MMS

SEMESTER - I (CBCS)

MANAGERIAL ECONOMICS

SUBJECT CODE : UMMSI.5

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CONTENTS

Semester	**:**	**I - Core**			
Title of the Subject / course	**:**	**Managerial Economics**			
Course Code	**:**				
Credits	**:**	**4**	**Duration in Hrs**	**:**	**40**

Learning Objectives

1	To enable the students to understand both the theory and practice of Managerial Economics,
2	To ensure that the students are in a position to appreciate the finer nuances of the subject.
3	To help the students in applying the knowledge so acquired in policy planning and managerial decision making.

Prerequisites if any	Nil
Connections with Subjects in the current or Future courses	1) This would be a pre-requisite to the second semester paper on Business Environment, which mainly deals with macroeconomic issues, and, 2) Both Managerial Economics and Business Environment papers also constitute the base for studying Strategic Management, which is a University paper in the third semester.

Module

Sr. No	Content	Activity	Learning outcomes
1	Introduction to Managerial Economics: The meaning, scope and methods of Managerial Economics, Dominic Salvatore model of application of Economics to business decision making. Scarcity, choice & production possibility curve.	Lecture& case study	The students should be able to decipher, analyse and apply the theory and practice of Managerial Economics
2	Consumer Behavior- I: Demand, types of demand, factors affecting demand & demand function. Making of linear demand function & linear demand curve. Law of demand. Consumer's surplus	Lecture& case study	Students develop an understanding of a businessman need to locate various factors affecting demand of his product and plan marketing & business strategies accordingly. Students develop an understanding of the practical application of law of demand.
3	Consumer behavior – II: Concept of elasticity of demand and its significance for a businessman. Types of	Lecture& case study	Students develop an understanding of the various concepts and its applications.

Sr. No	Content	Activity	Learning outcomes
	Elasticity – Price Elasticity of Demand, Income Elasticity of Demand, Cross elasticity of demand & Promotional Elasticity of Demand, Demand forecasting – features, significance & methods		
4	**Supply** – concept of supply, factors affecting supply& the law of supply Determination of equilibrium price :effects of changes in demand & supply on equilibrium price	Lecture & case studies	Students should understand the analytics of supply and demand and its various uses.
5	Production Function: Concept, Isoquant &Isocost analysis	Lecture and a case study	Student should get an holistic understanding of production economy.
6	Laws of returns to scale, economies & diseconomies of scale		
7	Revenue Analysis, Cost analysis and break even analysis	Lecture	Students will follow the relationship between costs, revenues, profits and losses
8	Types of markets: perfect competition, monopoly, oligopoly & monopolistic competition – features and price determination	Lectures & case study	Students will learn about the intricacies of the various market forms and their impact on the economy and business.
9	Types of markets: perfect competition, monopoly, oligopoly & monopolistic competition – features and price determination	Lectures & case study	Students will learn about the intricacies of the various market forms and their impact on the economy and business.
10	Pricing practices: Factors affecting pricing decision. Marginal cost pricing, mark up pricing, transfer pricing, product line pricing, price skimming and penetration price.	Lectures & cases	Awareness of students about various pricing practices.
11	• Profit management • Role of profits in a market economy • Nature and measurement of profit, profit policies • The hypothesis of profit maximization and it's alternatives	Lecture	Students learn about the role of profit in business.

Sr. No	Content	Activity	Learning outcomes
12	• Demand for capital • Supply of capital • Capital Rationing • Capital Budgeting, Net Present Value(NPV), Internal Rate of Return(IRR). • Appraising - the profitability of projects	Lecture	Students should realize the importance of the different methods of capital budgeting as a tool of project management.
13	Presentations by students		Students should realize the importance of the different methods of capital budgeting as a tool of project management.

Text books

1	Managerial Economics in a Global Economy by Dominick Salvatore
2	Managerial Economics by Suma Damodaran
3	Microeconomics for Business by Satya P Das

Reference books

1	Economics by Paul Samuelson and Richard Nordhaus : Indian Adaptation, 19th Edition
2	Managerial Economics by Milton Spencer and Louis Siegelman
3	Managerial Economics: Concepts and Cases by Mote, Paul and Gupta

Assessment

Internal	40
Semester end	60

1

INTRODUCTION TO MANAGERIAL ECONOMICS

Unit Structure

1.0 OBJECTIVES

- To study the scope and meaning of Managerial economics
- To understand various methods of managerial economics which organizations use
- To understand the Dominic Salvatore Model of Application Economics to business decision making
- To understand the problem of scarcity and usefulness of production possibility curve

1.1 SCOPE AND MEANING

Economics can be explained as the study of optimum resource allocation to meet demands. It deals with the following questions. What to produce? How to produce? How to distribute? In other words, the production, consumption and distribution of goods. It also deals with the utilization and availability of resources which are mostly scarce in the environment. Hence the above questions are difficult to answer. Therefore, decisions regarding the utilization of resources that are scarce have to be taken carefully. Economics provides the methodology to answer these fundamental questions. Economics examines in detail the action of individual decision-making firms, organisations or economy which contribute to the forces of demand and supply.

Managerial economics on the other hand explains the use of economic methods in order to make decisions. Managerial decision making is an important part of Managerial Economics. It is primarily science applied to the decision-making process.

The decision-making process is faced by individuals as consumers and producers along with the economy as a whole. Whether you are the owner of a small company or the chairman of a large global organisation, or a non-profit organization, Managers in these respective Institutions must understand the market forces which create opportunities as well as problems for running businesses.

1.2 METHODS OF MANAGERIAL ECONOMICS

In order to be in a position of ideal decision making, a firm must utilize various methods and techniques to solve business problems.

Following are some methods that organisations need to evaluate as per situations that apply to their respective business.

1. The Scientific Method or Experimental Method

This method is concerned with observed fact which are classified in a systematic manner,and which includes trusted method for the discovery of accurate information. It is amode of examination by which scientific and systematic information is arrived at. Scientific method alone can bring about confirmation in the validity and reliability of conclusions because it concentrates on controlled experiments and studies the behaviour of different elements in a very simplified environment.

The experimental method may be usefully applied to those aspects of managerial decision making that call for accurate and logical thinking. But sometimes the experimental methods are of limited use to managerial economics as the economist cannot apply experimental methods to the same level and in the same way as a physicist can in physical sciences.

The above method is of limited use because it is difficult to carry out experiments to test the validity of managerial behaviour, as it deals with human aspects &behaviour which is complex and extremely difficult to measure.

2. The Statistical Method.

Statistical method is a mechanical process especially designed to facilitate the analysis of the large amounts of quantitative data. Through this method, the data is classified, tabulated, compared, correlated and then finally interpreted to support decision making.

The aim of statistical method is to facilitate comparison, study relationships between the two phenomena and to understand the complicated data for the purpose of analysis Many a time comparison must be made between the changes and the results which are due to the changes in time, frequency of occurrence, and many other factors.

Statistical methods are used for such comparison among past, present and future estimates.

Statistical approach is useful for the study of management, economics, etc. and it is very helpful to different sectors like bankers,planners, speculators, researchers, etc. Though statistical methods are crucial to managerial economics, they should be used with care. Statistical method helps us to seek regularities and patterns in economic data and allows us to arrive at generalizations that cannot be reached by any other method.

3. Method of Intellectual Experiment

The basic problem in managerial economics is to find out the nature of any relationship between different variables such as cost, price and output. The real world is also equally complex. It is influenced by many factors such as physical, social, temperamental and psychological. It is difficult to locate any order, sequence or law in such a confused and complex structure. Hence it is essential for the managerial economist to consult in model building.

At times, to analyse behaviour we use various models. A model may be in the form of diagram, a verbal description or a mathematical description. Since they are an approximate representation of reality, they help us in understanding the different forces of the complex world of reality through estimation. Model building is more useful in managerial economics, as it helps us to know the actual socio-economic relationship existing in a firm.

4. The Method of Simulation

This method is an extension of the intellectual experiment. This method has gained popularity with the development of technology, computer software and hardware, and other similar equipment along with internet services. We can programme a complex system of relationship with the help of this method. Computer is not only used for scientific or mathematical applications, but it may also be used for some business applications, document generations and graphical solutions.

A manager must take numerous decisions in the management of business which may be small or large, simple or complex. They must ensure that once the decision is taken, it is to be implemented within the minimum time, cost and resources The existing technology will help the manager to understand business problems in a better manner and increase his ability to solve the business problems facing him in the management of business activities.

5. The Descriptive Method

This method is simple and easily applicable to different business problems, especially those problems existing in developing countries. It is a fact-finding method related mainly to the present and basic overviews through the cross-sectional study of the present situation.

This method is mainly concerned with the collection of data and to some extent, the descriptive method is also concerned with the interpretation of data. In order to apply the descriptive method, the data should be accurate, fair and quantifiable to some extent

Since the descriptive method relates to the cause and the effect of the collected facts, it is necessary for it to make comparisons between one situation with the other and among different aspects of the same situation. Thus, situational comparability is an important element of this method.

1.3 DOMINIC SALVATORE MODEL OF APPLICATION ECONOMICS TO BUSINESS DECISION MAKING

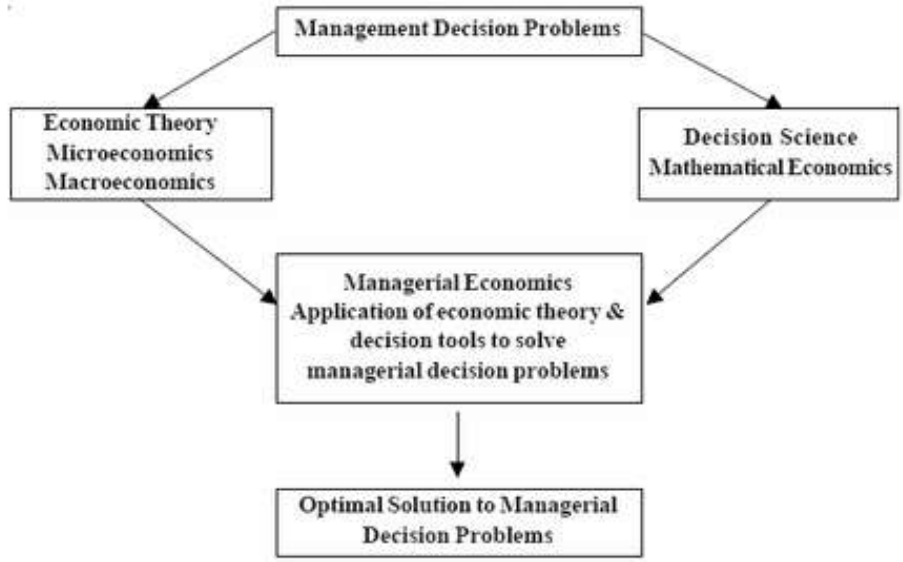

Fig. 1.1

FIGURE 1: The Nature of Managerial Economics Managerial economics refers to the application of economic theory and decision science tools to find the optimal solution to managerial decision problems.

The above figure shows us how decision problems can be solved in different ways. An organization can solve its management decision problems by the applying The Economic Theory and the tools of Decision Science.

Microeconomics and Macroeconomics come under the purview of Economic Theory. Microeconomics is the study of the economic behaviour of an individual decision-making unit. For example, business firms and owners, individual customers, small or medium enterprises etc. Whereas macroeconomics is the study of the total level of output, income, employment, consumption, investment, prices, all the above with regards to economy is viewed as a whole.

Even though the microeconomics theory is the most important factor in managerial economics, the macroeconomics factors of an economy such as the total demand in an economy, rate of inflation, general interest rates existing in the markets are also important. This is because a business or an

organization operates within such micro and macro factors and business decisions must be taken by considering all these important elements in order to make a sound assessment. Hence different Economic Theories usually begin with a model that is tried and tested. These models must be studied in order to apply its theory. Important details must be identified from these models. For example, the theory of the firm assumes that the firm seeks to maximise its business profits and based on which it takes decisions on how much to produce, what is the market structure how many resources to allocate. While the firm may have many other aims, profit maximisation model correctly predicts the behaviour of firms and therefore we accept the model. Hence the methodology of economics is to accept a theory or a model if it predicts correctly and if the predictions follow logically from the assumptions.

Just as Managerial Economics is closely related to Economic theories, it is also linked to Economic Sciences. Here the various tools of mathematical economics and econometrics are used. They help to construct and estimate decision models aimed at determining the optimal performance of the firm, in other words, how the firm can achieve its goals in the most efficient manner. To do this, mathematical equations are used to formalize the economic models proposed by various economic theory. Econometrics applies statistical tools to real world data to help estimate theories for forecasting. In simple terms with the help of various economic theories and scientific and mathematical calculations, managers are in sound positions to make suitable decisions for their organisations. This creates a situation of optimal solution to managerial decision problems.

For example, economic theory suggests that the quantity demanded (Q) of a commodity is a function of or depends on the price of the commodity (P), the income of consumers (Y), and the price of related (i.e., complementary and substitute) commodities (P_C and P_S, respectively). Assuming constant tastes, we may suggest the following formal mathematical model:

Q = f(P, Y, P P)

By collecting data on Q, P, Y, P_C, and P_S for a particular commodity, we can then estimate the econometric relationship. This will permit the firm to determine how much Q would change by a change in P, Y, P_C, and P_S, and to forecast the future demand for the commodity. This information is essential for management to achieve the goal or objective of profit maximisation for the firm in the most efficient manner. To conclude, *managerial economics* refers to the application of economic theory and decision science tools to find the optimal solution to managerial decision problems.

1.4 SCARCITY, CHOICE AND PRODUCTION POSSIBILITY CURVE

Scarcity and Choice.

Economics is fundamentally about scarcity and choice. Choosing how to allocate limited resources to each area of a business is a crucial decision-making process. The choice is the decision made by managers and organisations after careful evaluation of resources and alternatives and expected consequences after such allocation, both for present and future.

Meaning of Scarcity

The basic meaning of Scarcity is lack of supply. In economics it refers to when the demand of a resource, product or service is greater than its available supply.

Every Economic civilisation faces the problem of allocation of resources which are insufficient to meet the overall demand. They must use these resources in such a way that the best welfare of the society is taken into consideration. The economists are forced to decide how best to assign the resources in the best possible manner so that the society continues to operate in a peaceful and practical manner.

Concept of Scarcity

1. A scarcity of resources arises when the resources or means to fulfil an end are either limited or costly.

2. Scarcity is an economic problem. It calls for the economic allocation of scarce resources to fulfil unlimited wants or needs.

3. Free natural resources could also become scarce resources due to the additional costs of obtaining them and consuming them. Scarcity also arises in the case of an increase in demand of a product or a service in comparison to its availability in the market.

4. In simple terms, money and time are among the most scarce resources. People have too little of time, money, or both. People who have little or no work would have abundant time, but little money to pay for their basic necessities. People who have professionally demanding jobs might have enough earnings for retirement, but yet insufficient time to eat and rest or for entertainment.

5. Scarcity of a commodity or resource is relative to its demand. A resource which is of no use or not known to the people would not be scarce even when it is limited in nature.

Production Possibility Curve

The production possibility curve is a graph that shows the different combinations of the quantities of two goods that can be produced in an economy at any point of time, subject to limited availability of resources.

In other words, this curve shows that if we want to have more of one good, we must have less of another good due to limited availability of resources.

To understand this concept further we must first understand the concept of opportunity cost.

Opportunity Cost

It refers to the "opportunity cost" of a resource, that is the value of the next-highest-valued alternative use of that resource. If, for example, you spend time and money going to a mall or a restaurant, you cannot spend that time at home reading a book, and you can't spend the money on something else. Hence it the value of the next best alternative to any decision you make.

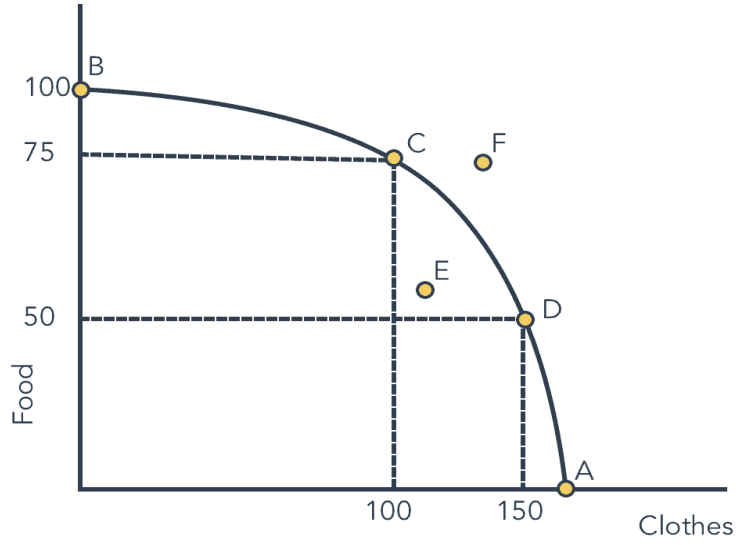

Figure 1.2 above: Production possibility curve (PPC)

The PPC curve is graphed as a curve, or an arc. On such a graph, one of the commodities is shown on the x-axis, while the other is shown on the y-axis. The entire curve is made up of points at which the two commodities are being produced in different amounts, most efficiently using the limited resources that they require.

The above graph shows the production possibilities frontier for a particular country's economy. In this example, the two commodities that that country produces are food (F) and clothes (C). (This is, of course, a highly simplified illustrative view of an economy, just for the purposes of understanding the production possibility curve.

Point A on the X axis shows the production level of clothes alone in an economy. Point B on the Y axis indicates the production level of only food in the same economy.

Point C on the curve is one possible combination of levels of production of both food and clothes in the same economy. Point D is another combination of these production levels (50F, 150C. Point E shows inefficient utilization of resources or unemployed resources, i.e. a case in

which the output is less than what it has the potential to produce. Point F shows an unattainable level of production, based on current resources, which means that it is outside the capacity of the economy.

If the country wants to produce more food, they must produce fewer clothes, based on limited resource availability. Likewise, if they want to produce more clothes, they must produce less food. The government must assess the opportunity cost of producing more of one or the other. The graph above demonstrates this trade-off. If this country wants to increase the production of food from 50 to 75 units, this requires sacrificing the production of 50 units of clothes. And if this country wants to increase the production of clothes from 100 to 150 units, they must sacrifice the production of 25 units of food.

An outward shift of the production possibilities frontier is only possible if the country discovers new resources or there is an improvement in technological development. Furthermore, an inward shift is also possible. This can happen if there is a natural or human-made disaster, like a hurricane destroying a factory and machinery.

Assumptions to the PPC curve

The PPC curve assumes that one commodity's production must decrease to allow the increased production of another commodity.The curve studies the combination of only two goods or services. While plotting the points on the graph, we assume that all available resources are fully employed into production and that the technology and production techniques remain unchanged for the sake of the graph analysis. We also assume that technology is used efficiently, and the resources are fixed and unchanged.

Importance of the PPC curve

As available resources of an economy are always limited in nature, The PPS curve helps to decide the commodities most beneficial to the economy. The curve helps in determining what quantity of goods should be produced, among different available alternatives.

1.5 SUMMARY

1. Managerial decision making is an important part of Managerial Economics. It is primarily science applied to the decision-making process.

2. In order to be in a position of ideal decision making, a firm must utilize various methods and techniques to solve business problems.

3. The Scientific method or Experimental method is concerned with observed fact which are classified in a systematic manner, and which includes trusted method for the discovery of accurate information.

4. Statistical method is a mechanical process especially designed to facilitate the analysis of the large amounts of quantitative data.

Through this method, the data is classified, tabulated, compared, correlated and then finally interpreted to support decision making.

5. Model building is more useful in managerial economics, as it helps us to know the actual socio-economic relationship existing in a firm.

6. The Simulation method is an extension of the intellectual experiment. We can programme a complex system of relationship with the help of this method.

7. The Descriptive method is simple and easily applicable to different business problems, especially those problems existing in developing countries. It is a fact-finding method related mainly to the present and basic overviews through the cross-sectional study of the present situation.

8. According to Dominic Salvatore, an organization can solve its management decision problems by the applying The Economic Theory and the tools of Decision Science.

9. The basic meaning of Scarcity is lack of supply. In economics it refers to when the demand of a resource, product or service is greater than its available supply.

10. The production possibility curve is a graph that shows the different combinations of the quantities of two goods that can be producedin an economy at any point of time, subject to limited availability of resources.

1.6 QUESTIONS

1. Explain the meaning and scope of managerial economics.
2. What are the various managerial methods organizations use to solve their business problems?
3. Explain the Salvatore's model in business decision making.
4. Discuss the production possibility curve in relation to scarcity of resources.

1.7 REFERENCES

- Managerial Economics Principles and Worldwide Applications EIGHTH EDITION Dominick Salvatore *Distinguished Professor of Economics and Business Fordham University* Siddhartha K. Rastogi *Associate Professor (Economics) Indian Institute of Management, Indore*
- Managerial economics D.D. Chaturvedi, S.L. Gupta
- Intelligenteconomist.com

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2

CONSUMER BEHAVIOR - I

Unit Structure

2.0 OBJECTIVES

- To study different types of demand
- To understand the factors determinants of demand
- To understand the concept of demand function
- To understand the difference between linear demand function and linear demand curve
- To study the Law of demand
- To study the concept of Consumer's surplus

2.1 INTRODUCTION

Demand is the number of individuals that are willing and able to purchase things at a variety of prices throughout a particular time period. Demand for any item indicates customers' desire to get the product, as well as their willingness and capacity to pay for it.

The consumer's demand for a particular commodity is determined by its price, the prices of related commodities, the income of consumer, and their likes and preferences. When one or more of these factors changes, it is probable that the amount of the product purchased by the customer will vary as well. If other products' pricing, the consumer's income, and their

likes and preferences stay constant, the quantity of a commodity that the consumer ideally purchases becomes entirely reliant on its price. The demand function is the relationship between a consumer's optimum quantity selection and the price of an item. A desire that is accompanied with a willingness to acquire and the capacity to pay is called as Demand.

Demand = Desire + Willingness + Ability

Demand Definition:

According to Benham "the demand for anything at a given price is the amount of it, which will be bought per unit of time at that price"

In ordinary terminology, demand refers to a desire. Desire is a strong drive for something. Demand in economics refers to a desire that is accompanied with a willingness and capacity to pay.

2.2 TYPES OF DEMAND

Demand is often categorised according to a set of attributes, including the type of the product, its actual use, the population of users, and the suppliers of the goods. Demand for a certain product varies according on circumstance. As a result, businesses should be certain about the sort of demand for their goods.

The following paragraphs describe the many types of demand.

i. Individual and Market Demand:

This term refers to the categorization of a product's demand according to the numbers of customers in the market. Individual demand is defined as the quantity desired by an individual for a product at a certain price and time period. For instance, Mr. A requires 100 units of a product at a price of Rs. 12 per unit over the period of a week.

Individual demand for a product is determined by the product's pricing, the customer's income, and the consumer's tastes and preferences. On the other hand, market demand is defined as the quantity demanded for a commodity by all individuals at a certain price and time.In basic words, market demand is the total of the individual demands of all customers over a certain time period and at a specified price, assuming that all other variables remain constant.

For instance, there are three wheat customers utilising monthly 10 Kgs, 20 Kgs and 30 Kgs of wheat respectively. Through this it can be said that the monthly market demand for wheat is 60 Kgs.

ii. Firm and Industry Demand:

This term refers to the market-based categorisation of demand. The desire for a firm's product at a certain price during a specified time period is referred to as firm demand. For instance, Suzuki automobiles are in high demand therefore it is firm demand. The aggregate amount of all firms'

demand for items within a certain industry is referred to as industry demand.For instance, in India, the demand for automobiles from different brands such as Mahindra, Maruti, Honda represents the industry's demand.

iii. Direct and Derived Demand:

It involves categorization of demand according to its dependence on other items. Direct demand or Autonomous demand refers to desire for a product that is unrelated to the demand for other items. The autonomous demand occurs as a result of an individual's internal desire to consume the goods.

For instance, demand for food, housing, clothing, and automobiles is direct demand, since it originates as a result of customers' biological, physical, and other human requirements. By contrast, derived demand is the desire for a product that comes as a result of the demand for other items. Also in example of demand for petrol, diesel, and other lubricants is dependent on vehicle demand. Apart from that, raw material demand is derived, since it is based on the manufacturing of other goods. Additionally, demand for alternatives and complementing items is generated.

iv. Perishable and Durable Goods Demand:

This term refers to the categorisation of demand according to the way things are used. The commodities are classified as perishable or durable. Perishable or non-durable items are those that are intended for a single usage. For instance, cement, coal, gasoline, and food. Durable products, on the other hand, are those that may be used again.

For instance, clothing, shoes, machinery, and structures. Individuals' immediate needs are met by perishable commodities. However, durable products meet both current and future consumer need. As a result, buyers choose sturdy things based on their durability. Additionally, durable items need replacement due to their continued usage. Demand for perishable items is very volatile and is determined by current prices of commodities and consumers' income, tastes, and preferences, while demand for durable goods is more stable over time.

v. Demand in the Short and Long Term:

This term refers to the categorization of demand by time period. Short-term demand refers to the desire for items that are intended to be utilised for a short period of time or in the immediate future. This demand is contingent upon customers' present tastes and preferences.

For instance, demand for umbrellas, raincoats, sweaters, and long boots is cyclical in nature. Long-term demand, on the other hand, refers to the desire for things over a longer time period. Durable things, in general, have a long life. The long-term demand for a product is determined by a variety of variables, including technological advancements, the nature of

competition, promotional efforts, and the availability of replacements. A company's ability to create a new product requires an understanding of both short- and long-term demand ideas.

2.3 FACTORS/DETERMINANTS INFLUENCING DEMAND

The price of an item, its perceived quality, advertising, income, consumer confidence, and changes in taste and fashion all influence demand for that commodity.

We may examine either an individual demand curve or the economy's overall demand.

- The individual demand curve depicts how much individuals are willing to pay for a certain amount of a product.
- The total of all individual demand curves will be the market demand curve. It depicts the amount of an item that customers want to purchase at various prices.

1. Price as a factor leading to movements in demand curve:

A movement in the Demand Curve is caused by a price fluctuation. Price has a greater impact on certain commodities than on others.

- When the price of sugar rises and since it is a necessity good, demand falls only to a little extent. Hence it can be said as having inelastic demand.
- When the price of a specific brand of softdrinkrises, there will be a major drop in its demand as consumers will opt for its cheaper alternatives, here the demand is called as elastic.

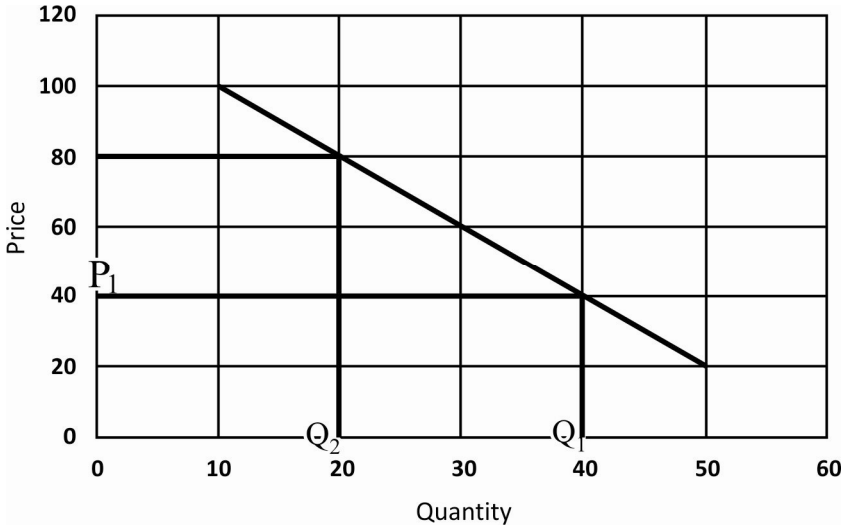


Fig. 2.1

In the above diagram, when the original price was P_1, the demand of the commodity was Q_1. As the prices rises from P_1 to P_2, the demand falls

from Q_1 to Q_2. The combinations of these two movements give us the demand curve which is downward sloping from left to right. There exists only one demand curve on which the movements take place due to change in price.

2. Non-price factors leading to shifts in demand curves:

This happens when buyers are willing to purchase a smaller or larger quantity of goods for the same price. This change in demand occurs due to changes in other factors apart from price or non-price factors.

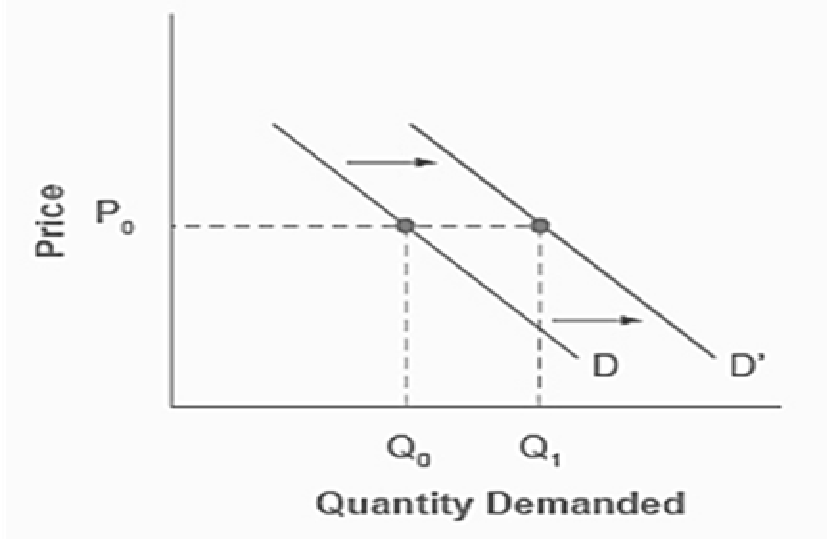


Fig. 2.2

In the above diagram, when the original price was P, the demand of the commodity was Q_0. As there occur changes in non-prices factors like income, the demand increases from Q_0 to Q_1. Thus resulting to this change, a new demand curve is drawn D' which shows the shift in the demand curve. The shift in the demand curve is due to the change in other non-price factors. There exist two demand curves through which the shiftcan be shown.

The demand curve might move to the right (or left) due to variety of reasons:

1. Income - Consumers will be able to purchase more things as their disposable income rises. Better earnings might be the result of a multitude of factors, including higher salaries and fewer taxes.

2. Credit options - If borrowing is simpler and less costly, people may be enticed to purchase expensive products on credit, such as vehicles and international vacations.

3. Quality - People are more likely to purchase something if the quality of it improves, such as higher quality digital cameras.

4. Advertising may promote brand loyalty and demand for products. Coca-Cola, for example, has grown worldwide sales by increasing its advertising budget.

5. Substitutes - An increase in the price of replacements, for example, if the price of Samsung mobile phones rises, demand for Apple iPhones, a key Samsung alternative, would rise as well.

6. Complements - The demand for complements will grow if the price of complements falls. For example, lowering the price of the Play Station 2 will boost demand for compatible Play Station games.

7. Weather - During the winter, there will be a higher need for fuel and warm clothing.

8. Expected price hikes in the future - A commodity such as gold may be purchased for speculative purposes; if you believe it will rise in value in the future, you will buy today.

9. Circumstances change - The Covid shutdown of 2020/21 resulted in a huge drop in demand for leisure activities like as going to the movies, but also resulted in a surge in demand for electronic items such as televisions and Netflix subscriptions.

10. Economic cycle - Even if their income is stable, consumers will cut down on spending during a recession. Because they are afraid of losing their jobs, they will adopt a risk-averse stance and cut down on their expenditures. In an economic boom, confidence will be strong, and earnings will rise, resulting in increased demand.

11. Wealth-effect - Households will be more inclined to spend if their wealth increases (for example, if housing prices rise). This is due to the fact that they may re-mortgage their home to get equity withdrawal and/or because they will have greater confidence as a result of having more assets.

2.4 DEMAND FUNCTION

The relationship between quantity demanded of a good and the determinants influencing its demand can be expressed through a mathematical function called as demand function.

Q_{dx} = f (Px, Py, Y, T, A, N, E, O)

Where,

Q_{dx} = Quantity demanded of a commodity X

P_x = Price of the commodity X

P_y = Price of related (Substitute or complementary) goods

Y = Income level

T = Tastes and preferences

A = Advertising

N = Population (Market size)

E = Expectations about future prices

O = other factors

2.5 LINEAR DEMAND FUNCTION &LINEAR DEMAND CURVE

A linear demand curve is a line that depicts the connection between a product's or service's demand and its price. Everyone understands that sales are related to price: the higher the price, the fewer items you can anticipate to sell. If you sell a product and have altered the price at least once, you could theoretically use a linear demand curve to determine the approximate number of units you could sell if the price were modified. Simply plot the price on the y-axis (up and down) and the amount sold on the x-axis (left to right), and then draw a line between both points on the graph.

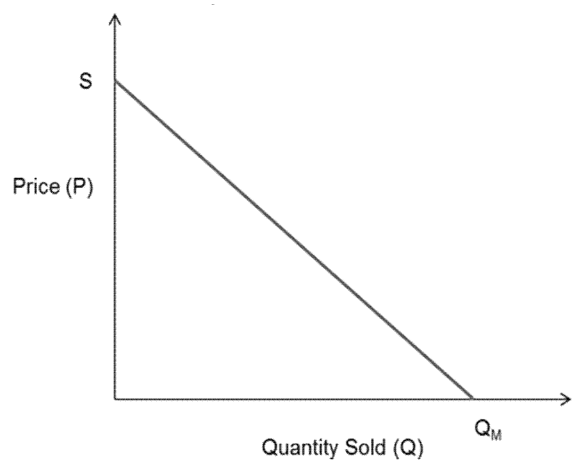


Fig. 2.3

The demand curve for the majority of goods is a downward sloping line, illustrating the inversely proportionate connection between price and demand — the higher the price, the fewer things you sell. Occasionally, the curve may flatten, indicating that any increase in price beyond a certain point decreases demand to zero. According to Columbia University, this is referred to as a horizontal demand curve, and it may occur when customers can get the same product from a different source at a cheaper price.

A vertical demand curve is also feasible; in this instance, regardless of the price, the amount sold stays constant. These are uncommon, but may contain life-saving medications. As long as people can afford the price you charge, they will pay whatever amount is necessary.

Demand Function in Linear Form:

A function is a mathematical statement that expresses a connection between two or more variables and has a cause and effect link. Similarly, the word "demand function" emphasizes the relationship between the quantity demanded (dependent variable) and the factors that influence product demand (independent variables). In other words, the demand function expresses the effect of numerous demand variables on the desire for a product, such as price, customer income and habits, and level of life.

A linear demand function is an algebraic expression that may be used to calculate demand curves without drawing a demand function graph. It refers to the demand function in which, regardless of the level of the dependent variable, the change in the dependent variable is constant for a unit change in the independent variable. In the short run, the demand function expresses the connection between aggregate demand for a product and its price, while maintaining the other demand determinants constant. In the long run, however, a demand function demonstrates a link between a product's aggregate demand and a variety of demand variables, such as price, consumer income, standard of living, and price of alternatives.

The demand function in case of short run will be;

$D_X = f(P_X)$

where,

D_X represents dependent variable

$P_x$represents independent variable

f indicates functional relationship

The above equation indicates that quantity demanded (Dx) is a function of price (Px) for product X. This asserts that if the price of product X changes, the demand for product X will likewise vary. The demand function, on the other hand, does not interpret the amount of change in demand caused by a change in the price of the product.

The mathematical equation can be used to understand the quantitative relationship between demand and price. Although there is no standard method to express a demand function, they often have the form;

Qd = a – b(P)

where,

P is the price

Qd denotes the quantity demanded

a denotes external variables influencing demand other than price and

b denotes the slope of the demand curve i.e it indicates how the price influences the quantity demanded.

Fox instance, the value of a is given as 200 and that of b is 10, with these values the demand equation can be written as;

Q_d = 200 – 10(P) which can be further simplified with the help of following illustration.

Price (P)	**Demand equation is given as, $Q_d = 200 – 10(P)$**	**Quantity Demanded Q_d**
1	$Q_d = 200 – 10 (1)$	190
2	$Q_d = 200 – 10 (2)$	180
3	$Q_d = 200 – 10 (3)$	170
4	$Q_d = 200 – 10 (4)$	160

$Q_d = a – b(P)$ is a helpful function for estimating demand as and when there is a change in the price. According to EconomicsHelp.org, if one need to determine the price in order to attain a certain quantity desired, then the following formula can be used;

$P = a - b(Q_d)$,

where "a" is the intercept at price zero and "b" indicating the slope of the demand curve.

2.6 LAW OF DEMAND

The relationship between the quantity demanded and the price of a commodity is described by the law of demand. It argues that when the price of a product rises, so does its demand, while the other factors remain constant. As a result, there exists an inverse relationship between a commodity's price and its quantity demanded.

"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"-Marshall.

According to Robertson, *"Other things being equal, the lower the price at which a thing is offered, the more a man will be prepared to buy it."*

According to Ferguson, *"Law of Demand, the quantity demanded varies inversely with price."*

The law of demand explains the relationship between demand and the price of the commodity. It states that price influences the demand of a product hence price is a dependent variable and demand is an independent variable which can be seen from the following function;

$D_x = f(P_x)$

where,

D_x represents demand of a commodity X

$P_x$represents price of a commodity X

f indicates functional relationship

Other demand factors (apart from price) should be held constant in the law of demand, since demand is sensitive to a variety of effects. Allowing all variables to change simultaneously may work against the law. Certain notions, such as demand schedule, demand curve, and demand function, may assist in learning the law of demand.

Demand Schedule:

A demand schedule is a table that illustrates the relation between price and quantity demanded. It represents the amount of a product that a person or a group of people want at a specific price and time.

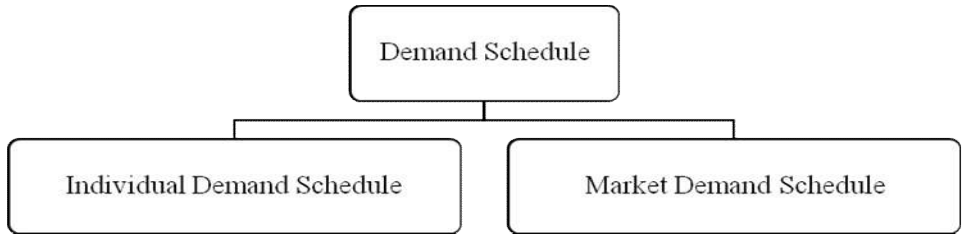


Fig. 2.4

1. Individual Demand Schedule:

The individual demand schedule is the tabular representation of all the units of a commodity demanded at various prices and time period.

Price of a commodity (Rs. per unit)	**Quantity Demanded (Monthly units requirement)**
10	65
20	55
30	45
40	35
50	25

Individual demand curve illustrate the influence of changing prices on consumers' purchasing behaviour, rather than on the overall demand for a product. It shows the gap in demand by contrasting the product's pricing. Additionally, it indicates that when prices rise, the quantity demanded decreases and vice versa.

2. Market Demand Schedule:

An aggregate amount required by people at various prices and times is shown in a table called a market demand schedule. As a result, it indicates the market's desire for a product at various price points. Individual demand schedules may be aggregated to create the market demand schedule.

Price of a commodity (Rs. per unit)	Individual Quantity Demanded by A (Monthly units requirement)	Individual Quantity Demanded by B (Monthly units requirement)	Individual Quantity Demanded by C (Monthly units requirement)	Market Demand (Monthly units requirement)
10	6	9	5	20
20	5	8	4	17
30	4	7	3	14
40	3	6	2	11
50	2	5	1	8

Thus the market demand schedule was derived by adding all the individual demand schedules. There exists an inverse relation between Market demand schedule and price of a commodity.

Demand Curve:

The demand curve illustrates the demand schedule graphically. It is created by graphing the price and quantity demanded. On a demand curve, the Y-axis represents the price, while the X-axis indicates the quantity demanded. R.G Lipsey described demand curve as "the curve which shows the relationship between the price of a commodity and the amount of that commodity the consumer wishes to purchase is called Demand Curve."

Individual demand curves and market demand curves are two distinct forms of demand curves. Individual demand curves are used to illustrate individual demand schedules, while market demand curves are used to illustrate market demand schedules.

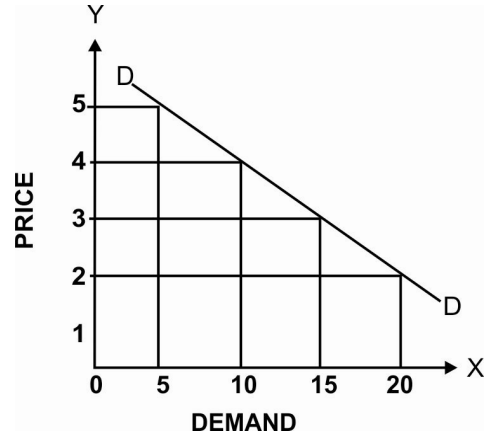


Fig. 2.5
Individual Demand Curve

In the above figure DD curve shows the inverse relationship between price and quantity demanded at different price levels. By joining various combinations the DD curve has been obtained which is termed as the individual demand curve.

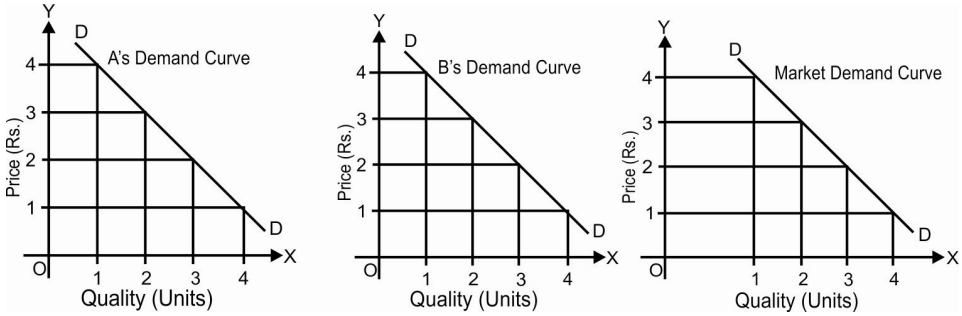


Fig. 2.6
Market Demand Curve

Assumptions in the Law of Demand:

The law of demand examines the relationship between changes in demand and changes in price. In other words, the law of demand's central premise is that it examines the influence of price on the demand for a product while maintaining other demand determinants constant.

However, some assumptions underpin the law of demand, including the following:

i. Assumes constant consumer income. When an individual's income improves, his or her desire for items increases as well, this violates the law of demand. As a result, the consumer's income should remain stable.

ii. Assumes that the consumer's tastes stay constant.

iii. Believes that fashion does not change, since if it did, consumers would stop purchasing out-of-style things.

iv. Assumes no change in the population's age structure, size, or gender ratio. This is because as the population grows, the number of purchasers rises, thus affecting the demand for a product.

v. Restrains innovation and new product variants on the market, which may have an effect on demand for the present product.

vi. Restrains changes in the income distribution.

vii. Prevents any change in the fiscal policies of a nation's government that would decrease the influence of taxes on product demand.

Apart from these factors, the rule of demand presupposes that the universe is static and that individuals consume items at a set pace and price in the market. These assumptions no longer hold true in a changing environment.

Exception to the Demand Law:

Until now, we have established that there is an inverse connection between a product's demand and price. According to the universal rule of demand, a rise in the price of a product reduces demand for that commodity, and vice versa. However, there are certain cases where a decrease in price results in a decrease in demand, while an increase in price results in an increase in demand. This is a paradoxical scenario and is seen as an exception to the rule of demand. In plain terms, an exception to the rule of demand refers to circumstances in which the law of demand does not apply. When exceptions occur, the demand curve has an upward slope and is referred to as the unusual demand curve.

1. **The Giffen Paradox:**

This is one of the most significant criticisms of the law of demand. The Giffen Paradox was coined by Sir Robert Giffen, who divided products into two categories: poor goods and superior goods, which were together referred to as Giffen goods. Affordably priced potatoes and vegetable ghee, for example, are examples of inferior items whose demand falls with a rise in consumer wealth.

Because these commodities are of poor quality, the demand for them diminishes as a result of an increase in the income of the consumer population. Aside from that, as long as the high-priced items are of great quality, the demand for these things will rise as well. For example, coffee is seen as superior as tea, while tea is regarded as inferior to coffee. In the event that the price of any of these commodities rises, customers will raise their demand for tea in order to meet their needs while still paying the same amount.

2. Products that are believed to be necessary for the consumer are referred to as "**necessity products**." The demand for necessities does not grow or decrease in response to an increase or reduction in the price of such necessities. Example: Salt is a need good whose use cannot be raised if the price of salt lowers in the marketplace. Consequently, in such a situation, the rule of demand does not apply.

3. **Prestige Commodities**: These are goods that are believed to be a prestige symbol, such as diamonds, among other things. The demand for these commodities stays constant regardless of whether their prices are raised or lowered. There is no application of the law of demand in this situation.

4. In this context, **speculation** refers to a consumer's expectation about how the price of a product will vary in the future. If the price of a product is predicted to grow in the future, then the demand for the commodity rises in the current condition, which is in contravention of the law of supply and demand.

5. **Customers who are psychologically biased**: This is an example of one of the most significant exceptions to the law of demand. Customers' views

of the pricing of a goods vary depending on the product. A common misconception among buyers is that a cheap price indicates poor quality of a certain item. However, this is not always the case. The demand for a product naturally reduces as the price of a product falls, as a result of this.

6. **Brand Loyalty**: This refers to a consumer's preference for a certain brand above other brands. In response to a rise in the price of a particular brand, consumers are less likely to switch. For example, if a customer liked to wear Levi's jeans, he would continue to buy them regardless of if the price of Levi's pants increased. The law of supply and demand cannot be applied in such a circumstance.

7. A scenario in which the law of demand is not applicable is referred to as a "**emergency situation**." A shortage and uncertainty in the supply of commodities are common in times of crisis such as war and natural disasters such as floods and earthquakes. Consumers, under such circumstances, prefer to stockpile a huge number of items, regardless of the cost at which they are sold.

2.7 CONSUMER SURPLUS

When a consumer purchases an item, his surplus is the difference between the price he pays for that thing and the amount he would be prepared to pay if he had to go without it. When the price that consumers pay for a product or service is less than the price that they are willing to pay, this is referred to as a consumer surplus. In other words, it is a measure of the extra advantage that customers obtain as a result of paying less for something than they would have been prepared to pay otherwise. It is based on the economic theory of marginal utility, which states that consumer surplus refers to the extra pleasure a customer obtains by purchasing one more unit of an item or service. Depending on an individual's unique preferences, the utility a product or service offers will differ from one person to the next. The region between the equilibrium price and the demand curve on a supply and demand curve is known as the demand curve.

Consumer surplus is defined as the area below the downward-sloping demand curve, or the amount a consumer is willing to spend for given quantities of a good, but above the actual market price of the good, as depicted by a horizontal line drawn between the y-axis and the demand curve on a graph of consumer surplus. It is possible to compute consumer surplus on either an individual or aggregate basis, depending on whether the demand curve is individual or aggregated in nature. Consumer surplus always grows when the price of a thing lowers, and it always decreases when the price of a good goes up.

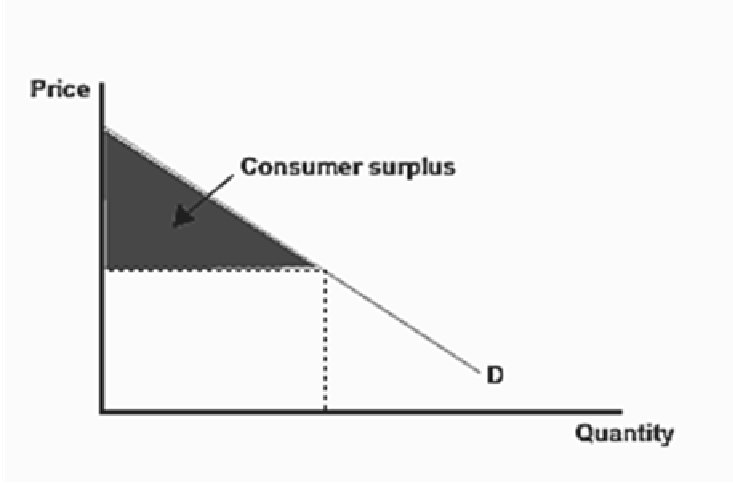


Fig. 2.7

Is it possible for businesses to minimise consumer surplus?

1. If a firm has market power, it has the ability to minimise consumer excess. As a result, they are able to increase prices beyond the level of competitive equilibrium. A monopoly allows a company to maximise revenues by minimising consumer surplus.

2. Engaging in price discrimination is another method of reducing consumer excess. Consumers from various demographics are charged varying costs. Inelastic demand will cause the consumer surplus of those who have it to be decreased. Customer surplus cannot be totally eliminated without first-degree price discrimination on the part of the company, which entails charging the consumer the highest price they are willing to pay.

