMENT QUESTIONS

Q1. How do you define the pricing practices?

Q2. What are the methods of pricing practices?

Q3. Explain the different types of pricing method.

Q4. What is mark-up pricing?

18.7 LESSON END EXERCISE

Q1. What are the objectives of pricing?

Q2. Explain the Cost Oriented Pricing Method.

8.8 SUGGESTED READINGS

- What is Pricing? Definition, Meaning, Objectives and Types, Different Methods (byjus.com)
- Ahuja, H.L *Managerial economics*, S Chand Company, Delhi
- Dwivedi D.N *Managerial Economics*, Vikas Publishing House, Delhi
- Chopra O.P *Managerial Economics*, Tata McGraw Hill, Delhi

METHODS OF PRICE DETERMINATION IN PRACTICE**STRUCTURE**

- 19.1 Introduction
- 19.2 Objectives
- 19.3 Method of Price determination in Practice
- 19.4 Pricing of Multiple Products
- 19.5 Summary
- 19.6 Glossary
- 19.7 Self Assessment questions
- 19.8 Lesson End Exercise
- 19.9 Suggested Readings

19.1 INTRODUCTION

Price is the worth that buys a finite amount, weight, or another match of goods or services. In other words, it also expresses the value of the goods produced and the services rendered by factors of production such as land, labor, and capital. Thus, the determination of prices is of great significance in an economy. Determination of Prices means to determine the cost of goods sold and services rendered in the

free market. In a free market, the forces of demand and supply determine the prices.

19.2 OBJECTIVES

After studying this lesson, you shall be able to understand the concept of the following:

- Methods of price determination in practice
- Cost plus Pricing
- Target Return Pricing
- Pricing of multiple products

19.3 METHODS OF PRICE DETERMINATION IN PRACTICE

Some of the methods of Price Determination for a product are as follows:

A. Cost Based Pricing Methods

Costs establish the floor for the possible price range and there are two commonly used costs oriented pricing methods to set the product prices.

1. Cost plus pricing and
2. Target returns pricing

1. Cost plus Pricing Method: Cost plus or target or mark-up pricing involves simply adding a percentage of the cost to arrive at the price. There is slight difference between cost plus and mark-up pricing. Mark-up pricing is an addition of profit calculated as a percentage of sales rather than as a percentage of cost. In the final analysis, the amount of profit will be the same though the percentage of profit differs on cost and on sales.

This is clarified by the following example:

Table 19.1

THE PRODUCTS SOLD BY THE FIRM			
	Radio Mono	Two-in -one	Stereo -deck
	Rs.	Rs.	Rs.
Prime cost	500.00	800.00	1,700.00
Manufacturing overheads	300.00	400.00	600.00
Administrative burden	100.00	200.00	400.00
Selling & distribution burden	50.00	100.00	300.00
Cost of sales	950.00	1,500.00	3,000.00
Profit (25% on cost) or (20% on sales)	237.50	375.00	750.00
SELLING PRICE	1,187.00	1,875.00	3,750.00

$$\text{Selling price} = \frac{\text{Average unit cost}}{1 - \text{Desired mark-up percentage}}$$

$$\therefore \text{Rs. } 1,000 = \frac{\text{Rs. } 700}{1 - 30\%} \quad \therefore \text{Rs. } 1,000 = \frac{\text{Rs. } 700}{1 - 0.30}$$

$$\therefore \text{Rs. } 1,000 = \frac{\text{Rs. } 700}{0.70}$$

2. Target returns pricing

It is another very popular cost oriented method followed by good many manufacturers. It is based on the break even analysis. It sets the prices at a desired percentage return over and above the breakeven point. Thus, the costs of producing and offering the goods for sale are determined and a target percentage return is then added to these costs at a given standard output level. Since, total revenue to be generated includes costs and profits, it is easier to find unit selling price by dividing the total sales revenue by total output or input level. If Kemp and Company has a standard output level of say, 80,000 tricycles and the total cost works out to be Rs. 1,27,50,000 consisting of Rs. 42,50,000 fixed costs and Rs. 85,00,000 variables costs and it wants to make 20 per cent on costs, the total revenue generated will be of Rs. 1,53,00,000. Therefore, the unit selling price will be of Rs. 180 each. This data can be presented in the form of a graph showing the cost,

volume and profit relationship as given in Fig. 19.1

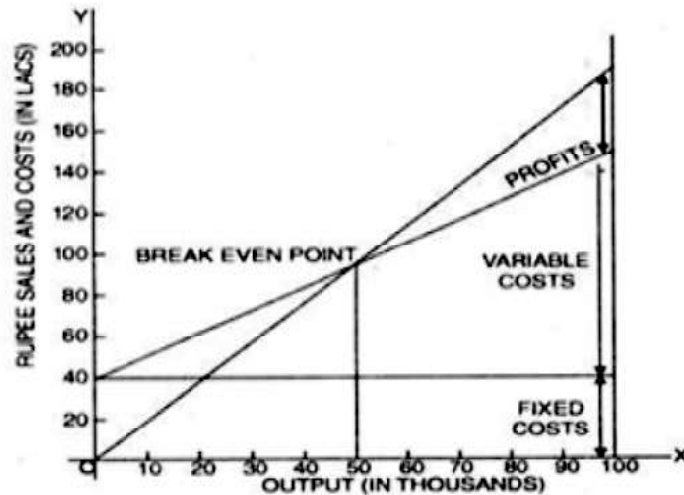


Figure 19.1

Merits and Demerits of Cost Based Methods:

The cost based methods covered above have their own merits and demerits. The worth emphasizing one are narrated below:

Merits

The following are the merits of the cost based methods

- ***Simplicity***

Unlike demand approach, cost ascertainment is much easier as estimation would not pose any problem. Moreover, it is internal to the firm.

- ***Harmonious Competition***

There are lesser changes of price wars between the competitors as industry-wide costs mark-ups are uniform. Cost-plus pricing thus provides competitive stability.

- ***Socially Justifiable***

Relative to demand oriented and competition oriented approaches, cost-plus pricing is socially fair. It is because, the rate or return remains the same even if the demand rises or falls.

- ***It is Safer***

Cost based methods guarantee recovery of costs of production and distribution and do not allow the management to play with seasonal and cyclical shifts in the business.

- ***It Moves with New technology***

It is quite reasonable and dependable method to opt for cost based pricing whenever a company is welcoming a new technology where the production problems and long-term cost conditions can hardly be predicted with ease and certainty.

Demerits

The following are the demerits of the cost based methods

- ***Ignores Demand and Competition***

Perhaps, the greatest shortcoming of the cost oriented methods is that they ignore the impact of demand and competition. Any pricing method that ignores these two strong external factors has hardly any practical utility.

- ***Arbitrary Cost Allocation***

The methods used for joint costs allocation are far from being precise and perfect as large degree of arbitrariness prevails. Therefore, the prices based on such costs tend to be imperfect. This is a specific problem of company with multiple product portfolios where joint cost allocation is a headache.

- ***Cost Irrelevance***

Very often prices which are based on costs are not always relevant to the pricing situation. For instance, there are situations where opportunity or incremental costs are more relevant than full costs; during inflation future costs are more fitting than historic costs.

- ***New Products***

Pricing new products is a problem as the firm is not having any past cost experience. Accurate unit cost can be arrived at only if market is tested and sales volume is known.

- ***No Penalty for Inefficiency***

Cost based pricing does not penalize the inefficiency that is creeping in. On the contrary, it gives a good hideout. Say, if the product costs have shot-up by work stoppages, material wastage reduced output, all are covered as a part of total cost.

B. Competition Based Methods

Many firms set prices largely in relation to the pricing of their competitors. Though, no firm can afford to disregard cost and demand factors in pricing, it gives major attention to positioning its prices just relative to the prices of its competitors. There are two such commonly used competition based pricing.