3. In order to develop market dominance, a company may promote in order to build brand loyalty, which would cause demand to become more inelastic.

What is the relevance of the consumer surplus in today's world?

- In competitive marketplaces, corporations are required to maintain prices as low as possible in order to allow consumers to accumulate consumer surplus. In the absence of competition in markets, the consumer surplus would be less and inequality would be larger.
- A decrease in consumer surplus leads to an increase in producer surplus and an increase in inequality.
- A decrease in consumer surplus allows consumers to buy a broader variety of items.

2.7 SUMMARY

Demand is the number of individuals that are willing and able to purchase things at a variety of prices throughout a particular time period. A linear demand curve is a line that depicts the connection between a product's or

service's demand and its price. The relationship between the quantity demanded and the price of a commodity is described by the law of demand. When a consumer purchases an item, his surplus is the difference between the price he pays for that thing and the amount he would be prepared to pay if he had to go without it.

2.8 QUESTIONS

1. What is Demand? Explain its types.
2. What are the various factors affecting demand?
3. Elaborate the linear demand function and linear demand curve.
4. Write in detail the law of demand.
5. Explain the concept of consumer surplus.

3

CONSUMER BEHAVIOR II

Unit Structure

3.0 OBJECTIVES

- To understand the significance of the concept of elasticity of demand for businessmen
- To study various types of elasticity of demand
- To study and understand the significance and methods of demand forecasting

3.1 INTRODUCTION

From demand function we know that there are various determinant of demand such as price, income, Promotions, substitute price etc. Quantity demanded is related to these determinants in various fashions. Law of demand tells us that relationship between price and quantity demanded is inverse. We could understand the direction of change from law of demand but we could not know the magnitude of change. E.g. suppose price of apple increases its quantity demanded would fall.

Now consider a case when we have 500 kgs of apple. On routine basis apple demand in particular part of Mumbai is 400 kgs at Rs 100 per kg. Here our stock is 500 kgs and quantity demanded is 400 kgs and if we want to sell the 500 kgs of apple we know that we want to reduce price of apples. But how much price to be reduced so as to sell entire 500 kgs is still not known from law of demand. Here we should have additional information like pace or rate of change i.e. response of quantity demanded to respective change in price. Our objective is to sell 500 kgs of apple then how much price to be charged so that all 500 kgs of apple could be sold. The amount is less than 100 but exact amount can be finalized based on

data of response of quantity demanded to price. This response is known as elasticity of demand.

Demand elasticity is defined as ratio of percentage change in quantity demanded to percentage change in determinant of demand. It is sensitivity shown by quantity demanded to changes in variables like price, income, promotions and other factors.

3.2 SIGNIFICANCE OF ELASTICITY OF DEMAND FOR BUSINESSMAN

The firm is engaged in producing or procuring goods and services and distributing to its customers at profit. Quantity demanded depends on various factors, few of the factors like price of the product and expenses on advertising are within control of organization while others such as income and prices of substitute and competitive products are not within the control of organization. On account of fluctuations in demand all aspects can't be accommodated in production and other functions of organization but it is necessary to understand the impact on quantity demanded. The elasticity of demand concepts helps business manager primarily in making changes in price so as to stimulate demand in favor of company.

Fate of any company depends largely on total sale of final product ensuring revenue generated. Any variations are closely monitored by manger of firm. From qualitative study of law of demand manager is able to understand direction of change. From quantitative study of elasticity of demand manager is able to understand the magnitude of that change. The quantitative study helps in finding out, if we change price by 10% then resultant change in to quantity demanded can be 10%, 20% or 5%. The concepts of elasticity of demand addresses this issue and helps business manger to understand effect of changing factors of demand and its result on quantity demanded.

Consider an example where there are three 5 star hotels in Kalina Mumbai offering similar services and similar rates. Hotel A is strategically located near Mumbai university campus and has higher occupancy of rooms as compared to rest of two. Here hotel B & C based on their occupancy rates needs to reduce the rates so as to attract more customers, so the discounts on room fares are different in Hotel A, B, and C. We can trace similar situation for pricing of fashion garments differently on different websites and showrooms. Raymond may offer different discounts at same time for end of season sale in different showrooms in various cities. Such situation is very often in almost all business firms due to fluctuations of demand and inventory level. The revenue and profitability of the firms largely depends on its pricing strategy. The concept of elasticity of demand helps business manager to address this issue. It is helpful in determining the prices so as to increase revenue and profit. It is equally helpful in uplifting the overall efficiency of organization by promoting the use of underutilized resources by reducing price of its goods resulting in to increased demand. Few organizations with higher capacity and lower

market demand as compared to their capacity can plan to reduce the price so that their sales increase. In case of companies running short of capacity as compared to market demand, pricing can be increased so that overall profit can be increased. The price elasticity of demand helps manager in understanding how much a consumer will move away from the goods and services when its price increases. From all these examples it is very clear that the concept of elasticity of demand is highly useful for managers working in all types of firms. It is equally applicable to product companies like hp, dell, Sony, LG and service companies like Jio, Airtel, HDFC bank and Tata play etc.

3.3 TYPES OF ELASTICITY OF DEMAND

As discussed earlier, the elasticity refers to response in quantities demanded to respective change in determinant of demands. The elasticity of demand can be calculated for all of its determinants. The major types of elasticity of demand are as follows,

1. Price elasticity
2. Income Elasticity.
3. Cross Elasticity
4. Promotional Elasticity.

Let us discuss each one of these in details.

3.3.1 Price elasticity of demand.

Amongst all types of elasticity of demand, price elasticity of demand is crucial and most important as firms do have better control on pricing as compared to rest of the factors determining demand. Price elasticity of demand is defined as ratio of percentage change in quantities demanded to percentage change in price. It is generally negative as price and quantity demanded are inversely proportional to each other. It is given by expression

$$\mathbf{Ep} = \frac{\mathbf{\%\ change\ in\ quantity\ Demanded}}{\%\ Change\ In\ avergae\ price} = \frac{\%\ \Delta\ \mathbf{Q}}{\%\ \Delta\ P}$$

Here ΔQ- Change in quantity demanded given by Q1-Q2

ΔP- Change in price, given by P1-P2

Therefore, Expression for income elasticity can be written as follows,

$$\mathbf{Ep} = \frac{\Delta q}{\Delta p} * \frac{P\mathbf{1} + P2}{Q\mathbf{1} + Q2}$$

The price elasticity can be calculated by various methods such as point method and arc method.

3.3.2 Degree of elasticity

As discussed earlier, elasticity refers to response, it must be understood that role or utility of every goods and services is not same. Exactly according to this consumer response to change in price does not remain same to all types of goods and services, in addition to this we must understand that even for same goods or services upon consumption consumer may behave differently at the different price and consumption level but this type of response to price change is not as significant as response based on price based on utility. Similar type of degrees does exist for all type of elasticity such as Income, elasticity, cross elasticity and promotional elasticity. For the sake of simplicity we here discuss only levels of degrees of demand elasticity of price

a) Perfectly Inelastic demand

b) Inelastic demand

c) Unitary elastic demand

d) Elastic demand

e) Perfectly elastic demand

Let us discuss each of these in detail.

3.3.2.1 Perfectly inelastic demand

This is situation where we make changes in to price but resultant quantity demanded neither increases nor decreases. This is basically hypothetical situation. In this situation Ep=0.

We derive this from basic expression of elasticity of demand that is

Price elasticity of Demand = % Change in Quantity demanded / % Change in price of goods

Here as we know the situation % change in quantity demanded =0 therefore

Ep=0/Px, therefore, Ep=0 where Px- % Change in Price.

This situation can be well understood with the help of following graph

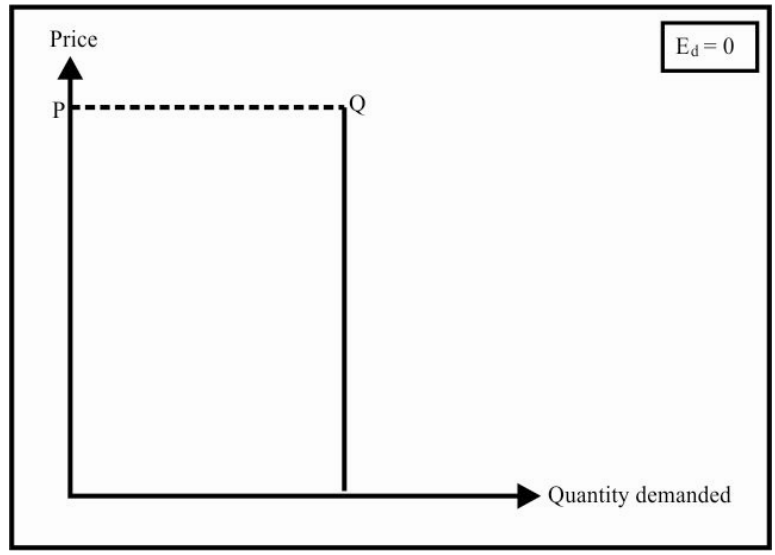


Fig 3.1: Perfectly Inelastic demand

The above graph shows quantity demanded on X axis and price on Y axis, we may see that demand curve for this situation is straight standing line representing there is no change in quantity demanded irrespective of changes in to price.

3.3.2.1 Inelastic demand

This is situation where we make changes in to price but resultant changes in quantity demanded are less than the changes in price of products. We can trace such situation generally in all need based products such as medicines, essential food items like rice, salt and sugar where consumers response to change in price is very low or negligible. In this situation $0<Ep<1$ (we are considering magnitude of elasticity and not the negative sign as negative sign only indicates inverse relationship, here we are more interested in understanding the response shown and not the direction)

We derive this from basic expression of elasticity of demand that is

Price elasticity of Demand = % Change in Quantity demanded/ % Change in price of goods

Here as we know the situation % Change in price is more than % change in quantity demanded

Therefore,

Ep=Qx/Px, Where

Qx- % Change in Quantity Demanded

Px- % Change in Price. e.g. consider Qx=5% and Px=20%

Here Ep=5/20=0.25 which is less than 1.

Qx< Px therefore Ep<1

This situation can be well understood with the help of following graph

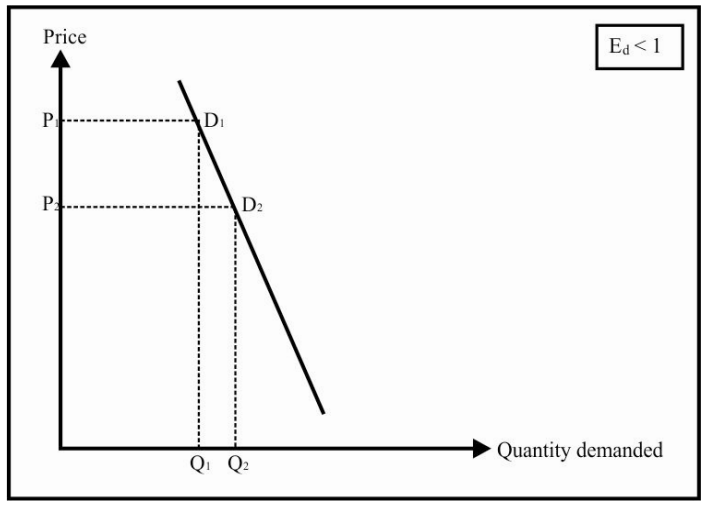


Fig 3.2: Inelastic Demand

The above graph shows quantity demanded on X axis and price on Y axis, we may see that demand curve for this situation is steeper representing there is less change in quantity demanded as compared to larger change in to price.

3.3.2.1 Unitary elastic demand

This is situation where we make changes in to price and resultant changes in quantity demanded are exactly same as changes in price of products. This is basically hypothetical situation. In this situation Ep=1 (we are considering magnitude of elasticity and not the negative sign as negative sign only indicates inverse relationship, here we are more interested in understanding the response shown and not the direction)

We derive this from basic expression of elasticity of demand that is

Price elasticity of Demand = % Change in Quantity demanded/ % Change in price of goods

Here as we know the situation % Change in price is less than % change in quantity demanded

Therefore,

Ep=Qx/Px, Where

Qx- % Change in Quantity Demanded

Px- % Change in Price. e.g. consider Qx=10% and Px=10%

Here Ep=10/10=1 Qx= Px therefore Ep=1

This situation can be well understood with the help of following graph

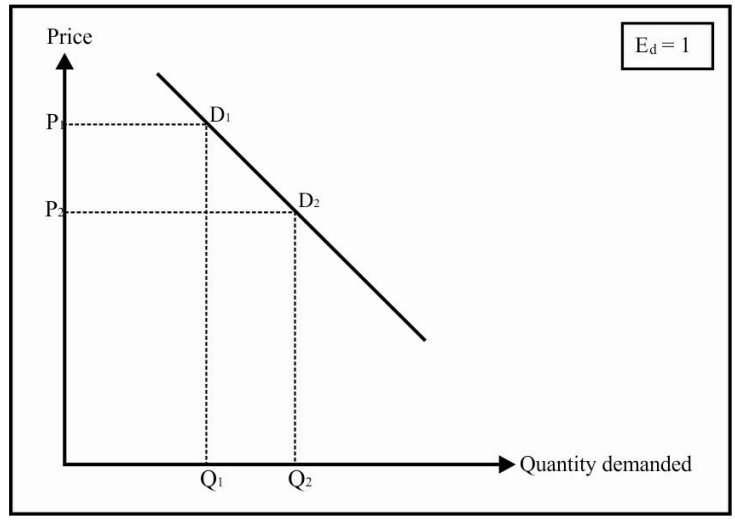


Fig 3.3: Unitary Elastic Demand

The above graph shows quantity demanded on X axis and price on Y axis, we may see that demand curve for this situation is exactly 45 degree line representing there is exactly same change in quantity demanded as compared to change in to price.

3.3.2.1 Elastic demand

This is situation where we make changes in to price and resultant changes in quantity demanded are more than changes in price of products. We can trace such situation generally in all lifestyle products such as motorcycle, shoes, mobile phones etc, where consumers response to change in price is more. We may see that end of season sale and other discount offers are generally made in this category of items. We may also say that most of the goods under corporate management fall under this category. Industrial goods popularly known as B2B goods also follow this type of degree as even the demand remains constant at industry level; firm may get additional quotas only with very less discounts. In this situation Ep>1 (we are considering magnitude of elasticity and not the negative sign as negative sign only indicates inverse relationship, here we are more interested in understanding the response shown and not the direction)

We derive this from basic expression of elasticity of demand that is

Price elasticity of Demand = % Change in Quantity demanded/ % Change in price of goods

Here as we know the situation % Change in price is less than % change in quantity demanded

Therefore,

Ep=Qx/Px, Where

Qx- % Change in Quantity Demanded

Px- % Change in Price. e.g. consider Qx=5% and Px=20%

Here Ep=25/10=2.5 which is more than 1.

Qx> Px therefore Ep>1

This situation can be well understood with the help of following graph

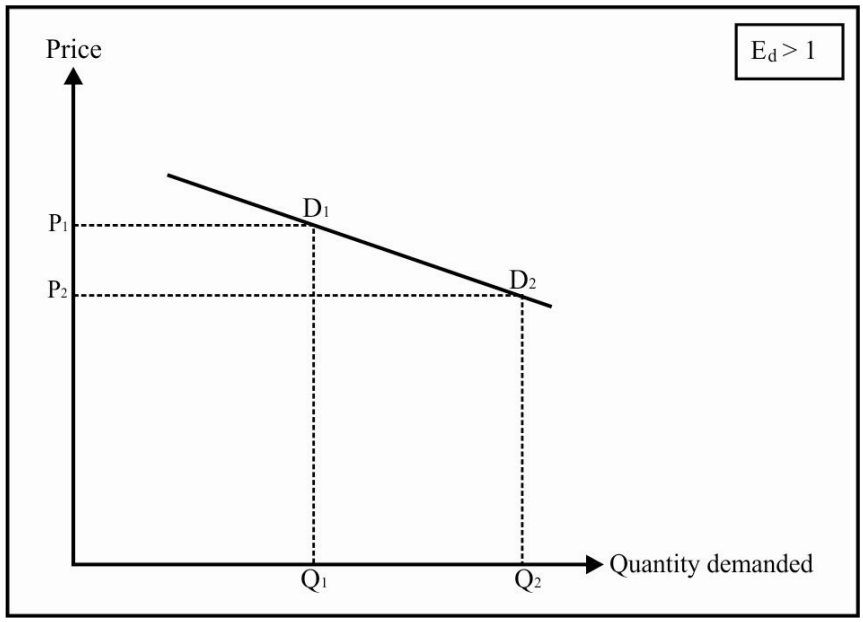


Fig 3.4: Elastic Demand

The above graph shows quantity demanded on X axis and price on Y axis, we may see that demand curve for this situation is having less slope and more flatter representing there is more change in quantity demanded as compared to lesser change in to price.

3.3.2.1 Perfectly elastic demand

This is situation where we make do not make any changes in to price but resultant changes in quantity demanded are there even though rest of the factors are kept constant. This is hypothetical situation. In this situation Ep=∞

We derive this from basic expression of elasticity of demand that is

Price elasticity of Demand = % Change in Quantity demanded/ % Change in price of goods

Here as we know the situation % Change in price is less than % change in quantity demanded

Therefore,

Ep=Qx/Px, Where

Qx- % Change in Quantity Demanded

Px- % Change in Price. e.g. consider Qx=5% and Px=0%

Here Ep=5/0=∞ as anything divided by 0 is ∞

This situation can be well understood with the help of following graph

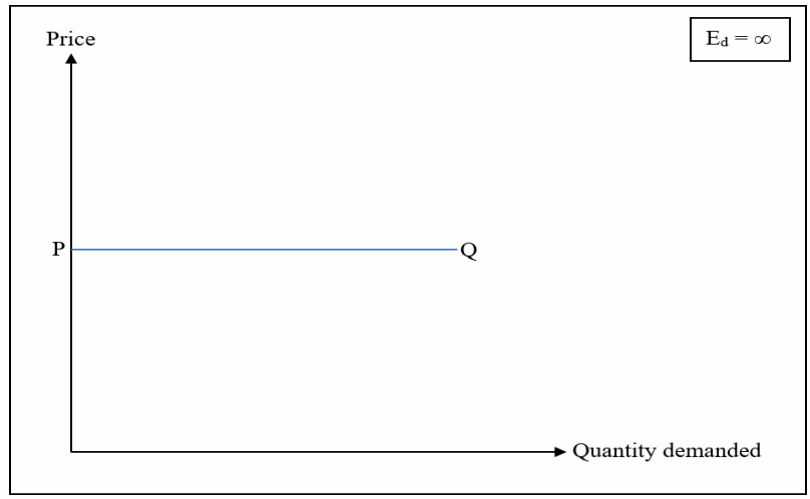


Fig 3.5 Perfectly Elastic Demand

The above graph shows quantity demanded on X axis and price on Y axis, we may see that demand curve for this situation is sleeping line representing there is change in quantity demanded even if there is no change in to price.

3.3.3 Price elasticity and revenue

As we know total revenue is given by price multiplied by number of units sold, TR=P*Q, here we need to add MR and AR. MR is marginal revenue is calculated as additional revenue generated for one more unit sold. It is given by expression MR= ΔTR/ ΔQ. Here Average revenue is given by total revenue divided by number of units sold. It is given by expression AR= TR/Q = QP/Q = P average revenue is equal to price. Consider following tables for supply schedule.

Point	P	Q	TR	AR	MR
1	10	4	40	10	-
2	9	6	54	9	14
3	8	8	64	8	10
4	7	10	70	7	6
5	6	12	72	6	2
6	5	14	70	5	-2
7	4	16	64	4	-6

Table3.1: Revenue for linier demand curve

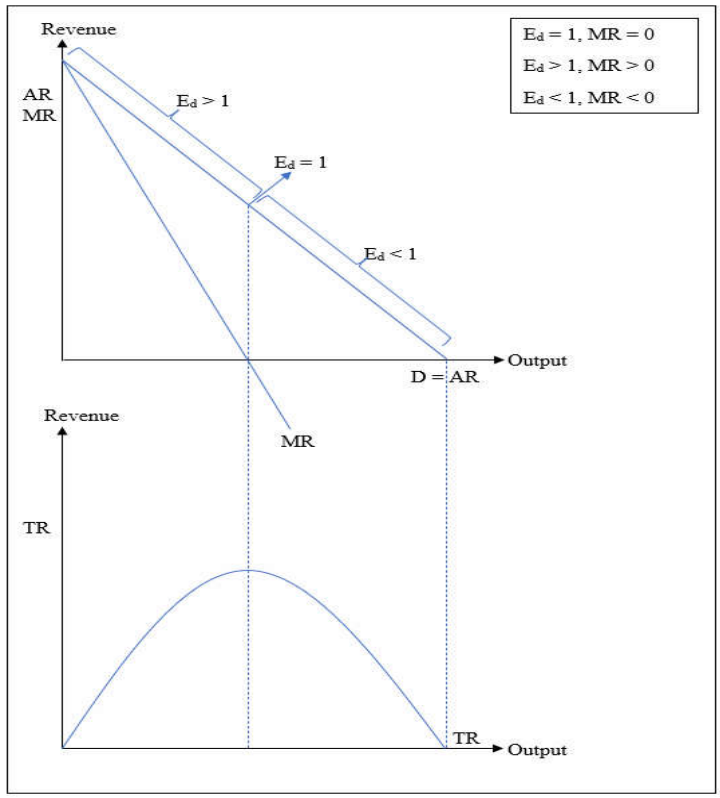


Fig: 3.6: Linear demand curve and corresponding AR, MR and TR values

From table 3.1 and graph 3.6 we can conclude that marginal revenue is highest at the starting but it goes on decreasing and point will come where marginal revenue falls under negative territory (At price Rs 6 in above table) total revenue is maximum at this corresponding level (Rs 72 in this case). Total revenue start decreasing beyond this point indicating losses.

Consider following example for perfectly competitive firm

P	Q	TR	AR	MR
10	0	0	0	-
10	5	50	10	10
10	10	100	10	10
10	20	200	10	10
10	40	400	10	10

Table 3.2: Revenue for firm in perfectly competitive market

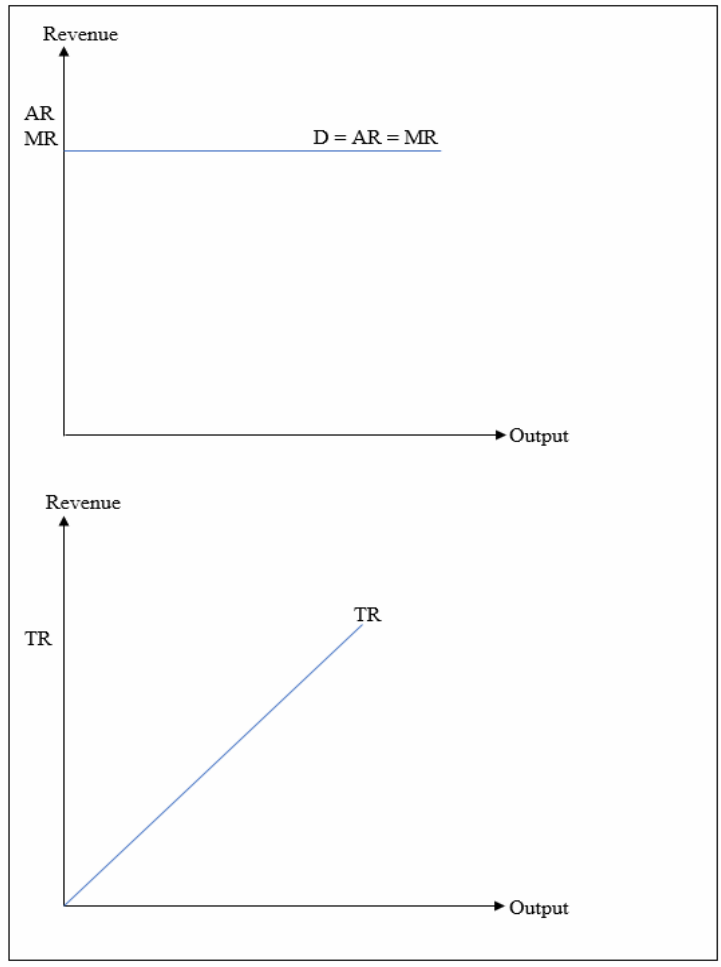


Fig 3.7: Horizontal demand curve and corresponding AR, MR and TR values

From table 3.2 and figure 3.7 we can infer that for a firm in perfectly competitive market its revenue increases as its volume increases. Here industry demand remains constant and your supply schedule shows that marginal revenue and average revenue for the firm remains constant as the price in this case is determined by market forces. Here total revenue increases with increase in total number of units sold as the price remains constant. We can conclude in following manner.

1. Decrease in Price:- Increase in total revenue. (Elastic Demand)
2. Increase in Price:- Decrease in total revenue.(Elastic Demand)
3. Decrease in Price:- Decrease total revenue. (inelastic Demand)
4. Increase in Price:- Increase in total revenue.(inelastic Demand)

3.3.4 Income Elasticity of Demand

Income elasticity of demand refers to response of quantity demanded to changes in average income of the consumers. It is given by following expression,

$$\mathbf{Ei} = \frac{\%\ \textbf{change in quantity Demanded}}{\%\ Change\ In\ avergae\ income} = \frac{\%\ \Delta\ \mathbf{Q}}{\%\ \Delta\ I}$$

Here ΔQ- Change in quantity demanded given by Q1-Q2

ΔI- Change in average income of consumers. Given by I1-I2

Therefore, Expression for income elasticity can be written as follows,

$$\mathbf{Ei} = \frac{\Delta q}{\Delta I} * \frac{I1 + I2}{Q1 + Q2}$$

We know that as the average income increases, quantity demanded by market increases and vice a versa. Income elasticity is generally positive in nature. We may see this situation in consumption driven economy of India. We know that number of cars, white goods, housing units, FMCG and other product sell in India is on rise, this increased consumption may point towards increase in average income of Indian in last few decades on account of multiple efforts by all government coupled with efficient private sector management. Exactly opposite to this situation we may notice that in few of the economies for certain period at the time of recession and high inflation in economy, real income decreases leading towards lesser consumption by people. Income elasticity also has various degrees as mentioned in price elasticity so degree of response for various categories of items is not same even if we may observe change in income level.

3.3.5 Cross Elasticity of Demand

Cross elasticity of demand refers to response of quantity demanded for item x to changes in price of item y. It is given by following expression,

$$\mathbf{Exy} = \frac{\%\ \textbf{change in quantity Demanded for x}}{\%\ Change\ In\ price\ of\ y} = \frac{\%\ \Delta\ \mathbf{Qx}}{\%\ \Delta\ Py}$$

Here ΔQx- Change in quantity demanded for product x given by Q1-Q2

ΔPy- Change in price for product y. Given by P1-P2

Therefore, Expression for income elasticity can be written as follows,

$$\mathbf{Ei} = \frac{\Delta Qx}{\Delta Py} * \frac{Py1 + Py2}{Qx1 + Qx2}$$

The cross elasticity may be positive or negative based on type of relationship between the two products. The association between two products is important in many cases e.g. fuel prices and automobile sale. There are many such situations where increase or decrease in price of one product may lead to increase or decrease of quantity demanded for another item. We may categories products as complimentary products, competing products and substitute products, the cross elasticity for the categories can be derived from same expression as the values for change will be different in various categories.

3.3.5.1 Cross Elasticity for complimentary products

Complimentary products refers to set of products which goes together to make a usable preposition for consumers e.g. Sim card and mobile phone or petrol and motor cycle. We know that as the internet data charges are drastically reduced after launch of Reliance Jio, it resulted in rapid increase in sell of android based smart phones. We can again trace the similar situation in automobile industry, whenever petrol and diesel prices sharply increases we can see reduction in growth of automobiles, we may see positive growth in automobile sector even in increasing fuel prices but this growth is on account of increase in Income.

For such category cross elasticity is negative as price increase in complimentary products results in reduced quantity demanded for other products and vice a versa.

3.3.5.2 Cross Elasticity for competing products

Consider an example of a college canteen having 500 students consuming carbonated drink Pepsi or Coca cola. Both are priced at Rs 20 for 200 ml pet bottle, out of 500 students 250 choose Pepsi daily and 250 choose Coca Cola. Now a sales manager of Pepsi starts giving two rupees discount on each bottle making effective price of Pepsi at Rs 18. Now quantity demanded for pepsi increases as result of decrease in price and now 300 students choose Pepsi out of 500, remaining 200 still choose Coca Cola. In the case of Coca Cola even the price and other factors does not change quantity demanded decreases as a result of decrease in price of Pepsi. Cross elasticity in this case would be positive as the relationship is direct that means for competing products, whenever price increases for product, quantity demanded for its competing product increases.

3.3.5.3 Cross Elasticity for substitute products

Substitutes refer to alternate products satisfying similar want. Here we can take a example where student want to travel to Delhi from Mumbai, current price of train 2 AC class is at Rs 3000/- and fare of airplane is at Rs 5000/-. An airline manager observe lower occupancy in non peak hours and offers a discount of Rs 1500 on this route now few of the passenger earlier traveling by train will choose to travel by Plane. In this example even if there is no change in price or fare of train, there is decrease in total number of passengers. The cross elasticity for substitute products is positive as price increase in another product will lead to increase in demand for your product and vice a versa.

3.3.6 Promotional Elasticity of Demand

Various determinants of demand such as income, price of complimentary, substitute and competing products are not controlled by firm. To increase or decrease in price is not the solution in short run as the dynamics associated with price change and consumer behavior are different. The first step any company would like to do is increase the advertising of the product or to do some sort of sales promotion activity to overcome the

market imbalance occurred and resulted in decrease in companies sell in short run. The promotional elasticity refers to response of the change in quantity demanded to the change in advertising budget. Whenever advertising budget increases, quantity demanded would also increase and vice a versa. Promotional Elasticity is positive as relationship is direct in nature.

Promotional elasticity of demand refers to response of quantity demanded for increase in adverting budget. It is given by following expression,

$$\mathbf{Ea} = \frac{\%\ \textbf{change in quantity Demanded for x}}{\%\ Change\ advertising\ budget} = \frac{\%\ \Delta\ \mathbf{Qx}}{\%\ \Delta\ A}$$

Here ΔQx- Change in quantity demanded for product x given by Q1-Q2

ΔA- Change in advertising budget. Given by A1-A2

Therefore, Expression for income elasticity can be written as follows,

$$\mathbf{Ea} = \frac{\Delta Qx}{\Delta A} * \frac{A1 + A2}{Qx1 + Qx2}$$

3.4 DEMAND FORECASTING

Demand forecasting refers to predicting future market requirement for products based on scientific methods. “Demand forecasting is defined as the process of making estimations of future customer demand over a defined period, using historical data and other information.” Proper demand forecasting gives businesses valuable information about their potential in their current market and other markets, so that managers can make informed decisions about pricing, business growth strategies and market potential.

3.4.1 Significance of demand forecasting

Let us consider following three cases

1. Virat is senior manager in Company A, he focused on making more products irrespective of market demand. Products manufactured will be distributed to market but few of the product remains unsold and requirement from retailers about the products reduces lowering down the dispatch, this situation will lead to piling of finish goods inventory blocking warehouses and stoppage of production, on the other hand his money requirement towards resource acquisition is more as compared to peers as he produced more products than the peers As price in market is function of industry cost and not the firm cost and price remaining constant. Here company A invested more amount and sold similar volume in the market, this situation leads to stoppage of production after some time making it difficult even to meet working capital requirements. Here return on investment reduces for company A and management control also

reduces, top management of company A is very upset with Virat as he ended with overproduction.

2. Rahul is senior manager in company B, he takes lessons from this situation and work defensively in operations, he consumes lesser resources and irrespective of market demand he produces less number of units. He is very happy that warehouses are not blocked and market requirement is there. His stock is sold out in the market immediately leading towards additional requirements from retailers. As he do not have sufficient stock of product with him he is not able to deliver as per requirements. In this situation retailers switch to competing brand from company C which promises consistent supply. Management learns about these things. They are very upset with Rahul because it is very difficult to get customers and Rahul has lost customers. Apart from this Rahul kept lot of scarce resources either idle or underused leading to underproduction.

3. Sachin is smart manager in company C, he forecast demand and make the production in anticipation of demand. He produces products as many required in market. Whiledoing so his control on inventory, working capital production planning, logistics and supply chain, manpower is stronger as demand and supply are consistent with less variations. Retailers are happy with company C as they get the products on th rightv and right quantity as required by them, they make stronger relations with company C. Simmilarly management is happy with Sachin as he has made good profit even with lesser fund requirement. Company C promoted Sachin to higher post with good pay hike as he has made right volume of production. He has also made optimal utilization of scarce resources.

From above mentioned three cases it is clear that performance of company C with smart manger Sachin is better than that of company A & Company B with Virat and Rahul. Sachin has forecasted demand and made the production in anticipation of demand. He got rewarded and his company made better profits and better control over operations as compared to competitors.

3.4.2 Methods of demand forecasting

a. **Survey of Buyers Intention**: It is also known as consumers' expectations or opinions survey. The most commonly used method for estimating demand in short run is to ask customers what they are planning to buy in forthcoming period, usually a year. It is commonly used method for sales forecasting involving direct interviews of customers. A sale is the result of consumer intention to buy the product. Many companies conduct periodical survey of consumers' buying interest to know when and how much they will buy. Application of this method is more in Industrial marketing rather than consumer marketing as preciseness about intentions of buying is more with Industrial buyers. It can be conducted at sample level or census survey.

b. Collective opinion Method: Companies having wide distribution and sales personnel network can use this method. Under this method sales person opinion is collected about future requirement of companies

products**.** Sometimes, it is also called as composite of sales force opinion or sales force estimate method. Company can ask, either all or some of the salesmen, to estimate demand for a given time. Each sales representative estimates how much each current and prospective customer will buy the company's product. Here, for estimating the future demand, the company's sales force opinions are taken as a base. Since salesmen have direct and close contact with customers, competitors, dealers, and overall market environment, they can provide more realistic forecast. Personal biases of the sales force are nullified after data collection. Impact of many macroeconomic changes may not be known to all sales people that impact is understood after collection of forecasting data.

c. Expert Opinion Method: Professional market experts have precise knowledge about various factors of demand. Their experience and expertise and access to information help to arrive at industry demand for future date. Interviews and questionnaires are helpful tools for collecting unbiased data from these sources. Company can also take assistance of experts to obtain forecasts. The experts include dealers, suppliers, distributors, consultants, and trade associations. These experts supply their estimate individually or jointly in form of the pooled individual estimate. Along with the estimates, they also underline certain assumptions. Company contacts them periodically or occasionally for their opinions regarding level of company sales in the future. Some companies buy economic and industry forecasts from well-known economic firms. E.g there are few experts having sound knowledge of energy Industry, companies which depend on this Industry can take advice from them about future demand. This is applicable even to Jewelry brands so as to understand price fluctuation in gold in future and demand associated with each of the price band can be understood. As compared to few other methods it is much faster. Personal biases can be there which may influence the forecast.

d. Controlled Experiments: It is popularly known as test marketing. It is an experimental method. Opinions are not considered but the real experiment is made. This is most reliable method. It is based on the actual study of market situation. In this method, neither buyers are asked to reveal their intention nor experts are contacted to give their opinion on the future sales, but a direct market test is conducted. Direct market test is desirable in case of a new product and existing products as well as existing products in new channel or territory. The method is used to measure consumers' and dealers' reactions in handling, using, and repurchasing the product. Information regarding trial, first time purchase, repeat purchase, etc. can help in more accurate estimate of sales for a given time however major drawback of this method is that, it is conducted in controlled situation (laboratory experiment), the real position cannot be measured; and if it is conducted in natural setting (field experiment), impact of extraneous factors cannot be estimated.

e. Barometric method – In barometric method, demand is predicted on the basis of past events or key variables occurring in the present. This method is also used to predict various economic indicators, such as saving,

investment, and income. This technique helps in determining the general trend of business activities. For example, suppose government allots land to the XYZ society for constructing buildings. This indicates that there would be high demand for cement, bricks, steel and aggregates. The main advantage of this method is that it is applicable even in the absence of past data. However, this method is not applicable in case of new products. In addition, it loses its applicability when there is no time lag between economic indicator and demand.

f. **Statistical methods:** These methods use some statistical technique to find out demand forecasts.

- Trend Projections–Trend projection or least square method is the classical method of business forecasting. In this method, a large amount of reliable data is required for forecasting demand. In addition, this method assumes that the factors, such as sales and demand, responsible for past trends would remain the same in future. In this method, sales forecasts are made through analysis of past data taken from previous year's books of accounts. In case of new organizations, sales data is taken from organizations already existing in the same industry

- **Graphical method:** It is the simplest statistical method in which the annual sales data are plotted on a graph, and a line is drawn through these plotted points. A free hand line is drawn in such a way that the distance between points and the line is the minimum. In this method, it is assumed that future sales will assume the same trend as followed by the past sales records. Although the graphical method is simple and inexpensive, it is not considered to be reliable. This is because the extension of the trend line may involve subjectivity and personal bias of the researcher.

- **Fitting trend method:** This **i**mplies a least square method in which a trend line (curve) is fitted to the time-series data of sales with the help of statistical techniques.

Linear trend – $S = a + bT$;

Exponential trend – $S = aT^b$

(S = annual sales, T = time, a & b are constants)

- **Regression analysis –**It is alsovery popular method of demand forecasting. In regression method, the demand function for a product is estimated where demand is dependent variable and variables that determine the demand are independent variable

- **Simple regression:**

  - If only one variable affects the demand, then it is called single variable demand function. Thus, simple regression techniques are used.

  - $Y = a + Bx$

- **Multiple regression:**

➢ If demand is affected by many variables, then it is called multi-variable demand function. Therefore, in such a case, multiple regression is used.

➢ $Y = a + b_1X_1 + b_2X_2$

Here, Y = Variable dependent on X (estimated demand)

X = Independent factor/variable

a & b are constants

All professionally managed companies make the use of tools and techniques from demand elasticity and demand forecasting.

3.5 SUMMARY

- From law of demand we could understand direction of change in quantity demanded on account of change in price but we need demand elasticity for decision making. Demand elasticity is ratio of percentage change in quantity demanded to percentage change in determinant of demand.

- Demand elasticity can be calculated for all the determinants of demands such as price, income, price of the related products and promotions. It is called as price elasticity, income elasticity, cross elasticity and promotional elasticity respectively.

- The firm may have control on only few factors such as price and promotions nut they do not have much control on income and price of related goods.

- Elasticity can have various degrees. Need based product are inelastic in nature and life style products are elastic in nature. Other degrees such as perfectly inelastic , perfectly elastic and unitary elastic can be discussed but their applicability is restricted to very few products.

- There is strong relationship between price and revenue, for elastic products increase in prices results in decrease in revenue and vice a versa whereas for inelastic products increase in price will result in increase in revenue.

- Demand forecasting refers to predicting market requirement at future time frame based on some methods. There are various methods of demand forecasting such as survey methods and statistical methods. Accurate demand forecasting helps business manager to plan for production in efficient way with better control and better ROI.

3.6 QUESTIONS

1. What do you mean by demand elasticity? Explain its significance for business manager.

2. Elaborate various methods of demand elasticity with their mathematical expressions.

3. What are various degrees of demand elasticity? Explain their application areas.

4. What is the significance of demand forecasting for running the business successfully?

5. Explain various methods of Demand forecasting.

4

SUPPLY

Unit Structure

4.0 OBJECTIVES

After studying this unit, you should be able to:

- Understand the meaning of supply
- State the law of supply
- Know the factors affecting or determinants of supply
- Understand the various types of elasticity of supply
- Explain how market equilibrium is reached.
- Understand that supply is an independent economic activity but it is based on the demand for commodities
- Explain how the market price is determined by the interaction of demand and supply

4.1 INTRODUCTION

In the previous modules, we have studied about the various aspects of an important economic function 'Demand'. Demand types, demand function, elasticity of demand, demand forecasting etc. has been discussed in these modules. Demand and supply are the two basic tools of economics. Demand for a good, as seen in modules 3–4, draws from the theory of consumers' behaviour. Supply of a good is derived from the theory of firm behavior (and the behaviour of factors of production) which is based on the firms' objectives, their production functions (technologies), inputs' prices (or inputs' supplies), firms' organizations (single or multiple product firms), size and integration, government regulations, etc. In the demand theory, consumers were the only behavior unit and thus the demand function was relatively easy to derive systematically. However, in the supply theory, behavior of several units (such as firms, workers, savers, investors and governments) are involved and thus it is hard to derive the supply function in that unique fashion. It is true that economy runs on demand but that demand has to be fulfilled with corresponding supply as well. Say, if there is a huge demand for automobiles in an economy, there has to be corresponding supply to fulfil that demand. If adequate supply is not there, then the demand would not be fulfilled.

4.2 CONCEPT AND DEFINITION OF SUPPLY

When you ask to the producer: how much quantity of a commodity he is willing to sell? The obvious reply will be the 'it depends on the price'. At the higher price, he will be willing to sell more quantity, while at lower price, he will be willing to sell less quantity. Accordingly, supply of a commodity refers to a schedule (or a table) showing various quantities of a commodity that the producers are willing to sell at different possible prices of the commodity at a point of time. Thus, the "supply" of a

commodity includes the various amounts of a commodity which are supplied at different prices. Supply is different from the stock. Stock is the total quantity of goods, which is stored in the warehouse, but it will not be offered for sale. Hence supply is only a part of stock which is offered for sale. The concept of supply should be studied from the manufacturer point of view.

For example, Ram Corporation may produce 60,000 laptops, but it may only sell 40,000 laptops. Here, we consider the 60,000 laptops which the firm offers for sale and not the 40,000 laptops actually sold. Therefore, we only study as to what is offered for sale. Here 60,000 laptops is the stock and 40,000 laptops is the sale. In another example, the 'supply' of coal does not mean the amount of coal lying underground waiting to be mined. It mean that supply of coal is the amount of coal which owners are willing to put on the market at various prices.

Like demand, we cannot speak of supply without specifying some price. Two important points which are true for supply are:

(i) Supply refers to what producer's offer for sale at a given price. What they offer for sale may not actually get sold.

(ii) Supply is a flow concept. The quantity supplied is so much per unitof time, per day, per week, per month or per year.

Supply can be studied individually and collectively. The **individual supply** is the supply of a product in some amount by an individual producer or firm at a particular price during a given period of time. **Market supply**, on the other hand, is the specific quantity of output that all the producers are willing and able to make available to consumers at a particular price over a given period of time. In one sense, supply is the mirror image of demand. Individuals' supply of the factors of production or inputs to market mirrors other individuals' demand for these factors. For example, if we want to rest instead of weeding the garden, we hire someone: we demand labour. For a large number of goods, however, the supply process is more complicated than demand.

In the words of **Dooley,** "The law of supply states that other things being equal the higher the price, the greater the quantity supplied or the lower the price, the smaller the quantity supplied."

According to **Lipsey,** "The law of supply states that other things being equal, the quantity of any commodity that firms will produce and offer for sale is positively related to the commodity's own price, rising when price rises and falling when price falls."

According to **Meyers**, "we may define supply as a schedule of the amount of goods that would be offered for sale at all possible prices at anyone instant of time, or during anyone period of time, for example, a day, a week, and so on, in which the conditions of supply remain the same."

4.3 FACTORS AFFECTING/ DETERMINANTS OF SUPPLY

Innumerable factors and circumstances could affect a seller's willingness or ability to produce and sell a good. Some of the more common factors are:

a) **Price of the Product (Own Price)** is the most important determinant of supply of a product. Normally, a large quantity of a product is supplied at a higher price and a smaller quantity of a product is supplied at a lower price. The relationship between the price and the quantity supplied of a product, keeping other factors constant, has been conventionally expressed by the law of supply.

b) **Prices of Related Products** also determines the supply of a produc. The related products include both substitutes and complementary products. The supply of one product may change as a result of a change in the price of some other product.

c) **Prices of Factor Inputs** has an inverse relationship with the supply of a product. It means that as the price of factor inputs increases, the cost of production must go up which results in decrease in the supply of the product produced. Hence, prices of factor inputs are the important determinant of supply.

d) **Change in Technology** is the most important determinant of the supply of products. Changes in technological advances with innovations or inventions result in the production of new products, new efficiency levels of production, etc. As a result these technological advancements will bring in more supply of products to the market.

e) **Time Periods** is also related supply of a product. Marshall classified markets on the basis of time. The time periods include very short (market) period, short period, long period and very long (secular) period market. The pricing process can be studied under these time period markets depending upon whether supply conditions have time to make no adjustment, some adjustment of labour and other variable factor and full adjustment of all factors and all costs.

f) **Government Policy** regulation is also another important determinant of supply of a product. Government regulatory measures include imposition of heavy taxes, price regulation, etc. Based on these regulations, the producers or sellers can either increase or decrease the sales of their products. The imposition of a sales tax or an excise duty causes a downward shift in supply and the grant of subsidy by the government increases supply.

g) **The Natural Factors** like flood, drought, etc. also governs the supply of a product. Normally, poor monsoons may lead to poor power generation. This will, in turn, affect the production in the agricultural sector and also in other sectors.

h) **Goal of the firm** also determines the supply. If goal of the firm is to maximisation of revenue or sales rather than of profits, supply would be larger. If goal of the firm is to maximisation of profits, more quantity of the commodity will be offered at a higher price.

i) **Number of firms** producing a particular commodity increases, the market supply would increase. Thus, number of firms in particular industry also determines the supply.

j) **Business expectations of future** prices also determine supply. In situations of bullish expectations, investment tends to rise and supply starts rising. Accordingly, quantity supplied rises even when own price of the commodity remains constant. During inflation, sellers anticipate further rise in prices in future and would reduce supply.

k) **Other Factors**may include like, fear of war or depression, weather conditions (flood, drought etc.), inequalities of income, means of transport and communications, agreements among producers, Epidemics (unexpected situations), etc.

4.4 ALTERNATIVE WAYS OF EXPRESSING SUPPLY

Supply of commodity/ies by an individual producer/ firm or the market/ industry as a whole can be conventionally expressed in three alternative forms, which are as follows:

- A supply function
- A supply schedule
- A supply curve

4.4.1 Supply Function

The supply of a good depends on many factors. These include the own price (price of the good itself), price of the other related goods, changes in technology, price of the inputs or the factors of production, government policies and taxes and others. It is the functional relationship of quantity supplied and factors affecting the supply. It can be either with respect to one producer (individual supply function) or to all the producers in the market (market supply function).

Individual Supply Function

Individual supply function refers to the functional relationship between supplyand factors affecting the supply of a commodity. It is expressed as:

$S_x = f(P_x, P_o, P_f, S_t, T, G)$ Where,

S_x = Supply of the given commodity x;

P_x= Price of given commodity x;

P_o = Price of other goods;

P_f = Prices of factors of production;

S_t = State of technology;

T = Taxation policy;

G = Goals of the firm.

Market Supply Function

Market supply function refers to the functional relationship between market supply and factors affecting the market supply of a commodity. As discussed before, market supply is affected by all the factors affecting individual supply. In addition, it is also affected by some other factors like number of firms, future expectations regarding price and means of transportation and communication.

Market supply function is expressed as:

$S_x = f(P_x, P_o, P_f, S_t, T, G, T, G, N, F, M)$Where,

S_x = Market supply of given commodity x;

P_x = Price of the given commodity x;

P_o = Price of other goods;

P_f = Prices of factors of production;

S_t = State of technology;

T = Taxation policy;

G = Goals of the market;

N = Number of firms;

F = Future expectation regarding P_x;

M = Means of transportation and communication.

4.4.2 Supply Schedule

A supply schedule is a tabular statement that shows different quantities of commodities that are offered by the firm in the market for sale at different prices at a given time. It describes the relationship between quantities supplied of a good in response to its price per unit, while all non-price variables remain unchanged. A supply schedule has two columns, namely

(a) Price per unit of the commodity (P_x)

(b) Quantity supplied per period (S_x)

The supply schedule is a set of pairs of values of P_x and S_x. There are two types of supply schedule, namely

- Individual Supply Schedule
- Market Supply Schedule

Individual Supply Schedule

It relates the supply of a good or service by one firm at different prices, other things remains constant or equal. Table 4.1 shows that as the price of good X increases from Rs. 10 to 60 the corresponding supply of the commodity increases from 1000 units to 6000 units.

Table 4.1: Individual Supply Schedule for Commodity X

Price per unit of Commodity X (P_x)	Quantity Supplied of Commodity X (Units)(S_x)
10	1000
20	2000
30	3000
40	4000
50	5000
60	6000

Market Supply Schedule

The market supply schedule, on the other hand, like market demand schedule is thesum of the amounts of good supplied for sale by all the firms or producers in the market at different prices duringa given time. Let us assume, there are two producers for a good (Table 4.2). At price Rs. 10 per unit, producerA sells 1000 units and producer B offers 2000 units. Hence the total market supply at Rs. 10 per unit is 3000. Asprice increases from Rs 10 to Rs. 50, the market supply increases from 3000 units to 11000 units.