The following exhibit makes this concept very clear:

Going Rate Price Fixing:

Price per ton:

Costs and mark-up	Competitor	The pricing firm The possible price alternatives		
		Alternative I	Alternative II	Alternative II
Cost of sales	Rs. 5,000	Rs. 5,100	Rs. 5,100	Rs. 5,100
Profit margin	Rs. 1,000	Rs. 900	Rs. 1,000	Rs. 800
Final price	Rs. 6,000	Rs. 6,000	Rs. 6,100	Rs. 5,900

Table 19.2

Whether this method is appropriate or not, this depends on many factors such as firm's pricing objectives, the structure of the industry, existence of spare capacity, costs of production administration and selling of competitors and the customers' perceptions of the products of the firm as compared to those of competitors. This going rate pricing is popular where the costs are difficult to measure and competitive response is uncertain. It reflects industry's collective wisdom to the pricing that guarantees industrial harmony and fair return.

In all those business lines where the firms bid for jobs, competition based pricing is followed rather than its costs and demand. The firm fixes its prices on how the competitors price their products. It means that if the firm is to win a contract or a job, it should quote less than the competitors. With all this, the firm cannot set its price below a certain level. This is, it cannot price below the cost. On the other hand, higher price above its costs reduces the chances of winning the job. The net effect of the two opposite pulls can be well described in terms of "expected profit" of a particular bid.

This can be explained with reference to the following exhibit:

Effect of Different Bids on Expected Profit:

Table 19.3

Case	Firm's bid	Firm's profit	Probability of getting this bid (A guess)	Expected profit
1.	Rs. 6,500	Rs. 100	85 per cent	Rs. 85
2.	Rs. 7,000	Rs. 500	36 per cent	Rs. 180
3.	Rs. 7,500	Rs. 1,000	9 per cent	Rs. 90
4.	Rs. 8,000	Rs. 1,500	3 per cent	Rs. 45
5.	Rs. 8,600	Rs. 2,100	1 per cent	Rs. 21

In the exhibit, case one gives the lowest profit but the highest chances of getting the bid. With all that, profit is rupees 85. On the contrary, case No. 5 gives the highest profit with least chance of getting the bid with a profit of only rupees 21. Under these circumstance, the best bid would be one that gives maximum expected profit and that is case No. 2, with a profit of rupees 180.

These competition based pricing methods are generally followed by the managers when:

1. They believe that strong competitors are better and able to select appropriate prices so they "follow the leader."
2. Retaliatory price changes are likely beyond given range, and price changes by competitors have a substantial effect on company sales.
3. Costs, demand and other factors that affect sales and profit are stable enough to make it possible to rely on following general industry pricing trends.

C. Demand Based Pricing Methods

All those firms that set product prices based on costs or competition cannot afford to forget the relationship between traditional mark-ups or competitors' prices and market demand considerations. Demand for products has its impact and, hence,

demand schedules can be purposively incorporated into price setting through different methods.

There are two important demand based methods namely:

- (1) Demand modified break even analysis pricing and
- (2) Perceived value pricing.

1. Demand Modified Break Even Analysis

Demand modified break even pricing is that method which sets the prices to achieve highest profit (over the break-even point) in consideration of the amount demanded at alternative prices.

In other words, this method requires estimates of market demand at each feasible price break even points and expected profit levels of total sales revenue can then be calculated.

The following exhibit and graph Fig. 3 elucidate this concept very clearly.

1. Cost Volume Profit Relationship

Unit price Rs.	Market demand (units)	Total revenue Rs.	Total point (units)	Break even point (units)	Expected profit Rs.
At 5	65,000	3,25,00	3,62,500	80,000	37,500
At 10	55,000	5,50,000	3,37,500	26,667	2,12,500
At 15	45,000	6,75,000	3,12,500	16,000	3,62,500
At 20	30,000	6,00,000	2,75,000	11,429	3,25,000

Table 19.4

Note:

Total costs include fixed costs to the tune of Rs. 2, 00,000. As per the exhibit, the fixed costs are of Rs. 2, 00,000, unit variable cost Rs. 2.50 and the demand forecasts at prices Rs. 5, Rs. 10, Rs. 15 and Rs. 20 are given correspondingly. It is quite evident that the price of Rs. 15 gives the highest profit amongst all the alternatives figuring Rs. 3, 62,500. Hence, Rs. 15 is the price accepted. Though this method gives the clear way, the basic challenge is one of getting accurate estimates of the price and the quantity demanded relations. In case of established products, the firm may employ time series analysis. Alternatively, the firm may conduct direct customer interviews rating the likely response at different price levels. Here, much depends on how the consumers actually respond. Instead, another approach is to use controlled store experiments. This approach can be used both in case of existing and the new products and it guarantees greater validity than time series analysis.

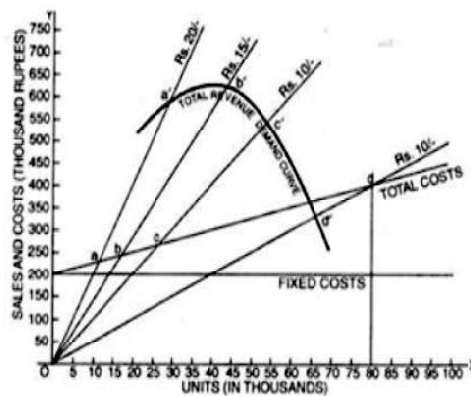


Figure 19.2

2. Perceived Value Pricing

Of late, good many firms are setting their product prices on the basis of perceived value of a product. It is the buyer's perception of value and not the seller's cost which the key to the product is pricing. The prices setter use non-price variables

in marketing-mix to build up perceived value in the buyer's minds and price is set to capture the perceived value. This approach fits well within the thinking of product positioning. For instance, people have their own perception value for say Zodiac ties, Double bull shirts, Leo toys, Bata shoes, Fiat car, Vespa scooter, HMT tractors, Tata trucks, Bajaj tempos and so on. This pricing strategy is though psychological, underscores the behavioural foundation underlying price elasticity. The people are readily willing to pay a premium price. The willingness of customers to pay a higher price depends on their perception of the fairness of the price, of the quality they get for the price they pay. If a competitor is selling his tractors at Rs. say Rs. 80,000 and you are selling at Rs. 90,000 you must convince your customer as to why he should pay more to the extent of Rs. 10,000.

For this, your answer may be:

	Rs. 80,000	only if equivalent to the competitor
Plus	Rs. 6,000	price premium for extra durability
Plus	Rs. 5,000	price premium for reliability
Plus	Rs. 4,000	price premium for superior service
Plus	<u>Rs. 5,000</u>	price premium for longer warranty on parts
	Rs. 1,00,000	The package value
Minus	<u>Rs. 10,000</u>	Discount
	Rs. 90,000	Final Price

Thus, the customer may be convinced as to why he is to pay more by Rs. 10,000 and gain getting a discount of Rs. 10,000 failing which he would have paid Rs. 20,000 extra. The key to perceived value pricing is the most accurate determination of the market's perception of the offer's value. Inflated or deflated perception value calculated by the price setters are likely to go wrong. That is why market research is needed to establish the market's perception of value as a guide to effective pricing.

19.4 PRICING OF MULTIPLE PRODUCTS

The firm bases its prices largely on the competitors' prices with less attention paid to its own costs or demand. Therefore, the firm may charge the same, more or less than the major competitor or competitors. Going rate pricing is the method of setting the prices in relation to the prices of competitors. Generally, in industries where oligopoly prevails such as steel, paper, fertilisers, aluminium, copper and the like, the firms charge the same price as their competitors. It is natural that the firm charges the prices when the competitor or competitors change not bothering about their costs and demand changes. Some firms may charge not higher or lower prices than their competitors.

19.5 SUMMARY

The determination of prices is of great significance in an economy. Determination of Prices means to determine the cost of goods sold and services rendered in the free market. In a free market, the forces of demand and supply determine the prices.