Table 4.2: Market Supply Schedule for Commodity X

Price per unit of Commodity X (P_x)	Quantity Supplied by Producer A (S_{xa})	Quantity Supplied by Producer B (S_{xb})	Market Supply (S_x= S_{xa}+ S_{xb})
10	1000	2000	3000
20	2000	3000	5000
30	3000	4000	7000
40	4000	5000	9000
50	5000	6000	11000
60	6000	7000	13000

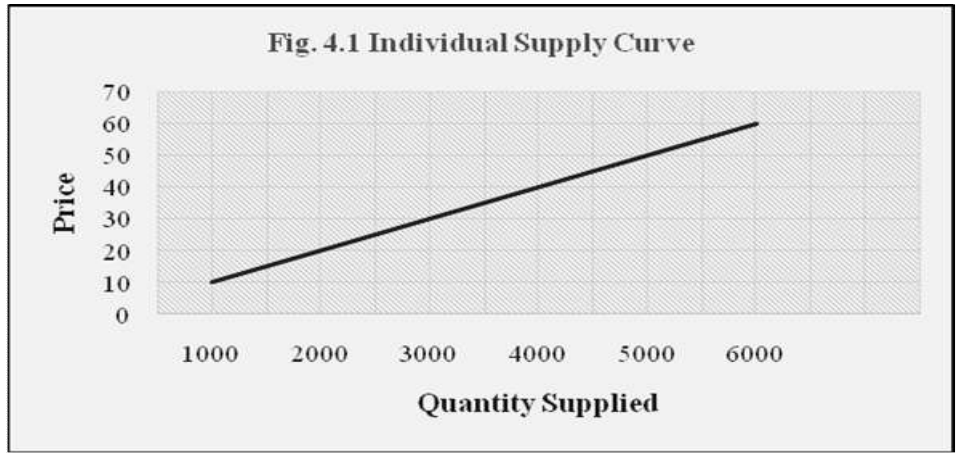
4.4.3 Supply Curve

The supply curve is a graphic presentation of the information given in supply schedule showing various quantities of a commodity offered for sale at different possible prices of that commodity. It shows the positive relationship between price of a commodity and its quantity supplied. Higher the price of the commodity or product, the greater will be the quantity of supply offered by the producer forsale and vice versa, other things remains constant. There are two types of supply curve aspects, namely

- Individual Supply Curve
- Market Supply Curve

Individual Supply Curve

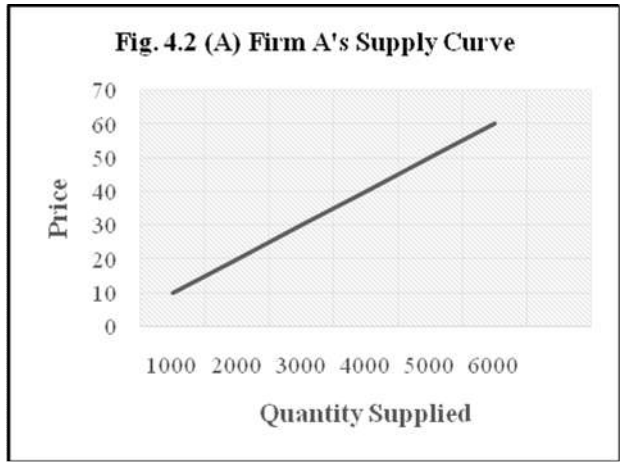
Individual supply curve is a graphic presentation of supply schedule of an individual firm in the market. Sloping upwards, it indicates positive relationship between price of a commodity and its quantity supplied as in Fig. 4.1.

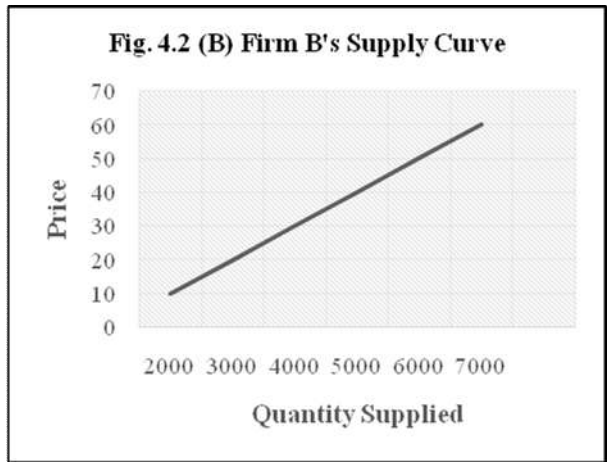


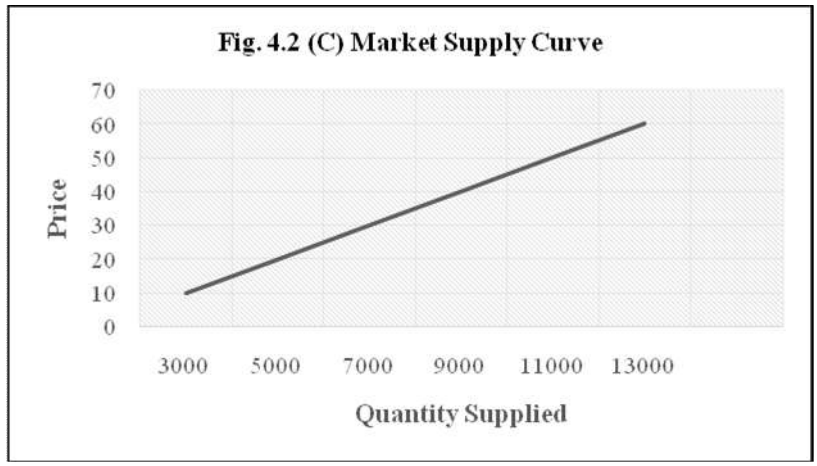
This figure is drawn on the basis of individual supply schedule of table 4.1.The curve has a positive slope, showing that quantity supplied increases in response to increase in own price of commodity, and it decreases in response to decrease in own price of the commodity. Thus, when the price is Rs. 10 per unit, the firm is ready to sell 1000 units of the commodity. And, when the price is Rs. 20 per unit, the firm is ready to sell 2000 units of the commodity and so on.

Market Supply Curve

Market supply curve is a graphic presentation of market supply schedule. It is supply curve of the industry as a whole. It is divided by way of horizontal summation of supply curves of all the forms in the industry.







These figures are drawn on the basis of market supply schedule of table 4.2. A and B segments of Fig. 4.2 show individual supply curves of firm A and B while segment C shows market supply curve. It shows that when the price is Rs. 10 per unit, the firms are ready to sell (1000+2000) units= 3000 units of the commodity. And, when the price is Rs. 20 per unit, the firms are ready to sell (2000+3000) units= 5000 units of the commodity and so on.

Why Does the Supply Curve Slope Upwards?

The reasons behind the positive relationship between the price and the quantity supplied of a good are as follows:

(a) An increase in production and thus an increased supply can only occur at a higher price because of the law of diminishing returns.

(b) By selling at a higher price, the producer is able to make greater profits. Thus with an increase in price, the producer increases the quantity supplied.

4.5 LAW OF SUPPLY

It is observed in markets that when high price of commodities are offered to sellers. They increase the quantity supplied of these commodities and when the level of prices decreases, the sellers decrease the quantity supplied. This behaviour of seller is called law of supply. The law of supply states that other things remaining the same, the higher the price of a commodity the greater is the quantity supplied. The logic is easy to understand. Price of the product is revenue to the supplier; therefore higher price means greater revenue to the supplier and hence, greater is the incentive to supply. At the same time, higher profits also attract new firms to the market. The law of supply can be understood with the help of supply schedule and supply curve (already explained above).Therefore we can say that there is a positive relationship between the quantity that suppliers are willing to sell and the price level. Thus, according to the law of supply, the quantity supplied of a commodity is positively related to price. Because of this direct or positive relationship between price and quantity supplied of a commodity the supply curve slopes upward to the right. For example, if the price of wheat increases in comparison to sugarcane, producers would produce more of wheat as compared to sugarcane.

$Ss_x = f(P_x)$

The above function shows that there exists a relationship between the supply of a good and the price of the good, *ceteris paribus*. This relationship explains the law of supply. Accordingly, other things remaining the same, the quantity supplied of a good increases when the price of the good increases and decreases when the price decreases.

4.5.1 Assumptions of the Law of Supply (ceteris paribus)

Important assumptions of the law of supply are as follows:

1. There is no change in the price of factors of production.
2. There is no change in the level of technology used in the production or other process.
3. There is no change in the goal of the firm.

4. There is no change in business expectations.
5. There must not be any kind of change in government policies/ regulations.
6. There is no change in competitors' actions on product differentiation and their prices.

4.5.2 Exceptions to the Law of Supply

The positive relationship between own price and quantity supplied of a commodity may not always hold good or may not firmly hold good in certain situations as under:

1. It does not apply strictly to the **agricultural products** whose supply is governed by natural factors. If due to natural calamities, there is a fall in the production of wheat, then its supply will not increase, however, high the price may be.
2. Supply of goods having **social distinction** will remain limited even if their price tends to rise.
3. At a given point of time, sellers may be willing to sell more of a **perishable commodity** even at a lower price.
4. **Future expectations** in the fall or rise in the price level. If prices are expected to fall, the sellers sell more at present; and if prices are expected to rise, they will sell only less and store it.
5. Changes in the **level of technology** will create changes in tastes and preferences of the consumers that, in turn, affect the existing firms. The existing firms with obsolete technology may be willing to sell more at lower porices to clear their inventory.
6. Changes in **weather, national and international disturbances** will also influence the supply of products. This will alter the shape of the supply curve, i.e., slopes downwards from left to right.
7. **Backward Sloping Supply Curve**: When wages of labourers in an industry or a firm rise to a level where the labourers get maximum satisfaction level, then they will work less than before in order to have more leisure time. The supply curve in such a situation is backward sloping.
8. **Market power:**If the supply side of the market is controlled by a small number of sellers then the law of supply might not operate. For example, in case of monopoly (single seller) may not necessarily offer a larger quantity even though the price is higher. Market control by the monopolist allows it to set the market price based on demand conditions and fix the quantity supplied without cost constraints being imposed from the supply side.
9. In other market structures like **oligopoly and monopolistic competition**, sellers might be facing more competition, thereby

offering to sell larger quantities at lower prices and negating the law of supply.

10. **Legislation Restricting Quantity:** Suppliers cannot offer to sell more quantities at higher prices where the government has put regulations on the quantity of the good to be offered or the price ceiling at which the good is to be offered in market. Producers are unable to play with either of the factors on their own.

4.6 MOVEMENT ALONG A SUPPLY CURVE AND SHIFTS IN SUPPLY CURVE

Movement along a supply curve refers to **extension or contraction** of supply in response to change in own price of the commodity, other determinants of supply remaining constant. **Extension of supply** implies increase in quantity supplied when own price of the commodity increases. **Contraction of supply** implies decrease in quantity supplied when own price of the commodity decreases.

Shifts in supply curve refers to **increase or decrease** in quantity supplied even own price of the commodity remains constant. These are caused by the other determinants of supply other than on price of the commodity. **Increase in supply** implies a forward shift shift in supply curve: quantity supplied increases even when own price of the commodity is constant. **Decrease in supply** implies a backward shift in supply curve: quantity supplied decreases even when own price of the commodity is constant.

Movement along a Supply Curve: Extension or Contraction of Supply

Movement along a supply curve, caused by change in own price of the commodity are often studied as:

(a) Extension of Supply: An expansion or extension of supply is a rise in the supply of the good as a result of an increase in the price of the good.

Price (P_x)	Units (S_x)	Description
10	10	Rise in Own Price of the Commodity
↓	↓	↓
50	50	Extension of Supply

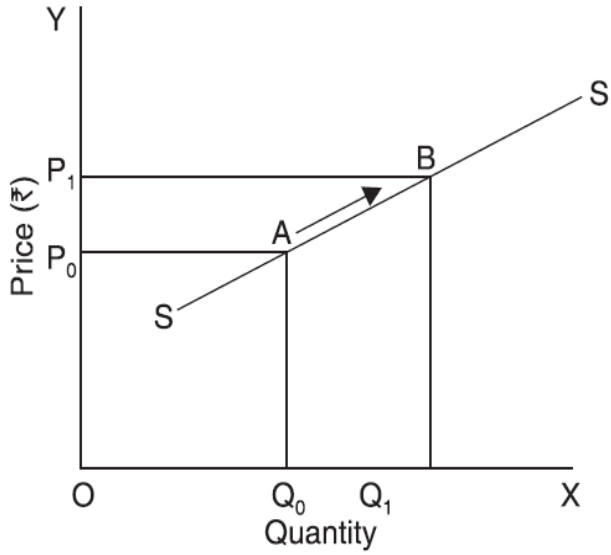


Fig. 4.3: Extension of Supply

Figure 4.3 depicts the effect of a increase in price on change in supply. Initially, the producer is on the supply curve SS at point A supplying OQ_0 units of commodity at price OP_0. An increase in the price of the good to OP_1 leads to an increase in the quantity supplied of the good to OQ_1 and the producer attains point B on the supply curve SS. This is called an extension of supply.

(b) Contraction of Supply: A contraction of supply is a decrease in the supply of the good as a result of a fall in the price of the good.

Price (P_x)	Units (S_x)	Description
50	50	Fall in Own Price of the Commodity
↓	↓	↓
10	10	Contraction of Supply

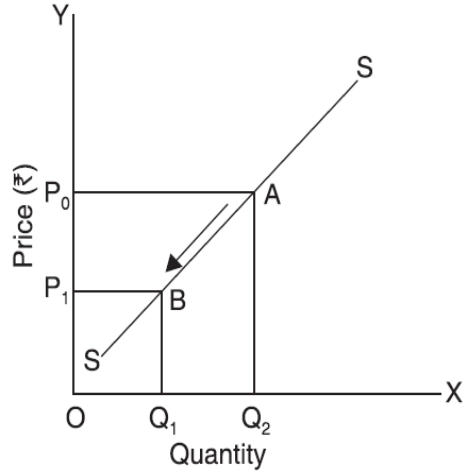


Fig. 4.4: Contraction of Supply

Figure 4.4 depicts the effect of a decrease in price on change in supply. Initially the producer is on the supply curve SS at point A supplying OQ_2 units of commodity at price OP_0. A fall in the price of the good to OP_1 leads to a decrease in the quantity supplied of the good to OQ_1 and the producer attains point B on the supply curve SS. This is called a contraction of demand.

Shift in Supply Curve: Increase or Decreasein Supply

Shift in supply curve refers to a situation of increase or decrease in quantity supplied of a commodity even when own price of the commodity remains constant. It is caused by factors other than own price of commodity. The shift in supply can be of two types.:

(a) Increase in Supply: An increase in supply is an increase in the supply of the good as a result of a change in any of the factors, which influence the supply other than the price of the good itself.

Price (P_x)	Units (S_x)	Description
10	10	No Change in Price of the Commodity
↓	↓	↓
10	50	Increase in Supply

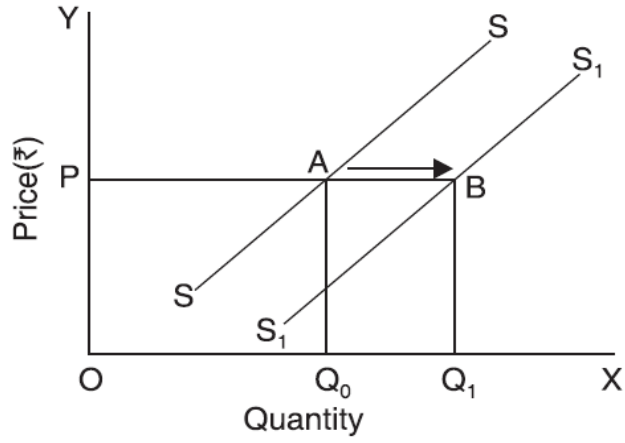


Fig. 4.5: Increase in Supply

Figure 4.5 shows an increase in supply. Initially, the producer is on the supply curve SS supplying OQ_0 units of the good at the price P. An increase in supply leads to an outward movement in the supply curve from SS to SS1. An increase in supply implies that at the same price P, a larger quantity of the good is supplied which increases from OQ_0 to OQ_1.

(b) Decrease in Supply: A decrease in supply is a decrease in the supply of the good as a result of a change in any of the factors, which influence the supply other than the price of the good itself.

Price (P_x)	Units (S_x)	Description
10	50	No Change in Price of the Commodity
↓	↓	↓
10	10	Decrease in Supply

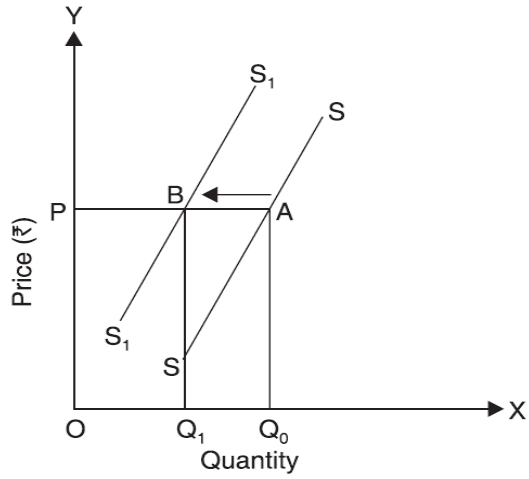


Fig. 4.6: Decrease in Supply

Figure 4.6 shows a decrease in supply. Initially, the producer is on the supply curve SS supplying OQ_0units of the good at the price P. A decrease in supply leads to an inward movement in the supply curve from SS to SS_1. A decrease in supply implies that at the same price P, a smaller quantity of the good is supplied, which decreases from $OQ_0$to OQ_1.

SELF ASSESMENT TEST(A)

1. **Fill in the blanks with appropriate words:**

(a) _____ the amount of a product that would be offered for sale at all possible prices that could prevail in the market.

(b) According to the _____, sellers will generally offer more for sale at high prices and less for sale at lower prices.

(c) _____ is a listing of the various quantities of a particular product supplied at all possible prices in the market.

(d) Prices and quantities are said to have a direct relationship because they move in the _____ direction.

(e) _____ is what we call the graphical representation of the supply schedule.

(f) The supply curve is always _____ sloping.

(g) A combination of all of the individual supply curves is called a _____.

(h) A change in _____ indicates a change in the amount supplied. This shows a movement _____ the supply curve.

(i) A change in _____ occurred when producers offer different amounts of products for sale at all possible prices in the market.

(j) A _____ shift indicates an increase in supply and a _____ shift indicates a decrease in supply.

2. State *true or false* for the following statements:

(a) Supply is a positive function of price.

(b) A trader has 10 bags of cement in his store. This represents supply of cement.

(c) A supply schedule is a table that represents the various amounts of goods available for supply at various prices.

(d) When quantity demanded is more than quantity supplied, the prices tend to fall.

(e) The supply curve of a good shifts to the right when prices of other goods rise.

3. Match the following terms with their respective definition:

I. Quantity Supplied A. A graphical object showing the relationship between the price of a good and the amount that sellers are willing and able to supply at various prices.

II. Supply Curve B. The claim that, other things being equal, the quantity supplied of a good increases when the price of that good rises.

III. Supply Schedule C. The amount of a good that sellers are willing and able to supply at a given price.

IV. Law of Supply D. A table showing the relationship between the price of a good and the amount of it that sellers are willing and able to supply at various prices.

4. **Answer the following:**

- Define the concept supply and the law of supply.
- Explain the factors affecting the supply in the market with an examples.
- Assume yourself as a manager of any FMCG firm. In what ways supply analysis is important
- for you?
- Distinguish between extension and contraction of supply on the one hand and increase and decrease of supply on the other with illustrations.
- Discuss Supply function. Also write about the determinants of supply.

4.7 EQUILIBRIUM PRICE

After a detailed analysis of demand and supply, we are now in a position to understand market dynamics. So far we have understood how price affects demand and supply; but with this knowledge one cannot explain how price is determined. Till now, price has been assumed to be given. Now let us elaborate on how price is determined in the market by interaction of demand and supply.

The buyer represent the demand side of the market. Every rational buyers aims at maximizing his satisfaction by purchasing more at a lower price and less at a higher price. This is called demand behaviour of a buyer i.e. law of demand. The seller represents the supply side in the market. Every rational seller aims at maximizing his profit by selling more at a higher price and lesser at a lower price. This is called supply behaviour of a seller i.e. law of supply. The objectives of consumers (buyers) and firms (sellers) are opposed to each other. This leads us to examine the actual price charged and quantity sold in particular market.

There is only one price at which the objectives of sellers and buyers meet together. Equilibrium occurs when the quantity demanded of a good in the market over a certain time is equal to the quantity supplied of the good over the same time.At that point, the quantity of a commodity demanded by the buyer is equivalent to the quantity that the seller is willing to sell. This price is called the equilibrium price and it occurs at the point of intersection of the supply curve and the demand curve.The equilibrium quantity is that quantity at which the equilibrium exists.

Interaction of demand and supply to reach equilibrium is shown in Figure 4.7.

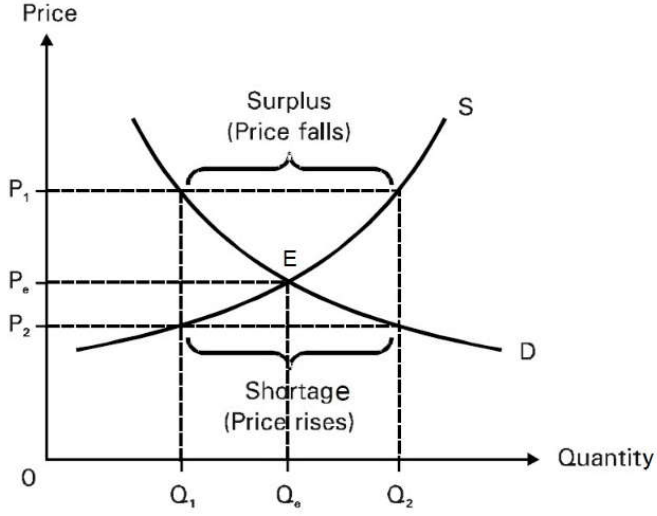


Figure 4.7: Equilibrium Point

Graphically, the interaction of supply and demand curves will indicate the equilibrium point (E).

If market price is OP_1, the quantity demanded by consumers is OQ_1, while the quantity which producers wish to supply is OQ2. There is thus a surplus of Q_1Q_2 at this price. It is well known that a surplus leads to a downward pressure on price and so market price will fall. At the lower price of OP_2, the quantity supplied is OQ_1, while the quantity demanded is OQ_2. There is, therefore, a shortage at this price, represented by Q_1Q_2. This shortage tends to put an upward pressure on price and market price is expected to rise.

There is only one price, at which the quantity supplied is equal to the quantity demanded, there is no surplus or shortage, no rise or fall of price- OP_e. It is thus referred to as the equilibrium position.

4.8 DETERMINATION OF EQUILIBRIUM PRICE AND QUANTITY

In context of demand and supply, equilibrium is a situation in which quantity demanded equals quantity supplied and there is no incentive to buyers and sellers to change from this situation. The market clears itself and becomes stablei.e. at the market equilibrium, every consumer who wishes to purchase the product at the market price is able to do so, and the supplier is not left with any unwanted inventory.

Law of demand and law of supply explain separately the 'plans' of consumers as to how much they would buy at a given price and the 'plans' of producers as to how much they would offer for sale at the given price. Although the demand would be very high at lower prices but in practice consumers may never get the opportunity to buy the product at that low price because suppliers are not willing to supply at that price. Similarly, although suppliers may be prepared to offer a large amount for sale at a high price, they may not be able to sell it at all because the consumers are not willing to buy at that price.

The demand for a product and the supply of a product are two sides of the market, and it is necessary to bring these together to establish equilibrium in the market which is the point where both the sides of the market are satisfied simultaneously.

This can be better understood with the help of the following illustration:

There are 1000 individuals in the market with identical demand schedules for good x, $Dd_x = 10-P_x$and 100 identical producers in the market with the identical supply schedules for good x, $Ss_x = -20+20P_x$. Determine the equilibrium price and equilibrium quantity for good x.

Market demand schedule: $DD_x = 1000\ (Dd_x)$

$= 1000\ (10-P_x)$

$= 10{,}000-1000\ P_x$

Market supply curve for good x: $SS_x = 100\ (Ss_x) = -2000 + 2000\ P_x$.

Table 4.3 depicts the market demand and supply schedules while Fig. 4.8 shows the equilibrium.

Table 4.3: Market Demand and Supply Schedules

P_x	DD_x	SS_x
5	5000	8000
4	6000	6000
3	7000	4000
2	8000	2000

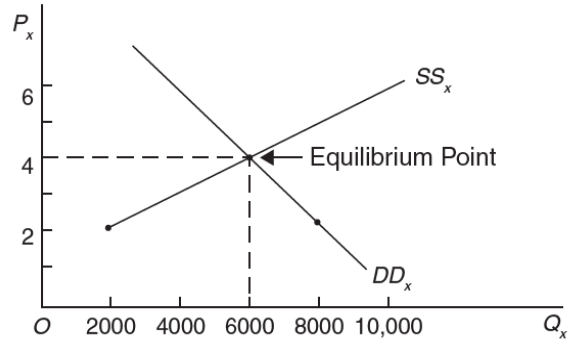


Figure 4.8:Determination of Equilibrium

Graphically, equilibrium occurs at the price P_x equal to Rs. 4 and quantity Q_x equal to 6000.

Mathematically to determine the equilibrium:

$DD_x = SS_x$

$10{,}000 - 1000\ P_x = -2000 + 2000\ P_x$

$3000\ P_x = 12{,}000$

P_x= Rs. 4

Substituting the equilibrium price into the demand or supply equations:

$DD_x = 10{,}000 - 1000\ P_x$

$= 10{,}000 - 1000\ (4)$

$= 6000$

Or

$SSx = -2000 + 2000\ Px$

$= -2000 + 2000\ (4)$

$= 6000$

Further the equilibrium price and quantity can be determined for different periods as under:

A. Market Period Price Determination

B. Short Period Price Determination

C. Long Period Normal Price Determination

4.8.1 Market Period Price Determination

In order to determine prices under market period, Dr. Marshall divided commodities into two categories:

1. Perishable Goods

2. Durable Goods

Perishable Goods

In simple terms, goods which cannot be stored for some time are called the perishable goods. Fresh vegetables, milk etc. are included in this category. Supply of such goods at any given time is fixed. If demand increases supply cannot be increased so quickly. There fore, it is demand that plays a dominant role in the determination of price.

In fig. 4.9, quantities of perishable goods is measured on horizontal axis, price on vertical axis. SS is the supply curve. It signifies the fact that supply of perishable goods remains fixed. DD is the original demand curve which shows the equilibrium at paint E. Thus, OP is the equilibrium price. Now, suppose, if in the very short period demand increases and assumes the form of D_2D_2.

The equilibrium will also shift to E_2. It depicts that with the increase in demand the price increases to OP_2. On the contrary, if the demand falls from DD to D_1D_1,the equilibrium will shift to E_1 from E side by side price will fall from OP to OP_1.

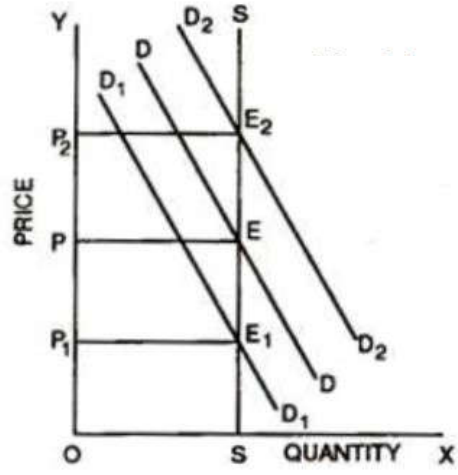


Fig. 4.9

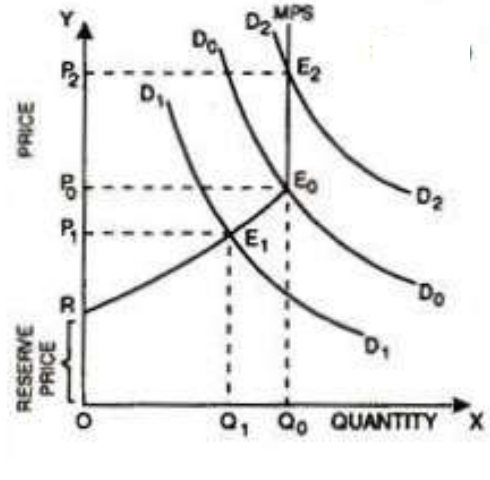


Fig. 4.10

Durable Goods

Durable goods are those which can be reproduced or those can be stored. Like perishable goods, the supply of durable goods is not vertical throughout the length. Firms selling such goods have a minimum reserve price. They will not sell goods at less than the reserve price. These goods are like wheat, soap, oil etc.

In fig. 4.10, MPS is the market period supply curve where OQ_0 is the stock of the commodity. To start with the demand for the commodity is shown by D_1D_1 where the price is OP_1 and quantity supplied is OQ_1. Q_1O_0 stock will be held back. If the demand is D_2D_2, the whole stock will be sold out at OP_0 price. But in case the demand is D_2D_2, the equilibrium will be at E_2 and the price will be OP_2 where the entire output is sold.

At OR price i.e. 'the 'Reserve Price' the entire output is held back. But from R to E_o, as the price rises, the quantity supplied also rises.

4.8.2 Short Period Price Determination

Price determination in the short period has been explained with the help of Fig. 4.11.

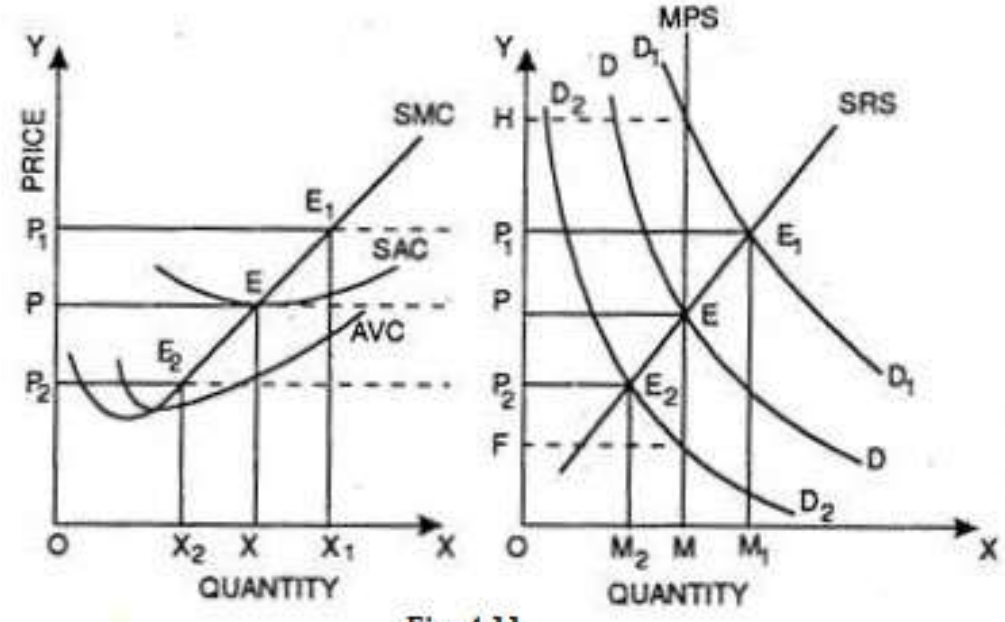


Fig. 4.11

DD is the demand curve of the industry. MPS is the market period supply curve while SRS is the short run supply curve of the industry.

Initially, OP is both the market price as well as the short run price. At price OP the individual firm will adjust its output OX. At equilibrium level of output OX, price is equal to its marginal cost and marginal cost curve cuts the MR curve from below.

The firm enjoys normal profits. Now, suppose demand increases from DD to D_1D_1 and the industry is in equilibrium at point E_1 which determines the price OP_1. The new price OP_1 is less than the new market price i.e., OH.

The reason is being that in the short run marginal cost curve rises as more is produced. Thus, the individual firm will take price OP_1 and will produce OX_1 level of output at which price OP_1 equals the marginal cost and the firm enjoys supernormal profits.

On the other hand, if the demand curve falls to D_2D_2 the new equilibrium will be established at E_2 and the price will falls to OP_2. But in the short period the firm will contract output by reducing the employment of labour and other variable factors. Therefore, the new equilibrium level established at E_2 will determine the price OP_2 and the firms will produce OX_2 level of output. But, it is worth mentioning here that price OP_2 does not cover the SAC and the firms operating in the industry incur losses.

4.8.3 Long Period Normal Price Determination

Normal price comes to prevail in the long period. It is also called long periodprice. Normal price is influenced more by supply than demand. According to Marshall, "Normal price is that price which tends to prevail in a market when fulltime is given to the forces of demand and supply to adjust themselves". Thus, it is clear from the definition that normal price is one that tends to prevail in the long period. It is not a real price.

Under perfect competition, the long run supply gets sufficient period to adjust itself to the changed conditions in demand. If supply is less than demand, price will rise. Thus, total supply will increase and all the producers will get normal profits only.

If supply is more than demand, price will fall and producers suffer losses. Some of the producers may leave the industry under pain of loss. Thus, total supply will decrease and once again price will rise to its normal level.

This has been illustrated with the help of fig. 4.12 below:

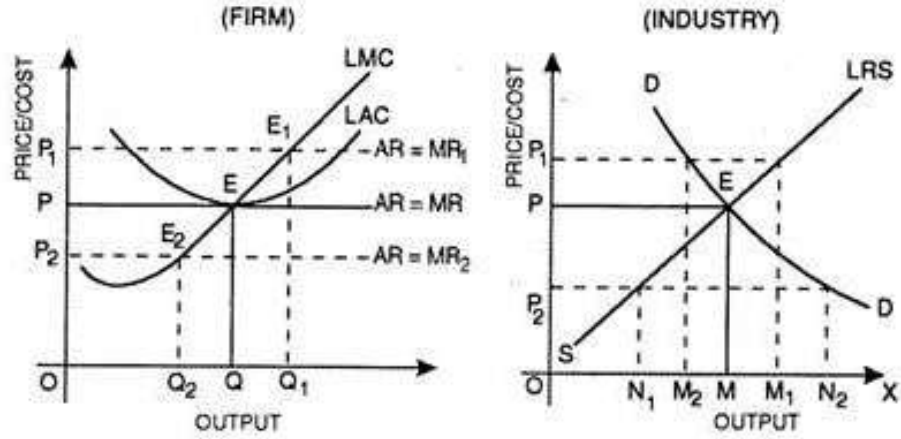


Fig. 4.12

In fig. 4.12, we have taken output on X-axis and price on Y-axis. Industry's demand curve DD and long run supply curve LRS cut at point E which determines OP price and OM output. If price by the industry is raised to OP_1, the demand isOM2 and supply is OM_1Since D<S, price will

fall to OP. On the other hand, if price is OP_2, in this case S<D. It is because at OP_2 price, supply is ON_1 and demand is ON_2. This will raise price to OP.

A firm under perfect competition in the long run is in equilibrium at output where Price= MC= Minimum LAC. This point is shown by E. It shows that the firm is making just normal profits. If the price is above the minimum long run average cost, the firms will be making super-normal profits.

In the figure, if the price is OP_1, in that case the firm will be producing OQ_1output and would be making super normal profits. These super-normal profits will lure the new firms to enter the industry. With this, the supply of the industry would increase which would reduce the price and hence the existing firms will be left only with normal profits.

Q_1 the other hand, if the price is OP_2, in that case the firms will be in equilibrium at $E_2$and hence the firm would be producing OQ_2. In this case the firm will be sustaining losses as AR<AC. Due to these losses, some of the firms will exit from the industry. This will reduce the supply which in turn would raise the price and hence the existing firms will be left with normal profits only.

4.9 EFFECT OF CHANGES IN DEMAND & SUPPLY ON EQUILIBRIUM PRICE

The equilibrium price remains constant only if all other things influencing demand and supply remains constant. But, if there is a change in these factors, the effect of these changes would increase, decrease or leave the equilibrium price unaffected. The effect of these changes can be studied in the following three categories:

1. Change in demand

- Increase in demand

- Decrease in demand

2. Change in supply

- Increase in supply

- Decrease in supply

3. Simultaneous changes in demand and supply

4.9.1 Change in Demand

Changes in demand take place due to changes in the price of related goods, income, consumers' tastes and preferences, etc. To study the changes in demand, we assume that the supply curve remains constant and the only demand increases or decreases.

Increase in Demand

This is when the demand curve increases (shifts to the right) and supply curve remains constant.

This has been illustrated with the help of fig. 4.13 below:

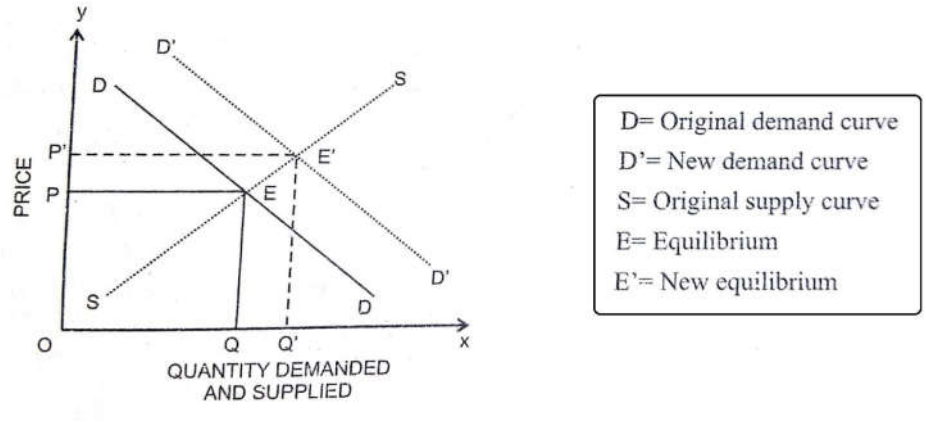


Fig. 4.13

If there is a rise in the price of a substitute good, the demand curve will shift to the right. Thus, the demand curve shift from D to D' with the supply curve remains constant. We notice that the equilibrium price also increases from P to P'. This is because when the demand increases, the supply is short of the demand and hence, the price will go to OP'. With the rise in price, supply will also go up and the new equilibrium would be reached at point E'. At this point, OP' is the price and OQ' is the quantity demanded and supplied.

Thus, as the demand curve shift to the right i.e. demand increases, supply being constant, the equilibrium price and quantity also increases.

Note the distinction between change in quantity demanded and change in demand. Change in quantity demanded occurs only when there is change in the price. Thus, the change in the price-quantity schedule brings movement on the demand curve, whereas the changes in the other determinants (namely income, tastes, price of the substitutes, etc.) shifts the demand curve as a whole.

Decrease in Demand

This is a case when the demand curve decreases (shift to the left), supply curve remaining constant.This has been illustrated with the help of fig. 4.14 below:

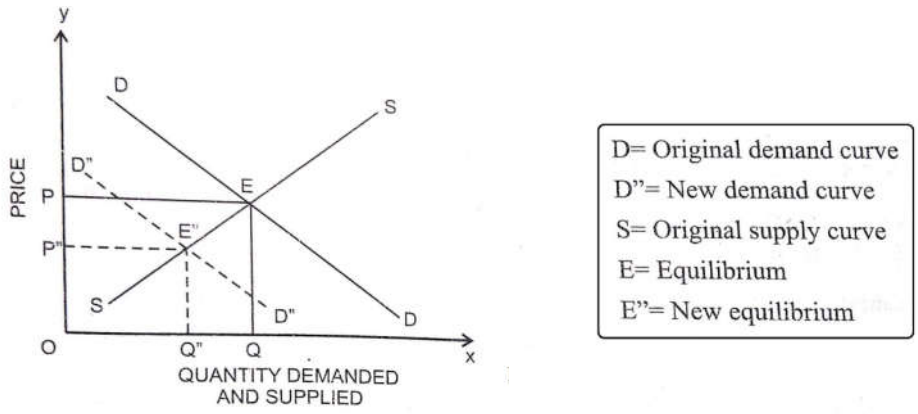


Fig. 4.14

If there is a fall in the price the price of a substitute goods, the demand curve will shift to the left. Thus, the demand curve shifts from D to D" with the supply curve remaining constant. We notice that the equilibrium price decreases to P" to P.

This is because, as the demand increases, the supply is greater than hence, the price falls from OP to OP". With the fall in price, supply will also fall from OQ to OQ" and the new equilibrium would be reached at point E". At this point, OP" is the price and OQ" is the quantity demanded and supplied.

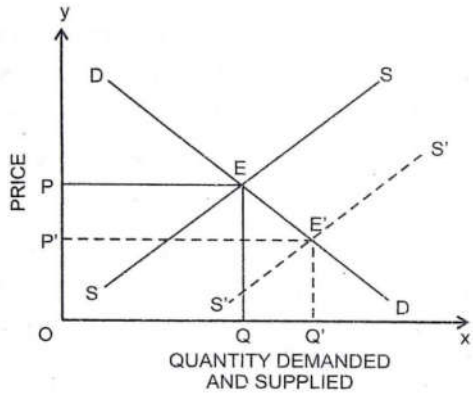
Thus, as the demand curve shift to the left i.e. demand decreases, supply being constant, the equilibrium price and quantity also decrease.

4.9.2 Change in Supply

Changes in supply take place due to change in cost of production, technique of production etc. To study the change in supply, we assumed that the supply curve increases or decreases while the demand curve remains constant.

Increase in Supply

This is when the supply curve increases (shifts to the right) ,demand curve remaining constant. This has been illustrated with the help of fig. 4.15 below:



D= Original demand curve
S= Original supply curve
S'= New supply curve
E= Equilibrium
E'= New equilibrium

Fig. 4.15

Fig. 4.15

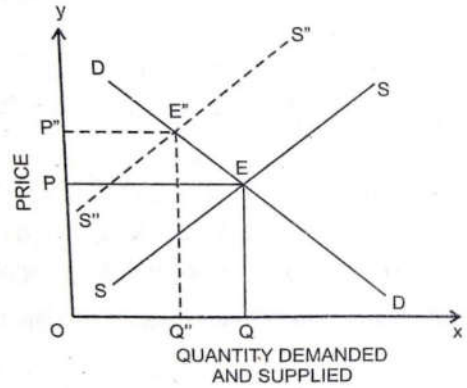
If there is a fall in the price of related goods, the supply curve will shift to the right i.e., there will be an increase in supply. Thus, the supply curve shifts from S to S' with the demand curve remaining constant. We notice that equilibrium price decreases from P to P'.

This is because, when the supply increases, the supply is greater than demand and hence, the price falls from OP to OP'. With the fall in price, demand will increase from Q to Q' and the new equilibrium would be reached at point E'. At this point, OP' is the price and OQ' is the quantity demanded and supplied.

Thus, as the supply curve shift to the right i.e. supply increases, demand being constant, the equilibrium price decreases but the quantity increases.

Decrease in Supply

This is when the supply curve decreases (shift to the left), demand curve remaining constant. This has been illustrated with the help of fig. 4.16 below:



D= Original demand curve
S= Original supply curve
S"= New supply curve
E= Equilibrium
E"= New equilibrium

Fig. 4.16

Fig. 4.16

If there is a rise in the price of related goods, the supply curve will shift to the left i.e., there will be a decrease in supply. Thus, the supply curve shift from S to S" with the demand curve remaining constant. We notice that the equilibrium price increased from P to P".

This is because, when the supply decreases, the supply is short of the demand and hence, the price rises from OP to OP". With the rise in price, demand will decrease from Q to Q" and the new equlibrium would be reached at point E". At this point, OP" is the price and OQ" is the quantity demanded and supplied.

Thus, as the supply curve shift to the left or decreases, demand being constant, the equilibrium price increase but the quantity decreases.

4.9.3 Simultaneous Changes in Demand and Supply

So far, we have discussed the effect of changes, either in demand or supply, on the equilibrium price and quantity. Now, we moved to a situation when both, demand and supply increase or decrease at the same time. We can study this under six broad categories as follows:

1. If demand and supply increases in the same proportion

2. If demand and supply decreases in the same proportion

3. If the increase in demand is more than the increase in supply

4. If the decrease in demand is more than the decrease in supply

5. If the Increase in demand is lesser than the increase in supply

6. If the decrease in demand is lesser than the decrease in supply

If Demand and Supply Increases in the Same Proportion

When the increase in demand is equal to the increase in supply, the equilibrium price remains the same but the quantity increases. This has been illustrated with the help of fig. 4.17 below:

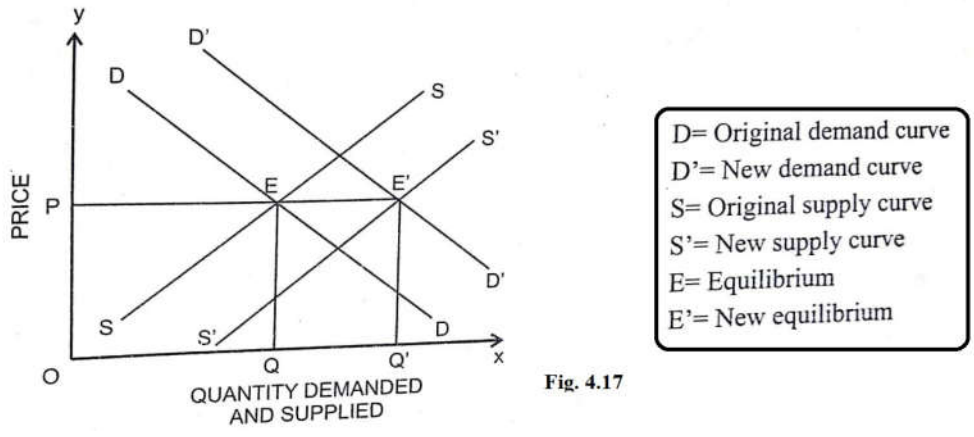
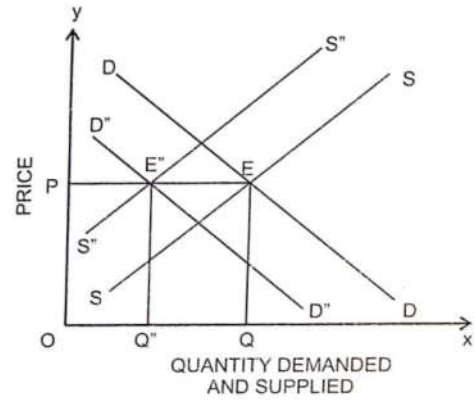


Fig. 4.17

Fig. 4.17

If Demand and Supply Decreases in the Same Proportion

When the decrease in demand is equal to the decrease in supply, the equilibrium price remains the same but the quantity decreases. This has been illustrated with the help of fig. 4.18 below:



D= Original demand curve
D"= New demand curve
S= Original supply curve
S"= New supply curve
E= Equilibrium
E"= New equilibrium

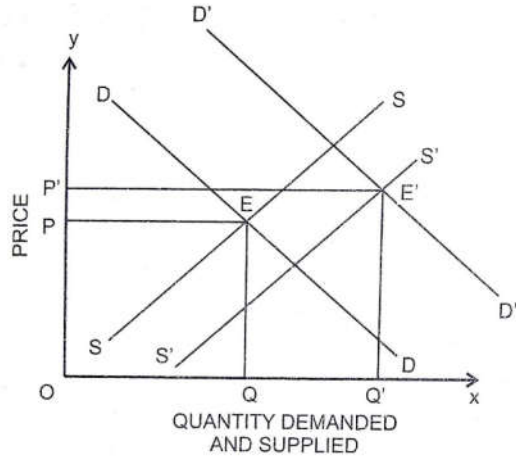
Fig. 4.18

Fig. 4.18

If the Increase in Demand is more than the Increase in Supply

When the demand increases in a greater proportion in relation to the increase in supply, then the equilibrium price increases from OP to OP' and the equilibrium quantity increases from OQ to OQ'. This is because, when supply does not increase in the same proportion with the demand, then, there will be a short supply which will lead to an increase in price and due to the increase in price, the demand will fall to some extent and demand will reach a new equilibrium point at E' where demand will be equal to supply.

Thus, the increase in quantity is more than the increase in price. This has been illustrated with the help of fig. 4.19 below:



D= Original demand curve
D'= New demand curve
S= Original supply curve
S'= New supply curve
E= Equilibrium
E'= New equilibrium

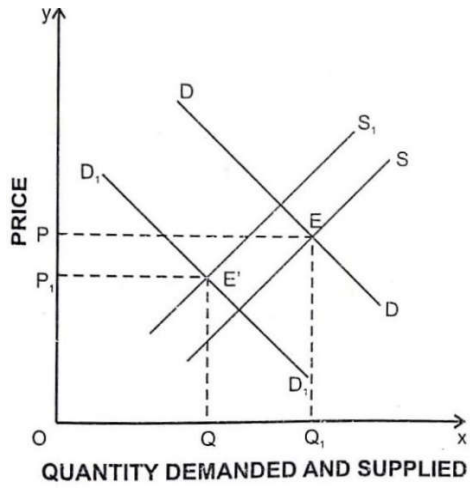
Fig. 4.19

Fig. 4.19

If the Decrease in Demand is more than the Decrease in Supply

If the fall in demand is greater than the fall in supply, then the equilibrium price will decrease. This is because, when supply decreases in a greater proportion than demand, then there will be supply in excess of demand which will lead to a decrease in the price and due to the decrease in the price, demand will rise to some extent and the demand reach a new equilibrium point at E', where demand will be equal to supply.

Thus, the decrease in quantity is more than the decrease in the price. This has been illustrated with the help of fig. 4.20 below:



D= Original demand curve
D'= New demand curve
S= Original supply curve
S'= New supply curve
E= Equilibrium
E"= New equilibrium

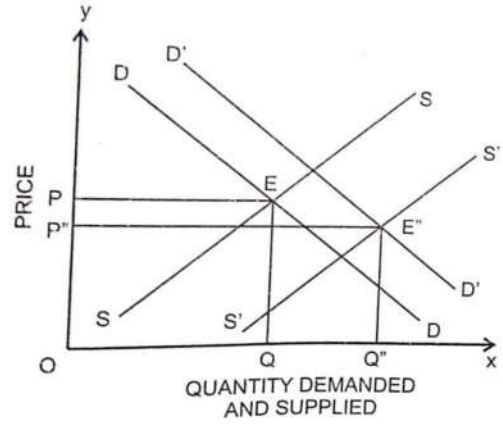
Fig. 4.20

Fig. 4.20

If the Increase in Demand is Lesser than the Increase in Supply

When the supply increases in a greater proportion in relation to the increase in demand, then the equilibrium price decreases from OP to OP" and the equilibrium quantity increases from OQ to OQ". This is because, when supply increases in a greater proportion than that of demand, then there will be a fall in price, due to which there will be an increase in demand and demand reaches a new equilibrium at E", where demand will be equal to supply.

Therefore, the increase in quantity is more t..... ... fall in price. This has been illustrated with the help of fig. 4.21 below:



D= Original demand curve
D'= New demand curve
S= Original supply curve
S'= New supply curve
E= Equilibrium
E"= New equilibrium

Fig. 4.21

If the Decrease in Demand is lesser than the Decrease in Supply

If the supply decreases in a greater proportion in relation to the decrease in demand, the equilibrium price will increase. This is because, there will be a rise in price due to which there will be a decrease in demand and

demand reaches a new equilibrium at E', where demand will be equal to supply.

Thus, the increase in quantity is lesser than the fall in price. This has been illustrated with the help of fig. 4.22 below:

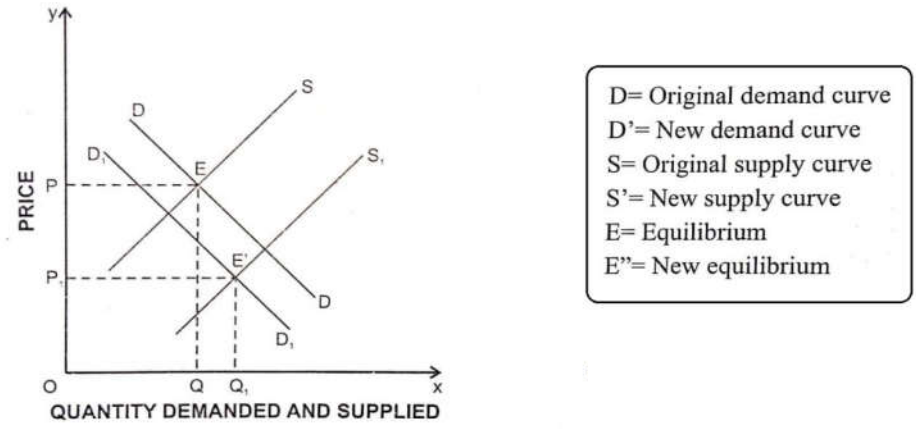


Fig. 4.22

SELF ASSESMENT TEST (B)

1. **Fill in the blanks with appropriate words:**

(a) _____ is a situation where market demand is equal to market supply.

(b) Equilibrium price may be determined through both _____ and _____ .

(c) When there is increase in demand and decrease in supply, equilibrium price _____.

(d) As a result of increase in the number of firms there is an increase in supply, then supply curve shifts towards _____ .

(e) In a perfectly competitive market, equilibrium occurs when market demand _____ market supply.

(f)If the supply curve shifts rightward and demand curve shifts leftward equilibrium price will be _____ .

(g) Due to rightward shifts in both demand and supply curves the equilibrium price remains _____ .

2. State *true or false* for the following statements:

(a)Equilibrium occurs when the quantity demanded of a good in the market over a certain time is equal to the quantity supplied of the good over the same time.

(b) A shift in supply curve is caused by a change in any of the factors, which influence the supply other than the price of the good itself.

(c) An increase in production and thus an increased supply can only occur at a higher price because of the law of the increasing returns.

(d) A expansion of supply is a decrease in the supply of the good as a result of a fall in the price of the good.

(e)Th e equilibrium price is that price at which the equilibrium exists. Th e equilibrium quantity is that quantity at which the equilibrium exists.

3. Identify how each factor will shift the supply curve: right, left, or move along.

Market	**Change**
(a) Computers	Price of memory chips decreases.
(b) Airline Tickets	Government imposes a new tax on fuel.
(c) Milk	Demand for milk increases.
(d) HomesPotential sellers expect home prices to decline in six months.	
(e) Cars	A new engine design reduces the cost of producing cars.
(f) Corn	The price of wheat (a substitute in production increases in price).
(g) Oranges	A disease in Nagpur kills 25% of the orange crop.

4. **Answer the following:**

- What is market equilibrium and equilibrium price? Explain.
- What are the primary causes of changing the price of an item with regards to its demand and supply?
- How do the equilibrium price and quantity of a commodity change when price of input used in its production changes?
- Explain the simultaneous shifts of demand and supply curve in perfect competition with the help of diagrams.
- Explain determination of equilibrium price and quantity.

4.10 SUMMARY

Supply means the quantity of goods offered for sale at pre-determined price at a certain point of time. It is the specific quantity of output that the producers are willing and able to make available to consumers at a particular price over a given period of time. Law of Supply states that a firm will produce and offer to sell greater quantity of a product or service as the price of that product or services rises, other things being equal.Other things include cost of production, change of technology, price of related goods (substitutes and complements), prices of inputs, level of competition and size of industry, government policy and non-economic factors. Supply of a good by an individual producer/firm or the market/industry as a whole is conventionally expressed in three alternative forms, namely a supply function, a supply schedule and a supply curve. Supply of a product X (Sx) is a function of price of product (Px), cost of production (C), state of technology (T), government policy regarding tax

and subsidies (G), other factors like number of firms (N). Supply for a good can change in two ways i.e. firstly a producer moves from one point to another on the same supply curve (Movement along supply curve) and secondly, when the entire supply curve shifts its position (Movement from one supply curve to the other). Price is determined by the two forces of demand and supply, in a free market. A point of balance, where demand equals supply is known as market equilibrium. The market price, or equilibrium price, is determined by the interaction of demand and supply at a given time with given conditions of demand and supply.The equilibrium price remains constant only if all other things influencing demand and supply remains constant. But, if there is a change in these factors, the effect of these changes would increase, decrease or leave the equilibrium price unaffected. The effect of these changes can be studied in the following categories namely increase in demand, decrease in demand, increase in supply, decrease in supply and simultaneous changes in demand and supply.

4.11 KEY WORDS

- **Ceteris Paribus:** *Ceteris paribus* or *caeteris paribus* is a Latin phrase, literally translated as "with other things the same" or "all other things being equal or held constant".
- **Change in Quantity Supplied:** A movement along a supply curve resulting from a change in a good's price.
- **Change in Supply:** A movement or shift in an entire supply curve resulting from a change in one of the non-price determinants of supply.
- **Determinants of Supply:** Changes in non-price factors that will cause an entire supply curve to shift (increasing or decreasing market supply); these include 1) the number of sellers in a market, 2) the level of technology used in a good's production, 3) the prices of inputs used to produce a good, 4) the amount of government regulation, subsidies or taxes in a market, 5) the price of other goods sellers could produce, and 6) the expectations among producers of future prices.
- **Equilibrium Price: It is** the price where quantity demanded is equal to quantity supplied.
- **Law of Supply:** Law of supply states that other factors remaining constant, price and quantity supplied of a good are directly related to each other. In other words, when the price paid by buyers for a good rises, then suppliers increase the supply of that good in the market.
- **Market Equilibrium:** Equilibrium occurs when the quantity demanded of a good in the market over a certain time is equal to the quantity supplied of the good over the same time.

- **Quantity Supplied:** The amount of a good or service that sellers are willing to sell at a specific price; quantity supplied is represented in a graphical model as a single point on a supply curve.
- **Shift in Supply:** when a change in some economic factor (other than price) causes a different quantity to be supplied at every price.
- **Supply Curve:** A supply curve is the curve showing relationship between the quantities supplied of a commodity by the producer at alternative prices.
- **Supply Curve:** A line that shows the relationship between price and quantity supplied on a graph, with quantity supplied on the horizontal axis and price on the vertical axis.
- **Supply Schedule:** A table that shows a range of prices for a good or service and the quantity supplied at each price.
- **Supply:** Willingness and ability to produce a specific quantity of output available to consumers at a particular price over a given period of time.
- **Surplus:** At the existing price, the quantity supplied exceeds the quantity demanded; also called 'excess supply'.

4.12 ANSWERS TO SELF ASSESMENT TEST

(A)

1. (a) Supply (b) law of supply (c) Supply schedule (d) Same (e) Individual supply curve (f) upward (g) market supply curve (h) quantity supplied; along (i) supply(j) right; left

2. (a) True (b) False (c) True (d) False (e) True

3. I. C II. A III. D IV. B

(B)

1. (a) Market equilibrium (b) demand; supply (c) rises
   (d) Right (e) is equal to (f) decreasing (g) same

2. (a) True (b) True (c) False (d) False (e) True

3. (a) Right (b) Left (c) Along-Greater (d) Right
   (e) Right (f) Left (g) Left

4.13 FURTHER READINGS

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5

PRODUCTION FUNCTION

Unit Structure

5.0 OBJECTIVES

- To understand the meaning of production function
- To study Cobb-Douglas production function
- To study various types of production function
- To understand the significance / importance of production function
- To study various concepts such as Total Product, Average Product and Marginal Product
- To study Iso-quant analysis
- To study Iso-cost analysis

5.1 INTRODUCTION

Firm and Industry produces goods and services to satisfy human wants. When we go to the market to buy commodities, it is the production function which fulfills the supply of the goods and services. A producer combines various factors of inputs to convert those into output. Goods and services are demanded by consumers.

In the form of output, after converting input, the producer plays an important role in providing supply for the goods and services demanded by the consumers. Production function performs a significant role in this area. We can say that by changing the form of physical utilities, a producer creates utilities in the form of a production function. Thus, the production function is all about creation or adding utilities. In this chapter, we will study about production function in detail.

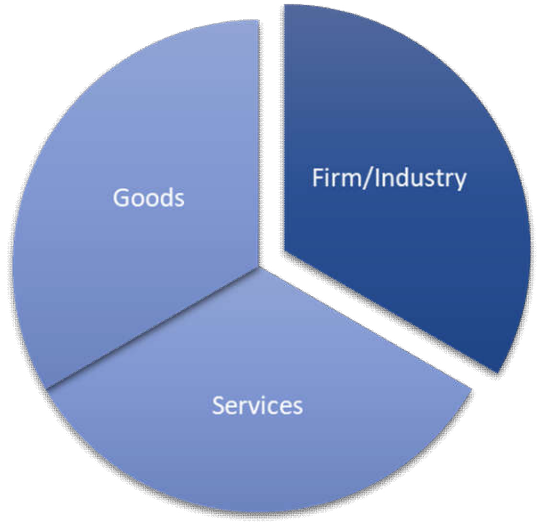


Fig. 5.1 : Firm and Industry

5.2 MEANING

In economics, the production function plays an important role. Firm and industry transforms the inputs into outputs. The functional relation between inputs and outputs is known as production function. It expresses the relationship between physical inputs and outputs. In simple words, it studies the relationship between investment and production.

Firm purchases inputs and sells outputs. Inputs are the things which are purchased by the firm calling it investment and output is sold by the firm. Thus, the production function studies the functional relationship between inputs as investment and output as production. To make the concept of production function more comprehensive, the element of time and technology can be also added.

In a broader way, the production function expresses the functional relationship between physical inputs and outputs for a particular period of time under given technology. State of technology is an important element of production function as improvement in technology brings new production techniques and on the basis of that, large output can be produced.

There are two important points which must be considered while studying production function -

1) Production function is determined by the state of technology.
2) Production function refers to a period of time i.e.., short run or long run.

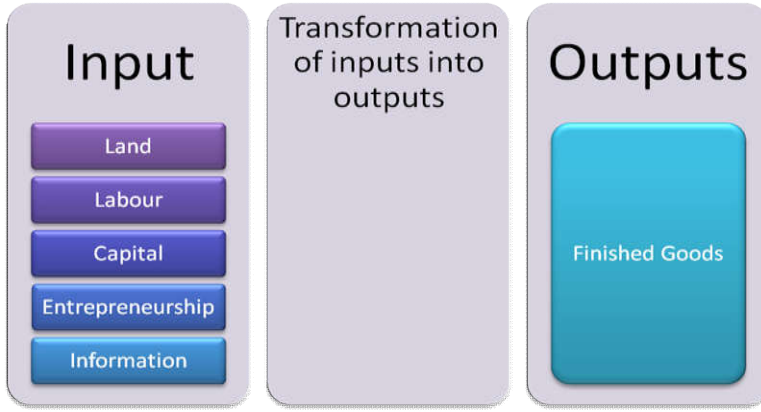


Fig.5.2: Functional relationship between inputs and outputs

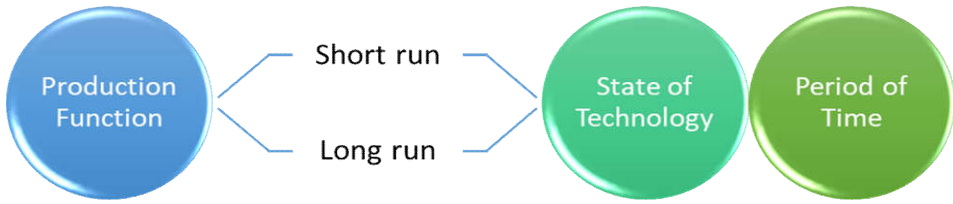


Fig.5.3: Important consideration of Production Function

If there are two factors as inputs: Labour (L) and Capital (K), production function can beexpressed in an algebraic equation as -

Q = f {L,K}

Where as,

Q = Quantity of output of a commodityL = Units of labour employed

K = Units of capital employed

With the help of this equation, we can simply state that the quantity of output depends upon the quantity of labour and capital employed by the firm in production.

There are various assumptions like in production function, the factors of production are perfectly homogenous. It also refers to a constant state of technology and relates to a specific period of time. It is also assumed that the firm/industry uses the most efficient method of production and perfect competition is assumed in the market.

5.3 COBB AND DOUGLAS PRODUCTION FUNCTION

In 1928, Charles Cobb and Paul Douglas gave this production function. This production function takes into consideration two factors of input - Labour and Capital. It is based on the empirical studies of the American manufacturing industry. This production function advocates that about 2/3rd of increase in production is due to labour and 1/3rd is due to capital. This function exhibits constant returns to scale.

Cobb-Douglas production function is,$Q = L^{2/3} C^{1/3}$

Where Q is Output, L is the quantity of labour and C is the quantity of capital.

Criticism of Cobb- Douglas production function

01. This function considers only two factor inputs - labour and capital and ignores others.Other factors are equally important.
02. It assumes constant returns to scale which may not be possible. In the production function, increasing or decreasing returns to scale is application.
03. The function assumes perfect competition in the market which is unrealistic.
04. This function ignores plant to plant and firm to firm variations.
05. All labour units are considered to be homogenous which is not always true and practical.

5.4 TYPES OF PRODUCTION FUNCTION

On the basis of time, there are mainly two types of production function - Long run production function and short run production function.

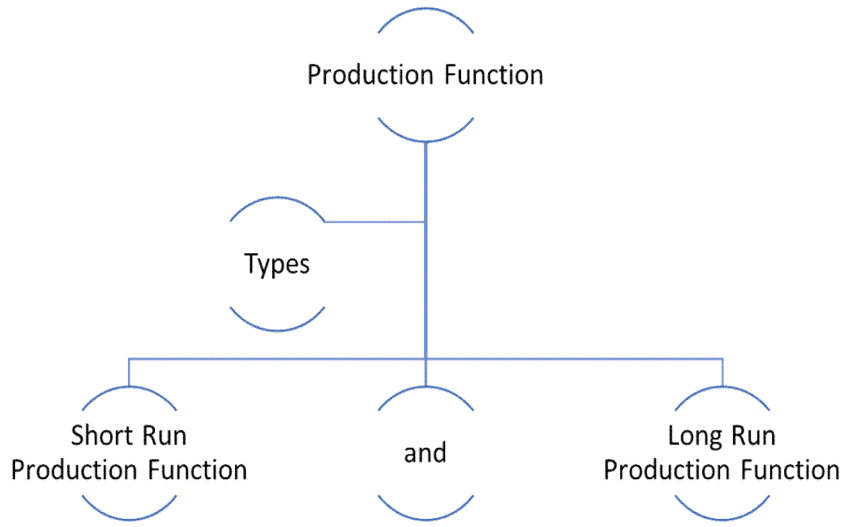


Fig.5.4: Types of Production Function

01. Long run Production Function

This production function studies the output behaviour in the long run in relation to the changes in factor inputs. In the long run, all the factors become variable. In the long run, the production can be increased. It studies the impact on output as in the long run all the factors of production can bechanged simultaneously and in the same proportion.

A firm can expand or contract its operations. In the long run, we have returns to scale. For example, we can build a plant in the long run by employing all inputs in the same proportion.

02. Short run production function

This production function examines the production function when only one factor is variable, keeping quantities of other factors fixed. In simple words, a short run production function deals with the functional relationship of input-output, when production is increased by changing the quantity of one input.

In the short run, all the factors of production cannot be increased or decreased simultaneously. As mentioned earlier, to study long run production function we have returns to scale. To study short run production function, we have a law of variable proportion.

5.5 SIGNIFICANCE OF PRODUCTION FUNCTION

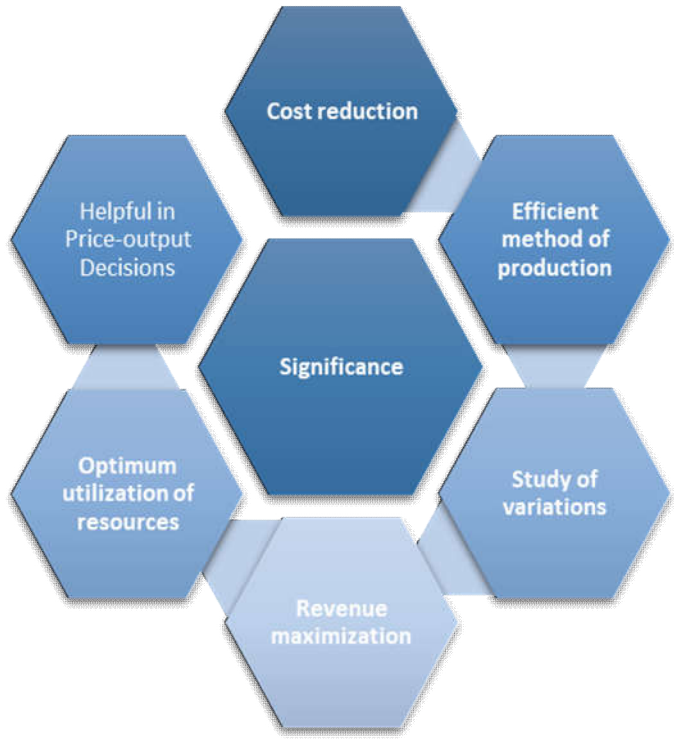


Fig.5.5: Significance of Production Function

01. Efficient method of production

Production function helps firms and industries to use the most efficient method of production by studying the functional relation between inputs and outputs. It also enables producer to choose the optimum level of technology for production

02. Cost reduction

With the help of combinations of various inputs and outputs, a firm by proper planning can reduce the cost of production. This function will show the important leads in the various mixture of physical inputs and outputs which will help firms to reduce the production cost.

03. Study of variations

Production function study is based on industry variations. Knowledge of this function is essential as it will help firms to optimize the resources as per the nature and characteristics of their industries.

04. Revenue maximization

With the assistance of production function knowledge, a producer can minimise losses of the firm. The loss control will help firms to maximize the revenue. Adoption of the right technology will help producers to make the right decisions.

05. Optimum utilization of resources

Production function refers to the given period of time. It is also determined by the state of technology. These two important parameters along with the right selection of inputs will help producers to optimum utilize resources of the firm.

06. Helpful in Price-output decisions

As regards to pricing and output of a product, the production function helps managers to make decisions. It is to be noted the price output decisions made by a firm also depend on the type of market structure. It means the degree of competition prevailing in the market.

5.6 TOTAL PRODUCT, AVERAGE PRODUCT AND MARGINAL PRODUCT

To understand the concept of production function, it is important to understand the concept of total product (TP), average product (AP) and marginal product (MP). We will see in detail how these concepts contribute in the area of production function.

Fig.5.6: Total product, Average product and Marginal Product

01. Total product (TP)

Total product is the sum total of output of all the workers. It is the aggregate produced when all inputs are employed. In other words, total product refers to the total volume produced by a firm using given inputs. It refers to a given period of time.

It is simply the output produced by all the employed workers. As the variable factor increases, the total product also increases. With the help of this understanding, we can analyse the behaviour of the total product in production function. With the different levels of scale, the TP will behave in this direction that can be analyzed with the help of this table.

Table 5.1 Behaviour of Total Product

Particular	Description
Increasing returns to scale	TP increases at an increasing rate
Constant returns to scale	TP increases at constant rate
Decreasing returns to scale	TP increases at a diminishing rate
Negative returns to scale	TP falls

It can be expressed as -

TP = Average product X Variable factors employedOR

TP = Σ Marginal Product

02. Average product (AP)

Average product is calculated by dividing the total product with the variable factors. It can be defined as the output per unit produced when fixed factors are held constant. It is the output produced per unit by the labour employed.

It is simply the number of units produced by comparing the total product and the number of inputs needed to produce a commodity. Higher the average product, higher is considered the productivity of inputs. As the variable factor increases, the average product also increases.

Table 5.2 Behaviour of Average product

Particular	Description
Increasing returns to scale	AP increases at a slower rate than MP
Constant returns to scale	AP increases insignificantly
Decreasing returns to scale	AP falls
Negative returns to scale	AP falls but remains positive

It can be expressed as -

AP = Total product/Units of variable factor input

03. Marginal product (MP)

Marginal product is an additional output generated by employing an additional unit of variable input. It denotes the additional units produced by employing additional units of variable input i.e.labour.

Marginal product means the additional output as a result of employing additional units of input. When an extra factor input is used, the addition to the total product is known as marginal product.

Table 5.3 Behaviour of Marginal product

Particular	Description
Increasing returns to scale	MP increases faster than AP
Constant returns to scale	MP is also constant
Decreasing returns to scale	MP falls more compare to AP
Negative returns to scale	MP becomes negative

It can be expressed as -

MP = Change in output / Change in inputOR

MP = Δ Total Product / Δ Variable Factor

Table 5.4 Relationship between Total Product, Average Product and Marginal Product

Units of Labour Employed	Total Product (TP)	Average Product (AP) (TP/Units of Labour employed)	Marginal Product (MP)	Returns to Scale
1 2	100 250	100 125	100 150	Increasing Returns
3 4	400 550	133.33 137.5	150 150	Constant Returns to scale
5 6 7	650 700 700	130 116.67 100	100 50 00	Diminishing Returns to Scale
8	650	81.25	-50	Negative Returns to Scale

With the help of this table, we can determine the relationship between Total Product, AverageProduct and Marginal Product.

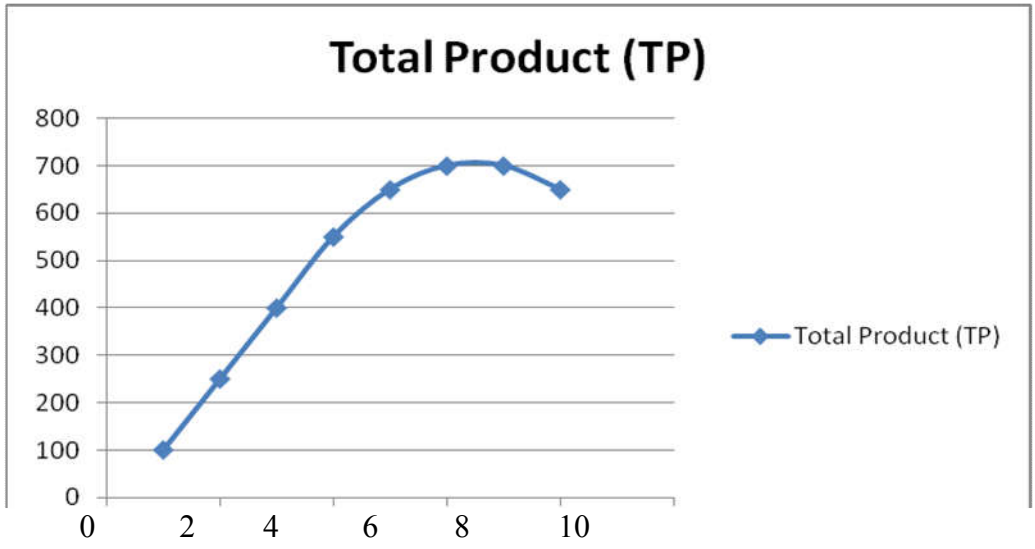


Fig.5.7 : Units of Labour and Total product

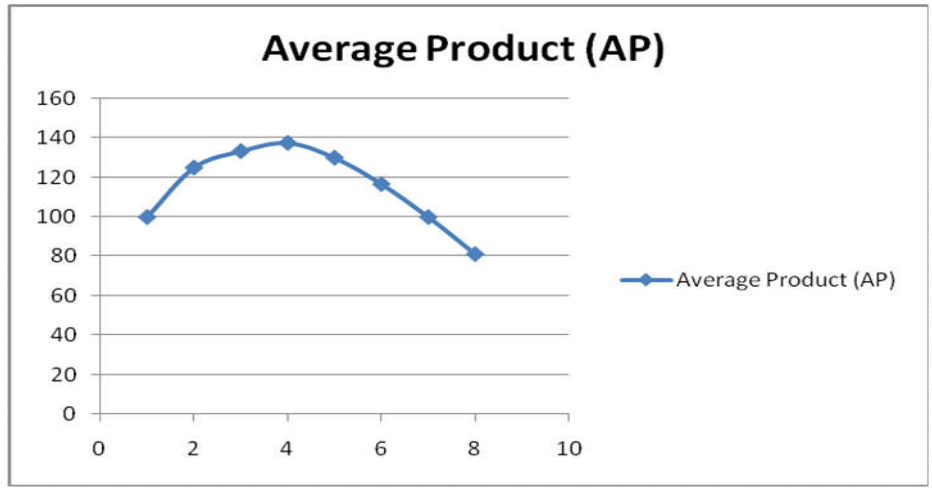


Fig.5.8: Units of Labour and Average product

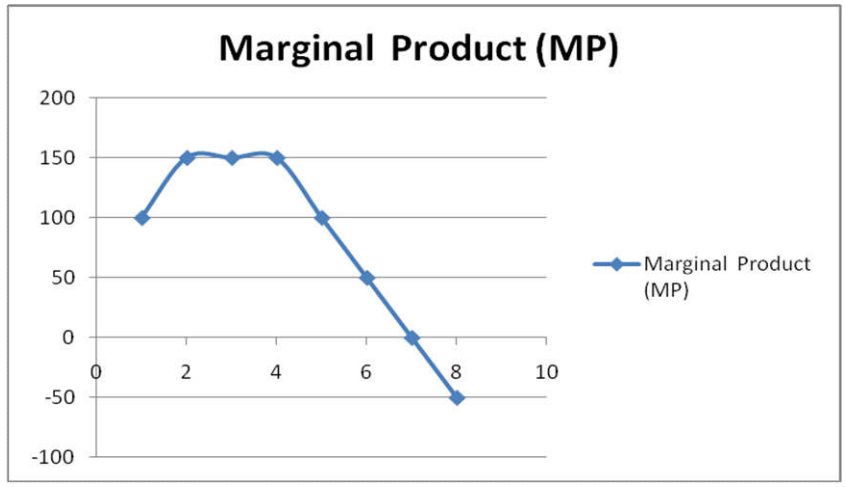


Fig.5.9: Units of Labour and Marginal product

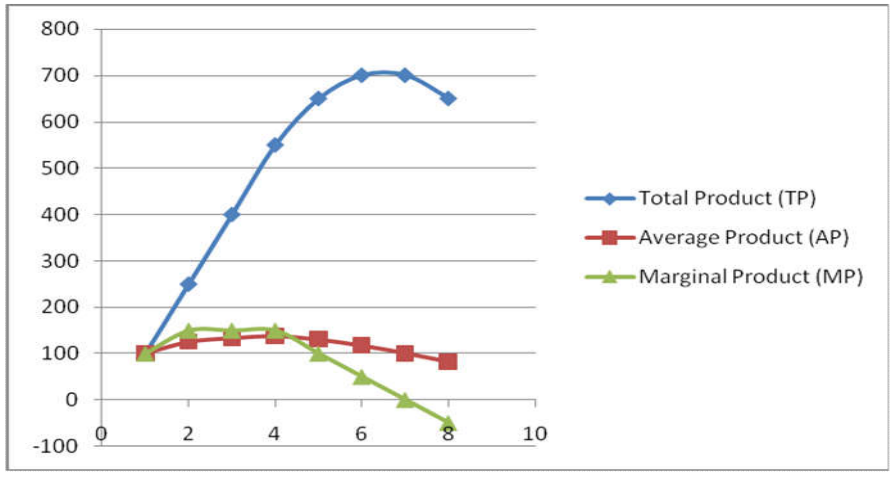


Fig.5.10: Relationship between TP, AP and MP

5.7 ISOQUANTS AND ISOCOST ANALYSIS

5.7.1 INTRODUCTION

Isoquant and iso-cost analysis is used in the theory of production function. This term is also known as Iso-product, Equal-product or Production indifference curve .It shows a technical relation between the inputs and outputs. With the help of an isoquant curve, how inputs are converted into output is depicted. The theory of isoquant curve is similar to the theory of indifference curve. Indifference curve theory was used to provide various combinations of goods to consumers which yield equal amounts of satisfaction. Isoquant theory deals with the combinations of inputs which are capable of producing the same level of output.

The indifference curve deals with theory of consumer behaviour. The isoquant curve deals with the theory of production behaviour. This theory is an extension of the Indifference curve. It is shifted from the theory of consumption to the theory of production.

5.7.2 MEANING

The term isoquant comprises two words - iso and quant. Iso means equal and quant means quantity. Thus, it means equal quantity or equal output. Isoquant may be defined as the curve which shows the various combinations of two inputs giving the same level of output. We can say labour and capital are the two inputs which are used to produce different combinations of output.

An isoquant curve represents all those combinations of inputs which are competent of producing the same level of output. An isoquant curve represents all those combinations which produce the same level of output, the producer is indifferent between them. That's why this curve is also called the production indifference curve. Like, indifference curve isoquant curve also slopes from left to right. The slope expresses the Marginal Rate of Technical Substitution (MRTS).

Marginal rate of technical substitution shows how one input can be substituted for another while holding the constant output.

5.7.3 DEFINITIONS

"The Iso-product curve shows the different input combinations that will produce a given output."

- Prof. Samuelson

"An Iso-quant is a curve showing all possible combinations of inputs physically capable ofproducing a given level of output."- Ferguson

5.7.4 ASSUMPTIONS

01. Only two factors i.e Labour and Capital are used to produce a commodity.

02. Factors of production are divisible in nature.

03. Production function is of variation nature rather than fixed proportion/. The substitution between two the two factor inputs is technically possible.

04. The technique of production is known or assumed to be constant.

05. It is assumed that all combinations produce the same level of output.

The concept of isoquant is made clear with the help of isoquant schedule and graph.

Table 5.5 Isoquant Schedule

Combination	Units of Capital	Units of Labour	Marginal Rate of Technical Substitution (MRTS)
A	20	1	-
B	16	2	4:1
C	13	3	3:1
D	11	4	2:1

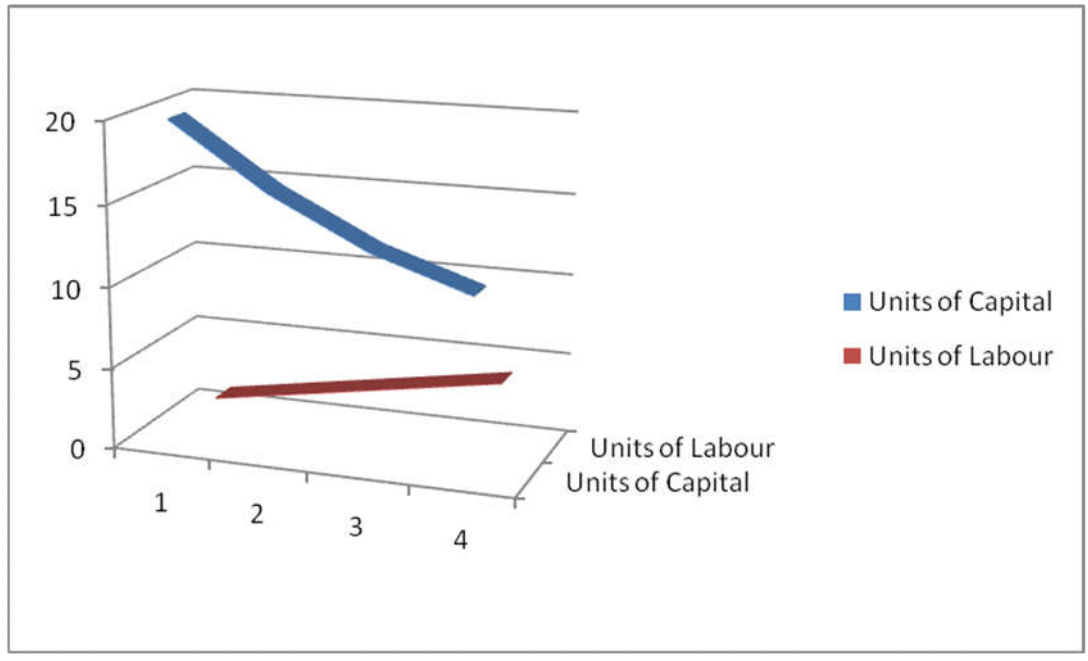


Fig.5.11: Isoquant Curve

The table shows that the combinations of two inputs i.e. labour and capital yield the same levelof output. Thus, the output of 200 units can be produced by combining.

1) 1 unit of labour and 20 units of capital

2) 2 unit of labour and 16 units of capital

3) 3 units of labour and 13 units of capital

4) 4 units of labour and 11 units of capital

Each of the factor combinations A,B,C, D produce the same level of output, say 200 units. Whenwe show them in a graph, we get an isoquant curve as shown in the figure.

5.7.5 Isoquant Curve

An isoquant curve shows the various combinations of factor inputs which produce the same level of output. It represents all those combinations of two inputs which are capable of producing the same level of output. There is a continuous substitution of one input.

5.7.5.1 PROPERTIES OF ISOQUANT CURVE

01. Isoquant curves slope downward from left to right

The slope of the isoquant curve is downward from left to right. This property of isoquant curve can be explained with the help of marginal rate of technical substitution. In order to maintain the same level of output, with the increase in the quantity of one factor of production the quantity of the other factor has to be decreased. If this thing will not be applied, the quantity of the output will increase in some combinations.

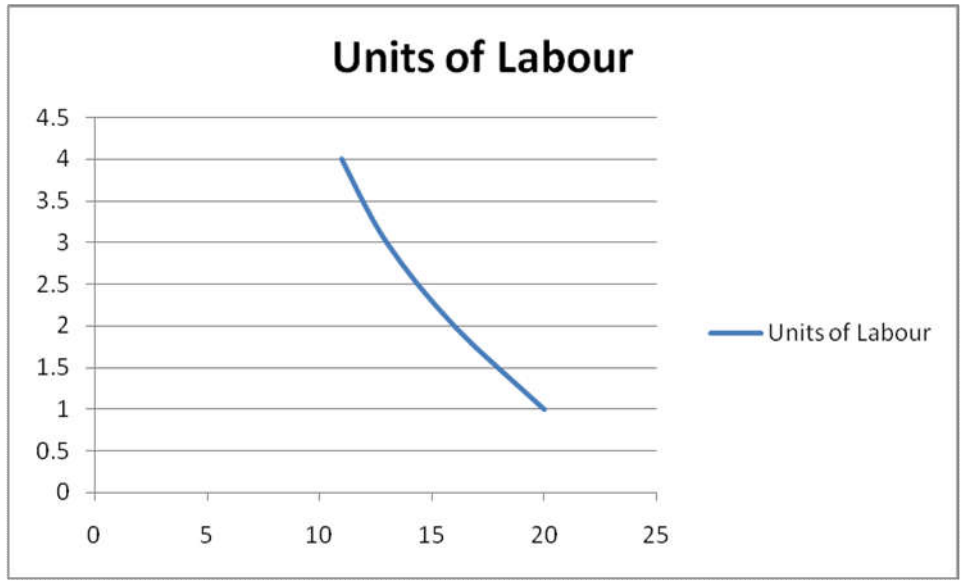


Fig.5.12: Downward slope from left to right

02. Two isoquant curves do not intersect each other

The second property of the isoquant curve is about their non-intersection nature. Two isoquant curves do not intersect each other. If two isoquant curves intersect each other, it means that the firm will not have the same

level of output. With the same combination of the factors, the firm will get different amounts of total output.

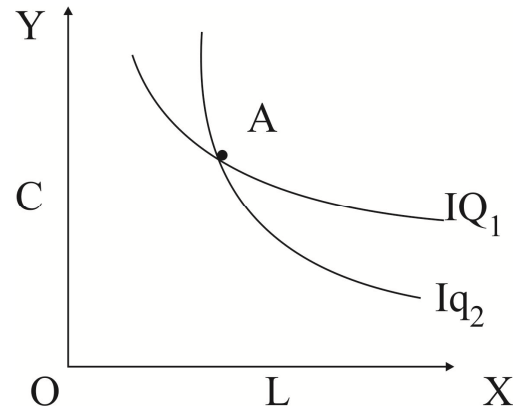


Fig. 5.13 : Two Isoquant Curves do not intersect

C stands for Capital and L stands for Labour

03. Isoquant curves are convex to the origin

Due to the marginal rate of technical substitution, isoquant curves are always convex to the origin and not concave. The tendency of marginal rate of technical substitution is decreasing in nature which means increase in labour will result in the decrease in capital. But, the sacrifice of labour goes on diminishing. Due to this feature, the isoquant curve has a convex shape. A concave shape means increasing the marginal rate of technical substitution which is against the assumption.

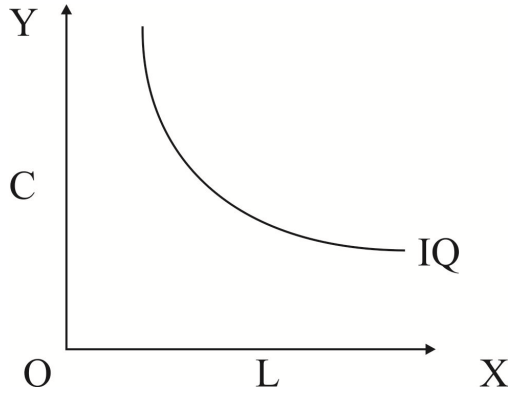


Fig.5.14: Isoquant curves are convex

04. Higher is quant means higher level of output

This property implies that the higher isoquant curve represents higher output. Since more units ofone factor or the other factor are involved on a higher IQ curve, the higher isoquant curve depictsa higher level of output. The upper curve produces more output. More combinations of factors produce a higher level of output.

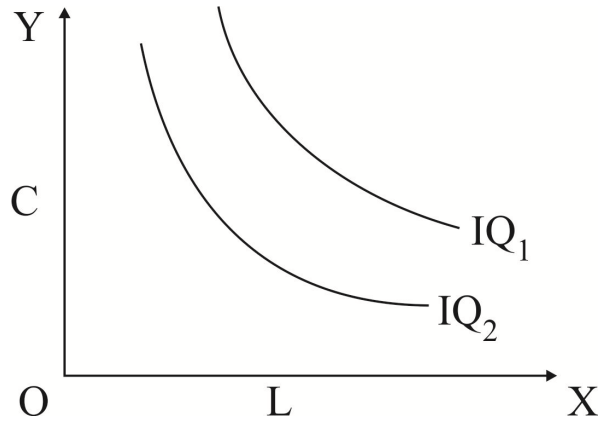


Fig.5.15: Higher Isoquant curve gives higher output

5.8 ISO-COST ANALYSIS

The iso-cost analysis can be done with the help of an iso-cost line. The iso-cost line is similar to the budget or price line. This line shows the various combinations of factors that will result in the same level of total cost. This line shows the different combinations of two factors at the same cost a firm can obtain. Iso-cost lines correspond to different levels of combinations at the same cost for the firms.

The Iso-cost line represents the amount of money on factor input an organization is willing to spend. It shows the different combinations of factors a firm can purchase at a certain amount of money. Iso-cost analysis may be defined as the line which shows the different combinations of two factor inputs which a firm can purchase at the same cost. It is the locus of points of all different combinations of labour and capital.

5.8.1 ISOCOST SCHEDULE

The following schedule depicts the various combinations of labour and capital a firm can avail -

Table 5.6 Combinations of Labour and Capital

Combination	Units of Labour @Rs. 10	Units of Capital @Rs. 20	Total expenditure
A	10	00	100
B	06	02	100
C	04	03	100
D	02	04	100
E	00	05	100

From the above schedule, we can see the various combinations of Labour and capital. The total expenditure incurred is Rs. 100. While, the combinations from A to E depicts the various combinations of labour and capital a firm can avail. In this case, a firm is willing to spend Rs.100 on the combination of Labour and Capital.

5.9 SUMMARY

- The functional relation between inputs and outputs is known as production function. It expresses the relationship between physical inputs and outputs. In simple words, itstudies the relationship between investment and production.
- Production function is determined by the state of technology and it also refers to a period of time i.e short run or long run.
- In 1928, Charles Cobb and Paul Doauglas gave this production function. This production function takes into consideration two factors of input - Labour and Capital.
- Total product is the sum total of output of all the workers. Average product is calculated by dividing the total product with the variable factor and Marginal product means the additional output as a result of employing additional units of variable input.

5.10 QUESTIONS

01. What is the Production Function? Give the assumptions and significance of theProduction Function.
02. Define Production Function.
03. Explain the concept of TP, AP and MP.
04. Explain Cobb-Douglas Production Function along with its limitations.
05. What is the Production Function? Give the assumptions and significance of theProduction Function.
06. Define Production Function.
07. Explain the concept of TP, AP and MP.
08. Explain Cobb-Douglas Production Function along with its limitations.

6

LAWS OF RETURNS TO SCALE, ECONOMIES AND DISECONOMIES OF SCALE

Unit Structure

6.0 OBJECTIVES

- To study the meaning and types of the Law of Returns to scale
- To study various types of economies and diseconomies of scale
- To study the solutions to correct diseconomies of scale

6.1 INTRODUCTION

In the short run, we have laws of variable proportion. In the long run, we have a law of returns toscale. The law of returns to scale is applicable in the long run. Economists use this phrase to describe the behaviour of output in the long run in relation to the changes in the factor inputs. This law explains the proportional change in output with respect to proportional change in input. In the short run by keeping one factor variable and other factor inputs fixed, we can get increasing returns to scale to some extent.

In the long run, all factors input become variable. No factor input can be fixed. It refers to increase in output due to an increase in all the factor variables. The degree of change in output is due to degree of change in input.

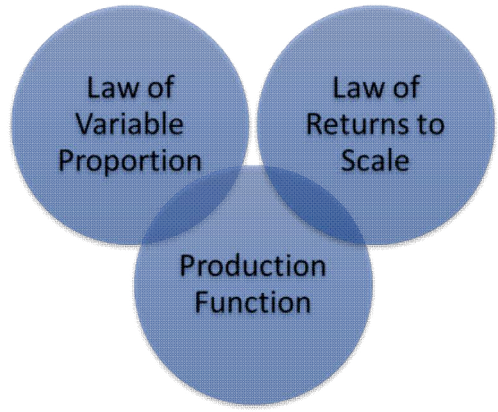


Fig.6.1: Theories of Production Function

6.1.1 DEFINITION

"Returns to scale relates to the behaviour of total output as all inputs are varied and is a long runconcept"

6.1.2 SSUMPTIONS

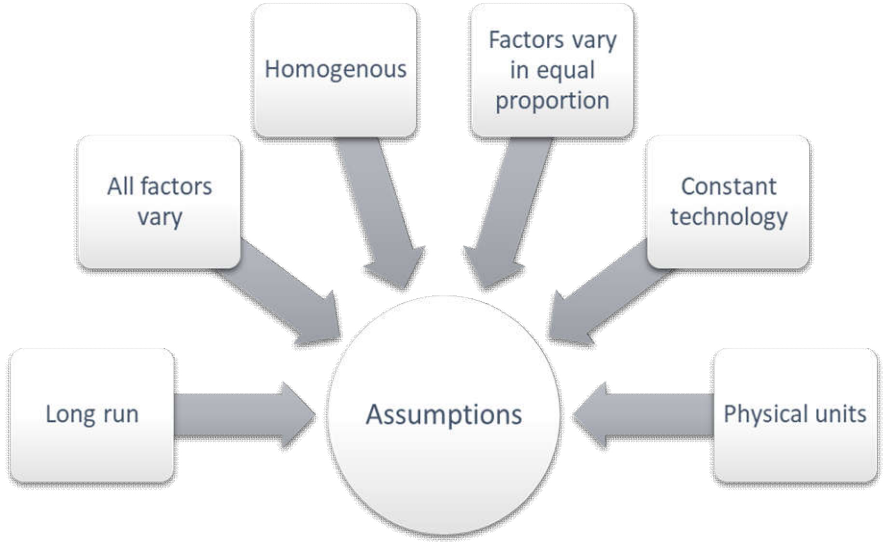


Fig.6.2: Assumptions

01. Applicable in long run

The law of returns to scale is applicable in the long run where all the factors of production become variable. The concept of production is studied in the long run. In the long run,the plant or operation size can be varied.

02. All factors vary

In the long run, all factors are assumed to vary. In the long run, all factors input become variable.

03. Homogenous

All the variable factors of production are assumed to be homogeneous.

04. Factors vary in equal proportion

It is assumed that all the variable factors vary in equal proportion.

05. Constant and optimum technology

The technology in this law is assumed to remain constant. It is also assumed that the producer isusing the optimum one.

06. Physical units

Only physical inputs and outputs are considered in this law. The monetary benefits attached withthe factors are ignored.