19.6 GLOSSARY

- Mark-up : Add a certain amount to the cost of goods to cover overhead and profit
- Retaliatory : Characterized by a desire for revenge
- Premium : A sum added to an ordinary price or charge
- Deflated : Having suddenly lost confidence or optimism

19.7 SELF ASSESSMENT QUESTIONS

Q1. What is cost based pricing methods?

Q2. What is target returns pricing?

Q3. What is going rate pricing?

19.8 LESSON END EXERCISE

Q1. Explain in detail the merits and demerits of cost based methods.

Q2. What is competition based methods?

Q3. What is sealed bid pricing?

19.9 SUGGESTED READINGS

- What is Pricing? Definition, Meaning, Objectives and Types, Different Methods (byjus.com)
- Ahuja, H.L *Managerial economics*, S Chand Company, Delhi
- Dwivedi D.N *Managerial Economics*, Vikas Publishing House, Delhi
- Chopra O.P *Managerial Economics*, Tata McGraw Hill, Delhi

PRICE DISCRIMINATION

STRUCTURE

20.1 Introduction

20.2 Objectives

20.3 Methods of Price discrimination

20.4 Summary

20.5 Glossary

20.6 Self Assessment questions

20.7 Lesson end Exercise

20.8 Suggested Reading

20.1 INTRODUCTION

The seller makes this possible by adopting various methods such as superior packaging to persuade customers to buy identical products at a higher price. Companies divide customers into different groups based on various attributes and charge different prices from each group. Companies identify different market segments and ask them to pay less or more depending on their willingness to pay. The willingness of consumers to pay for higher prices depends on the relative elasticity's

of demand. For example, consumer's part of relatively elastic sub-market pays lower prices, whereas consumers part of relatively inelastic sub-market pay higher rates.

20.2 OBJECTIVES

After studying this lesson, you shall be able to understand the concept of the following:

- Methods of price discrimination
- Example of Price Discriminatory Strategies
- Condition for Price Discrimination

20.3 METHODS OF PRICE DISCRIMINATION

Companies use various pricing strategies to generate profit by selling the same product. Price discrimination is popularly used pricing strategy by companies to generate profit. In a price discrimination strategy, a firm sells identical goods and services to customers at different prices. The seller makes this possible by adopting various methods such as superior packaging to persuade customers to buy identical products at a higher price. Companies divide customers into different groups based on various attributes and charge different prices from each group. Companies identify different market segments and ask them to pay less or more depending on their willingness to pay.

For example, the entry fee of the Taj Mahal is Rs. 50 per person for domestic tourists, whereas the entry fee for foreigners is Rs. 1300 per person. In this example, it is considered that foreign tourists are willing to pay more prices. It is one of the best methods to earn a profit. Companies are not required to make separate efforts to generate profit. They can earn more profits just by dividing the market into

different segments. The willingness of consumers to pay for higher prices depends on the relative elasticity of demand. For example, consumer's part of relatively elastic sub-market pays lower prices, whereas consumers part of relatively inelastic sub-market pay higher rates. In the article ahead, you will learn about the definition, types, examples, objectives, and necessary conditions for price discrimination. Price discrimination can be defined as a pricing strategy that is used by sellers to sell identical goods and services at different prices to a diverse group of customers based on various conditions such as demand of the product, the willingness of customers to pay.

The followings are the main types of strategies.

1. First Degree Price Discrimination

There are two conditions for exercising first-degree price discrimination, such as Monopoly in the market and the knowledge of absolute maximum price. The absolute maximum price can also be known as reservation price. The goods and services can be sold to a consumer at the highest price that he is willing to pay. In this profit earned by selling each individual is added to the total revenue generated by the company.

The total revenue generated by a company by selling goods at different prices is equal to the total of consumer surplus and producer surplus. First-degree price discrimination is challenging to implement than other types of price discrimination. Because while using first-degree, the seller needs to determine the right price that a customer will be willing to pay to buy a particular product or service. In hospitality, airline, and motorcar industry, first-degree is easy to implement. Because in these industries, the transaction taking place between a consumer and seller is private.