6.1.3 TYPES OF LAW OF RETURNS TO SCALE

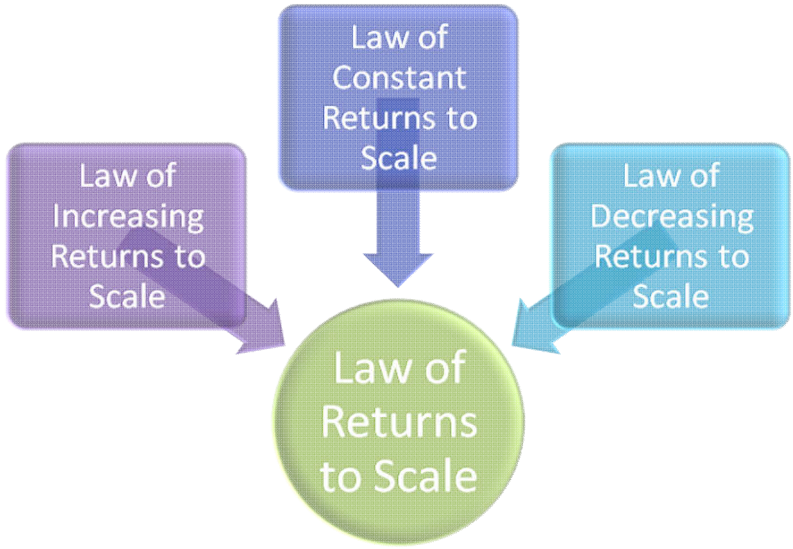


Fig.6.3: Scales of laws of returns

In the long run, there are three types of returns to scale -

Table 6.1 Three types of returns to scale

Units of Labour	Units of Capital	Combination	Marginal product	Total product	Scales
1	5	1+5	10	10	Increasing Returns to Scale
2	10	2+10	20	30	Increasing Returns to Scale
3	15	3+15	30	60	Increasing Returns to Scale
4	20	4+20	30	90	Constant Returns to Scale
5	25	5+25	30	120	Constant Returns to Scale
6	30	6+30	20	140	Decreasing Returns to Scale
7	35	7+35	10	150	Decreasing Returns to Scale

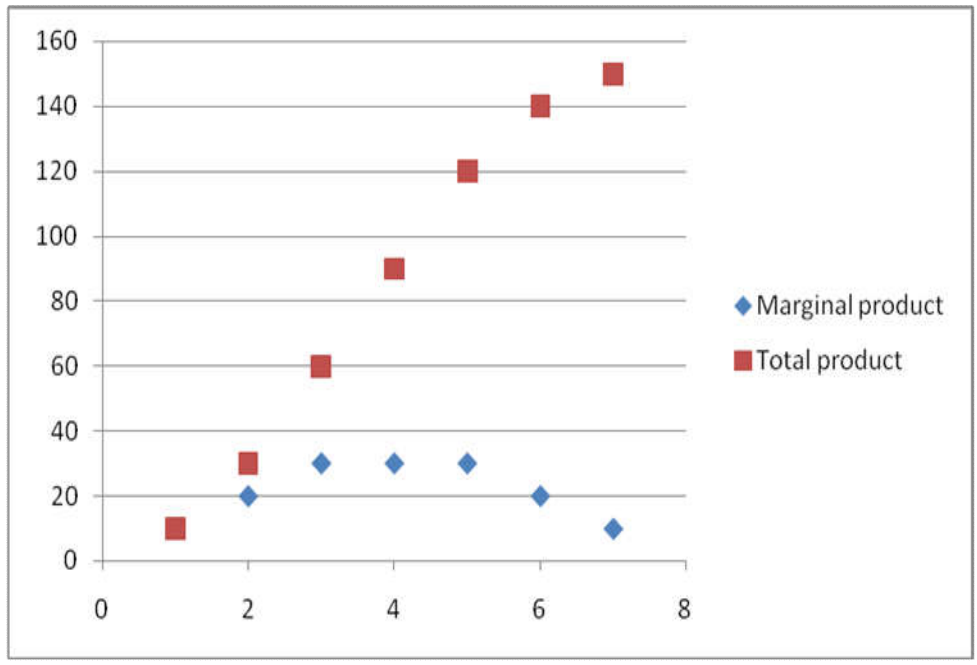


Fig. 6.4: Returns to Scale

01. Law of increasing returns to scale

In increasing returns to scale, output increases more than proportionately. It is a situation where the output increases more than the factor inputs. A firm achieves increasing returns to scale dueto specialization and division of labour. As the firm expands, it enjoys internal economies of scale.

For example, if there is an increase of 10% in factors input but the increase in output is 30%, it issaid to be increasing returns to scale.

02. Law of constant returns to scale

In this scale, the increase in factor inputs is proportional to the change in output. Constant returns to scale are where the inputs and outputs are increased in the same proportion. In this scale, output increases in the equal proportion to input factors.

For example, if there is an increase of 10% in factors input and the increase in output is also10%, it is said to be a case of constant returns to scale.

03. Law of decreasing returns to scale

Diminishing returns to scale refers to a situation where the increase in output is less than the increase in input. Diminishing returns to scale are where inputs are increased but the increase in output is less than the increase in factor inputs.

For example, if there is an increase of 10% in input and the increase in output is only 5%. It is said to be a case of decreasing returns to scale.

6.1.4 OPTIMUM STAGE OF OPERATION

A rational producer will seek to produce in which stage is an important question. A producer in the long run will not produce in stage three. In stage three, the marginal product is falling. A rational producer will not produce in stage one. The marginal product is not optimally utilized in stage one. A rational producer will produce at stage two. In stage two, marginal product is constant and the first stage economies have been extended.

6.2 ECONOMIES AND DISECONOMIES OF SCALE

Large scale production usually helps firms in reducing the cost of production especially the fixed cost. The concept of economies of scale and diseconomies of scale deals with the concept when a firm opts for large scale production. Due to large scale production, the drop in the cost of production of the firm leads to economies of scale. When the increase in output leads to increasing cost per unit, this is said to be a situation of diseconomies of scale.

If a firm is working on a large scale, it can be economical or sometimes can give uneconomical results. The study of economies and diseconomies of scale is important to increase benefits and decrease the disadvantages attached to it. To study, economies and diseconomies are further divided into two parts - Internal and External.

6.2.1 ECONOMIES OF SCALE

By the expansion of their production in the long run, a firm can utilize the cost advantages. These cost advantages result in economies to scale. When a firm takes advantage of decreasing cost due to large scale production in the long run, this is said to be economies of scale. Therefore, the benefits of large scale expansion are known as economies of scale. Economies of scale is a long term subject. A firm achieves economies of scale when there is an increase in the sales of an organization. The firm enjoys large scale production and drop in cost of production especially fixed cost per unit. Due to lowering cost, a firm can save and invest more. By availing raw material in bulk, a firm can get better discounts from the suppliers.

The concept of economies of scale is further divided into two parts - Internal and External Economies.

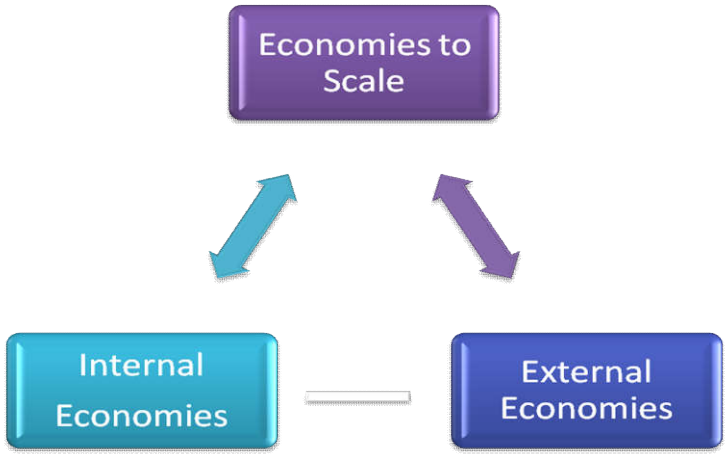


Fig. 6.5: Economies of scale and its types

01. Internal Economies

These economies, as the name suggests, arrive within the firm and are for the firm only. When the output increases leading to decrease in cost of production, a firm utilizes internal economies of scale. These economies arise due to many internal factors which are within the organization and are controllable in nature like entrepreneur skills and abilities, technical scale, managerial skills of managers, skilled labour, marketing skills etc.

These are the real economies that arise when the firm expands its business. These economies are the results of growth and development of the firm. A firm enjoys internal economies of scale through the following sources -

Fig. 6.6: Sources of Internal economies of Scale

01. Managerial Economies

These economies arise due to the scope of employing qualified, well skilled and trained employees. A firm by employing skilled employees can create these economies. It occurs when large firms can afford specialists and experts of management. With the growth and development, a firm can take the help of these specialists.

02. Labour Economies

With the expansion in the scale of production, many labour economies like specialization, new inventions, efficient production and time saving production occurs. A large scale production firm can create labour economies. A large firm needs a large number of workers. As per their skills and specialization, they are allotted work. Workers who are skilled and trained in their operationssave time and money for the organization.

03. Risk Bearing Economies

A big firm can average out the risk because of having better command over its resources. It can diversify the risk by compensating the loss through the profit of another service. With the multi product and diverse production capabilities, a firm enjoys the economies of risk bearing.

04. Technical Economies

A firm producing output at large scale is linked to technical economies. With the increase in scale of operation, a firm needs to use more efficient and specialized forms of capital equipment and machinery. Specialized kind of capital equipment and machinery helps firms to produce larger outputs at lower unit cost.

05. Marketing Economies

A firm can take the benefits of economies of scale when they increase their budget. At a lower price, they can buy raw material in bulk. By setting up branches, they can spread their market. Many big firms are taking the benefits of having large scale businesses.

06. Commercial Economies

Commercial economies deal with the overall benefits a firm can source when it works at a large scale. Cheaper raw material is one of the benefits a firm can enjoy if they purchase at bulk and ata discounted price. Output with the help of marketing economies can be sold at a better price.

6.2.2 External Economies

External economies refers to those economies which are outside the organization. Firms have no control over it as they are external in nature. The sources and impact of these economies is common as the benefits attached to these economies are availed by other firms as well. These economies arise due to the growth and development of industrial areas. All the firms belongingto this area take the benefits in general.

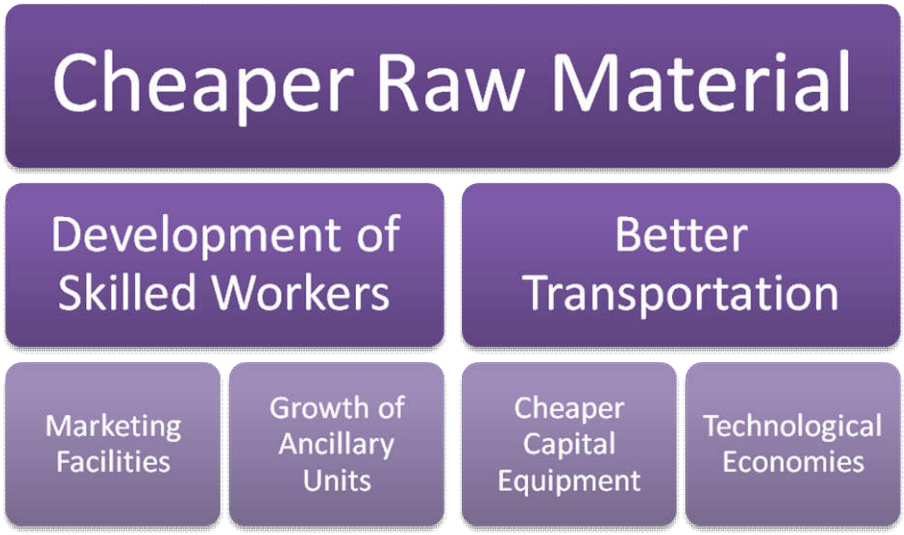


Fig. 6.7: Sources of External Economies

01. Cheaper Raw Material

The expansion of an industry may result in various types of economies. One of the external diseconomies which a firm can enjoy is getting raw material at cheaper rates. The expansion ofan industry results in cheaper sources of raw material, machinery and other capital equipment. The cost of production is reduced because of cheaper raw materials. It also results in exploration of new markets for the raw materials and other capital equipment.

02. Development of Skilled Workers

The expansion of an industry also results in the development of skilled workers. The workers get accustomed to doing the various productive works. Out of this, a worker learns various skills to do different kinds of jobs.

03. Better Transportation

The external economies of an expansion of an industry also brings better transportation facilities to a firm. With the growth and development of the particular area, a firm and industry can avail and enjoy the benefits of getting better transportation. Better transportation facilities greatly reduce the cost of production of the firms.

04. Marketing Facilities

When an industry expands, it usually results in many economies for the firm. The demand for material and labour increases. With the expansion of the large scale production, a firm can extend its marketing facilities. Better and efficient marketing facilities ensure the proper supply of goods and services in the market. A firm can take the benefits of a market network also.

05. Growth of Ancillary Units

Ancillary units are small firms that produce and supply intermediate goods to the large firm. The facilities at one place helps the firms to grow and expand their operations. With the expansion of several firms of an industry, many ancillary industries start specializing. They produce raw material, tools, machinery in a specialized way. They offer the materials or other things at a low price because all these facilities help the firms to develop and grow.

06. Cheaper Capital Equipments

Expansion of an industry also leads to availability of new and cheaper sources of capital equipment. This expansion and exploration results in reducing the cost of production. Thereduction in cost of production results in change in prices. Thus, the firms using these capital equipment will be able to get them at lower prices.

07. Technological Economies

Development and expansion of an industry results in technological economies. When an entire industry expands, for the said industry new knowledge leads to new and improved kinds of machinery. It enhances the productivity of the firms. It can also result in reduction of production costs.

6.2.3 INTERNAL DISECONOMIES

Internal diseconomies are the diseconomies resulting from the internal difficulties within the organization. Due to lack of supervision, management and technical difficulties, these diseconomies are the factors that raise the production cost. It implies all those factors which raise the production cost. When the output increases beyond a certain limit, it results in raising the cost of production. The following are considered as the reasons/sources of internal diseconomies of scale -

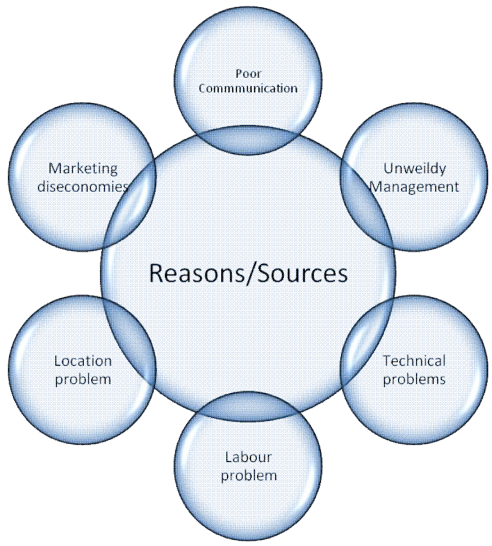


Fig. 6.8: Sources of Internal Diseconomies

01. Poor Communication

Poor communication is one of the important reasons for the creation of internal diseconomies of scale in a firm. If the goals and objectives of the production or any other activity is not communicated property, it will lead to overproduction or under production. Both things are not good for the firm and it leads to create diseconomies of scale.

02. Unwieldy Management

Managing large scale organizations is one of the difficult tasks. If a large organization creates economies, its mismanagement can also create diseconomies. One of the main reasons for internal diseconomies is the difficulty of managing large scale organizations. Coordinating the work of different departments and sections can become pretty difficult. Supervision also becomes challenging.

03. Technical Problems

Emergence of technical difficulties is another reason for the creation of internal diseconomies. Technical improvements are possible upto a certain point. Beyond this point, it can result in creating diseconomies. Improved technology becomes uneconomical.

04. Labour Problems

In the form of non-cooperation from the labour class, labour problems can be a reason for production lags affecting the economies of a firm. Misunderstanding and communication gap can be considered as the potential reason for disagreement between the labour and management. Bad working conditions, insufficient bonus and wages etc. can be considered other reasons.

05. Location Problem

For the growth and survival of firms, location is an important element. Wrong choice of location is considered as a detrimental factor for the growth and development of a firm. Wrong location can cost firms to have expensive raw material, unavailability of labour, high transportation costs. Problem of unavailability of inputs also creates internal diseconomies for the firm.

06. Marketing Diseconomies

The further rise in the scale of production beyond an optimum point can result in increasing the advertisement costs for the firms. Selling and advertising diseconomies is bound to happen. Beyond a point, advertising costs increases and the overhead of marketing increase more than proportionately with the change

6.2.4 EXTERNAL DISECONOMIES

External diseconomies are not confined to any particular firm. These economies are suffered by all the firms. In an industry, all firms fall under

the preview of external diseconomies as they are outside the firm and sometimes uncontrollable in nature. When an industry expands beyond the certain limits then firms operating in that area suffer various types of external diseconomies.

When many firms are localized at a particular place, these diseconomies also come into operation. The following can be considered as the reasons for external diseconomies.

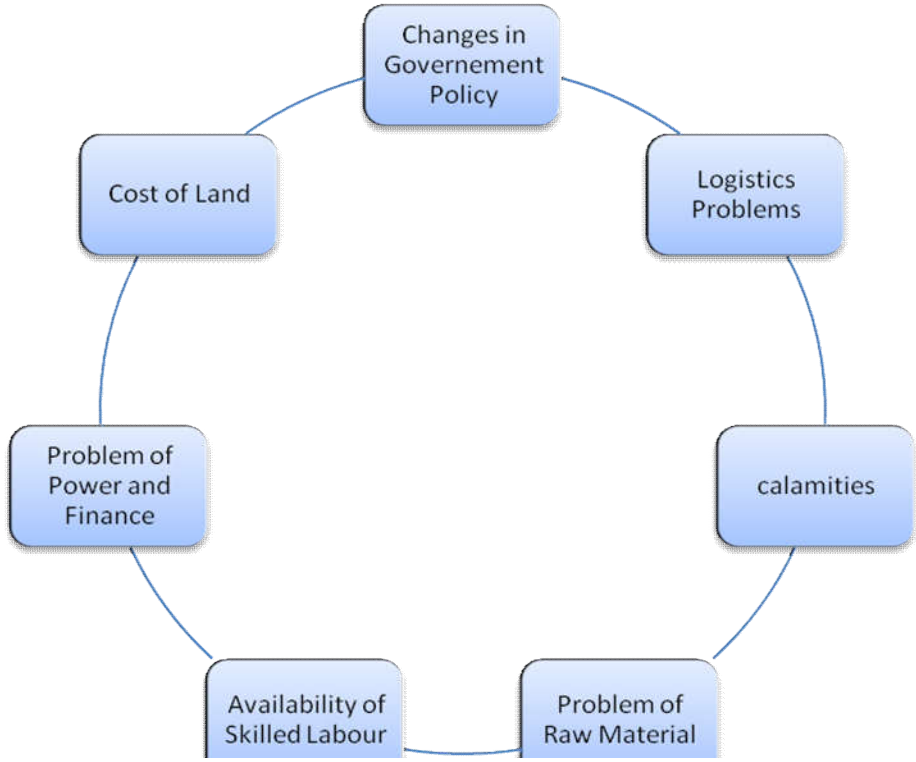


Fig. 6.9: Sources of External Diseconomies

01. Changes in Government Policy

Due to changes in government policy, a firm suffers many diseconomies. A firm is compelled to bring changes in the policy of their operation due to the change prescribed by the government. If the changes are not implemented properly b y the firm, it can causethem to be in legal preview.

02. Logistics Problems

Another diseconomy which a firm is bound to face is logistic problem. When many firms are localized in a particular area, it becomes difficult for means of transport. Additional burden of traffic in that area can create logistic problems. It can also give rise to transportation costs due to high demand.

03. Calamities

Calamities also pose a threat to the working of the firms. Natural calamities like floods, drought, earthquakes affect the day to day life of people and the working of the economy.This also results in diseconomies of scale to the firms

04. Problem of Raw Material

Because of the large demand for raw material, the problem of scarcity arises. Firms experience great difficulties in procuring raw material. Due to large demand, the raw material not only becomes scarce but also expensive. Besides, it also invites other problems.

05. Availability of Skilled Labour

Availability of skilled labour is another problem which a firm is likely to face. As, many firms are located at a particular place. They demand for skilled and trained labour. The availability of skilled labour becomes difficult and expensive and creates diseconomies.

06. Problem of Power and Finance

When many firms work in a particular firm, the problem of power and finance also arise. Because of the large demand for power by the firms, the problem of load shedding arises. Finance also becomes difficult and expensive due to high demand.

07. Cost of Land

For the new firms, the cost of land becomes high. Significant external diseconomies come into operation when many firms are localized at a particular place. New firms entering this area may get the land at much higher price.

Other diseconomies

Apart from the diseconomies mentioned above, the firms are likely to face other diseconomies aswell due to the following reasons

01. Changes in Global Policy Framework

02. Recessionary Markets

03. Levies and Taxes

6.3 SOLUTIONS TO DISECONOMIES OF SCALE

Diseconomies can be converted into economies if the firm adopts various measures. Internal diseconomies can be controlled as they are internal in nature. With the help of some measures, its negative impact can be reduced or stopped. But, the impact of external economies cannot be reduced because the fall will be on every firm.

Lowest average production cost is one of the solutions a firm may adopt to decrease the impact of diseconomies. Generating demand for the product in other nations can also help firms to diversify risk and manage costs. Exploring new markets for products and procuring raw material for firms is also considered as one of the solutions to reduce the negative impact of external diseconomies.

A firm can adopt healthy practices for human resources to ensure the smooth communication andrelations between workers and management. It can solve the problem of unwieldy management. Problems which are internal to organization are controllable in nature. A firm by assessing them properly can take necessary measures to solve it.

Good connectivity with the employees can also help in reducing the diseconomies related to human resource management. Redesigning business operations and strategies can also help firmsin dealing with these diseconomies in a better way. Effective supervision of labour can also reduce the impact of diseconomies. Proper implementation of government policy is another way out.

6.4 SUMMARY

- In the short run, we have laws of variable proportion. In the long run, we have a law of returns to scale.
- The law of returns to scale explains the proportional change in output with respect to proportional change in input. In the short run by keeping one factor variable and other factor inputs fixed, we can get increasing returns to scale to some extent.
- In the long run, there are three types of return to scale. They are Increasing, Constant and Decreasing returns to scale.
- When a firm takes advantage of decreasing cost due to large scale production in the long run, this is said to be economies of scale. Therefore, the benefits of large scale expansion are known as economies of scale.
- A firm is likely to face diseconomies when an industry in a given area expands beyond certain limits then firms operating in that industry suffer diseconomies.
- A firm can adopt healthy practices for human resources to ensure the smooth communication and relations between workers and management. It can solve the problem of unwieldy management. Problems which are internal to organization are controllable in nature. A firm by assessing them properly can take necessary measures to solve it.

6.5 QUESTIONS

01. Explain in detail the law of returns to scale.

02. Explain in detail various economies and diseconomies to scale.

03. Explain the concept of economies to scale.

04. What are the solutions to diseconomies of scale for firms?

7

REVENUE ANALYSIS, COST ANALYSIS AND BREAK EVEN ANALYSIS

Unit Structure

7.0 OBJECTIVES

- To study different types of costs
- To understand the concept of revenue function
- To study the concept of Break even analysis

7.1 INTRODUCTION

Revenue is function of price in market and profit is function of price and cost. Here price is determined in the market by many forces such as market structure, demand and supply, manufacturing expenses, industry competition and substitute availability. The market is highly sensitive to price and price is function of market and industry dynamics. Firm do not have great control on pricing as consumer sentiments are strongly associated with price of product. Firm may face major loss of market share if it will increase the price, but at the same time firm is answerable to its investors for return on investment. This can be achieved with in depth understanding of cost concepts and efficiently controlling cost of the product and protecting competiveness of firm. Cost function is very closely related with production function. Cost of producing products can be different at different scale even though using similar resource combinations. In depth analysis of cost function will lead to sustainable profit management. Sustainable profit can be enhanced by studying

various resource combinations and its impact on cost. Cost is such a variable which can be controlled by firm.

Cost refers to expenses made to buy or gain some sort of resources. Cost analysis refers to study of behaviour of cost in relation to one or more production criteria. In the cost analysis various concepts associated with cost such as accounting & economic cost, real cost& opportunity cost, sunk cost, fixed cost, variable cost, total cost, average cost, marginal cost, short run cost and long run cost are studied.

7.2 ACCOUNTING COST AND ECONOMIC COST

Accounting cost are all those expenses an entrepreneur will incur to acquire outside resources to ensure the activities of business. The entrepreneur will make payment to buy raw material, salaries of the employees, utility bills and interest on borrowed capital from bank. All such expenses where actual payment is made are recorded in books of accounts and called as accounting cost. Accounting costs are explicit cost where money is being paid to outsider suppliers against receipt of certain goods or services. However to ensure production an entrepreneur also uses his own resources such as own money, own building, own time. It is not included in any type expenses and thus not recorded in any books of accounts. Alternatively it is possible that if entrepreneur would not use the resources in his own business, he could have earned return on it. He might get rent of his owned building, he may get interest by bank for his own money deposited in bank instead of investing in business and his services to run the business can be used for some other business and he may get some salary. All such expenses are included in economic costs. Economic costs are accounting costs added by cost o9f own resources.

Consider following hypothetical example.

Table 7.1: Accounting cost & Economic cost

Expenditure head	Accounting Cost	Economic cost
Capital Expenditure	50000	50000
Raw Material Purchase	15000	15000
Salary	5000	5000
Interest for bank	2000	2000
Utility payment	2000	2000
Own Salary	00	25000
Rent of building owned	00	10000
Revenue	100000	100000
Total Cost	74000	109000
Profit/ Loss	26000	(9000) Loss

From the above example it is very clear that even if we saw profit in many businesses in accounting term, we may incur loss at the end. Hence it is very important to analyse the businesses on economic front instead of accounting cost only.

Explicit cost and Implicit Cost

Explicit costs are all those cost which are paid to outsider supplier. It does not include cost of resources already owned by the firm. Whereas implicit cost are those cost that includes cost of buying outside resources and cost of internal resources of the firm.

Real cost & Opportunity Cost

Real cost are those costs which company incurs company making payment to all such expenditure and these are recorded in accounting books. Opportunity cost also known as alternate cost refers to benefits foregone on the next best alternative. We know that resources are limited in nature and wands are unlimited in nature. Here every one wants to maximise his satisfaction by allocating scarce resources to a decision from lot of available options. Here resources are scare in nature are having lot of alternate uses. We can use same resource and gains out of each decision will be different. You are choosing one option by rejecting rest of the options. Here the next best alternate also gives you some benefits and you are scarifies on that next best alternate by choosing to your decision. The gains of next best alternate that you will not get are known as opportunity cost or alternate cost.

Consider an example where you have 10 lakh rupees with you. You can put this money in to bank and earn fixed interest may be 5% annually. You have other option to start your business likely to give you 15% return on the money invested. You may prefer to choose the second option and put your money in business. Now while calculating the business returns you should keep in mind that opportunity cost of money is 5% and income from businesses must be higher than 5%.

7.3 INCREMENTAL COST AND SUNK COST

Incremental costs are related marginal costs. Incremental costs refer to the additional cost incurred by firm as a result of business decisions. For example, all costs such as replace worn out machine, buy new production facility, serve additional market and hire new media for advertisement are considered as incremental costs. Sunk cost refer to those costs which are already incurred and once and cannot be recovered. Example of sunk cost: In recently trending franchisee businesses we need to do interior of store which will be replaced by 5 years. Cost of interiors generally not considered and divided over five years by all such businesses, we should actually consider this sunk cost for calculating real profitability from franchisee.

Historical costs and replacement costs

Companies incur cost in the past on the acquisition of productive assets such as building, machinery, material handling vehicles etc. This cost is called as historical cost where as replacement costs refer to money expenditure that has to be incurred for replacing an old asset. Instability in prices make these two costs differ, other things remaining the same inflation will increase replacement cost higher than historical costs.

Private costs and social costs:

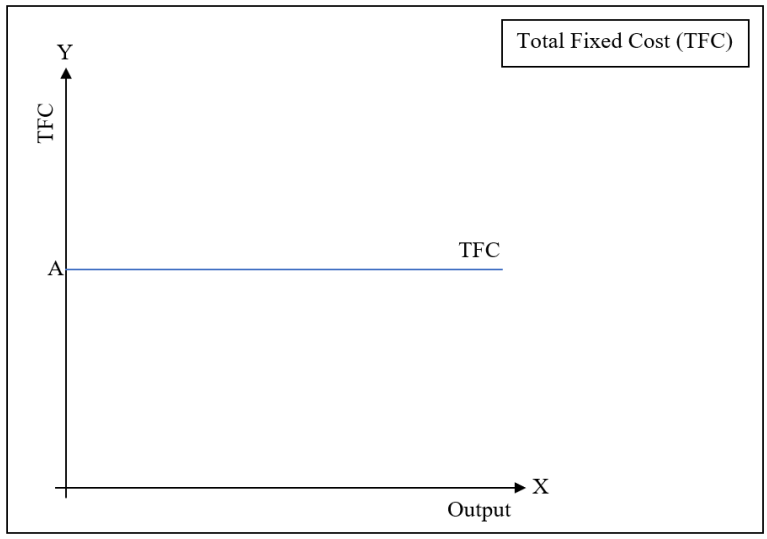
Private costs are costs actually incurred may be explicit or implicit costs. They normally figure in business decisions as they form part of the total cost and are internalised by the firm. Social cost, on the other hand, refers to the total cost borne by the society on account of a business activity and includes private costs and external costs. It includes cost of resources the firm is not required to pay price such as atmosphere, rivers, roadways, etc. And the cost in term of disutility created such as air, water, sound and environmental pollution.

7.4 FIXED AND VARIABLE COST

Fixed Cost

Fixed costs remains constant irrespective of volume of production. They do not vary with output up to a certain level of output.

Fig 7.1: Fixed cost



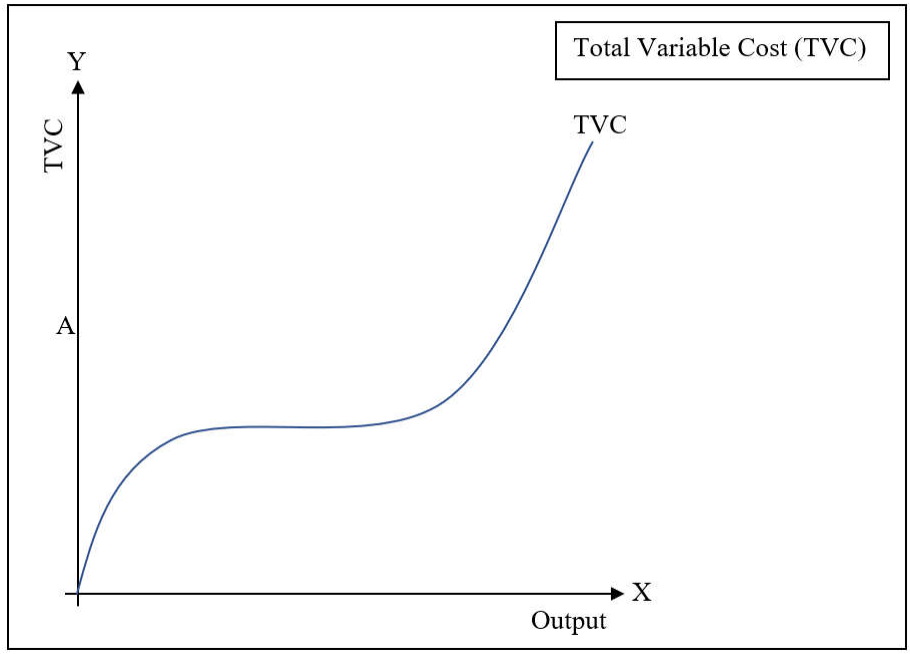
These costs require a fixed expenditure of funds irrespective of level of output, e.g. rent, property tax, interest and depreciation when taken as function of time and not the output. However, these costs vary with the size of the plant and are function of capacity. Therefore, fixed costs do not vary with volume of production output within a capacity level.

As shown in curve 7.1, output is denoted on x axis and costs are marked on y axis, fixed cost curve is parallel to x axis which means that it does not increase or decrease with changes in output. T

Variable Cost

Variable costs are those costs which vary with volume of production. E.g. wages of casual labour, raw material, electricity charges etc. these cost vary directly and sometimes proportionate with the output.

Fig 7.2: Total Variable cost



In figure 7.2, output is marked on X axis and costs are represented on Y axis, as shown in figure total variable cost increases increase in output, to produce more number of products we will consume more raw material and more labour, this can be traced by increase in variable cost. However, the pace of change in variable cost does not remains same, at the start the variable cost increases at faster rate, it matures after some time and remains constant for some more level of output production, further it again increases at faster rate.

Total Cost

Total cost is summation of all expenditure such as fixed and variable costs. These are all costs incurred on all resources necessary for production at a given level of output. Total cost is classified in total fixed cost and total variable cost.

TC= TFC + TVC

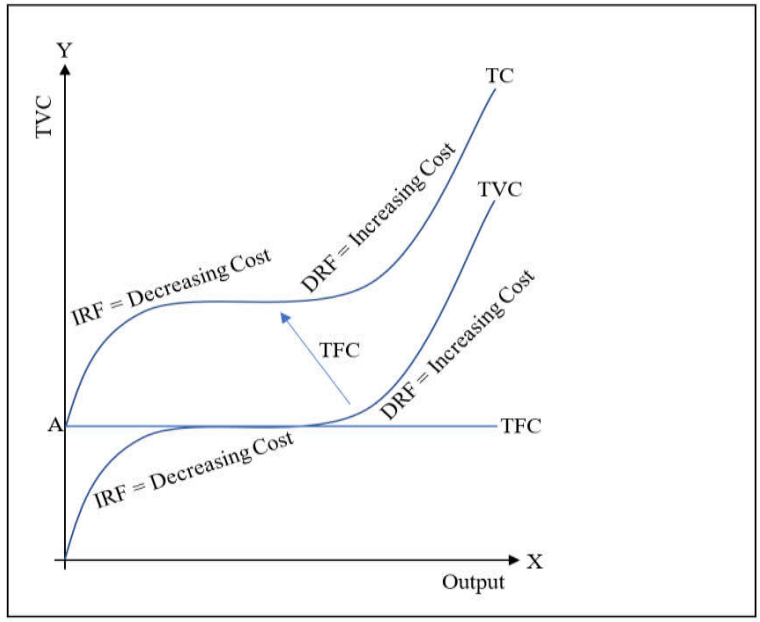


Fig: 7.3: Total cost

In figure 7.3, output is marked on X axis and costs are marked on Y axis. We can see curves of fixed costs and variable costs are super imposed on the curve of total cost. Total costs start from point A on Y axis instead of origin, this is because even if you don't produce any units contribution of fixed cost will be there so total cost starts from fixed cost curve at point A. Further it is clearly seen that pattern of total cost is somewhat closer to variable cost as total cost are addition of fixed cost and variable cost.

Average cost

Average cost refers to total cost divided by number of units. It can also be calculated for fixed cost and variable cost by dividing number of units to total fixed and total variable cost. It is important as it gives you right idea about cost of production and helpful in deciding price of the product. It is given by,

Average cost AC = TC / Number of Units.

Average Fixed Cost AFC = Total Fixed cost/ Number of units produced.

Average variable cost AVC = Total Variable cost/ Number of units produced.

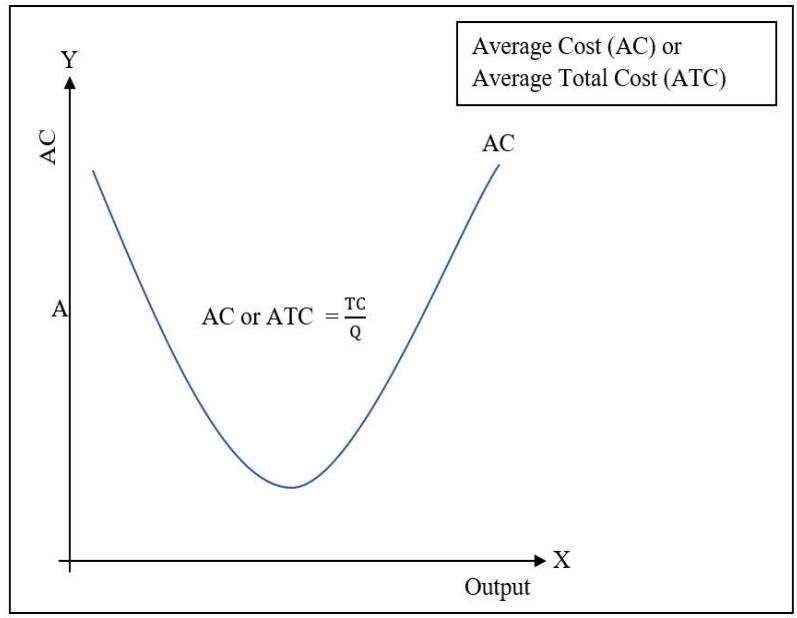


Fig 7.4: AVERAGE COST

In figure 7.4 output is marked on X axis and costs are marked on Y axis. Average cost decreases with volume in production, a point will come where average cost reaches to minimum level but beyond this point average costs again increases. This can be associated with stages of production where in second stage production costs is minimum, in stage 1 underutilisation results in higher costs. In stage III which exploits resources is case of over utilisation, cost are higher in this case also.

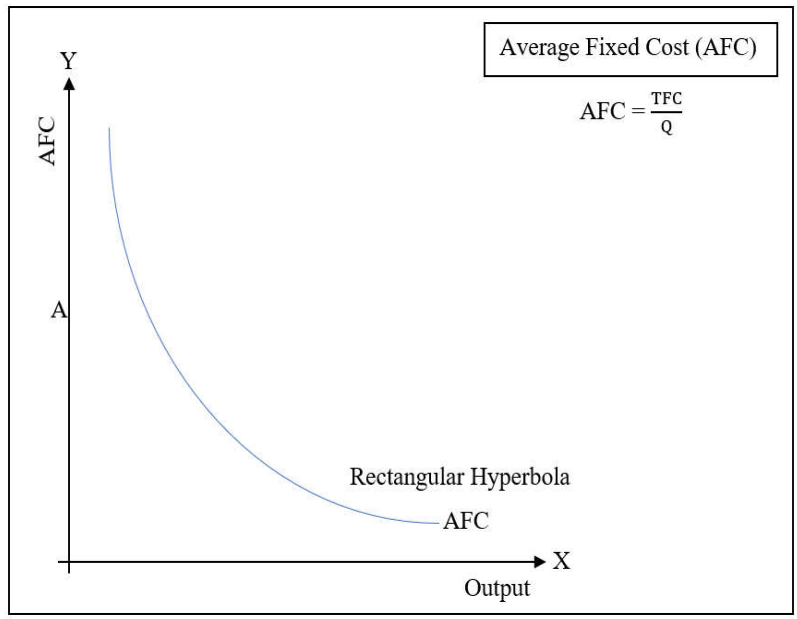


Fig 7.5

Figure 7.5 is expression for average fixed cost. On X axis output is represented and on Y axis average fixed cost is shown, it is seen from curve that average fixed cost reduces with increase in output, at larger

volume average fixed cost are very less but they are very significant when volume of production is very low.

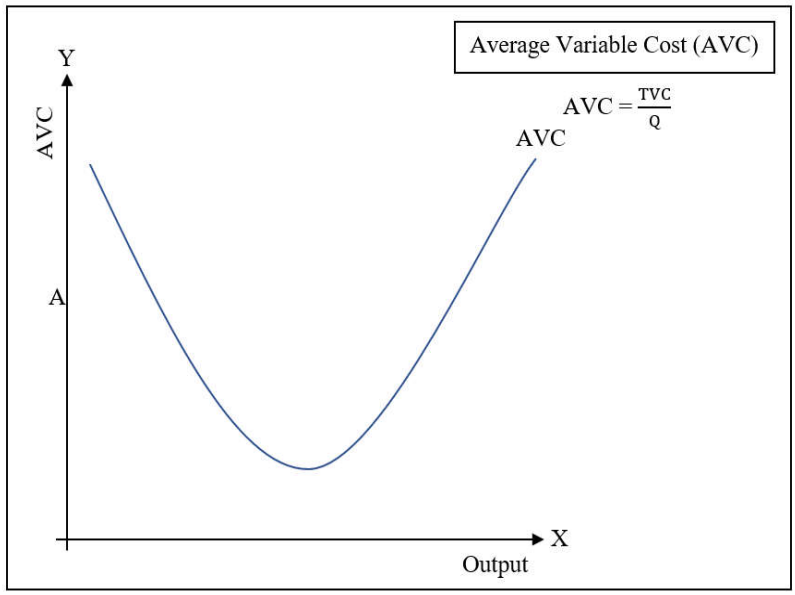


Fig 7.6: Average variable cost

Figure 7.6 is expression for average variable cost. On X axis output is represented and on Y axis average variable cost is shown, it is seen from curve that average variable cost reduces with increase in output, it reaches to one point when they are lowest but after this point average cost curve start increasing again.

Marginal Cost

Marginal cost is addition in cost due to producing one more unit of output. As the fixed cost remains the same, it is effectively change in total variable cost.

$MCn = TVCn - TVCn\text{-}1$

$MC = \Delta TVC / \Delta q$

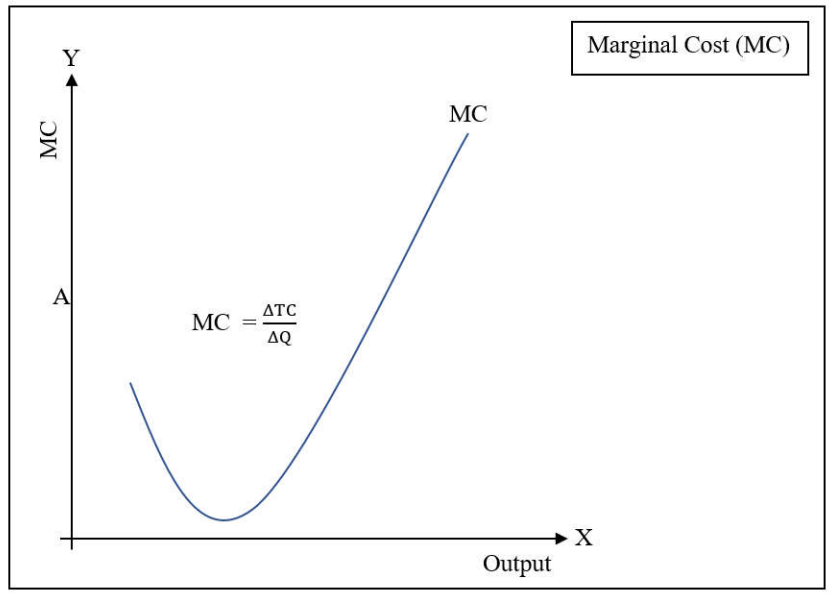


Fig 7.7: Marginal cost

Figure 7.7 is expression for marginal cost. On X axis output is represented and on Y axis marginal cost is shown, it is seen from curve that marginal cost reduces with increase in output, it reaches to one point when they are lowest but after this point average cost curve start increasing again. It is to be noted that it reaches to lowest point earlier than average cost and pace of increase is different in average cost and marginal cost.

.Table 7.2: Cost relationship

I	II	III	IV	V	VI	VII	VIII
Output	Total Fixed Cost	Total variable Cost	Total Cost	Average Fixed Cost	Average variable cost	Average total cost	Marginal Cost
0	100	0	100	-	-	-	-
1	100	50	150	100	50	150	50
2	100	78	178	50	39	89	28
3	100	98	198	33	33	66	20
4	100	112	212	25	28	53	14
5	100	130	230	20	26	46	18
6	100	150	250	17	25	42	20
7	100	175	275	14	25	39	25
8	100	204	304	13	26	38	29
9	100	242	342	11	27	38	38
10	100	300	400	10	30	40	58

In the table 7.2 various cost are presented and we can trace relationship between various types of costs. The values of various types of costs are presented with reference to volume. The values of output are taken from 0 units to 10 units and corresponding values of total fixed cost, total variable cost, total cost, average fixed cost, average variable cost, average total cost and marginal cost are presented. Here we can infer that for 0 units of production component of fixed cost remains which will lead to total cost but remaining all other types of cost does not exists. The findings from this table are as follows.

In the second column total fixed cost is presented, it remains constant over entire volume of production.

In third column total variable cost is presented. Total Variable cost increases with volume of production. It should be noted that pace of increase in total variable cost is not same.

In the fourth column total cost is presented. Total cost can be derived by adding fixed cost and variable cost i.e. column number II & column number III. Here total fixed cost also changes as volume of output increases. The pace of change in total cost is exactly same as in variable cost.

Fifth column gives values of average fixed cost which are derived by dividing column number II by column number I. We can infer from this table that average fixed costs are decreasing with the increase in volume. The pace of decrease is faster at the starting and pace is reduced later on. Average fixed cost nears to zero for higher volume but it never touches the x axis and always in the positive region.

Further in the sixth column average variable cost are presented. The values in the sixth column are calculate by dividing column number III by column number I. AVC decreases at the starting and pace of reduction is very high the pace reduces but still average variable cost reduces till point corresponding to give output of sixth unit. It is constant for sixth and seventh unit and after seventh unit it starts increasing, further it increases with faster pace.

Seventh column shows values for average total cost, the values for average total cost are calculated by dividing total cost by number of units produced, i.e. column number IV divided by column number I. The table shows that average total cost reduces with increase in volume the pace of reduction in average variable cost reduces and at a point corresponding to output of 8^{th} unit average total cost reduces at 8^{th}& 9^{th} point AVC remains constant and after point 9 average total cost start increasing. Again attention must be given towards difference in average variable cost and average total cost, at the start we will find that broader difference is there in AVC and ATC this is on account of higher average fixed cost at the starting later on as the average fixed cost decreases the difference in average total cost and average variable cost narrowed down.

The last column represents values for marginal cost. Values in this column are calculated by subtraction in IV column by the preceding value of the total cost, simply value of marginal cost for second unit can be calculated by subtraction, value of total cost for II unit minus value of total cost for Ist unit. E.g. MC for II unit= 150-100 =50. The table shows that values of marginal cost are reducing at very high speed at the starting and the pace decreases, at point corresponding to value of forth unit is the lowest value, after forth unit values of marginal cost increases and pace of increase is faster at a later stage. This corresponds to law of diminishing marginal returns.One more table is given for the study purpose of the students, few places are blank in this table and student should calculate based on cost relationships.

Table 7.3: Cost relationship (Exercise for students)

I	II	III	IV	V	VI	VII	VIII
Output	Total Fixed Cost	Total variable Cost	Total Cost	Average Fixed Cost	Average variable cost	Average total cost	Marginal Cost
0	-	0	50	-	-	-	-
1	-	50	-	-	-	-	-
2	-	78	-	-	-	-	-
3	-	-	148	-	-	-	-
4	-	112	-	-	-	-	-
5	50	130	-	-	-	-	-
6	-	-	-	-	-	-	20
7	-	175	-	-	-	-	-
8	-	-	254	-	-	-	-
9	-	242	-	-	-	-	-
10	-	300	-	-	-	-	-

7.5 SHORT AND LONG RUN COST

Short run of the firm is run till at least one of the factor remains constant. The scale or capacity of the plant remains constant in the short run. As shown in figure 7.8 marginal cost, average cost and average variable costs curves are plotted on same graph. Here on X axis output is marked and on Y axis costs are marked. It is seen from marginal cost curve and average variable cost, when marginal cost curve cuts average variable cost curve a point will come where marginal cost equals to average variable cost. It is also noted that at this point that average variable cost are lowest at this point. Further average variable cost increases from this point. In this graph average cost and average variable costs are also plotted, it is seen from these two curves that at the starting distance between average cost and average variable cost is high and this distance goes on reducing with

increasing output. This is on account ofreduction in average fixed cost over volume of production. At higher volume average variable cost is very low this corresponds to smaller distance in average cost curve and average variable cost curve.

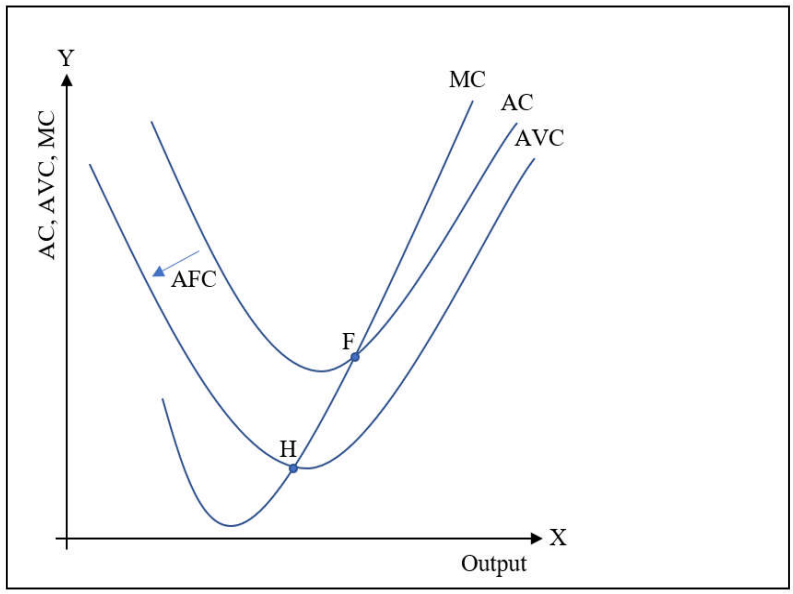


Fig 7.8: Short run cost

In figure 7.9 short run average cost curves are presented. Here SAC1 represents for scale 1, SAC2 represents higher scale of capacity and SAC3 represents third scale of production. OA level of output can be produced in both 1 & 2 factories. The corresponding cost for similar level of output OA in first factory is AL and in second factory it is AH. We can infer from this if we want to produce smaller level of output then smaller factories should be preferred as variable cost are less in smaller factories as compared to larger factories. But if we want to produce output OC, it can be produced in both the factories 1 & 2 here the situation is exactly reverse of first situation as variable cost in factory 1 will be CJ and average cost in factory 2 will beCK. Here CK < CJ so it can be inferred that average cost in factory 2 are less. If we want to produce higher output then factories with larger capacities should be preferred. Similarly for much higher output we should use much larger factory for minimum possible costs.