The seller can pitch price to the buyer based on the information obtained from

records, or it can be predicted by the looks and status of the customer. Moreover, e-commerce companies make the use of data mining techniques to obtain information about their various customers and thus giving them offers accordingly. Even though first-degree is challenging to implement but when implemented rightly, it allows the seller to generate good profits.

2. Second Degree Price Discrimination

Second-degree price discrimination is one of the most commonly used pricing. The price of goods and services varies according to the demand for quantity. That means large quantity orders will be sold at discounted prices. For example, when a consumer buys several units of a product, the average price charged for one product will be less as compared to the cost of the product when purchased separately. It is difficult for a seller to determine the exact highest price that a consumer will be ready to pay. Therefore, the seller provides benefits to customers who buy products in vast quantities. In this way, different pricing is decided for different consumers group, and thus a large portion of the market can be captured. For example, airlines provide lower air-ticket prices to customers who are frequent travelers.

Similarly, big retail stores take the benefits to sell products at high discounts to their customers. They buy products in bulk from the manufacturers and sell those products at lower prices as compared to their competitors. In this way, they not only generate high profits but also keep their customer loyal. However, second-degree price discrimination can be applied to quality as well as the quantity of the products. For example, an air traveler traveling in business class will be provided better services than the air traveler traveling in economy class. By doing this, airlines differentiate their customers based on their preferences and capture high consumer surplus.

3. Third Degree Price Discrimination

Third-degree price discrimination is when sellers divide their consumers into different consumers group. In this price discrimination, the pricing of products and services is done based on the different groups of consumers. The grouping of consumers is done because it is easy for companies to determine the overall preference of the whole group rather than deciding the unique choice of all customers separately. For example, the ticket price of students and senior citizens is lesser than the cost of the tickets of an adult, or differentiation in the price of tickets can be made based on the regular and casual traveler. Third-degree price discrimination exists in the real world.

Examples of Price

The followings are the examples of adopting a price discrimination strategy.

1. Airplane tickets

Airlines charge different prices for the tickets of planes to the same destination. The price of tickets varies depending on the time and day of travel. For example, if you are comfortable with a flexible date of flying, then there might be chances that you get cheaper flight rates. The price of plane tickets is usually high near the festive season because around this time. People travel to spend time with their families. Moreover, the price of plane tickets is high during weekdays Monday to Friday because, during that time business travelers travel, whereas plane tickets are cheap during the weekend as fewer business travelers travel during that time. However, the plane tickets to a holiday destination are expensive near the weekend, because most people go to these locations at the weekend. The price of airplane tickets is the best example, where airline companies charge a different price to different travelers to earn the surplus profit.

2. Low cost for high quantity

Selling large amounts of goods at a lower average price is one of the most popular selling strategies adopted by sellers. A customer gets a substantial discount when he buys goods in bulk and is required to pay full price when he buys a single unit of a product. Sellers use this strategy to clear out the stock as soon as possible as it reduces the risk of goods getting expired or damaged sitting in the inventory of the store. Large-scale retailers adopt this strategy as they buy products from manufacturers in the off-season and large quantities. In this way, this increases the profit margin by obtaining goods at lower prices. This is the reason that you find most products at a discount in these stores.

3. Loyalty Program

Another famous example of price discrimination is loyalty programs. Businesses like airlines, coffee shops, restaurants, retail stores give benefits to their regular customers. This strategy is known as the "Loyalty program". For example, airlines provide a discount on plane tickets to their frequent flyers. Retail stores give a loyalty card to customers who shop from them regularly. For example, a loyal customer will get a \$50 discount on the purchase of \$2000.

4. Age discount

Many businesses provide a discount to their customers based on their age. The movie tickets for an adult will be expensive than that of a child. Similarly, the price of train tickets for senior citizens and children is lower than the train tickets for adults. Age discount is typical in businesses and thus makes the famous example of price discrimination.

5. Parking charges

You are required to pay parking fees to park your vehicle, whether you travel to a movie theatre or shopping mall. These businesses also offer discounts on parking charges to their regular and loyal customers. For example, a loyal customer will pay \$2 for parking slots, whereas others will pay \$5 for a parking slot for a day. Moreover, discounts on parking charges are given to people who arrive early. This price discrimination strategy is used by businesses to manage parking rush.