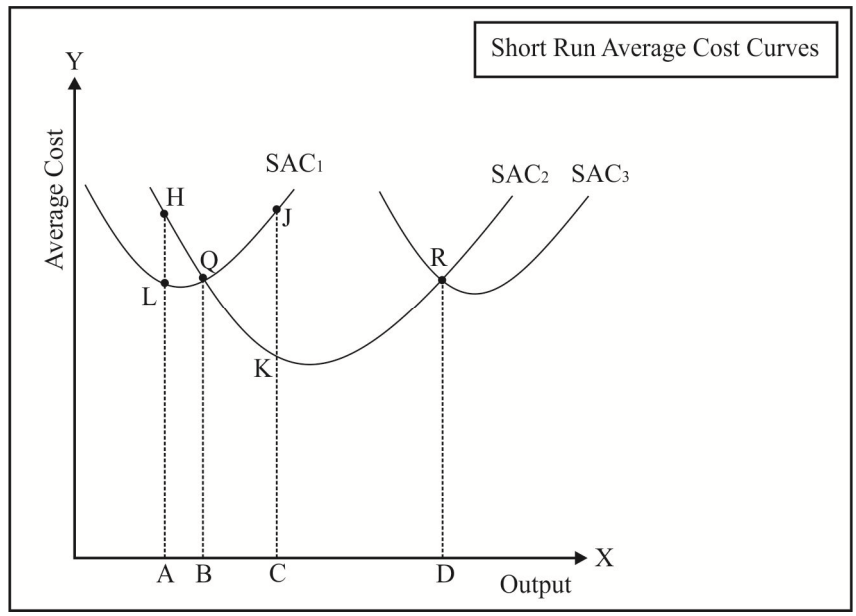


Fig 7.9: Short run Average cost

Long Run Cost

In the long run all the factors of production varies, even the technology and scale of production does not remains constant. New factories and facilities are created in the long run to cater to increasing demand. Smaller increase in demand can be catered by hiring few more labours in the existing facilities but over a time you need to expand to new increased facilities of production to cater to demand.

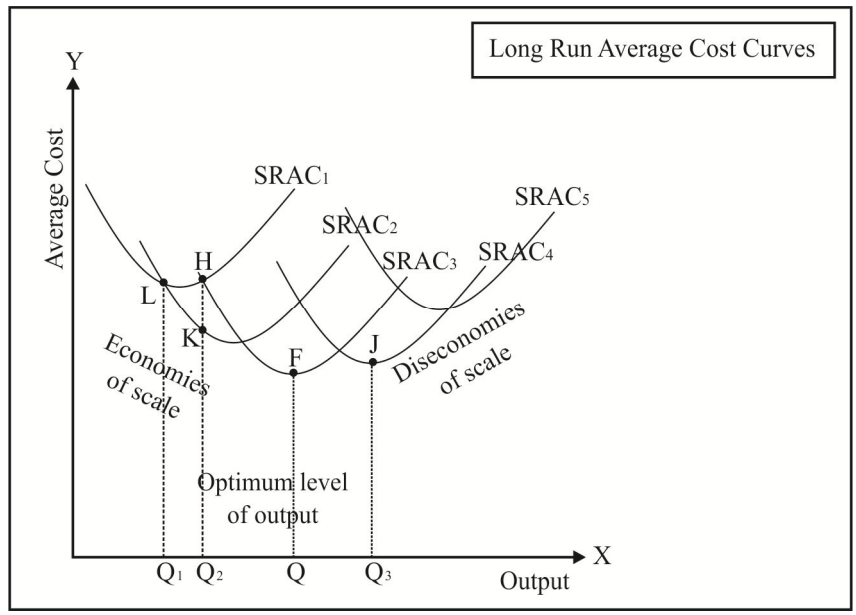


Fig 7.10: Long Run Average cost

Long run cost analysis is basically analysis of total cost, average cost and marginal cost. In the long run average variable cost is studied as the volume of production is different.Long run cost curve is envelope of many short run cost curve at different time and at different scale. LAC is

actually a tangent drawn at all these SAC, LAC is tangent at point L, K, F and J.Returns to scale can have three cases namely increasing returns to scale, constant returns to scale and decreasing returns to scale. The corresponding cost phenomenon is discussed as follows in each case.

From the definition of marginal cost and average cost, average cost is total cost divided by number of units produced and marginal cost is cost due to production of one additional unit.Using the same for long run in above case, we find that average and marginal cost remains constant for constant returns to scale. As he input doubles output also doubles TC will grow at constant rate and long run average cost LAC remains constant.

As shown in figure, the long run average cost curve is drawn as to be tangent to each of the short run average cost curve. Every point on the long run average cost curve will be tangency point with some short run AC curve. If the firm desire to produce any particular output, it then builds corresponding plant and operate on the corresponding short run average curve. As shown in figure, for producing OQ2 level of output, the corresponding point on LAC curve is K and the SAC2. If a firm desires to produce output of OQ2 then firm will construct plant corresponding to SAC2 and will operate on this curve at point K. Similarly firm will produce other level of output choosing the plant which suits its requirement of lowest possible cost of production. It is clear from the figure that larger output can be produced at lowest cost with larger factories and smaller output can be produced at lowest cost by smaller factories.

LAC curve is not tangent to the minimum points on SAC curves, when the LC curve is declining; it is tangent to the falling portion of Sac curves. When the LAC curve is rising, it is tangent to the rising portion of SAC curves. The level of output OQ will touch at minimum point on SAC. Thus, for producing output less than OQ at the lowest possible unit cost, the firm will construct relevant plant and operate it at less than its full capacity, i.e. less than it minimum average cost of production,. On the other hand for producing output large than OQ the firm will construct the plant and operate it beyond its optimum capacity, OQ is the optimum output. This is because OQ is being produced at minimum point on both LAC & SAC curve. Other plants are either used at less than full capacity r more than their full capacity, only SAC3 is being operated at minimum point. This can be corresponds to increasing returns to scale and decreasing returns to scale. The SAC3 corresponds to constant returns to scale. Prior to this point we will find increasing returns to scale and after this point we correlate with decreasing returns to scale.

The long run average cost curve is highly helpful to the firms in planning their facilities and planning operating level of these plants based on desired level of output. The long run average cost curve helps the firms in the choice of size of the plant for producing specific output at least possible cost.

7.6 REVENUE FUNCTION

Revenue for the firm can be calculated by using expression

Revenue= Number of units sold*unit price of the product.

As discussed in the cost function we can calculate total revenue, marginal revenue and average revenue. The difference lies in considering the price of the product.

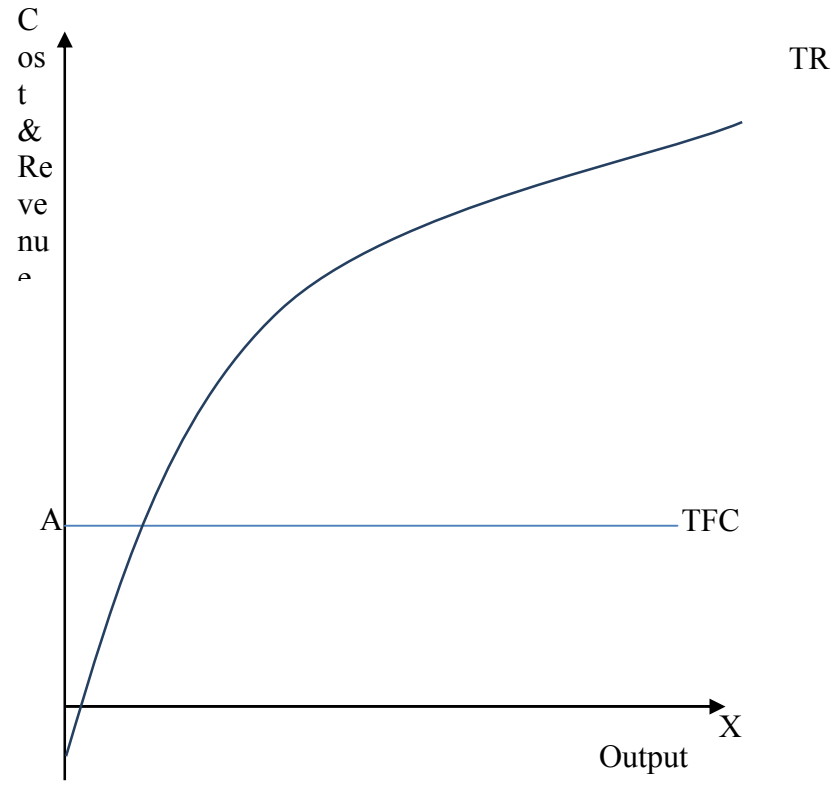


Fig 7.11: Total Revenue Curve

As we know that price is a function of many variables based on industry and market combined and firm do not have great control in finalisation of price only thing firm can do is to monitor cost curves and correlate with the corresponding revenue curve.

Figure 7.11 shows curve for revenue of the firm. On X axis output is assigned and on Y axis cost and revenue are assigned. We can see that revenue is zero when no units are produced and revenue curve starts from origin, it goes on increasing with increase in sales.

7.7 BREAK EVEN ANALYSIS

From cost analysis we could know that the firm has various level of cost and from revenue analysis we could know that revenue is function of sales price. Firm is keen on understanding its profitability and volume at which it will get the maximum profit. Breakeven point is such point where firms cost and revenue matches and there is situation of no loss or no profit. The

firm must operate the beyond the point of break even for real profit. For this purpose in the following figure total cost and total revenue curves are superimposed with each other.

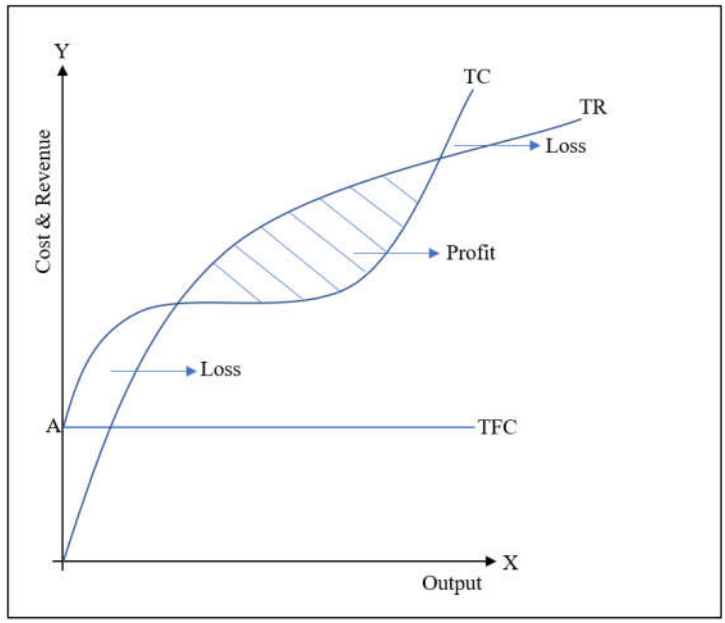


Fig 7.12: Break even Analysis

Figure 7.12 shows curve for revenue & cost of the firm. On X axis output is assigned and on Y axis cost and revenue are assigned. It can be observe from the figure that total cost of the firms starts from fixed cost line and not the origin. Whereas revenue of the firm starts from origin as the sale of very first unit. As we know that there is some fixed cost associated with each firm therefore, firm must incur these cost for profitability. We can see from the figure that firm will achieve a profitable zone where total revenue line is above total cost line. The region of profit again goes in to the line where company may incur loss. We may see that beyond breakeven point company starts earning its profit. Beyond certain point firm may aging go in loss zone because we know that long run average cost curve is u shaped and therefore LAC increases beyond certain point, but price is not the variable under control of the firm, we need to see market demand and level of competition for pricing of the firm. Higher cost decreases competitiveness of the firm.

Break even point is derived by the following expression

B.E.P= Fixed cost/ contribution

Where contribution= unit price – variable cost

Consider the following example,

The firm invest Rs 1,00,000. For fixed investment in plant for producing ball pens. The variable cost of producing ball pens is Rs 5/- and sales price of the ball pen is Rs 10/-.

We may calculate breakeven point as follows,

BEP= Fixed cost/ contribution and

Contribution= unit price – variable cost

Replacing the values,

Contribution = 10 -5 =5

Given fixed cost is 100000/-

BEP = 100000 / 5 = 20000

From this example it is very clear that firm can have profit if it could sale more than 20000 units. Similar BEP can also be calculated in days or years based on daily sale of the product.

BEP is very significant for analysing project at the initial stage. You may have two projects available and want to choose one out of these two projects, apart from other criterion project A will give BEP at 1.8 years and project B gives you BEP at 2.3 years. Project A should be preferred over project B in this case as you will get your money invested earlier in project A.

7.8 SUMMARY

The analysis of cost function, revenue functions and break even analysis gives you to look at aspects of volume and profitability. Cost can be accounting and economic cost, we should also see economic cost as it will result in to real picture about profitability of business. Opportunity cost is gains from next best alternate which you scarify. Fixed cost, variable cost and total cost are components of cost function based on factors. Fixed cost is cost fixed assets whereas variable cost of variable assets. Total cost combination of both fixed cost and variable cost. Marginal cost refers to additional cost due to producing one more unit and average cost refers to total cost divided by number of units produced.

In short run plant capacity remains same and due to law variable proportions we observe that cost reduces with increase in output till one point but after this point cost start increasing. Short run is also considered as plant period as the plant capacity remains constant for short run. In the long run, plant capacity also changes as firm may have additional units of production. The factory and output level of the factory can be decided or planned in the long run as we could compare relative short run cost curves, their capacity level and effective cost for desired level of production. Long run cost curve is envelope of many short run average cost curve and hence we could understand comparative average cost of production in multiple factories. For smaller level of output small factories can be used and for larger level of production output scale of the factory should be larger.

7.9 QUESTIONS

1. Explain different types of costs in brief.

2. Differentiate between the following:

a. Accounting cost and Economic cost

b. Incremental and Sunk cost

c. Fixed cost and Variable cost

d. Average cost and Marginal cost

3. Discuss the revenue function.

4. Examine Break even analysis in detail.

8

TYPES OF MARKETS

Unit Structure

8.0 OBJECTIVES

- To study the features and price determination under perfect competition market
- To understand the features and price determination under monopoly market
- To study the features and price determination under monopolistic market
- To study features and price determination of oligopoly market

8.1 INTRODUCTION

A market is a place where people can come together to exchange products and services. Typically, the parties involved are buyers and sellers. The market may be physical, such as a retail shop, where people meet face to face, or virtual, such as an online market, where buyers and sellers may not have direct physical contact. A market is a gathering place for buyers and sellers to exchange or transact products and services. A market can be physical, such as a retail establishment, or virtual, such as an e-retailer.

Physical sites where transactions take place can be used to depict markets. Retail stores and other comparable enterprises that sell individual items to

wholesale markets that sell goods to distributors are examples of this. They could also be virtual. Internet-based stores and auction sites such as flipkart and e-bay are examples of markets where transactions can take place purely online with no physical contact between the parties involved.

Different Types of market:

The market is basically divided into two parts a) Perfect Competition b) Imperfect Competition. Even there are different types of market available in Imperfect Competition i) Monopoly ii) Monopolistic Competition iii) Oligopoly

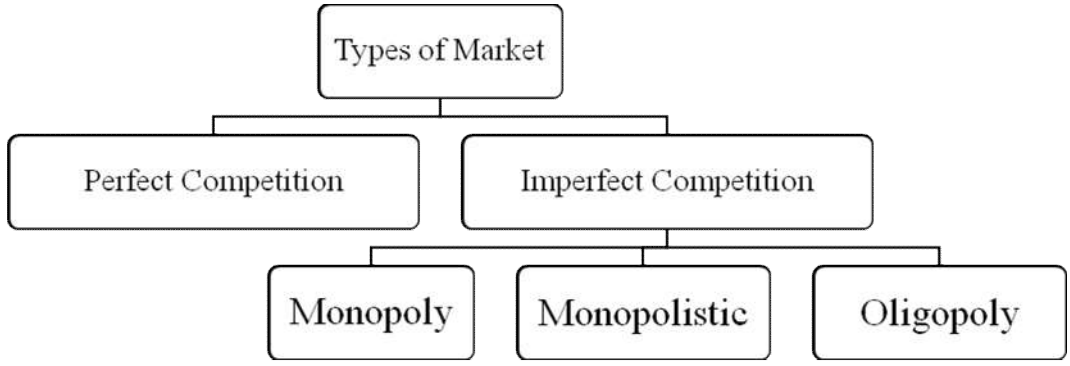


Fig 8.1

8.2 FEATURES OF PERFECT COMPETITION MARKET

A perfect competition marketplace is one in which several enterprises compete to sell the same product or service. Those things have piqued the interest of a large number of clients. None of these companies can set a price for their product or service without losing clients to competitors. There are no barriers to any corporation desiring to enter or exit the market. Because the end output from all sellers is so similar, consumers are unable to discern between one company's product or service and that of its competitors.

Features of Perfect Competition:

a) Large Number of buyers and Sellers

b) Homogeneous Product

c) Free Entry and Exit

d) Perfect Knowledge

e) Perfect Mobility of Factors of Production

f) Transport Cost

g) No Government Intervention

a) Large Number of Buyers and Sellers – There will always be a large number of buyers and sellers in this type of marketplace. The advantage of having a large number of small-scale producers is that

their resources cannot be pooled to affect market prices. If the quantity given by an individual seller is insignificant in proportion to the overall market produce, they will be unable to influence the market price on their own.

b) Homogenous Product - In an ideal market, the purchasers' product or service should be homogeneous in every manner. There should be no distinction between them in terms of quantity, size, flavour, or other criteria, so that they can be utilised interchangeably. If a retailer attempts to charge a higher price for nearly comparable products, they will quickly lose customers.

c) Free Entry and Exit - In a truly competitive market, no artificial barriers prevent a firm from entering or compel an established firm to remain when it wishes to leave. Their decision to enter, remain in, or depart the market is purely driven by economic concerns.

d) Perfect Knowledge - Both buyers and sellers are well informed about the current market conditions. Buyers are aware of the product's specifications as well as its price. At the same time, the sellers are aware of the potential sales of their products at different price points. Because the customers are already aware of the product, there is no need for advertising or sales promotion. As a result, firms are not required to invest in these operations. It also enables businesses to save money on advertising and other marketing activities, allowing them to keep product costs low.

e) Perfect Mobility of factors of Production- Under ideal competition, factors of production such as labour, raw materials, and capital should have complete mobility. Workers should be able to move from one location (industry, market, or manufacturing unit) to another based on their pay. There should be no restrictions on the movement of raw materials or capital.

f) Transport Costs - All sellers' costs for transferring goods, services, or production inputs from one location to another in a fully competitive market are either zero or constant. All vendors are presumed to be equally near or far from the market. As a result, the cost of transportation for all of them is the same. As a result, overall production costs and selling prices remain consistent across the board.

g) No Government Interference - The government or any other regulating agency is not interfering with the smooth operation of the ideal competition. There are no restrictions or limitations on supply or pricing, and prices can change entirely based on demand and supply. In a completely competitive market, all commodities and services have a single consistent price. It is determined by the supply and demand dynamics.

8.3 PRICE DETERMINATION UNDER PERFECT COMPETITION MARKET

8.3.1 Price Determination in Short Run:

The term short period refers to a period of time in which current plants cannot be expanded and new plants cannot be built to fulfil rising demand. However, there is enough time for producers to adjust their output to the increased demand by overworking their fixed capacity factories to some level.The fact that a company is in equilibrium does not mean it is making abnormal profits. Firms may generate supernormal profits, normal profits, or losses in the short-run equilibrium.

a) Supernormal profit:

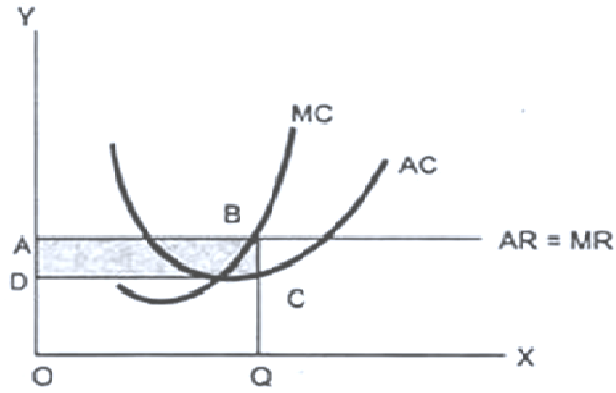


Fig 8.2

The level of the average cost in the short run equilibrium determines whether the firm produces supernormal profits, normal profits, or losses. The firm obtains supernormal profits if the average cost is less than the average revenue. The average cost QC is less than the average revenue QB in above figure and the firm makes profits equivalent to the area ABCD.

b) Loss:

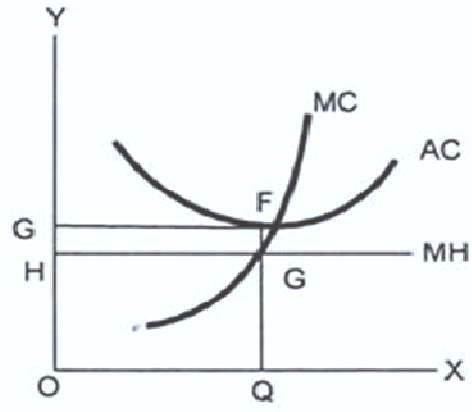


Fig 8.3

If the average cost exceeds the average revenue, the company will lose money. The above figure demonstrates that the firm's average cost QF exceeds its average revenue QG, resulting in a loss equal to the shaded region EFGH. In this instance, the company will only keep producing if it can cover its variable costs.

Otherwise, it will shut down since ceasing operations is preferable for the company; it reduces losses.

c) Shutdown:

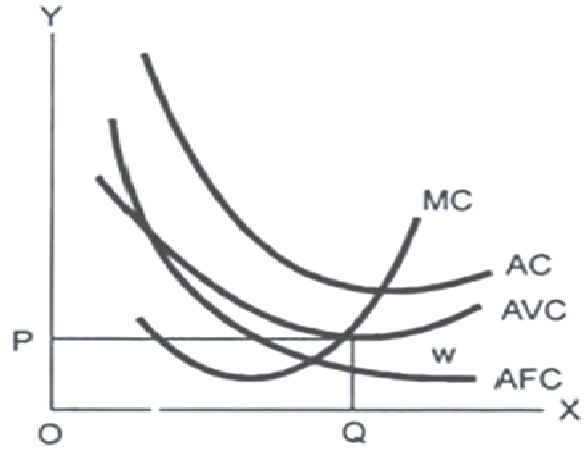


Fig 8.4

The 'closing-down point' is the moment at which a company's variable costs are covered. If the price falls below the cost of goods sold or average costs grow, the company will not be able to cover its variable costs and will be better off closing down. The shut-down point is depicted in the above figure.

8.3.2 Price Determination in Long Run:

The long run is defined as a span of time long enough to allow for changes in both the variable and the fixed factors. As a result, all factors are variable and non-fixed in the long run. Firms can change their output in the long run by upgrading their fixed equipment. They can increase the existing plants, replace them with new ones, or add new ones.

Furthermore, new businesses can enter the industry in the long run. On the other hand, if the situation requires it, firms can reduce their fixed equipment by allowing them to wear out without being replaced over time, and the present firm can exit the industry.As a result, the long run equilibrium will relate to a condition in which economic forces have been given complete freedom to adjust. The long run average and marginal cost curves are important for determining output decisions in the long run. Furthermore, in the long run, average variable cost has no bearing. Because all costs are variable and none are fixed in the long run, the average total cost is critical.

As a result, the conditions for a perfectly competitive firm's long-run equilibrium can be expressed as;

Price = Marginal Cost = Minimum Average Cost

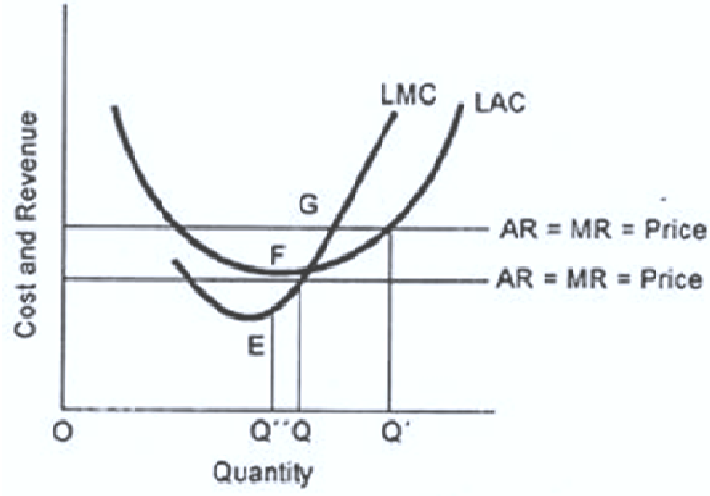


Fig 8.5

The firm under perfect competition is in long-run equilibrium at price OP when:

Price = Marginal Cost = Minimum Average Cost

At price OP, not only will all firms be in equilibrium at output OQ, but the industry will be in equilibrium as well, because there will be no incentive for new firms to enter or current firms to leave because everyone will be receiving normal profits. Thus, under perfect competition, entire equilibrium, i.e. equilibrium of all individual enterprises as well as the industry as a whole, is attained in the long term at OP price.

8.4 FEATURES OF MONOPOLY MARKET

The word monopoly is a mixture of two words: 'Mono' and 'Poly.' Monopoly is defined as a market condition in which there is only one seller of a commodity. Monopoly is defined as a market scenario in which there is only one seller of a commodity. There are no close substitutes for the product it provides, and admission is difficult. Individual owners, single partnerships, and joint stock companies are all examples of single producers. In other words, there is no distinction between firm and industry when there is a monopoly.

The monopolist has complete control over the commodity supply. He has the market power to establish the price since he controls the supply of the commodity. As a single seller, a monopolist can effectively rule without a throne. If monopoly is to exist, the cross elasticity of demand between the monopolist's product and the product of any other seller must be extremely low.

Definition:

"A pure monopoly exists when there is only one producer in the market. There are no dire competitions." –Ferguson

"Pure or absolute monopoly exists when a single firm is the sole producer for a product for which there are no close substitutes." –McConnel

Features of Monopoly Market:

a) One Seller and Large Number of Buyers:

b) No Close Substitutes:

c) Difficulty of Entry of New Firms:

d) Monopoly is also an Industry:

e) Price Maker

a) One Seller and Large Number of Buyers: The monopolist's business is the sole business; it is an industry. However, it is expected that there would be a considerable number of buyers.

b) No Close Substitutes: There must be no close substitutes for the monopolist's product. The cross elasticity of demand between the monopolist's product and those of others must be minimal or non-existent.

c) Difficulty of Entry of New firms: Even when a firm is producing abnormal profits, there are natural or artificial barriers to new firms entering the industry.

d) Monopoly is also an Industry: Under monopoly there is only one firm which constitutes the industry. Difference between firm and industry comes to an end.

e) Price Maker: When a monopoly exists, the monopolist has complete control over the commodity's supply. However, due to the vast number of purchasers, each buyer's desire represents an endlessly small portion of the total demand. As a result, customers must pay the monopolist's set price.

8.5 PRICE DETERMINATION UNDER MONOPOLY MARKET

8.5.1 Price Determination in Short Run:

Understanding the nature of the demand curve confronting a monopolist becomes critical when there is a monopoly. There is no distinction between firm and industry under a monopoly situation. As a result, when a monopoly exists, the firm's demand curve becomes the industry's demand curve. The monopolist faces a downward sloping demand curve because the consumer's demand curve slopes downward from left to right. It

simply means that if a monopolist lowers the price of a commodity, demand for that product rises, and vice versa.

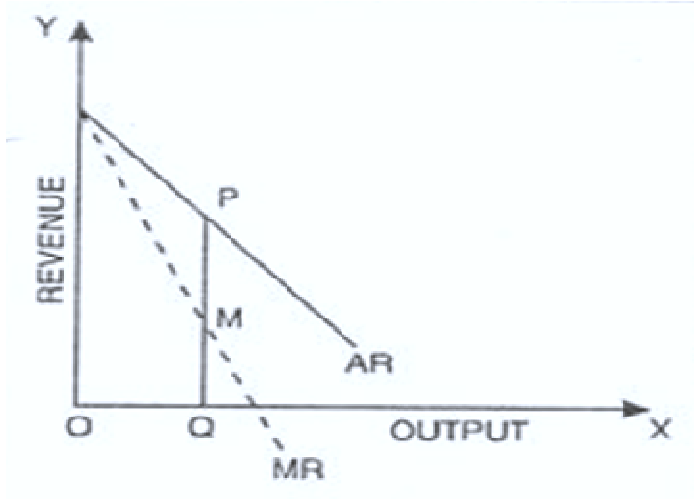


Fig 8.6

As shown in figure, the monopolist's average revenue curve slopes down from left to right. Also sloping downward from left to right is marginal revenue (MR) curve. The MR curve is below the AR curve, indicating that average revenue (= Price) is PQ at OQ output, but marginal revenue is MQ. As a result, AR> MR or PQ > MQ.

a) Supernormal profit:

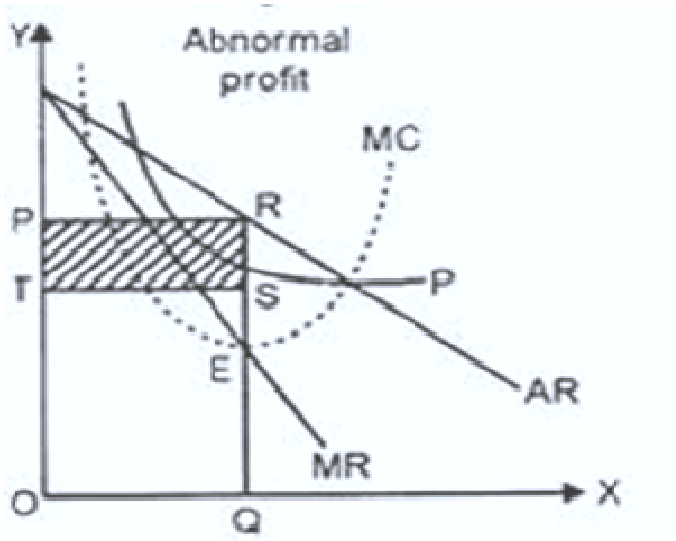


Fig 8.7

When MC = MR, the company is in equilibrium at point E, and the MC curve begins to rise. OP is the price, and OQ is the 'total production' of the commodity as determined by the condition. We must measure the difference between AR and AC in order to compute profits or losses. If AR > AC, the difference between the two is profit per unit, which we can calculate by multiplying it by the total number of units created.

b) Normal Profit:

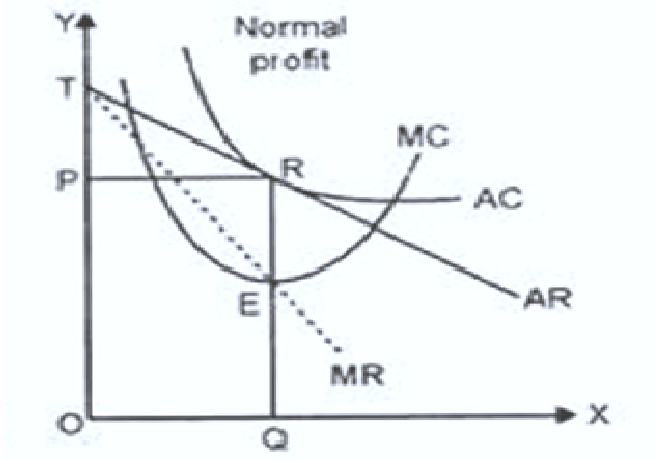


Fig 8.8

The price is RQ = OP in the first figure, and the cost of production per unit is TO in the second. As a result, RS =PT is the profit unit. Total profit is the PTSR dark region on the OQ quantity of production, which is abnormal profit. The established price is RQ = OP in the second figure, and the average cost is RQ. There will be no profit at all in this situation.

c) Loss:

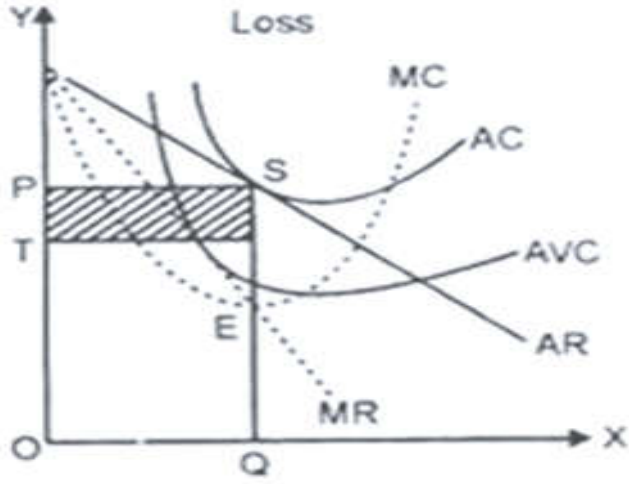


Fig 8.9

Price per unit is RQ = OP in figure three, whereas cost per unit is SQ. As a result, SR (TP) stands for loss per unit. As a result, the shaded area of the TPRS will be completely lost. However, this loss is only a temporary occurrence. This loss will vanish with time, and under certain conditions and circumstances, only profit will be earned.

8.5.2 Price Determination in Long Run:

Over time, the monopolist makes adjustments to his equipment and manufacturing procedures. During this time, he will adjust the efficiency

and capacity of his resources to meet his needs in order to maximise profit. However, the quantity of production is determined in the same way as it was in the short period.The following diagram demonstrates this:

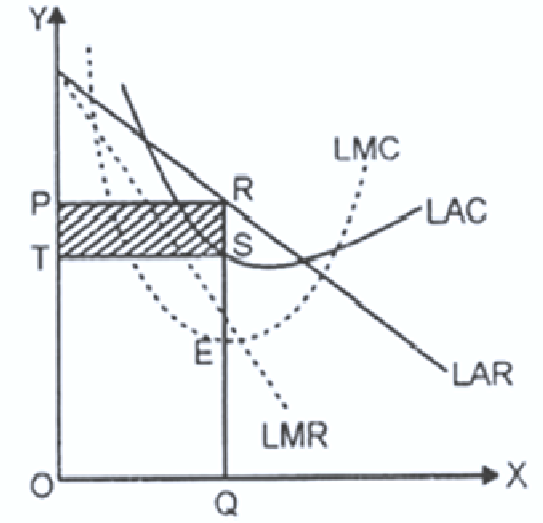


Fig 8.10

The LMC and LMR intersect at point E in this diagram, and then the LMC continues to rise. As a result, OQ production is established, and OP is the price. However, the average cost is SQ. So the profit per unit is RS, and the overall profit at OQ production is PTSR.

8.6 FEATURES OF MONOPOLISTIC MARKET

Monopolistic competition is a market condition in which a large number of companies sell closely related but distinct products. Monopolistic competition can be seen in markets for soap, toothpaste, air conditioning, and other items.When we go into a department store to buy toothpaste, we'll see a variety of brands such as Pepsodent, Colgate, Neem, Babool, and so on.

Monopolistic Competition = Monopoly + Perfect Competition

Features of Monopolistic Competition:

a) Large Number of Buyers and Sellers

b) Product Differentiation

c) Selling Costs

d) Freedom of Entry and Exit

e) Lack of Perfect Knowledge

f) Pricing Decision

g) Non-Price Competition

a) Large Number of Buyers and Sellers - There are a lot of companies selling things that are similar but not identical. Each firm is self-contained and has a small market share. As a result, a single

company's market price control is limited. The presence of a large number of businesses creates market competition.

b) Product Differentiation - Despite the enormous number of sellers, each firm can wield some degree of monopoly through product diversification. Differentiating items based on brand, size, colour, shape, and other factors is known as product differentiation. A firm's product is a close but not perfect equivalent for another firm's product.

c) Selling Costs - Products are differentiated under monopolistic competition, and these distinctions are communicated to purchasers through selling costs. The expenses incurred on product marketing, sales promotion, and advertising are referred to as selling costs. Such expenses are expended to encourage customers to purchase a specific brand of a product over a competitor's brand. As a result, under monopolistic competition, selling costs account for a significant portion of total costs.

d) Freedom of Entry and Exit - Firms under monopolistic competition have complete freedom to enter or depart the industry at any moment. It assures that a company does not experience abnormal earnings or losses in the long run. However, in monopolistic competition, admission is not as easy or as free as it is under perfect competition.

e) Lack of Perfect Knowledge - Both buyers and sellers are unaware of the current market conditions. Selling expenses instil fake superiority in the minds of consumers, making it difficult for them to compare and contrast different products on the market. As a result, even if other lower-cost products are of same quality, consumers prefer a particular product (despite its high price).

f) Pricing Decision - Under monopolistic competition, a company cannot be both a price taker and a price maker. Each firm, on the other hand, has partial control over the pricing by manufacturing a unique product or establishing a specific reputation. The amount to which he can control price is determined by how loyal his customers are to his brand.

g) Non-Price Competition - Non-price competition exists alongside price competition in monopolistic competition. Non-Price Competition is when a company competes with another company by giving away free gifts, offering favourable credit conditions, and so on, without increasing the price of its own items.

8.7 PRICE DETERMINATION UNDER MONOPOLISTIC MARKET

8.7.1 Price Determination in Short Run:

In the short run, a monopolistically competitive corporation can make a supernormal profit, a normal profit, or a loss. All three instances are explained in the diagrams below.

a) Super Normal Profit:

Given a firm's demand and cost curves, the firm would create the profit-maximizing level of output when MR=MC. This is the firm's output level of equilibrium.

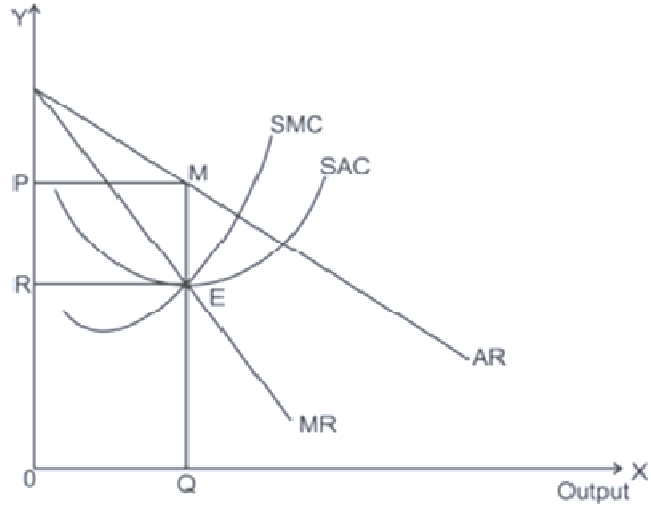


Fig 8.11

We measure output on the X axis and cost and revenue on the Y axis. AR and MR are the more elastic or flatter average and marginal revenue curves. The short run average and marginal cost curves are abbreviated as SAC and SMC. The equilibrium point of the firm is E, and the output level of the firm is OQ. As a result, the pricing is either OP or QM. TR= OQMP, TC=OQER in the following diagram with price OP and output OQ. As TR>TC, excess profit = REMP (OQMP-OQER)

b) Normal Profit: A typical profit condition is quite uncommon. Due to changes in demand and cost conditions, the firm may be able to just meet its production costs, i.e. the scenario of normal profit.

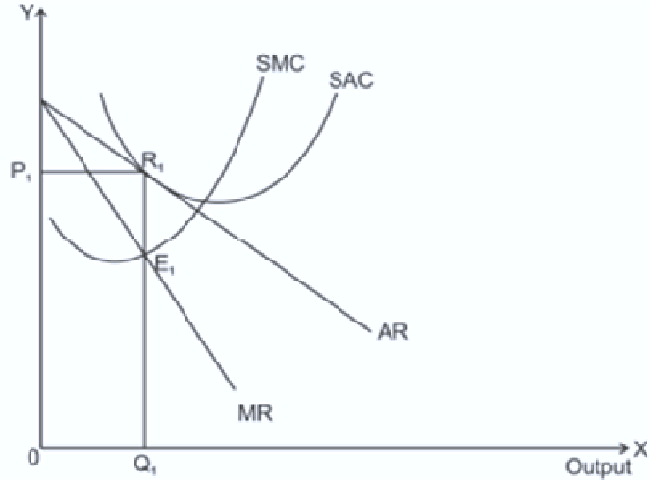


Fig 8.12

The firm is in equilibrium at point E_1, the intersection of the MR and MC curves, with provided revenue and cost curves. TR= $OQ_1R_1P_1$, TC= $OQ_1R_1P_1$, Output= OQ_1, Price= OP_1. The corporation will generate a regular profit because TR=TC.

c) Loss: Due to demand and cost factors, the corporation may have to run at a loss. We can demonstrate the loss scenario using the figure below.

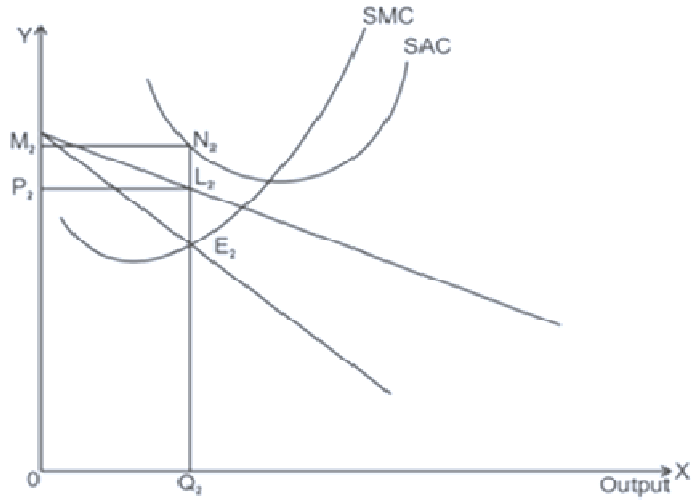


Fig 8.13

The firm is in equilibrium at point E_2, where the MR and MC curves overlap, with the specified revenue and cost curves. OQ_2 is the equilibrium output, and OP_2 is the equilibrium price. $OQ_2L_2P_2$ is the TR, while $OQ_2N_2M_2$ is the TC. The firm will lose money if TC>TR. When a company experiences a short-term loss, it must decide whether or not to continue operating. The company will continue to operate as long as it can cover its entire variable costs, and when TR comes into play.

8.7.2 Price Determination in Long Run:

The firm will be able to make all required modifications in its fixed factors of production in the long run. Because all costs are variable, the company cannot continue to lose money. Because there is no barrier to entry or exit, more firms will enter the market, and enterprises that cannot afford their costs of production will exit. More firms joining the market diminish the market share of existing firms, resulting in all firms making a normal profit in the long term. The following diagram can be used to demonstrate the scenario of normal profit.

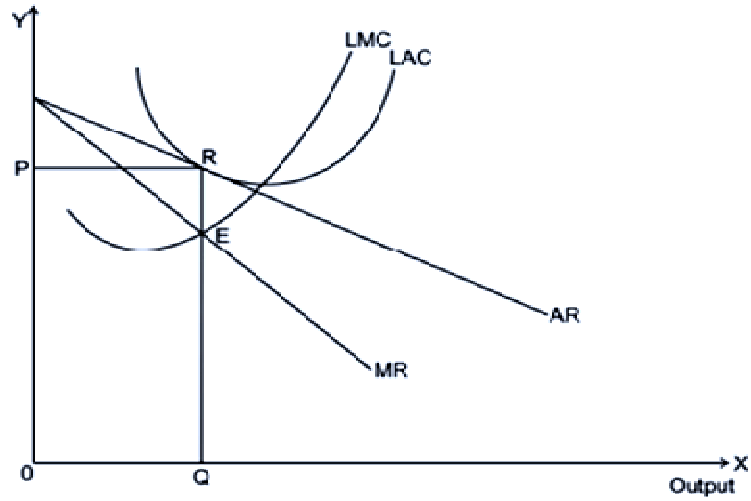


Fig 8.14

The equilibrium point is E, where the MR and MC curves intersect, given the revenue and cost curves. Because TR=TC, there is a normal profit. Equilibrium output= OQ, price= OP, TR= OQRP and TC= OQRP.

8.8 FEATURES OF OLIGOPOLY MARKET

The term oligopoly comes from two Greek words: 'oligo' which means few and 'poly' which implies seller. Oligopoly is a market structure in which there are just a few vendors of homogeneous or differentiated products (but more than two). So, oligopoly is a type of monopolistic competition that exists between monopolistic competition and monopoly.

A market scenario in which a few enterprises sell homogeneous or differentiated items is known as an oligopoly. The number of firms in an oligopolist market is difficult to estimate. There could be three, four, or five companies.Competition among the few is another name for it. With only a few firms in the market, one firm's actions are likely to have an impact on the others. In an oligopoly industry, products are either homogenous or heterogeneous.

Pure or perfect oligopoly is one type, whereas imperfect or differentiated oligopoly is another. Pure oligopoly is most common among manufacturers of industrial items such as aluminium, cement, copper, steel, zinc, and so on. Automobiles, cigarettes, soaps and detergents, televisions, rubber tyres, refrigerators, typewriters, and other consumer items are examples of imperfect oligopoly.

Features of Oligopoly:

a) Few Firms
b) Interdependence
c) Non-Price Competition
d) Barriers to Entry of firms
e) Role of Selling Costs
f) Group Behaviour
g) Nature of the Product
h) Indeterminate Demand Curve

a) Few Firms - There are just a few large enterprises in an oligopoly. The actual number of businesses is unknown. Each company contributes a considerable amount to the entire output. Different enterprises compete fiercely, and each one tries to outsmart the other by manipulating both prices and output volume. In India, for example, the vehicle market is oligopolist because there are only a few car manufacturers.Because the number of firms is so small, any action taken by one of them is likely to have an impact on the other firms. As a result, each firm maintains a watchful eye on the activities of competitors.

b) Interdependence - Oligopolistic firms are interdependent. The term "interdependence" refers to how the acts of one firm influence the actions of others. When deciding its price and output levels, a company evaluates the actions and reactions of its competitors. A change in output or pricing by one firm elicits a response from other market participants.

   In India, for example, a few companies dominate the automobile market (Maruti, Tata, Hyundai, Ford, Honda, etc.). Any alteration made by one company (say, Tata) to one of its vehicles (say, Indica) will cause other companies (such as Maruti, Hyundai, and others) to make changes to their own vehicles.

c) Non-Price Competition - Firms in an oligopoly have the ability to affect prices. They do, however, aim to avoid price competition because they are afraid of a price war. They adhere to a price-fixing policy. Price rigidity is a scenario in which prices tend to remain constant despite changes in demand and supply. Firms compete with each other through different means such as advertising, superior customer service, and so on.

   When a company seeks to lower its pricing, its competitors will respond by lowering their prices as well. If it tries to raise the price, though, other companies may not follow suit. It will result in the firm's proposed price increase losing clients. As a result, businesses prefer non-price competition to price rivalry.

d) Barriers to Entry of firms - The fundamental reason for the oligopoly's small number of firms is the hurdles that prohibit new firms from entering the field. Patents, the need for a considerable amount of capital, control over critical raw materials, and other factors all restrict new businesses from entering the market. Only those companies who can overcome these obstacles are allowed to enter the business. As a result, companies can make anomalous profits over time.

e) Role of Selling Costs - Because of the fierce competition and interdependence of the firms, numerous sales promotion strategies are employed to boost product sales. Under an oligopoly, advertising is in full flow, and it may often become a life-or-death situation. When a company is in an oligopoly, it relies more on non-price competition.

When there is an oligopoly, selling expenses are more essential than when there is monopolistic competition.

f) Group Behaviour - There is total interconnectedness among different enterprises in an oligopoly. As a result, a firm's price and output decisions have a direct impact on its competitors. Oligopoly enterprises prefer collective decisions that safeguard the interests of all the firms over separate price and production strategies. Firms that operate as if they were a single entity, despite their individual independence, are said to be engaging in group behaviour.

g) Nature of the Product- Oligopolistic enterprises can produce uniform or differentiated goods.

   a. The industry is known as a pure or perfect oligopoly if the firms create a homogeneous product, such as cement or steel.

   b. The industry is called differentiated or imperfect oligopoly if the firms create a differentiated product, such as autos.

h) Indeterminate Demand Curve- In an oligopoly, it is impossible to predict a producer's exact behaviour pattern. As a result, an oligopolist's demand curve is indefinite (uncertain). Because businesses are so intertwined, they can't afford to ignore the reactions of their competitors. Any pricing adjustment by one entity may result in price changes by competitors. As a result, the demand curve is always moving and is neither defined nor indeterminate.

8.9 PRICE DETERMINATION UNDER OLIGOPOLY MARKET

Oligopoly market can be understood throughSweezy's non-collusive oligopoly model as well as collusive oligopoly models involving cartels and pricing leadership.

8.9.1 Sweezy's Kinked Demand Curve (Rigid Prices) Model:

Prof.Sweezy proposed the kinked demand curve analysis in a 1939 work to explain price rigidities commonly encountered in oligopolistic settings. Sweezy assumes that if an oligopolistic firm cuts its pricing, its competitors will follow suit in order to avoid losing consumers. As a result, lowering the price will not significantly increase demand. Its demand curve is relatively inelastic at this point.If the oligopolistic firm raises its pricing, however, its competitors will not follow suit and modify their prices. As a result, the quantity requested of this organisation will be significantly reduced. This part of the demand curve has a lot of wiggle room. In both of these cases, the oligopolistic firm's demand curve has a kink at the current market price, which explains pricing rigidity.

The following figuredepicts the price-output connection in the oligopolist market, where KPD is the kinked demand curve and OP_0 is the prevailing price in the oligopoly market for one seller's OR product. Starting at point

P, which corresponds to the present price OP_1, any price rise above it will significantly lower his sales, as his competitors are unlikely to match his price increase. This is because the kinked demand curve's KP section is elastic, while the corresponding KA portion of the MR curve is positive. As a result, any increase in price will reduce not only his total sales, but also his total revenue and profit.

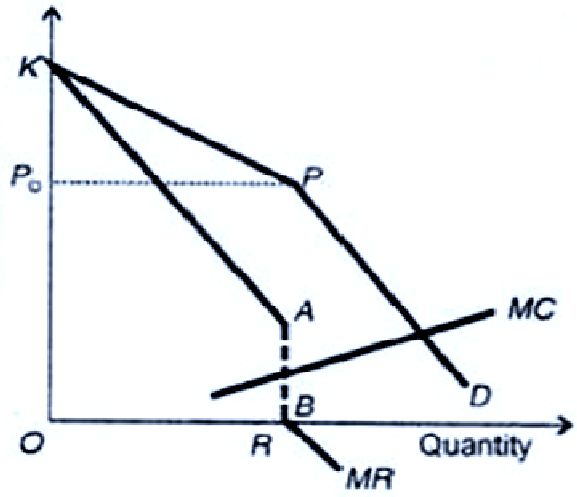


Fig 8.15

If the seller lowers the price of the goods below OPQ (or P), his competitors will also lower their pricing. He will increase sales, but his profit will be lower than before. The reason for this is that below P, the PD component of the kinked demand curve is less elastic, and the corresponding part of the marginal revenue curve is negative. As a result, the seller will lose in both price-raising and price-lowering situations. He would keep to the current market price, OP_0, which is still fixed.

Effects of Cost Variations on Kinked demand curve:

Changes in costs within a certain range have no effect on the prevailing price in oligopoly under the kinked demand curve approach. Assume that the cost of production reduces, and the new MC curve is MC_1. It cuts the MR curve in the gap AB, resulting in OR as the profit-maximizing output that can be sold at OP_0.It's worth noting that any cost decrease will result in the new MC curve cutting the MR curve in the gap, since as costs fall, the gap AB continues to grow for two reasons:

(1) As costs decline, the upper section KP of the demand curve becomes more elastic due to the increased certainty that a price increase by one seller will not be followed by competitors, reducing his sales significantly.

(2) As costs decrease, the lower half PD of the kinked curve becomes more inelastic, as there is a larger likelihood that a price cut by one seller will be followed by other competitors.

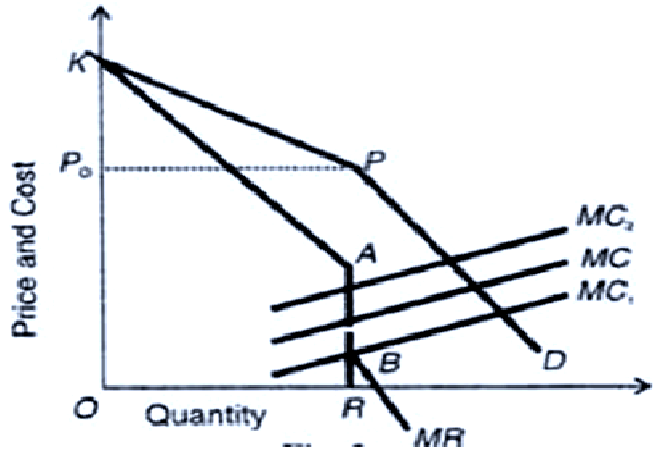


Fig 8.16

As a result, at P, the angle KPD tends to be a right angle, and the gap AB grows, cutting the marginal revenue curve inside the gap with any MC curve below point A. The overall consequence is the same production OR at the same price OP_0, with the oligopolistic sellers reaping higher profits.If the cost of production rises, the marginal cost curve, now known as MC_2, will shift to the left of the old curve, MC. The price situation will be rigid as long as the higher MC curve crosses the MR curve within the gap up to point A. However, as costs rise, the price is unlikely to stay constant indefinitely, and if the MC curve rises above point A, it will intersect the MC curve in the portion KA, resulting in a lower quantity sold at a higher price. We can conclude that even when costs fluctuate, price stability may exist under oligopoly if the MC curve cuts the MR curve in its discontinuous half. However, where costs are falling rather than rising, the odds of pricing rigidity are higher.

8.9.2 Collusive Oligopoly:

Collusive oligopoly is a situation in which companies in a given industry decide to band together as a single entity in order to maximise their combined earnings and negotiate market share. The former is referred to as a joint profit maximisation cartel, while the latter is referred to as a market-sharing cartel. Another sort of cooperation is called leadership, and it is built on unspoken agreements.

A) Cartels:

A cartel is a group of independent businesses operating in the same industry. Prices, outputs, sales and profit maximisation, and product distribution are all governed by cartel policies. Cartels can be voluntary or compulsory, open or secret, depending on the government's policy on the formation of cartels. As a result, cartels come in a variety of shapes and sizes, and they employ a variety of strategies to adhere to a variety of common policies, depending on the sort of cartel. The two most common types of cartels are discussed below: (1) joint profit maximisation or perfect cartel; and (2) market-sharing cartel.

a) Cartel for Joint Profit Maximization:

In an oligopolistic market, the uncertainty creates an incentive for rival enterprises to form a perfect cartel. A perfect cartel is a type of perfect collusion that is at its most extreme. In this case, companies that produce a uniform product form a centralised cartel board in the industry. This central board receives the price-output decisions made by the individual enterprises.

The board sets output quotas for its members, as well as the price to be charged and how industry profits are distributed. Because the central board manipulates prices, outputs, sales, and profit distribution, it acts as a single monopoly whose primary goal is to maximise the oligopolistic industry's combined profits.

Joint profits will be maximised when the industry MR matches the industry MC, given the market demand curve and its corresponding MR curve, D denoting the market (or cartel) demand curve and MR denoting the marginal revenue curve. The lateral summation of the MC curves of firms A and, resulting in M = MC_a + MC_b, is used to draw the aggregate marginal cost curve of the industry M. At point E, where the curve intersects the industry MR curve, the cartel solution that maximises joint profit is determined.

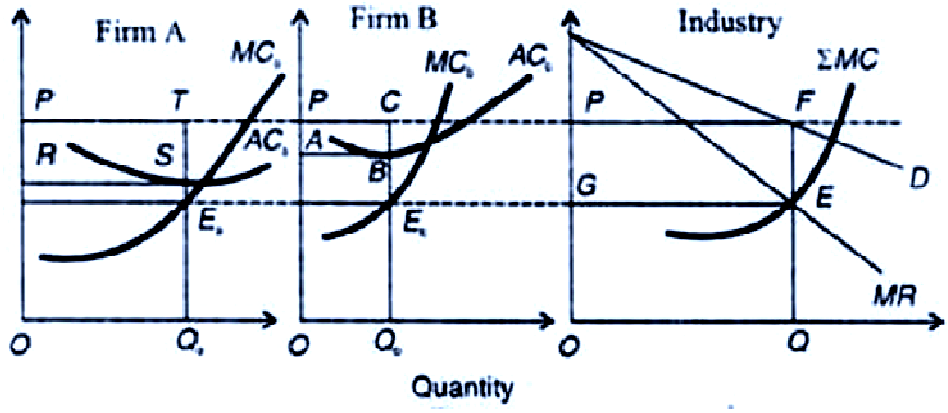


Fig 8.17

As a result, the total output is OQ, which will be sold at a price of OP = (QF). The cartel board will allocate industry output by equating the industry MR to each firm's marginal cost, just as it would in a monopoly. Drawing a straight line from E to the vertical axis and passing through the curves MC_b and MC_a of firms and A at points E_b and E_a, respectively, yields the share of each firm in the industry output.

As a result, firm A's part is OQ_a, and firm B's share is OO_b, both of which equal the total output OQ which is OQ_a + OQ_b. The monopoly solution is the price OP and output OQ distributed between A with lower costs sells larger output than firm B with higher costs, so OQ_a>OQ_b; however, this does not mean that A will make more profit than B.

The joint maximum profit is the sum of RSTP and ABCP earned by A and which will be pooled into a fund and distributed by the cartel board in accordance with the agreement reached by the two firms at the time of the cartel's formation. A pooling agreement of this type will allow both firms to maximise their joint profit as long as their individual profits do not exceed the former.

b) Cartel of Market-Sharing:

In practise, another type of perfect collusion in an oligopolistic market occurs when member firms of a cartel enter into a market-sharing agreement to form a cartel "while maintaining a significant degree of freedom concerning the style of their output, their selling activities, and other decisions."

Market-sharing can be done in two ways:

(i) Non-price competition - A loose form of cartel is a non-price competition agreement among oligopolistic enterprises. Under this sort of cartel, the low-cost enterprises urge for a low price and the high-cost firms for a high price. However, they eventually come to an agreement on a common price below which they will not sell.

They must be able to make some money at such a low price. Firms can compete on a non-price basis by varying the colour, design, shape, packaging, and other features of their products, as well as having their own advertising and other sales activities. As a result, each firm shares the market without regard to price while selling the product at the agreed-upon common price.

(ii) Quota Agreement - The quota agreement among firms is the second method of market sharing. In an oligopolistic industry, all firms form collusion in order to charge a uniform price. The fundamental agreement, however, is that the market will be shared evenly among member firms, allowing each firm to profit from its sales.

B) Price Leadership:

When all oligopolistic firms in an industry follow the lead of one large firm, it is referred to as price leadership.The firms have an unspoken agreement to sell the product at a price set by the industry leader (i.e. the big firm). There is sometimes a formal meeting with the leader firm, and a clear agreement is reached. A uniform price is established if the products are homogeneous. Prices can be uniform even if the product is differentiated. The leader announces any price changes that occur from time to time, and the other firms follow suit.

There are several sorts of price leadership. However, we'll look at three of the most common pricing leadership models right now:

a) Low-Cost Price Leadership:

In the low-cost price leadership model, an oligopolistic firm with lower costs sets a lower price that all other firms must follow. As a result, the low-cost company becomes the price leader.

b) Dominant Firm Price Leadership:

This is a typical case of price leadership in which the industry is dominated by one large dominant firm and a number of small firms. The dominant firm sets the price for the entire industry, while small businesses sell as much as they want and the dominant firm fills the remaining market. As a result, it will choose the price that maximises its profits.

c) Barometric Price Leadership:

The barometer price leadership model is one in where there is no single leader firm, but rather one oligopolistic firm with the wisest management that announces a price change first, followed by the rest of the industry. The dominant firm with the lowest cost, or even the largest firm in the industry, may not be the barometric price leader.It's a company that functions as a barometer for predicting changes in industry cost and demand situations, as well as overall economic conditions. Other firms in the sector consider such a firm as the leader and follow it in making price changes for the product based on a formal or informal implicit agreement.

8.10 SUMMARY

A market is a place where people can come together to exchange products and services.A perfect competition marketplace is one in which several enterprises compete to sell the same product or service.The term short period refers to a period of time in which current plants cannot be expanded and new plants cannot be built to fulfil rising demand.The long run is defined as a span of time long enough to allow for changes in both the variable and the fixed factors.Monopoly is defined as a market condition in which there is only one seller of a commodity.Monopolistic competition is a market condition in which a large number of companies sell closely related but distinct products.Oligopoly is a market structure in which there are just a few vendors of homogeneous or differentiated products (but more than two).

8.11 QUESTIONS

1. Explain the features of perfect competition market. How price is determined under perfect competition market?
2. What are the features of monopoly market? Elaborate the price determination in monopoly market.
3. What is monopolistic market? Explain its features and price determination.
4. Explain the features of oligopoly market along with collusive and non-collusive models.

9

PRICING PRACTICES

Unit Structure

9.0 OBJECTIVES

- To study the factors which affect pricing decision
- To understand the concept of marginal cost pricing
- To study the meaning of Mark-up pricing
- To understand the concept of Transfer pricing
- To study what is the meaning of Product line pricing
- To understand the concept of Price Skimming
- To understand the meaning of Penetration pricing

9.1 INTRODUCTION

Pricing strategy refers to the technique by which businesses price their products or services. Almost all businesses, large and small, base the pricing of their goods and services on production, labour, and advertising costs, then add a set percentage to make a profit. Pricing techniques

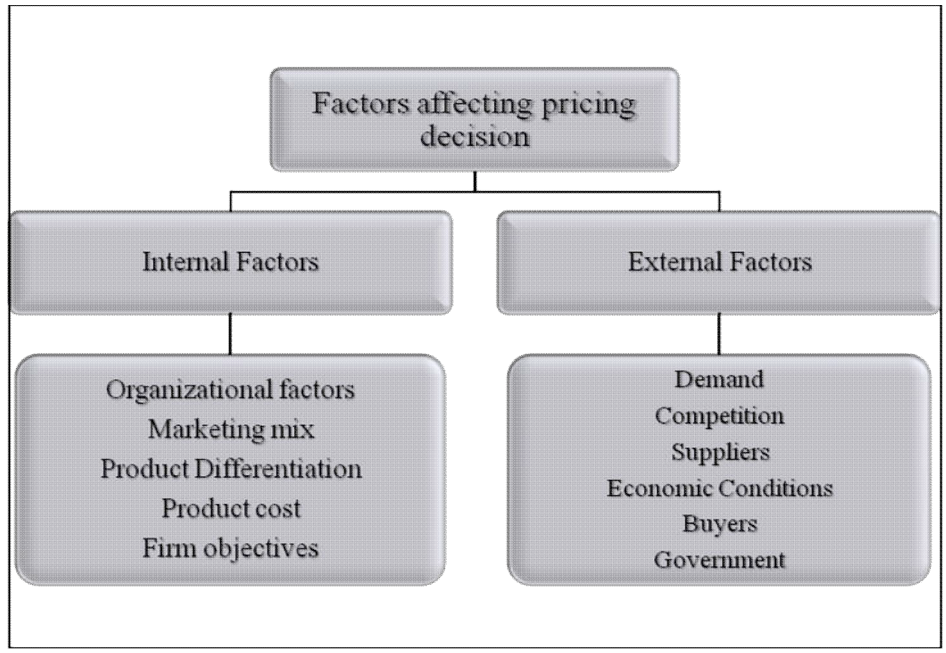
include penetration pricing, price skimming, discount pricing, product life cycle pricing, and even competitive pricing.

9.2 FACTORS AFFECTING PRICING DECISION

9.2.1 Internal Factors: Organizational Factors, Marketing Mix, Product Differentiation, Product Cost, and Firm Objectives.

1. Organisational Factors

Pricing choices are made at two levels inside the organisation. Top executives are in charge of overall pricing strategy. They identify the basic market segment ranges into which the product falls. The real mechanics of pricing are handled at lower levels of the organisation, with a focus on individual product plans. Typically, a team of production and marketing experts collaborate to determine the pricing.



2. Marketing Mix

Price is merely one of several crucial factors in the marketing mix, according to marketing professionals. Any change in any of the four factors has an immediate impact on the others: production, promotion, and distribution. In some industries, a company may utilise price reduction as a marketing strategy.

Other businesses may raise prices as part of a deliberate effort to create a high-end product line. In any situation, the endeavour will fail unless the price change is accompanied by a comprehensive marketing campaign. When a company raises its prices, it may include a more impressive-looking bundle and launch a new advertising campaign.

3. Product Differentiation

The price of the product is also determined by its qualities. To entice customers, many features are added to the goods, such as quality, size, colour, appealing packaging, alternate usage, and so on. Customers generally pay a higher price for a product that has a new style, fashion, a nicer box, and so on.

4. The product's cost

The cost and price of a thing are inextricably linked. The cost of production is the most crucial aspect. When selecting whether or not to promote a product, a company may try to determine what prices are reasonable in light of existing market demand and competition. The product is eventually sold to the general public, and their ability to pay will determine the price; otherwise, the product would flounder in the market.

5. The Firm's Objectives:

A company may have a variety of aims, and pricing plays a role in accomplishing those goals. Firms may pursue a number of value-oriented goals, such as increasing sales revenue, increasing market share, increasing client volume, decreasing customer volume, preserving an image, maintaining a constant price, and so on. Pricing policy should be created only after careful evaluation of the firm's objectives.

9.2.2 External Factors: Demand, Competition, Suppliers, Economic Conditions, Buyers, and Government.

1.Demand

Pricing is plainly affected by market demand for a product or service. Because demand is influenced by factors such as the number and size of rivals, prospective purchasers, their capacity and readiness to pay, their preferences, and so on, these considerations are taken into account when determining the price.

A firm can calculate the expected price in a few test markets by experimenting with different prices in different marketplaces and comparing the outcomes to a controlled market where the price is not changed. If the product's demand is inelastic, excessive prices may be set. If, on the other side, demand is elastic, the firm should not set high pricing, but rather lower prices than competitors.

2. Competition

Pricing decisions are influenced by competitive conditions. Price determination is heavily influenced by competition. A firm may set a price that is equal to or lower than that of its competitors, provided that the product's quality is never lower than that of its competitors.

3. Suppliers

Suppliers of raw materials and other commodities can have a considerable impact on product pricing. If the price of cotton rises, the increase is passed on to manufacturers through suppliers. It is then passed on to customers by manufacturers.

However, when a manufacturer looks to be generating significant profits on a specific product, suppliers may try to gain money by charging more for their supplies. In other words, the price of finished goods is inextricably related to the price of raw resources. Pricing is also determined by the scarcity or abundance of raw materials.

4. Economic Conditions

Pricing is affected by inflationary or deflationary tendencies. During a recession, prices are dropped significantly in order to maintain the level of turnover. Prices, on the other hand, rise during the boom phase to compensate rising production and distribution costs. To adapt to changes in demand, price, and so forth.

There are several pricing options available:

(a) Prices can be increased to safeguard profits from growing costs.

(b) Price protection mechanisms that link delivery prices to current costs can be devised.

5. Buyers

The numerous individuals and businesses who purchase a company's products or services may have an impact on price decisions. When a large number of them purchase a specific product, brand, or service, their nature and behaviour effect pricing.

6. Government

Price discretion is also influenced by price controls enacted by the government when it is deemed necessary to halt the inflationary tendency in the prices of specific products. Prices cannot be raised because the government closely monitors pricing in the private sector. Marketers clearly have significant control over internal elements, whereas they have little, if any, control over external factors.

9.3 MARGINAL COST PRICING

Prices are set by marginal cost rather than fixed cost in marginal cost pricing. Fixed costs are disregarded. For determining equilibrium production, economic analysis relies on Marginal Cost and Marginal Revenue analysis. Profit maximisation is a key goal for businesses. To achieve this goal, the firm strives to set its prices in such a way that the total contribution to fixed expenses is maximised.

Under perfect competition, the marginal cost curve cuts the marginal revenue curve from below, and at the point of equilibrium, MR= MC and MR= AR. Thus MC= AR.

Benefits of Marginal Cost Pricing:

1) Under marginal cost pricing, prices are made competitive simply by having a greater fixed overhead structure. If a company's variable expenses are significant, its prices become uncompetitive. In the near run, variable costs can be controlled, while fixed costs are uncontrollable.
2) Marginal costs more closely reflect future cost levels and cost relationships than present costs since one is more interested in modifying the cost when making a pricing decision. These fluctuations are represented by marginal cost, whereas fixed cost does not indicate such changes as a result of price decisions.
3) Marginal cost pricing enables firms to devise more aggressive price strategies. This pricing strategy increases sales while decreasing marginal expenses.
4) Marginal cost pricing is more useful for pricing a product over its life cycle.

Disadvantages of Marginal Cost Pricing:

1) Because some accountants are unfamiliar with marginal cost approaches, they are unable to explain their application to management.
2) Marginal cost pricing is unappealing.
3) During a recession, a corporation utilising the marginal cost pricing approach may drop its prices in order to stay in business; this may prompt other firms to lower their prices as well, resulting in cutthroat competition.

9.4 MARKUP PRICING

Markup pricing is a pricing method in which the price of a product or service is set by adding the sum of the items and a percentage of the total as a markup. In other terms, it is the process of determining a product's selling price by adding a percentage to its cost. A markup is the price difference between the selling price and the cost of a good or service. Profit for a corporation is essentially the price added to the total cost of a good or service. Consider the following equation to better understand this concept:

Cost of Good or Service + Markup = Selling Price

This means that firms can determine their retail or selling pricing by adding a specific markup to the cost of making the goods or providing the service. If you want to know the markup %, apply the following formula:

Markup Percentage = ((Sales Price – Unit Cost)/(Unit Cost)) × 100

The amount of markup used by a business is determined by its demands, the type of firm, and the industry in which it operates. While some industries can afford to mark up the price of their goods and services by a modest proportion, others can afford to mark up the price of their goods and services by a significant amount.

Advantages of Markup Pricing:

Markup Pricing has various advantages that can help your business succeed. Here are some of the advantages of Markup Pricing.

1) Increases Profits: Considering markup pricing will help you set strategic prices for your goods and services that will make a profit for your firm. If you mark up your goods and services sufficiently, you can assist offset any production costs.

2) Recover Costs: Because you have the ability to create a profit when you mark up the pricing of your products and services, you can apply this profit to the labour and materials you used. This will keep you from falling into debt solely to produce your goods and services.

3) Simple Calculations: While developing a pricing strategy necessitates various key figures, finding the appropriate markup price is very simple due to its simple equation.

How to Make Use of Markup Pricing:

You can utilise markup pricing for a variety of purposes to help your business get to the top of its industry. Here are a few examples of how you can use markup pricing to your advantage.

1) Determining unit selling or retail prices: Before deciding on a retail pricing for a product or service, evaluate how much profit you want to generate and the highest price it will go for on the market. For example, if you want to make a 10% profit on every item you sell, the retail price of each item must be the sum of its wholesale price and a 10% markup on its wholesale cost.

2) To satisfy profit objectives: To create a profit, a product or service mark-up must cover all business expenses. When you make a deliberate mark-up, you can assist offset any losses you made while developing the product or service and keep out of debt.

3) Create an effective pricing plan: You may use markup pricing to your advantage by developing an effective price strategy for your company. When you can create enough profits with the proper markup %, you can surpass your competitors and help your firm find better success in its specific market.

9.5 TRANSFER PRICING

The value of products transferred between two parties who are linked to one another is referred to as transfer pricing. The sum thus attached can be

used to both products and services. When items are transferred from one unit to another, especially when the two units are located in separate nations, the notion of transfer pricing comes into play.

The exchange of products and services should take place between two units of a multinational or multi-state corporation. Larger organisations are divided into many divisions in order to provide effective management control over the institution as a whole. The transfer price is the amount charged by one unit of the organisation to the other unit for goods or services delivered.

Because this transfer occurs between two units of the same organisation, it is classified as an internal transfer rather than a sale. It might be one of the most essential aspects in assessing the flow of goods and services among a company's many divisions.This might assist you in measuring the performance of various divisions and units. When there are a large number of internal transfers, it becomes critical and must be handled carefully.

Pricing must be determined with careful consideration for the eventual market price. If the transfer price is set too high, the selling centre will be preferred, whereas if it is set too low, the buying centre will be favoured.

Objectives of Transfer Pricing:

Now that we understand what a transfer pricing mechanism is and why it is significant, we can analyse the goals that the notion seeks to achieve. Here are a few aims that you might find interesting -

1) Profitability:

Transfer price should take into account the profitability of both the organization's divisions. Because both divisions are owned by the same company. As a result, the objects, goods, and services can be set at any price.

However, if you want to keep the profit margins of both divisions unaltered, it would be a good idea to keep the prices as close to market prices as possible.

2) Taxation:

Taxation will also be affected by the transfer price. A proper transfer pricing strategy will assist you in offsetting the tax liability of one division with an equivalent liability on the other. One of the primary goals of transfer pricing is to maximise your company's overall tax profits. Open market considerations do not influence the transactions. This allows you to increase your taxation options.

3) Goal Alignment:

The transfer pricing should be set up in such a way that the divisional earnings of each division are completely aligned with the parent company's goals. The emphasis should be on increasing the profit margins

of the subdivisions while not affecting the overall profitability of the parent organisation. Transfer pricing must be set up in such a way that overall company earnings improve.

4) Individual unit performance review:

Transfer pricing might be one of the greatest ways to arrive at the most accurate valuation of the individual divisions. This can aid in making more informed decisions.

Appraising the managerial performance of the divisions, evaluating the contributions of the individual entities to the overall profits of the company, and assessing the worth of each division as an individual unit are some of the areas where transfer pricing can help with performance appraisal and performance management.

5) Examining international trade in depth:

Another primary goal of transfer pricing is to quantify the international commerce scenario. Pricing should be consistent with import and export norms and precisely measured.

A price that is too low can distort international trade data to a larger extent. Transfer pricing prices should be set in such a way that they do not skew international trade data.

6) Profit shifting

Profit shifting is a method of lowering one's tax liability in a specific jurisdiction. This can be accomplished by artificially lowering profitability. It also aims to decentralise production so that profits are concentrated sufficiently in the region where the commodities are manufactured.

Some other objectives of transfer pricing:

While transfer pricing must address the key purposes stated in the preceding section, it must also address a few other critical objectives. Among the other goals outlined in plain terms are the following:

Why Lower customs duty payments because the transfer is between two divisions of the same parent company. This will assist in lowering your pricing so that your products remain competitive in the market.

- Transfer pricing supports you in avoiding import quota limitations. This allows you to import the items without restriction.
- Allowing you to transfer funds to other places to help with company funding rules.

The primary goal of the transfer pricing idea is to allocate earnings between the parent company and its subsidiaries. However, if the two units or divisions are located in different countries, the taxes patterns will

be different, making the accurate computation and fixing of the transfer price a problematic issue.

In any event, the main reason for choosing an appropriate transfer price is to minimise or decrease taxation and so enhance profit. Transfer pricing's worldwide goals will include lower foreign exchange risks, increased competitive advantage, and improved governmental relations.

9.6 PRODUCT LINE PRICING

Product line pricing, also known as product lining, is a retail marketing method that involves categorising and pricing products and services in the same category based on their characteristics and quality. The division of goods and services into pricing categories is intended to generate different levels of perceived quality in the minds of buyers. Retailers frequently use this pricing approach in-store to display products from the same category. Products are displayed in order of quality and features.

Purpose of Product Line Pricing:

The goal of product line pricing is to maximise profits by presenting new items with the highest quality and number of features alongside other products and services with lower quantity and features, with the highest quality products having the highest price tags.

Another goal of product line price strategy is for a company to be able to offer something to customers of various socioeconomic backgrounds when they visit a business store.

Effectiveness of Products Line Pricing:

People of various classes have options when it comes to product line pricing. Buyers typically examine price tags before determining which goods to purchase. If you own a retail store, you've probably seen customers look at the price tags before deciding which things to buy.

Customers are not all equal in terms of purchasing power or preference. Some customers desire premium quality products at any price, whereas others want decent quality products that meet their needs at a reasonable price.

As a result, product line pricing enables a firm to provide something to consumers of all socioeconomic backgrounds when they visit a business store. Pricing lines, on the other hand, without justifying the increased price, may leave an unfavourable impression in the minds of clients. As a result, in order to maximise profit, the pricing lining strategy must be thoroughly planned before implementation.

Benefits of Product Line Pricing:

The price line strategy offers numerous benefits for both businesses and customers.

1) It is beneficial to clients with varying purchasing power and requirements.

2) Customers may easily select the things they can afford without the seller's assistance.

3) The price lining technique provides buyers with multiple options for a single product.

4) Buyers can select from a variety of products based on their budget and the desired qualities of the product.

5) Changing the price is also advantageous for businesses since it allows them to create huge profits without making large investments, which is standard practise.

6) Using this strategy, businesses can increase sales because most customers buy things at greater prices because they believe that the higher the price, the higher the quality of the product.

7) Even if a company sells a variety of products, marketers should concentrate on a single brand. As a result, the pricing line lowers marketing and advertising costs.

8) A product line pricing strategy helps manufacturers reduce inventory since they know which products need to be produced more in order to fulfil demand.

9) Labor and overhead expenses are reduced since multiple items can be created with the same machines and the same work can produce products with varying qualities.

Product Line Pricing Drawbacks:

1) The price line marketing method is intended to focus solely on the price of products.

2) If the manufacturers make greater income using the strategy, it will have a negative impact on sales of the pricey product during inflation, as individuals may begin purchasing a cheaper product at a low price to save expenditures.

3) A shift in market trend or inflation may result in surplus inventory.

4) It can also have a negative influence on the brand's devoted customers if they are unable to find products that are worth the price.

5) The product line pricing approach suggests that the company does not treat all customers equally because not all customers can enjoy the premium features, and even if they stick with your branded product, they will be dissatisfied.

9.7 PRICE SKIMMING

Price skimming is a pricing strategy in which the price of goods or services is initially set high and then gradually reduced as consumers become more familiar with it. This strategy is aimed at early adopters rather than the general public.

A variation on this method is termed penetration pricing, and it involves setting cheap prices at the time of debut in order to penetrate markets.

Benefits of Price Skimming:

1. Increased Return on Investment

Charging the highest initial price at the introduction of an innovative product, particularly in high-tech industries, might assist your company in recouping R&D and advertising costs. Companies such as Apple gain from large short-term earnings at the debut of a product, and the initial higher prices are justified by the technological achievements they produce.

The bottom line is that if you put all of your cash flow and resources into developing a gadget or service that no competitor can match, you should be able to charge higher prices during the launch to recoup the majority of your investment and, hopefully, fund future developments.

2. It aids in the creation and maintenance of your brand's image

Price skimming can also give the impression that a product is a high-quality "must have" for early adopters who can't live without the latest technology. Higher costs at the start of a product's life cycle allow you to establish a prestigious brand image that really attracts status aware consumers, and you'll also have the breathing room you need to drop prices as competitors enter the market. In some circumstances, a lower starting price at the outset can create customer price sensitivity, making subsequent rate increases unfeasible without losing sales.

3. It divides the market into segments

Price skimming, as previously noted, is an excellent strategy to segment your consumer base, potentially allowing you to collect the most possible profits from different categories of customers as you lower the price. Starting with a higher price will not deter early adopters, and as you lower the price over time, you will attract more price sensitive customers. You may capture some of that consumer surplus and increase your revenue by changing your prices depending on the product demand curve and the maximum price your consumers are prepared to pay.

4. Early Adopters Aid in the Testing of New Products

One advantage of early adopter customers is that they serve as test subjects for new items. Those status conscious customers who buy your new product first can provide vital feedback and assist you in ironing out the wrinkles before the next update and, hopefully, a larger user base.

Early adopters who enjoy your product can act as brand ambassadors, creating a sense of quality through word of mouth in addition to being valuable testers. This free offer will entice new clients to purchase the goods when the price reduces.

Price Skimming's Drawbacks:

1. It is only effective if your demand curve is inelastic

Price skimming may be a realistic strategy for Apple, but only when the amount requested does not fluctuate drastically when prices change. If your product's demand curve is generally elastic, which means that price adjustments have a stronger effect on product demand, then starting with high prices could substantially hinder your sales. Any company's goal is to make a product as inelastic as possible, but not everyone sells tech products or services that are innovative enough to appear vital to consumers.

2. In a crowded market, this is a poor strategy.

Prior to determining prices in any business, it is critical to measure client valuations and analyse the competition (and their market share). If you already have a lot of competitors, chances are your demand curve is fairly elastic, and excessive prices during your product launch will drive buyers away. Price skimming is not a realistic approach in an already crowded industry, so unless your product has incredible new features that no one can match, it may be best to avoid skimming if you want to preserve a competitive advantage.

3. Competitors are drawn to skimming.

Perhaps your product is innovative enough to create a new market, but as demonstrated by the introductions of the iPhone and iPad, competitors such as Samsung and Microsoft are lurking around the corner. High prices at the start of a new product's life cycle will entice competitors to enter the market, and the inelasticity of a demand curve is almost always reduced over time due to the introduction of viable substitutes. Skimming pricing might also limit the rate of adoption by your potential customers, allowing your competitors more time to duplicate and improve on your product before you've profited on the desire for innovation.

4. It may enrage your early adopters.

Remember those brand evangelists who were the first to buy your product? They might just as well be the source of your worst PR catastrophe. If costs drop too drastically or too soon after the first product introduction, your early users will feel cheated. This type of backlash was experienced by Apple in 2007, when the company reduced the price of the iPhone by $200 dollars just two months after its introduction. The fast price drop from $599 to $399 may have helped raise demand, but some of the phone's early adopters were understandably disappointed.

To prevent making clients at the top of your demand curve feel duped, utilise price skimming consistently and avoid rushed or blatantly evident price drops. Price skimming is also known as price discrimination, which is the practise of selling the same product at different prices to different groups of customers. This tactic is prohibited in some situations, but the precise requirements that define illegal price discrimination are dubious to say the least. Check out our post on pricing strategy ethics for more information on the ethical issues surrounding price discrimination.

9.8 PENETRATION PRICING

Penetration pricing is a pricing strategy used to quickly gain market share by initially charging a low price to entice customers to buy. This pricing strategy is typically used by new market entrants. Predatory pricing is an extreme form of penetration pricing.

Rationale Behind Penetration Pricing:

A new entrant is likely to utilise a penetration pricing approach to swiftly gain a significant amount of market share. One of the simplest ways to distinguish new entrants from existing market players is through price. This pricing strategy's overarching goal is to:

- Obtain a market share
- Foster brand loyalty
- Convert consumers from competitors
- Create large demand while attempting to capitalise on economies of scale.
- Expel competitors from the market

Situations in which penetration pricing is effective:

- When product difference is minimal
- Price-elasticity of demand
- Where the product is appropriate for a mass market (and, therefore, for utilising economies of scale)

Penetration Pricing Illustration and Example:

A contemporary small-sized player in the laundry detergent business, where laundry detergent sells for roughly $15. Company A is a multinational corporation with a huge amount of extra manufacturing capacity, allowing it to create laundry detergents at a significantly cheaper cost.

Company A decides to enter the market, use a penetration pricing strategy, and sell laundry detergent for $6.05. The cost of producing laundry detergent for the company is $6.

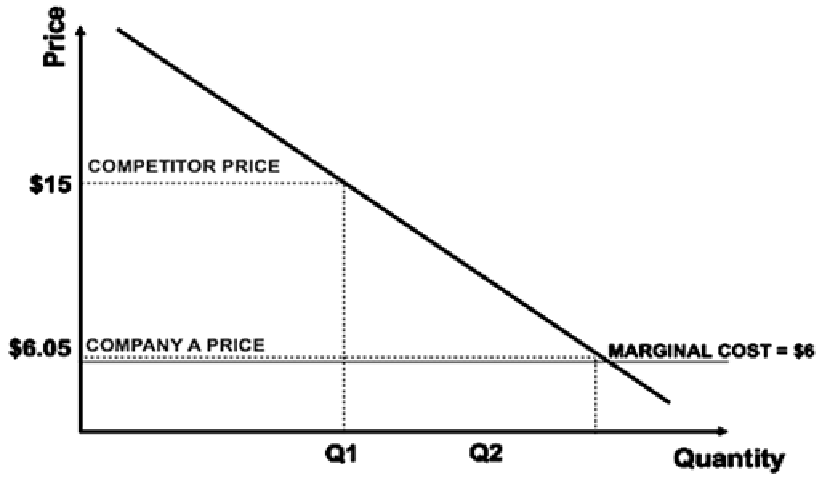


Fig 9.1

Company A makes a nominal profit per sale with a marginal cost of $6 and a sale price of $6.05 However, the corporation is content with this decision because its overarching goal is to convert clients, acquire as much market share as possible, and take advantage of economies of scale due to their large production capacity.

Company A feels that its competitor will be unable to sustain itself in the long run and will be forced to abandon the market. When the competition departs the market, Company A will become the exclusive seller of laundry detergent, allowing it to establish a monopoly and raise prices to a level that provides a substantial profit margin.

Benefits of Penetration Pricing:

1) Widespread adoption and diffusion: Penetration pricing allows a company's product or service to be swiftly embraced and adopted by clients.

2) Market dominance: Competitors are frequently caught off guard by a penetration pricing strategy and have little opportunity to respond. The company can take advantage of the opportunity to convert as many clients as possible.

3) Economies of scale: The price strategy generates a large number of sales, allowing a company to gain economies of scale and lower its marginal cost.

4) Increased goodwill: Customers who find a good deal on a product or service are more likely to return to the company in the future. Furthermore, increased goodwill generates positive word of mouth.

5) High inventory turnover: Penetration pricing increases inventory turnover, which pleases vertical supply chain partners such as retailers and distributors.

Drawbacks of Penetration Pricing:

1) Pricing expectation: When a company employs a penetration pricing approach, customers frequently expect constant low prices. Customers may get unsatisfied and cease purchasing the goods or service if prices progressively rise.

2) Little customer loyalty: Bargain hunters or those with low customer loyalty are frequently drawn to penetration pricing. If they locate a better bargain, said clients are likely to migrate to competitors. Price cuts, while successful for short-term sales, rarely result in client loyalty.

3) Harm brand image: Low prices may harm brand image by leading customers to perceive the brand as cheap or of poor quality.

4) Price war: A price war may be triggered by a price penetration strategy. This reduces overall market profitability, and the only companies strong enough to survive a protracted price war are usually not the new entrant that started it.

5) Inefficient long-term pricing approach: Price penetration is not a long-term pricing strategy. It is usually a better idea to enter the market with a pricing strategy that your company can live with in the long run. While it may take longer to gain a significant market share, such a patient, long-term strategy is more likely to benefit your firm in the long run and expose you to less financial dangers.

9.9 SUMMARY

Price is the value that is put to a product or service and is the result of a complex set of calculations, research and understanding and risk taking ability. A pricing strategy takes into account segments, ability to pay, market conditions, competitor actions, trade margins and input costs, amongst others. It is targeted at the defined customers and against competitors. Under marginal cost pricing prices are determined on the basis of marginal cost and not fixed cost. Markup pricing refers to a pricing strategy wherein the price of a product or service is determined by calculating the sum of the products and a percentage of it as a markup. Transfer pricing refers to the value of the goods transferred between the two parties related to one another. Product line Pricing, also known as product lining, is a retail marketing technique that involves grouping products and services in the same category into different price ranges based on their features and quality. Price skimming is a pricing strategy where the price of goods or services is set high at the time of launch and then lowered as consumers become more familiar with it.

9.10 QUESTIONS

1. Explain the factors affecting pricing decision.
2. Explain in detail marginal cost pricing.
3. Elaborate markup pricing.
4. What is transfer pricing? Explain in detail.
5. Write in brief about product line pricing.
6. Explain price skimming strategy in detail.
7. Illustrate penetration pricing in detail.

10

PROFIT MANAGEMENT

Unit Structure

10.0 OBJECTIVES

- To study the concept of profit
- To understand the concept of profit management
- To understand the role of profit in a market economy
- To study the significance / importance of profits in a market economy
- To study the nature and measurement of profit
- To understand various profit policies
- To study the hypothesis of profit maximization and its alternative

10.1 CONCEPT OF PROFIT

Profit is a financial concept which can be described when the income of the firm exceeds the expenses of the firm. After all the expenses and taxes, whatever is left with the firm is termed profit. In economies, it can be described as the amount gained by selling a product.

The amount earned should be more than the amount incurred on manufacturing the product. In sustaining business activities when the amount spent on the product is less than the amount earned on the product, the firm is said to be in a profitable position.

It can be better explained with the help of cost price and selling price. When the selling priceexceeds the cost price, the difference between them is profit.

Therefore,

Profit = Selling price - Cost priceProf. Schumpeter defines, "profit is the reward for the work of entrepreneur or it is a payment forrisks, uncertainties and innovations"

In economics, the excess of total revenue over the total cost during a specific period of time is profit.

10.2 PROFIT MANAGEMENT

The main objective of every business is to earn profit. Profit in any firm reflects the success and chances of survival. A business firm is designed with an objective to make profits. In managerial economics, profit management is a crucial and difficult concept.

To earn profit a firm needs to manage certain things. A firm has to take care of cost of the product, price of the product, allocation of the resources and decisions related to the investment.

From the beginning, it is expected that the firm should evaluate their business decisions properly. It is important for businesses to critically evaluate their investment decisions. Framing capital budgeting policies is another difficult area.

A firm has to consider the various aspects while dealing with this concept like amount of profit, profit margin, nature of profit, measurement of profit, pricing and profit policies, profit planning and management. Profit planning and management includes break even analysis, cost-volume profit analysis etc.

A firm takes risk to earn profit. Risk bearing is a reward for firms to earn profit. A successful businessman or manager is one who can evaluate the nature of costs and revenues at different levels of output.

It is a famous generalization in the field of management that "Whatever a manager does, he/she does through decision making. As, decision making is the heart of management. Decisionmaking related to profit in business is a spinal cord.

If the decisions related to profit and investment are made and framed wrong, the business will not stand long. The more successful manager estimation to reduce uncertainty brings more profits to the firm.

Profit planning and profit measurement are the major constituents of managerial economics in understanding how it involves difficult areas of business to be studied. Profit management helps firms to achieve the goal of their sustenance.

We can say it is premium to cover costs of staying in the market. It also ensures supply of future capital. In economics, an entrepreneur/manager is expected to take into consideration two types of costs - explicit costs and implicit costs to ascertain profit.

10.3 ROLE OF PROFITS IN A MARKET ECONOMY

In a market system a firm earns a profit, when its revenue is greater than its costs. To an opposite, in a market system a firm suffers loss, when its costs are greater than its revenue. Profitis the remaining item when the company pays all his expenses and still left with a certain amount. Thus, profit can be described as a monetary benefit which a firm earns after paying all expenses and taxes.

In a capitalist economy, profit creates incentives and opportunities for the firms. An incumbent company with higher profit incentive can decide to lower costs and produce new products. With an expansion of an economy, new businesses may join the market. Benefits play an important role when it comes to considering the concept of profit. The subject of profit in business is a lucrative concept.

Firm earning profit can increase productivity and production, and can expand customer choice. They can also go for allocating resources based on their customers choice and preferences.

Sometimes, to increase profit, firms may make some wrong decisions. Those wrong decisions can trigger market failures. In order to increase profit, a firm may pursue short term profit management policy and ignore its negative impact which will fall on long term policy. We have seen examples of many firms.

They start their journey of making wrong decisions by buying or investing in some failing businesses. It continues to make the decisions of selling off its properties. Last, the firms make the decision of laying off the employees, ultimately contributing in demeaning the goodwill ofthe firm.

In a market economy, profit plays an important role but the decisions related to this field play a more significant role. A firm on the basis of these decisions can stay, survive or leave the market. Capitalist economy demands profit but sometimes it triggers market failure which leads to losses generated by the firms.

10.4 SIGNIFICANCE OF PROFIT IN A MARKET ECONOMY

In the market, profit acts as a catalyst. The concept of profit in a market economy encourages firms to innovate new products and also increases

the efficiency of the firms. It helps firms to make important decisions related to fund investment and its management. It attracts new firms to enter the market. With the help of the diagram given below, can we understand how significant the concept of profit is?

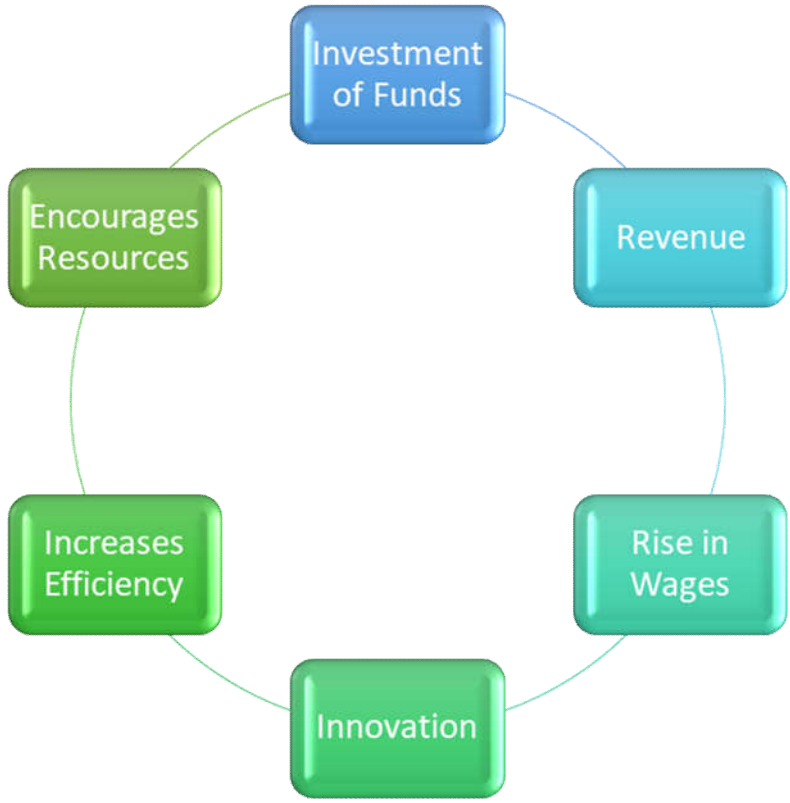


Fig.10.1: Significance of profit in a market economy

01. Investment of Funds

Firms earning high profit can contribute significantly in research and development of products. Because of the capacity of huge investment, firms can see the perspective of encouraging their research and development area to earn more and more profit.

02. Helps in Generating Revenue

Money attracts more money. Adequate amount of profit helps firms to expand their business operations. Expansion and development of their businesses results in generating more revenue for the firms. Higher the revenue, higher is the profit.

03. Rise in Wages

Workers are an integral part of any organization. If a firm earns higher profit, it can pay higher wages to workers. Profit increases the efficiency of firm in terms of payment of wages and salaries to workers and employees respectively.

04. Encourages Innovation

In a market economy, the profit management role is significantly visible. Due to more and more profit, an entrepreneur is encouraged to innovate new products, new markets, new methods of production and new techniques to cut costs. Profit management encourages innovation as a reward for the hard work put by the entrepreneur.

05. Increases Efficiency

Profit management encourages firms to cut costs. The planning and implementation is done in such a way that the firm innovates and works to cut production costs to earn more profit. This increases the efficiency of the firm.

06. Encourages Resource Allocation

Profit plays a vital role in resource allocation. Higher profit ensures smooth conduction of business firms. On the basis of decisions related to allocation of resources, a firm may continue to expand and explore more and more opportunities to work in this or in other areas.Higher profits act as an incentive for entrepreneurs.

10.5 NATURE AND MEASUREMENT OF PROFIT

10.5.1 Nature of Profit

The nature of profit can be defined as a factor reward. The concept of profit entails different meanings. Profit mabe looked upon as a reward for entrepreneurial skills. It is termed as a rewardearned by the entrepreneur for bearing risk and uncertainty in business. The following points explain the nature of profit in a more elaborate way.

10.5.1.1 The nature of profit can be defined as it is not predetermined. Like a contract where the amount to be received is certain, the nature of profit is not predetermined and certain. It is not a predetermined contractual payment.

10.5.1.2 The remuneration is not fixed in the form of profit for an entrepreneur.

10.5.1.3 To understand the nature of profit, one has to know the difference between ‘Economic profit’ and ‘Business profit’. Economic profit represents the sales revenue of the firm. It takes into consideration both explicit costs and implicit costs. While, business profits are an accounting term which represent the excess of income over payments.

10.5.1.4 Profit is the reward of an entrepreneur for bearing risk and uncertainties.

10.5.1.5 Profit does not arise in static conditions. It arises only in dynamic conditions. Many economists have favored this concept of profit in managerial economics.

10.5.1.6 Profit cannot arise under a perfect competition market. It arises when there is animperfect competition market.

10.5.1.7 Profit is considered as reward for innovation.

10.5.1.8 It is also considered that the profit may arise due to the nature of windfall. Maybe aninflationary boom can provide opportunities for firms to earn supernormal profit.