Necessary conditions for price discrimination

The followings are the necessary conditions for adopting a price discrimination strategy.

1. Monopoly in the market

The meaning of monopoly is when a company or person is the only supplier of a particular product in the market. Price discrimination is only possible when there is a monopoly in the market. Because of this reason, price discrimination is also known as discrimination monopoly.

2. The elasticity of demand

Different elasticity of demand in various markets helps in price discrimination. To maximize the revenue, the seller can fix the higher prices in the market segment where demand is relatively inelastic and can set lower prices in the market segments where demand is relatively elastic.

3. Legal authorization

It is legally authorized in case of a few goods and services. For example, people travels in the first class on a plane or train pay more as compared to people going in economy class. Similarly, the price of electricity is less for domestic use, whereas

the price of electricity for industrial use is high.

4. Product differentiation

Discrimination of price is done by making slight changes in the product. Product differentiation is a commonly used price discrimination strategy. For example, the same quantity of cooking olive oil is sold in different packaging at different prices. The seller of cooking oil generates more revenue by making little differentiation in the packaging of the cooking oil.

5. Imperfect Market

Last but not least necessary condition for price discrimination is the imperfect market. It is possible to divide only an imperfect market into different market segments for price discrimination.

Objectives of price discrimination

The followings are the main objectives are:

1. Extra Revenue using Price Discrimination

The main aim is the generation of extra revenue. Sellers divide their customers into different groups based on their history and charge a different price for the same goods and services. For example, in the hospitality industry, one hotel provides room services to varying rates to different customers. Similarly, many stores offer special discounts to students and senior citizens, whereas they charge full price for adults.

2. Higher Profit using Price Discrimination

Profit can be calculated by subtracting total expenses from total income. The total cost of manufacturing for goods remains the same when the seller sells it at

a higher price. As a result of which the higher profit can be generated by selling goods at higher rates.

3. Use up spare capacity

It does not only mean to sell products at high prices. Sometimes sellers sell goods at lower prices to clear the inventory. The goods are sold at less profit rather than wasting them completely. For example, a retailer sells off seasoned goods at a discounted price to clear inventory.

4. Improved Cash Flow

This strategy is used to sell products at different prices. By selling products at higher prices, a company can generate high revenue, which helps them balance their expenses and profit earned to help in smooth cash flow. Similarly, selling goods at lower prices helps in clearing stock and help the seller in improving the flow of cash in the system.

20.4 SUMMARY

Companies identify different market segments and ask them to pay less or more depending on their willingness to pay. The willingness of consumers to pay for higher prices depends on the relative elasticity's of demand. For example, consumer's part of relatively elastic sub-market pays lower prices, whereas consumers part of relatively inelastic sub-market pay higher rates. Companies divide customers into different groups based on various attributes and charge different prices from each group. Companies identify different market segments and ask them to pay less or more depending on their willingness to pay.

20.5 GLOSSARY

- Price discrimination : The action of selling the same product at different prices to different buyers, in order to maximize sales and profits
- Strategy : A plan of action designed to achieve a long- term or overall aim
- Off-season : A time of year when business in a particular sphere is slack
- Loyalty : The quality of being loyal

20.6 SELF ASSESSMENT QUESTIONS

Q1. What do you mean by price discrimination?

Q2. Briefly explain the second degree price discrimination.

20.7 LESSON END EXERCISE

Q1. What is first degree price discrimination?

Q2. Explain in detail the third degree price discrimination.

20.8 SUGGESTED READINGS

- Price Discrimination - Definition, Types, Strategy, Objectives & Examples
(marketing91.com)
- Ahuja, H.L *Managerial economics*, S Chand Company, Delhi
- Dwivedi D.N *Managerial Economics*, Vikas Publishing House, Delhi
- Chopra O.P *Managerial Economics*, Tata McGraw Hill, Delhi