10.5.1.9 In ordinary sense, profit is a residual surplus earned by the firm.

10. The term profit can be negative.

10.5.2 Measurement of Profit

As mentioned earlier, the term profit has different meanings for different people. For a businessman, profit means a surplus income generated from business activities after paying all the expenses and taxes.

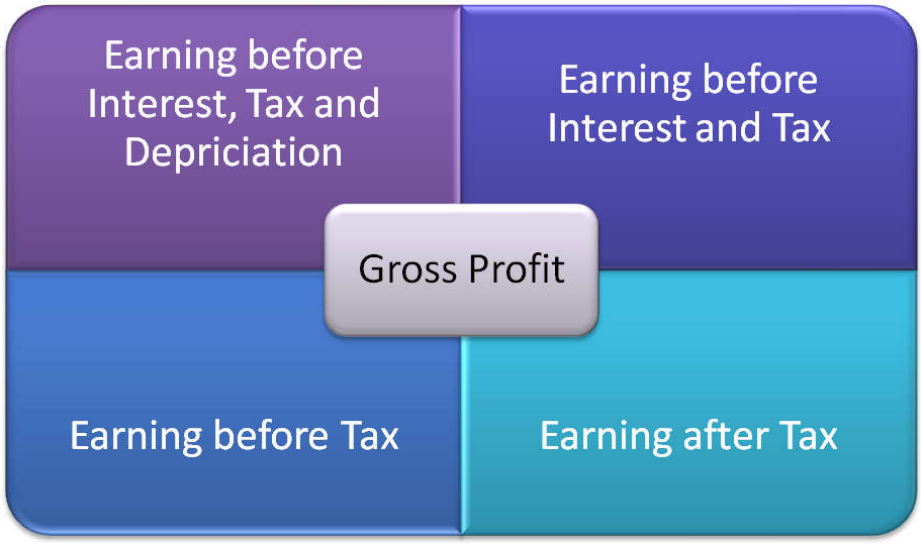
For Economists, profit can be described as a reward received by the entrepreneur for bearing riskand uncertainty in business. An entrepreneur earns profit when he/she combines all the factors ofproduction to serve the needs of society. It can be termed as economic profit or pure profit.

For an enthusiast, profit is an income that comes from deducting outflow from inflow. The same concept in opposite he/she will understand when the concept of loss will come. For an accountant, profit means excess of income over expenses.

The problem of measuring profit has always been a difficult affair due to the different concepts given by different people to the concept of profit. Accountants follow conventions and principles and define their terms of profit by enumeration. Their approach is completely different from economists. There is a difference between the concepts of historical profit and anticipated profit. Conventional accounting is concerned with historical profit. In Accounting, profit is an ex-post concept.

Economists define profit in their terms and it is functional in nature. They associate profit with the reward for an entrepreneur for bearing risks and uncertainties. In economics, profit is an ex-ante concept. Economists are basically interested in studying the theoretical aspects of economics, while accountants deal with the practical aspects. In general, it is true that profits are a better reflection of business as far as the growth and survival is considered.

There are several ways to understand the concept of how to measure profit. Here are some ways to understand this concept more clearly –



Gross profit is also referred to as gross income. It is the income from gains before tax. It is calculated by deducting the cost of goods sold (COGS) from sales revenue. Gross profit includesthe following items in addition to net profit -

- Remuneration for factors of production of entrepreneur
- Maintenance charges
- Depreciation charges
- Extra personal profit
- Net profit It is calculated as,

Gross profit = Sales revenue - Cost of Goods Sold (COGS)

02. Earning before Interest, Tax and Depreciation (EBIT)

Earning before interest, tax and depreciation provides an accurate picture of a firm's cash flow. Italso shows how easily a firm can repay its debt. Rather than simply looking at profit, this profit gives lenders an idea about the kind of risk associated with the firm.

After deducting the cost of goods sold and all expenses except interest, depreciation and taxes, this profit helps to measure the firm's cash flow.

It is calculated as,

EBIT = Sales revenue - Cost of goods sold and other expenses except interest, depreciation and taxes

03. Earning before Interest and Tax

Earning before interest and tax helps to identify the operating profit of the firm without deducting tax. It is an important measure of a firm's operating efficiency. It shows how much the business makes from its core.

Except interest and taxes, cost of goods sold and all expenses are deducted from sales revenue to get this profit.

It is calculated as,

EBIT = Sale revenue - Cost of goods sold and other expenses except interest and taxes

04. Earning before Tax

Earning before tax helps firms to know how much tax firms owe to pay from their business operations. It is also known as profit before tax or Pre Tax earning. It is calculated by deducting all expenses except tax. This profit metric can be used to measure the performance of firms in terms of paying taxes from their business operations.

It provides an insight to the firm's financial standing and performance. For various stakeholders, this profit metric plays an important role. It helps them to measure how a company is able to generate enough income in order to operate and pay its obligations.

It is calculated as,

EBT = Sales revenue - Cost of goods sold and other expenses except tax

05. Earning after Tax

Earning after tax is also known as profit after tax or net profit. It is an important measure of the firm. It shows the actual amount the firm is making in an operating year after paying all expenses including tax.with the help of net profit, a firm's operation efficiency and performance can be identified. It shows the cost and cash earnings of the firm.

It is the measure of a firm's net profitability. Earning after tax is often referred to as the bottom line because it is calculated after subtracting all expenses and taxes from the business revenue.

It is calculated as,

Earning after Tax or Net profit = Sales revenue - Cost of goods sold and all other expenses andtaxes

Table 10.1 Difference between Gross Profit and Net Profit

Point of Difference	Gross Profit	Net Profit
Meaning	Difference between total cost and total revenue is grossprofit.	When all the expenses are deducted from gross profit, the balance is called net profit.
Inclusion	Remuneration for factors of production of entrepreneur, maintenance charges, depreciation charges,extra personal profit and net profit	Reward for coordination, risk bearing, bearing uncertainties and innovation

Profit denotes the difference between total revenue and total cost. While calculating total cost, a firm includes all the expenses like raw material cost, labour cost, direct and indirect expenses, factory expenses, administrative expenses, selling and distribution cost. The implicit cost incurred by the entrepreneur is excluded. But, in economic cost explicit and implicit both cost are included to ascertain actual profit from total revenue.

The difference between total cost and total revenue is called gross profit. When all the expenses are deducted from gross profit, the balance is called net profit.

10.6 PROFIT POLICIES

The main motive of a firm is to make profits. The success of any firm is determined by the volume of profit generated by a firm in a particular period. But, in this modern world many firms do not agree with this objective of running businesses.

They give due importance to other objectives of the firm as well. Economic theory emphasizes profit earning and maximization as the chief policy of a firm while the modern businesses do not accept this view and advocate that they do focus on earning profit but the other goals are important as well.

In practice, firms seldom seek to maximize profits. Other than profit, firms focus on many other goals. Instead of putting pressure on profit maximization, many firms put limits on their profits. All these constitute the profit policy.

10.6.1 Aims of Profit Policy

The main aim of profit policy is to give due importance to other primary goals of the firm which helps the organization to earn profit. It's true that

profit maximization is an important objective but it is not the only objective of the firm.

Adequate profit ensures the regularity and efficiency of a firm paying dividends, salaries and wages to the shareholders, employees and labour respectively. The profit policy focuses on -

- Inventory goals
- Production goals
- Sales goals
- Administration goals
- Marketing goals
- Profit goals - profit planning, administration and management

The following points advocates the necessity and importance of profit policy in a firm -

Fig.10.3: Importance of Profit Policy

01. Restricting the Entry

Reasonable profits ensure survival and growth of the firm. If a firm is focusing on only profit, chances are there that they will compromise with the other primary goals of the firm. If a firm is following a policy which restricts its profit but ensures a sufficient amount to run business and other activities, no competitors are likely to enter the market. A firm to some extent can enjoy monopoly in this case.

02. Business and Consumer Goodwill

In order to win the confidence and appreciation of consumers, a firm's profit policy advocating low margin can help businesses in earning reputation and building goodwill. Consumer is the most important element of any business.

Firms have to restrict their profit limit to maintain goodwill in the eyes of their consumers. During inflation, a firm follows a stable pricing policy that can attract the attention of consumers. On the other hand, if a firm follows high profit margin may face consumer resentment

03. Consideration of Wages

Higher the profit, higher the wages. Higher profit may be considered as a reason for the firms to pay higher wages to the labour. With the help of their association, they can demand higher wagesif the firm declares higher dividends to the shareholders. If a firm keeps the reasonable profit margin, with consumers it ensures the harmonious relation of the firm with laborers also. Profit control is imperative if a firm wants to maintain cordial relations with the labour.

04. Preference to Liquidity

Liquidity preference means the priority to hold cash to meet the daily transactions. The first thingany investor will observe is the Balance sheet of the firm before investment. In order to maintain the ratio of current assets to current liabilities, the firm keeps less profit and maintains high cash.

For a comfortable position, it is important for a firm to maintain cash. In banking business, the more preference is given to liquidity rather than profitability.

05. Avoiding Government Interference and High Taxation

High profits may be considered as an index of monopoly power. It may attract the government's attention and further can lead to investigation. To avoid government interference and control, a firm adopts a reasonable profit policy.

High profits are also considered to generate high tax amounts for the firm. To avoid government regulation, intervention and high taxation, it is wise to adopt a low profit or reasonable profit margin policy.

06. Market Leadership

A firm can achieve market leadership either in the area of maximum sales volume or in the area of product lines by keeping profit margin satisfactory. The consistency of the profit should be in accordance with the capital invested in the business, workforce employed and the volume of output produced. To dominate the market, a firm may seek to maximize its sales volume.

07. Service Motive

Many firms adopt a service approach to serve the nation. A firm rather than to earn profit can work towards the motive of providing more employment and job opportunities with reasonable wages to the youth of the nation.

Rather than focus on profit maximization, a firm can look into the matter of welfare andgoodness of employees and workers.

10.7 THE HYPOTHESIS OF PROFIT MAXIMIZATION AND ITS ALTERNATIVES

According to traditional economic theory, maximization of profit is the sole objective of the firms. With the help of the analysis of demand and supply conditions, a firm generates a large amount of money to run a business. The conventional price theory is based upon the profit maximization hypothesis.

Conditions of profit maximizing

When the difference between total revenue and total cost is maximum at that level of output, a firm maximizes its profit. The traditional price theory determines the study of price-output in maximizing profit in terms of marginal cost (Mc) and marginal revenue (MR).

The two conditions where a firm maximizes its profit are -

i) Marginal cost = Marginal revenue

ii) Marginal cost curve cut the marginal revenue curve from below.

The two conditions mentioned above are applicable to a firm under perfect competition andmonopoly market.

It can be expressed as,Maximize π (Q)

Where π (Q) = R (Q) - C (Q)

Where π (Q) is profitR (Q) is revenue,

C (Q) are costs,

Q are the units of output sold.

Assumptions of Profit Maximization

The approach of profit maximization theory is based on following assumptions -

01. The firm wants to maximize its profit. The goal is to achieve this in the long run.

02. The firm has knowledge about the price at which it can sell different levels of output.

03. The firm has certainty regarding price or costs.

04. The entrepreneur himself is the owner and manager of the firm.

05. The firm is assumed to achieve this goal by applying the marginalist principle.

06. It is assumed that the tastes and fashion of the consumer is constant.

07. The technology of production is given.

08. The firm produces products which are divisible and standardized in nature.

09. New firms can enter the market only in the long run.

The hypothesis of profit maximization helps firms in two ways -

01. It helps in predicting the behavior of business firms.

02. It helps in predicting the price-output behavior. The price-output behavior can be predicted under various market conditions.

Under perfect competition at the price determined by the industry, business firms have to maximize their profits. In an imperfect market, the firms are price makers. They search for the price output conditions where they can maximize their profits. This hypothesis is better than any other hypothesis in explaining and predicting the behavior of firms under different marketconditions.

10.7.1 ALTERNATIVE TO PROFIT MAXIMIZATION THEORY

W.J. Baumol has suggested one alternative to profit maximization. His model is known as Boumol's Single Period sales (Revenue). He advocated that firms operating in oligopoly will seek to maximize sales revenue. It is subject to a profit constraint. His argument of this theory is based on public statements by businessmen. His model clearly states the difference between salesmaximization and profit maximization.

Based on his management consulting experience, Baumol has suggested that firms attempt to maximize sales. Maximizing sales is subject to profit constraint.

As an alternative to profit maximization, different economists have suggested a variety of profit policies.

01. According to K. Rothschild, the primary objective of an enterprise is long-run survival.He also emphasized maximizing the security of the organization.

02. W.W. Cooper has emphasized on the liquidity parameter as the most important factor forthe business firms.

03. An entrepreneur may have two objectives, according to N. Reder - to maximize profitsand to maintain financial control of the firm.

04. H.A. Simon advocated that an entrepreneur focuses on earning satisfactory return ratherthan maximizing profit.

10.8 SUMMARY

- When the selling price exceeds the cost price, the difference between them is profit. In economics, the excess of total revenue over the total cost during a specific period of time is profit.
- In managerial economics, profit management is a crucial and difficult concept. The main objective of every business is to earn profit. Profit in any firm reflects the success and chances of survival. A business firm is designed with an objective to make profits.
- In a capitalist economy, profit creates incentives and opportunities for the firms. An incumbent company with higher profit incentive can decide to lower costs and produce new products. With an expansion of an economy, new businesses may join the market.
- Economic theory emphasizes profit earning and maximization as the chief policy of a firm while the modern businesses do not accept this view and advocate that they do focus on earning profit but the other goals are important as well.
- Adequate profit ensures the regularity and efficiency of a firm paying dividends, salaries and wages to the shareholders, employees and labour respectively. The profit policy focuses on other goals as well.

10.9 QUESTIONS

01. Define profit. Explain the concept of profit in economic sense and general sense.
02. What is profit management? Explain its significance in market economy.
03. Write a note on nature and measurement of profit.
04. Explain the various aspects of profit policy. Why is it important for a firm to have a profitpolicy?
05. Explain the hypothesis of profit maximization.
06. Highlight the various alternatives to the hypothesis of profit maximization.

11

DEMAND FOR CAPITAL AND SUPPLY OF CAPITAL

Unit Structure

11.0 OBJECTIVES

- To understand the meaning of demand for and supply of capital
- To study the process of equilibrium between demand and supply
- To understand the concept of capital rationing
- To study the concept of capital budgeting

11.1 INTRODUCTION

Demand and supply analysis comes under the domain of microeconomics. Microeconomics is the study of individual units, firms etc. from the microscopic point of view. The concept of demand and supply analysis studies the interaction of buyers and sellers. How do they interact to fix transaction prices and quantities?

Price is something which determines the value of the product for the both-buyer and seller. Demand and supply analysis is an important concept to

study in macroeconomics. How the demand for capital and supply of capital affects the operations and activities of the firms is a major area to study.

For investment analysis, this concept significantly describes the need of the study.

11.1 DEMAND FOR CAPITAL

The demand for capital represents the amount of capital an entrepreneur wants to invest in his/her business. The amount of capital is required to purchase capital goods like equipment,plants, machines and tools. These capital goods are required for the production of goods and services. The demand for capital is inversely related to rate of interest.

If the interest rate is high, entrepreneur's demand for capital will be less. If the interest rate is low, entrepreneurs want to have high investment. This concept is because of marginal physical productivity of capital. Marginal physical productivity of capital is a change in the production output of the firm when an additional unit of capital is employed. The other inputs remain the same.

Symbolically it can be represented as,Symbolically,

A firm employs additional units of a factor until marginal revenue productivity equals marginal factor costing. Capital is an

$$demand\ for\ capital \propto \frac{1}{\text{interest rate}}$$

$$investment = \frac{1}{\text{interest rate}}$$

$$I = \frac{1}{r}$$

important factor of production and it is no different from other factors of production. The first step is to assess the firm's demand for capital. After this step, the firm determines the present value of marginal revenue products and marginal factor costs.

11.2 SUPPLY OF CAPITAL

Supply of capital is the amount available for investment. The amount which is available for investment is called savings. The amount which is left after consumption is savings. The monetary value left after the consumption is called savings. The relation between savings and rate of interest is direct. The rate and interests and savings are directly related. If the interest rate is high, people save more to earn interest. If the interest rate is low, the people will show less interest in savings or investment.

Symbolically it can be represented as,

$$supply\ of\ capital \propto interest\ rate$$

$$saving \propto interest\ rate$$

$$S \propto r$$

11.3 EQUILIBRIUM BETWEEN DEMAND AND SUPPLY

The point of equilibrium between demand and supply comes to a point when the demand for capital is equal to supply of capital. The equilibrium interest rate can be determined by the point of intersection of investment and savings curves. The actual interest rate may differ in real life. If it is to be brought on the graph, above the level of equilibrium saving exceeds investment.

The excess supply of capital brings down the rate of interest. It can go down to equilibrium level. If it is below the equilibrium, investment exceeds savings. The excess demand for capital brings the rate of interest up. The actual rate of interest sooner or later comes to the equilibrium level.

11.4 CRITICISM OF THE THEORY

The theory of demand for capital and supply of capital suffers from many criticisms –

1. Money is not only demanded for investment but also for speculation and precautionary motives.
2. This theory is based on diminishing marginal productivity of capital. Due to some other factors, there may be increasing marginal productivity of capital.
3. The demand and supply factors can also be determined by the level of income
4. Supply of capital also comes from other sources like dishoarding, depreciation fund etc.
5. Saving and investment are affected by each other. This theory ignored this dimesion.

11.5 CAPITAL RATIONING

Capital rationing is an approach of management. In this approach, management allocates the available funds by going through the various opportunities. The approach of capital rationing enhances the bottom line of the company. Firms always go for the project which has a higher net present value on the side.

There are many motives behind this approach of management. In many scenarios where the past revenues generated through investments were not up to the mark, the firm might take this approach. The primary goal is to make sure that a firm is going to take rational decisions while investing heavily in assets. This approach helps management to make decisions related to capital funds.

11.5.1 MEANING

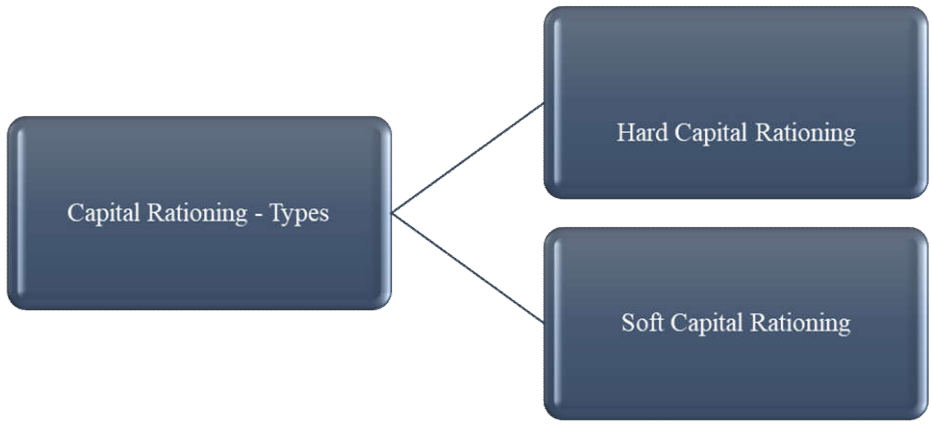
A firm decides to undertake many projects. Projects are analyzed on the basis of their performance in terms of their past performance. How much they have generated from the project is a matter of analysis in terms of return? Firms by putting the concept of capital rationing can bring the concept of ceiling on a project where the past revenues generated on the same were not up to the mark.

Capital rationing is a process through which a firm places a limit on the extent of projects that it decides to undertake. It is a strategy used by companies to limit the number of investment projects they undertake. It is a process of choosing the most profitable projects among the alternatives.

Companies that employ capital rationing produce more return on investment. As they choose wisely before investing into any project. It is one of the methods of investing wisely in thoseprojects which are expected to yield good returns or one can say positive net present value orreturn on investment.

11.5.2 DEFINITION

Capital rationing is defined as a process through which a firm puts a ceiling on the number ofprojects for a particular period.



11.5.3 TYPES OF CAPITAL RATIONING

There are two types of capital rationing -Fig.11.1: Types of Capital Rationing

01. Hard Capital Rationing

The first type of capital rationing is also known as external rationing. This rationing is being imposed on a company by circumstances beyond its control. A firm suffers from a low credit rating as they may be restricted from borrowing money to finance new projects. Thus, it may become difficult for firms to secure financing.

In general, companies raise capital for additional funds. The funds are raised through either equity or debt. This type of rationing arises from an outside need to reduce the spending on the project. Further, it can lead to a shortage of capital to finance future projects. In simple words, it involves raising new capital in response to limited funds.

02. Soft Capital Rationing

Soft rationing is also known as internal rationing. This type of rationing is internal to the firm and to some extent controllable in nature. Internal rationing represents the rationing which arises due to the internal policies of a company. A conservative policy adopted by the firm to achieve the objectives of self-imposement can be termed as soft rationing. For putting control on internal spending or expenditure on resources, soft rationing looks into the internal affairs of the company/firm.

Imposing some restrictions on its capital expenditure is a part of soft rationing. A company simply puts the limit on the number of projects that it will take at a time or in a particular period.

11.5.4 ADVANTAGES OF CAPITAL RATIONING

In the concept of capital rationing, return on investment analysis plays a significant role. Companies that employ this strategy are expected to produce higher return on investment. The reason is firms invest rationally. Return on investment is a measure to evaluate the performance of the investment. Companies invest their resources in highest profit potential projects. The concept of capital rationing signifies the following important points.

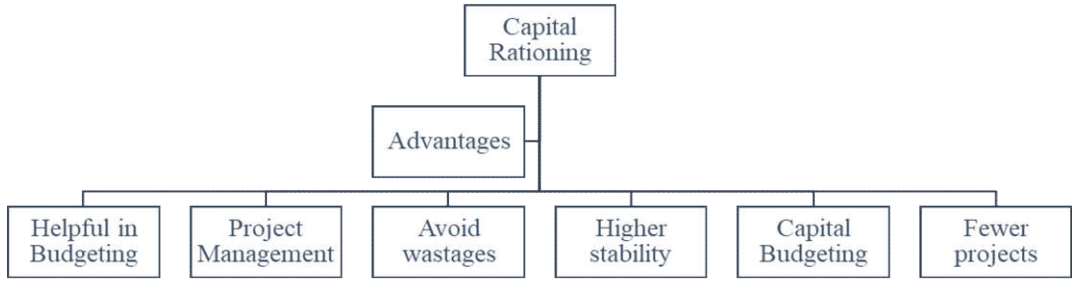


Fig. 11.2: Advantage of Capital Rationing

11.5.4.A Helpful in Budgeting

Capital rationing decisions are related to the allocation of funds to different long term and short term assets. While evaluating the various proposals, firms undergo careful and critical analysis of these proposals. The decisions related to capital rationing are found tobe helpful in budgeting.

11.5.4.B Project Management

Capital rationing helps in selecting those projects which ensures higher returns. Due to limited availability of capital, managing projects in terms of performance and returns has become an important task for the managers.

11.5.4.C Avoid Wastages

Capital rationing approach avoids wastages. It helps firms in preventing the wastages of funds by not investing in each and every project available for the investment. A firm can fully utilize the available funds by putting a ceiling on certain investments expenditure.

11.5.4.D Higher Stability

The right approach of capital rationing ensures stability in the working of the firms. As the company avoids investing in every project, the finances are utilized carefully and diligently. This approach helps in having adequate finances for rough times. This also ensures more stability.

11.5.4.E Capital Budgeting

Capital budgeting decisions are known for their long term implications in any business firm. Broadly speaking, capital budgeting decisions denote a situation where decisions are to be taken related to the investment of lump sum funds invested in the initial stagesof a project. Capital rationing helps in choosing best proposals in terms of returns.

11.5.4.F Fewer Projects

In the approach of capital rationing, a limited number of projects are selected by imposing capital restrictions. Capital restrictions ensure the selection of good proposals in terms of time, performance and returns. It also helps in keeping the minimum/sufficient number of active projects and thus manage well.

DISADVANTAGES OF CAPITAL RATIONING

The following are the disadvantages of capital rationing -

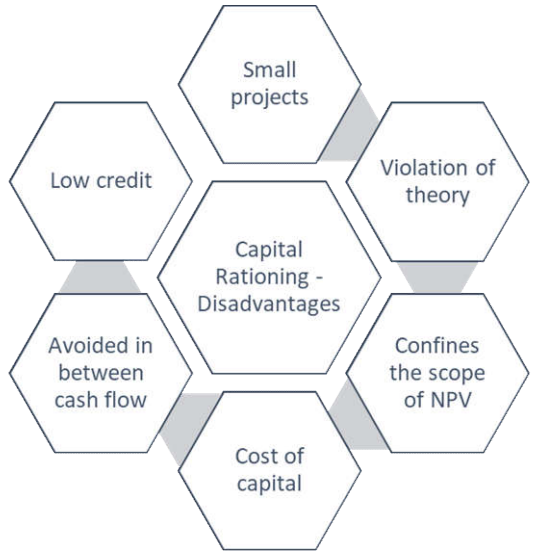


Fig.11.3: Disadvantages of Capital Rationing

01. Small Projects

A firm is expected to invest some amount of funds in big projects to gain long term benefits arising out of it. Due to limited funds, capital rationing leads to opt for small projects. Small projects may not prove to be profitable in the long run. Rationing puts restrictions on the amount of funds a firm may invest.

02. Violation of Theory

The approach of capital rationing goes against the efficient capital market theory. The theory suggests that projects which ensure hike in shareholders funds and contribute in value addition should be encouraged and selected. But, this approach puts a ceiling whichmay stop firms from choosing such projects. This approach advocates the projects which have profitability chances and are within the budget should be selected.

03. Confines the scope of NPV

Net present value represents the difference between the present value of cash inflows and the present value of cash outflows over a period of time. Projects with higher NPV are expected to be selected by the firms. Even if all the projects show high profitability indices, capital rationing by putting a ceiling limits their selection. It confines the scope of net present value of projects.

04. Cost of Capital

Determination of cost of capital is an important aspect for firms. If it is not determined accurately, it may result in ineffective capital rationing. This can also result in investmentin inappropriate projects by the firm.

05. Avoided In-between Cash Flow

The pattern of cash flow in a project and its analysis is critically analyzed by the experts in making decisions. The in-between cash flow helps to assess the next move of investment in generating returns. In the approach of capital rationing, only the final return on investment is considered. In-between cash flows are side lined.

06. Low Credit

The projects are selected only to estimate profit. Sometimes, a firm may select a project which will generate lower return and reject the project having the chances of generating higher returns. The approach also requires a larger time frame to conclude. Putting a ceiling can affect the financial performance of the firms and thus affect their credit in the market.

- **Example of Capital Rationing**

A firm XYZ Limited is in the process of preparing the capital budget for the financial year. A finance manager has four proposals to evaluate. On the basis of net present value, he is expected to choose some projects. Let us understand this example with the help of the information given in the table -

Table 11.1 showing the initial investment, net present value and profitability indexof the proposals.

Projects	Initial Investment(□)	Net Present Value(NPV)	Profitability Index(PI)
A	12,00,000	10,10,000	1.84
B	87,00,000	22,90,000	1.26
C	1,30,00,000	1,47,00,000	2.13
D	71,00,000	49,00,000	1.69

On the basis of initial investment, the company will evaluate the proposals and arrange the proposals in terms of higher profitability index. If we will arrange the projects on the basis ofprofitability index, it will be seen like this –

Projects	Initial Investment(□)	Net Present Value (NPV)	Profitability Index (PI)
C	1,30,00,000	1,47,00,000	2.13
A	12,00,000	10,10,000	1.84
D	71,00,000	49,00,000	1.69
B	87,00,000	22,90,000	1.26

From the rearranged table, we can see that Project C is showing the highest profitability index. Out of the given projects, a firm as per the capital rationing approach can choose the projects in adescending order.

11.6 CAPITAL BUDGETING

In capital budgeting, the role of a finance manager lies in the process of critical and detailed analysis of various alternatives of various proposals. The purpose is to select the best proposal out of it. The main objective of evaluating the projects is to select the long term best investment projects that are expected to make maximum contribution to the shareholder's wealth.

The main objective of financial management in the subject of managerial economics is to maximize the shareholders wealth along with the other objectives of the firm. The objective of capital budgeting justifies the same. It helps managers in selecting the best alternative from the given one. The decisions related to capital budgeting are related to the allocation of funds to different long term assets.

It involves the entire process of decision making. The decisions are taken to acquire the long term assets whose returns are expected to arise over a period of more than one year. That's why these decisions are called capital budgeting decisions.

11.6.1 MEANING

Capital budgeting decisions are known for their long term implications in any business firm. Broadly speaking, capital budgeting decisions denote a situation where decisions are to be taken related to the investment of lump sum funds invested in the initial stages of a project. It is expected that the returns will be generated over a period of more than a year. Capital budgeting is a financial commitment as well as an investment for a long period.

The decisions of capital budgeting are important because it creates accountability and measurability. It is a process of evaluating investments and huge expenses. The purpose is to obtain the best returns on investment. Organizations are expected to face many challenges when the

choice between two or more projects arise. Firms choose that project which ensures higher return among the alternatives.

Selecting profitable projects and capital expenditure control are some of the main objectives of capital budgeting. Finding the right sources for the firm is also one of the important area of capitalbudgeting.

11.6.2 FEATURES OF CAPITAL BUDGETING

The features of capital budgeting may be stated as follows -

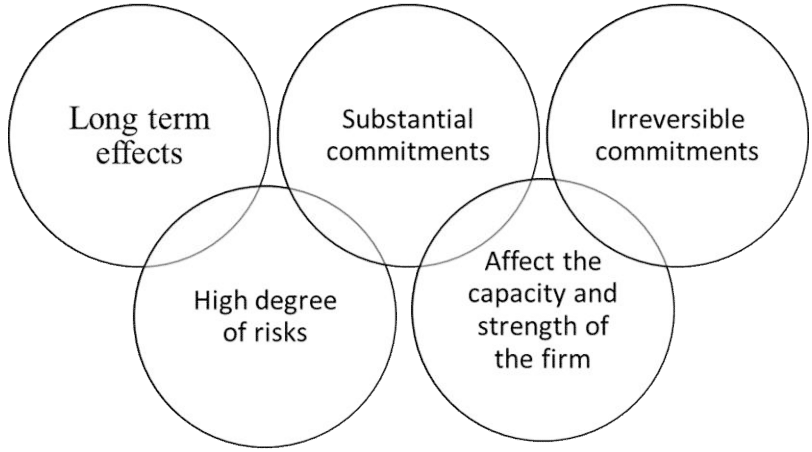


Fig.11.4: Features of Capital Budgeting

11.6.2.A Long Term Effects

This is the most important feature of capital budgeting. The decisions have long term effects on the risk and return composition of the firm. The decisions can affect the future position of the firm. A finance makes a commitment into the future by taking into consideration the future needs of the firm. The implications and consequences are long term of the capital budgeting decisions.

11.6.2.B Substantial Commitments

Capital budgeting decisions require substantial commitment. They generally involve large commitment of funds and as a result a substantial amount of funds are blocked in the capital budgeting decisions. More attention is required while making these kinds of decisions. Generating sufficient amounts of returns is always a challenge for managers as far as the domain of capital budgeting decisions are concerned.

11.6.2.C Irreversible Commitments

Most of the decisions are irreversible in nature. Once taken, a firm cannot revert back. Abandoning the project midway results in heavy losses. A firm cannot afford to absorb heavy losses. Therefore, the capital budgeting decisions should be taken only after considering and evaluating each and every aspect of the project. The financial consequences can be far reaching and a firm may find it difficult to cope up with it.

11.6.2.D Higher Degree of Risks

The decisions of capital budgeting involve a higher degree of risks. As the other features demand more commitment from the manager. The decisions have long term effects, require substantial and irreversible commitments. The degree of risk attached to these decisions is high.

11.6.2.E Affect the capacity and strength to compete

To face the competition, the capital budgeting decisions affect the capacity and strength to compete in the market. A firm may gain competitive advantage if the decisions related to capital budgeting are taken timely. Similarly, a firm may lose competitiveness if the decision to modernize is delayed or not rightly taken

11.6.3 KINDS OF CAPITAL BUDGETING DECISIONS

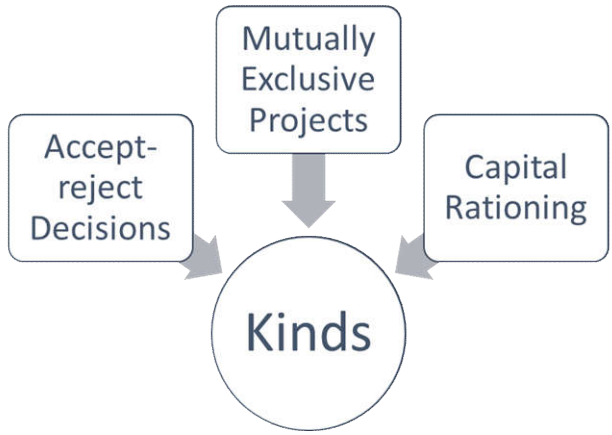


Fig.11.5: Kinds of Capital Budgeting Decisions

11.6.3.A Accept-reject Decisions

The fundamental decision in capital budgeting is accepting or rejecting the proposal on the basis of some criterias. If the project is accepted, the firm would invest in it. If the project is rejected, it would not go in the investment direction. The projects which yield a good return will be considered for investment.

Firms in total consider few criterias while smoking capital budgeting decisions -

11.6.3.A.1 Rate of return

11.6.3.A.2 Required rate of return

11.6.3.A.3 Cost of capital

The project which will satisfy all the conditions required will be considered forinvestment and rest will be rejected.

11.6.3.B Mutually Exclusive Projects

In this case of capital budgeting, acceptance of one project will exclude the acceptance ofother projects. It means if a firm is accepting one project, it may rule out the necessity of accepting other projects as only one is to be chosen. The alternatives in this case are mutually exclusive.

In the case of mutually exclusive projects, only one or some proposals can be accepted and others have to be rejected. The most profitable proposal will be accepted, lettingother proposals be mutually exclusive. The best alternative will be chosen by rejectingthe other alternatives.

For example, if there is a need to buy a vehicle for transporting goods from factory to warehouse, the firm will think of various options. After choosing one proposal, the firm will eliminate other proposals.

11.6.3.C Capital Rationing

Capital rationing is a process through which a firm places a limit on the extent of projects that it decides to undertake. It is a strategy used by companies to limit the number of investment projects they undertake. It is a process of choosing the most profitable projects among the alternatives. Companies that employ capital rationing produce more return on investment. As they choose wisely before investing into any project.

When firms have a fixed capital budget, they go for a capital rationing approach. Large number of proposals compete for this fixed investment. The best among all alternatives isselected by the firms.

11.7.4. PROCESS OF CAPITAL BUDGETING

The process of capital budgeting involves the following important steps -

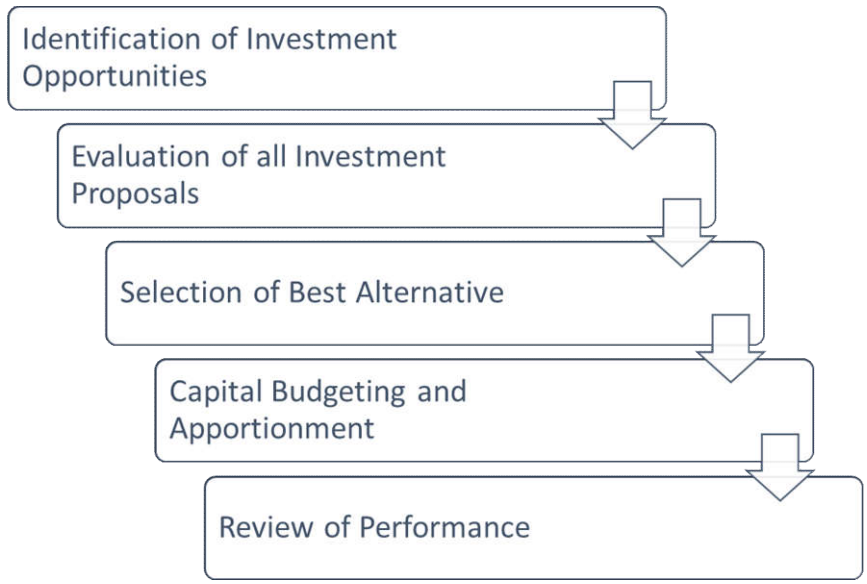


Fig.11.6: Steps involved in Capital Budgeting

11.6.5 CAPITAL BUDGETING: TECHNIQUES OF EVALUATION

The attractiveness of any investment proposal depends on the following aspects -

11.6.5.A Amount of expenditure required

11.6.5.B The potential benefits

11.6.5.C The time period

11.6.5.D Economic life of the project

There are different techniques available for evaluation and selection of a proposal. Thetechniques of evaluation can be grouped into two categories -

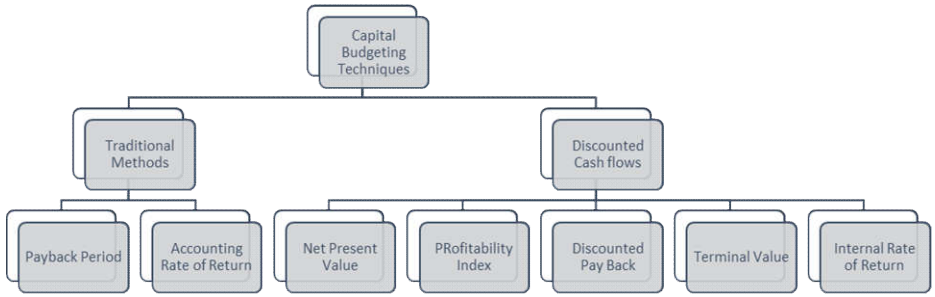


Fig.11.7: Techniques of Capital Budgeting

I. TRADITIONAL TECHNIQUES

The traditional techniques are also known as non-discounting techniques. As the name itself suggests, these techniques do not discount the cash flows to find out their net worth. The traditional or non-discounting are further divided into two techniques -

01. Payback Period

Payback period is the length of time required to recover the initial cost of the project. It is defined as the number of years required for the proposal's cumulativecash inflows to be equal to its cash outflow. But, this technique does not give clear indication of the decision regarding investment.

The technique compares the payback period with some predetermined target period. If the payback period is more than the target period, the proposal should be rejected. If the payback period is less than the target period, it can be accepted.

For example, if a proposal requires an initial investment of Rs.1,00,000 and is expected to generate a cash flow of Rs.20,000, Rs.30,000, Rs.40,000, Rs.10,000 and Rs.8,000 over the next five years respectively.

Table 11.2 Calculation of payback period

Year	Annual Cash Flow (in Rs.)	Cumulative Cash Flow (in Rs.)
1	20,000	`20,000
2	30,000	50,000
3	40,000	90,000
4	10,000	**1,00,000**
5	15,000	1,15,000

A firm can expect to get the investment back in the fourth year because the sum ofcash inflows of the first 4 year is Rs.20,000, Rs.30,000, Rs.40,000 and Rs.10,000. The same is visible in the above table.

02. Accounting Rate of Return (ARR)

Accounting rate of return is a technique based on the accounting concept of return on investment. The annual returns of a project expressed as a percentage of the net investment in the project. It may be defined as annualized net income earned on the funds invested in a project. It is a measure based on the accounting profit.

Symbolically,

ARR = Average Annual Profit (after Tax) / Average Investment in the project x 100

For example, the initial investment of the project is Rs.2,00,000 and the salvage value is Rs.20,000. A project requires an additional working capital of Rs.50,000 and is expected to generate the average annual profit (after tax) of Rs.25,000, then the average investment and accounting rate of return can be calculated as,

Average Investment = ½ (Initial Cost - Salvage Value) + Salvage value + Additional working capital

= ½ (2,00,000 - 20,000) + 20,000 + 20,000

= Rs.1,30,000

ARR = Annual Profit (after tax) / Average investment in the project x 100

= 25,000/1,30,000 x 100

= 19.24 %

II. DISCOUNTED CASH FLOWS OR TIME ADJUSTED TECHNIQUES

The discounted cash flow techniques or time adjusted techniques are based upon the fact that the cash flows occurring at different points of time are not having the same economic worth. It is a valuation method used to estimate the value of an investment based on its expected future cash flows. There are various techniques of evaluating cash flows. All these techniques have been discussed as follows -

01. Net Present Value (NPV) Method

The net present value of an investment proposal involves cash inflows and outflow over a period of time. It is calculated by taking the difference between present value of cash inflows and the present value of cash outflows over a period of time. Net present value is considered as the strongest element in making decisions for investment.

If a firm has multiple projects, the project with higher NPV is more likely to be selected. The investment with the positive and higher NPV will be considered for investment. It is an important tool of capital budgeting. NPV technique is used to analyze the profitability of a project. If the project is found suitable, on the basis of NPV firms select the project for investment.

It is calculated as,

NPV = Present value of Cash Inflows - Present value of Cash Outflows

$$NPV = \frac{R_t}{(1+i)^t}$$

t = time of the cash flow
i = discount rate
R_t = net cash flow

The decision rule of the NPV deals with the concept of "Accept the proposal if the NPV is positive and reject the proposal if the NPV is negative". The positive NPV signifies that the value of cash inflow is more than cash outflow. It implies that the project will generate positive returns.

In the case of mutually exclusive projects, the project with the highest NPV will be selected for investment. After that, the second highest NPV project will be given priority. On the priority basis, the project with the highest NPV will be given first priority and the project with the lowestNPV will be assigned as the lowest one. The main objective is to find out the proposal whose inflows have greater values than the outflows.

Properties of the NPV Criteria

This technique has several important properties -

01. The net present values are additive. Other techniques do not have this property.

02. The NPV calculations allow for the expected change in the discount rate.

03. The intermediate cash flows are reinvested at a discount rate.

Merits of NPV

The merits of the NPV can be enumerated as follows -

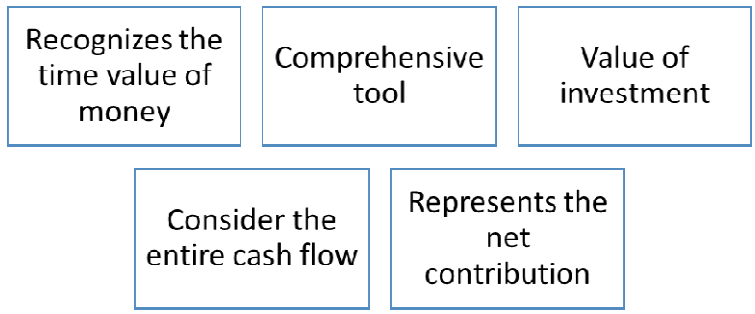


Fig.11.9 : Merits of NPVShortcomings of the NPV techniques

Apart from the merits, the NPV technique suffers from following shortcomings -

01. There are multiple assumptions in this technique.

02. The technique involves different calculations.

03. It requires the predetermination of the required rate of return.

04. It does not provide a measure of the project's own rate of return.

05. The decisions are based on absolute measure.

02. Profitability Index

Profitability index is defined as the benefits per rupee invested in the proposal. This technique is also known as benefit-cost ratio or present value index. This technique is based on the basic concept of discounting the future cash flows. The future cash flows can be ascertained by comparing the present value of the future cash inflows with the present value of the future cash outflows.

The profitability index is calculated by dividing the total present value of the cash inflows with the total present value of the cash outflows.

Profitability Index = Total present value of the cash inflows / total present value of the cash outflows

The decision rule of PI is accept the proposal if PI is more than 1 and reject if PI is less than 1. If the PI is equal to 1, then the firm may be indifferent.

03. Discounted Payback Period

The discounted payback period method is a combination of the payback method and the discounted cash flow technique. The cash flows are discounted to find their present values. The present value of cash inflows is compared with the total present value of the cash outflows. The recovery period of initial cost is also being measured. This method involves the concept of time value of money.

04. Terminal Value (TV)

In this technique, the present value of the project is compared with the initial outflow. The purpose is to find out the suitability of the proposal. The techniques involve compounding the future cash flows first. The future cash flows are first compounded at the expected rate of interest. The compounded values are then discounted at an appropriate discount rate. It results in finding out the present value. It is based on the assumption of investment of all future cash inflows.

05. Internal Rate of Return (IRR)

Internal rate of return is another important discounted cash flow technique of evaluation of capital budgeting. It is defined as the discount rate which produces a zero NPV. Unlike the NPV, the IRR is also based on discounting techniques.

The internal rate of return is the discount rate which equates the total present value of the cash inflows with the total present value of the cash outflows. It is a measure used in financial analysis to find out the potentiality of the proposals. The IRR indicates the annualized rate of return for a given investment.

Symbolically it is calculated with the help of the formula given below -

$$IRR = \frac{(Cash\ flows)}{(1+r)^i} - Initial\ Investment$$

Where:
Cash flows= Cash flows in the time period
r = Discount rate
i = Time period

The decision rule of IRR advocates that higher IRR is considered as the more desirable investment. And the lower IRR can be given lowest priority in selecting proposals for investment. In the case of multiple projects, a firm can prioritize the number of projects in terms of IRR. The project with the highest IRR will take the first position and lowest IRR will be placedat last. It does not take into consideration the duration of the project.

Critical Evaluation

01. Besides the NPV, internal rate of return is another important discounted cash flowtechnique of evaluation of capital budgeting.

02. It takes into account the time value of money.

03. It helps firms in achieving the objective of maximization of shareholders wealth.

04. The approach is based on the cash flows.

05. The proposal as per this technique is expressed as a percentage.

Illustration

The following mutually exclusive projects are considered :

Particular	Project A	Project B
PV of Cash Inflows	Rs.40,000	Rs.16,000
Initial Cash outlay	Rs.30,000	Rs.10,000
NPV	Rs.10,000	Rs.6,000
PI	1.33	1.60

Which project should be preferred and why?

Analysis : The project with the higher NPV should be selected. As per the NPV method, Project A should be selected. However, as per the PI technique, project B should be selected as it is having higher PI.

11.7 APPRAISING THE PROFITABILITY OF THE TECHNIQUES

The various techniques of capital budgeting deal with the various aspects of the proposals. They are meant to appraise the performance of a project. As per the decision rule, the technique evaluates proposals and suggests. Let us understand the various techniques in brief.

01. **Payback Period** - If the payback period is more than the target time, reject the proposal.If it is less than the target time, accept the proposal.

02. **Accounting Rate of Return** - IF the ARR is more than the pre-specified rate of return,the proposal is likely to be accepted. If not, a firm may reject the project.
03. **Net Present Value** - Accept the proposal if its NPV is positive and reject the proposal ifits NPV is negative.
04. **Profitability Index** - Accept the proposal if PI is more than 1 and reject if PI is less than 1. If the PI is equal to 1, then the firm may be indifferent.
05. **Discounted Payback Period** - A project is acceptable if its discounted payback is lessthan target payback period.
06. **Terminal Value** - Accept the proposal of the present value of the total compounded value of all the cash inflows is greater than the present value of the cash outflows.
07. **Internal Rate** of Return - A proposal may be accepted it its IRR, r, is more than the minimum rate i.e., k. If it is less than, it may be rejected. If it is equal, the firm may be indifferent.

11.8 SUMMARY

- The demand for capital represents the amount of capital an entrepreneur wants to invest in his/her business. The amount of capital is required to purchase capital goods like equipment, plants, machines and tools. Supply of capital is the amount available for investment. The amount which is available for investment is called savings.
- The point of equilibrium between demand and supply comes to a point when the demand for capital is equal to supply of capital. The equilibrium interest rate can be determined by the point of intersection of investment and savings curves.
- Capital rationing is a process through which a firm places a limit on the extent of projects that it decides to undertake. It is a strategy used by companies to limit thenumber of investment projects they undertake. It is a process of choosing the most profitable projects among the alternatives.
- Capital budgeting decisions denote a situation where decisions are to be taken related to the investment of lump sum funds invested in the initial stages of a project. It is expected that the returns will be generated over a period of more thana year.
- The net present value of an investment proposal involves cash inflows and outflow over a period of time. It is calculated by taking the difference between present value of cash inflows and the present value of cash outflows over a periodof time.
- The internal rate of return is the discount rate which equates the total presentvalue of the cash inflows with the total present value of the cash outflows. It is a measure used in financial analysis to find out the potentiality of the proposals.

11.9 QUESTIONS

01. Explain the concept of demand for Capital and supply of capital.

02. Write a note on the equilibrium point of demand for Capital and supply of capital.

03. What is capital rationing? Explain its significance and shortcomings.

04. What is capital budgeting? Classify its various techniques.

05. Capital budgeting evaluation techniques should be capable of ranking different proposals.Comment.

06. Do the NPV, IRR and PI always agree with respect to accept-reject decisions? Support your explanation with the help of a few examples.