MBA Semester - I

COURSE : 103

MANAGERIAL ECONOMICS

Lessons 1-12

INTERNATIONAL CENTRE FOR DISTANCE EDUCATION & OPEN LEARNING

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CHAPTER-1

THE ECONOMIC BACKGROUND TO MANAGEMENT

STRUCTURE

1.0 INTRODUCTION

Managerial Economics is one of the*most* important and useful course which provide a foundation of studying other courseslike finance, marketing, operations research, and managerial accounting. It also provide a theoretical framework to other courses to have a cross-functional view, Economics is "the study of the behavior of human beings in producing, distributing and consuming material goods and services in a world of scarce resources"[1]

1. Campbell McConnell, Economics, New York: MCGraw-Hill, 1993, p-1.
2. For books supporting this definition, see Peter Drucker, Management, New York : Harper & Row, 1973.

1.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand the concept of managerial economics andhow it is related to management. And also important terms and concepts used.

1.2 MANAGERIAL ECONOMICS

Management is the discipline of organizing andallocating & firm's scarce resources to achieve ifsdesired, objectives.[2]These two definitions clearlypoint out the relationship between economics andmanagerial decision making. In fact, these two termscan be combined together to define managerialeconomics as the use of economic analysis. Joe! Dean, defines managerial economics as "the 'use of economic analysis in the formulation of businesspolicies.[3]

William Barmol, stated that an economist can use Its ability to build theoretical, models and applythem to my business problem, no matter howcomplex, break it down Into essential components, and describe the relationship among the components, thereby facilitating a systematic search for an optimal solution. In his extensive experience as a consultantto both industry and government he found that everyproblem that he worked on was helped in samewayby "the method of reasoning involved in thederivationof some economic theorems".[4]

1.3 MANAGERIAL ECONOMICS ANDOTHER DISCIPLINES

In recent years, certain authors have lined their managerial economics texts thematically with strategy. The main approach in this text willemphasize the linkages of economics with otherbusiness functions, while maintaining a focus on the heart of managerial economics: the microeconomictheory of the behavior of consumers and firms incompetitive markets. This theory provides managers with a basic framework for making key business decisions about the allocation of the firm's scarce resources. In making these decisions managers must deal essentially with the questions listed below in a bridged form.

1. What are the economic conditions in a particular market ? It includes:
   (a) Market structure ?
   (b) Supply and demand conditions ?
   (c) Technology ?
   (d) Government regulations ?

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3. Joel Dean, Managerial Economics, Englewood Cliffs, NI : Prentice-Hall, 1951, p. vii.
4. William Esumol, “What can Economic Theory Contribute to Managerial Economics ?” American Economic Review, 51, 2 (May 1961), p. 114.

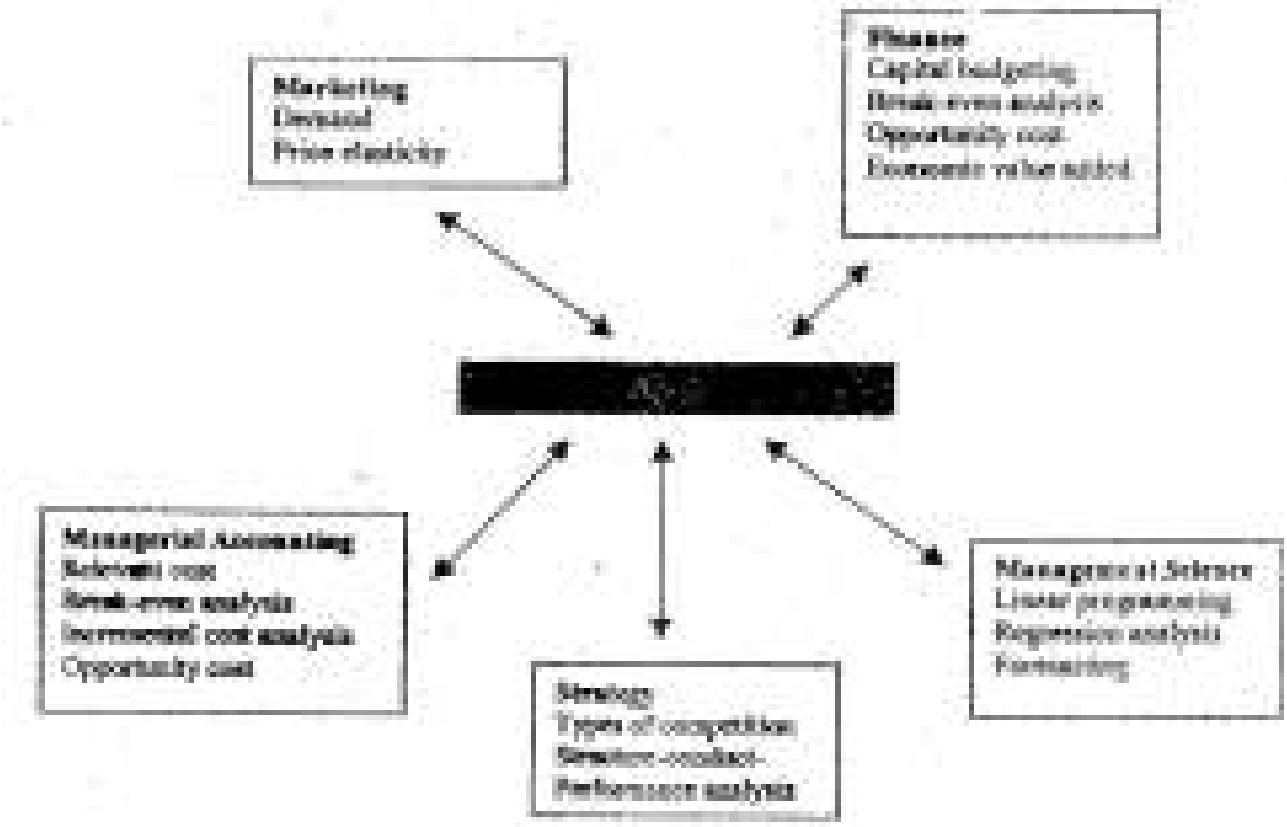


Figure 1.1

(e) International dimensions?

(f) Future conditions?

(g) Macroeconomic factors?

2. Should our firm be in this business?

3. If so, what priceand output levels should be set in order to maximize economic profit orminimize losses in the short run?

4. How can we organize and invest in ourresources? (land, labor, capital, managerial,skills) It consists of following competitiveadvantages.

(a) Costleader?

(b) Product differentiation?

(c) Focus on market niche?

(d) Outsourcing, alliances, mergers, acquisitions?

(e) Internationaldimension-regional or country focus or expansion?

5. What are me risks involved ?

Perhaps the most fundamental managementquestion is whether or not a firm should be in thebusiness in which they are operating ?

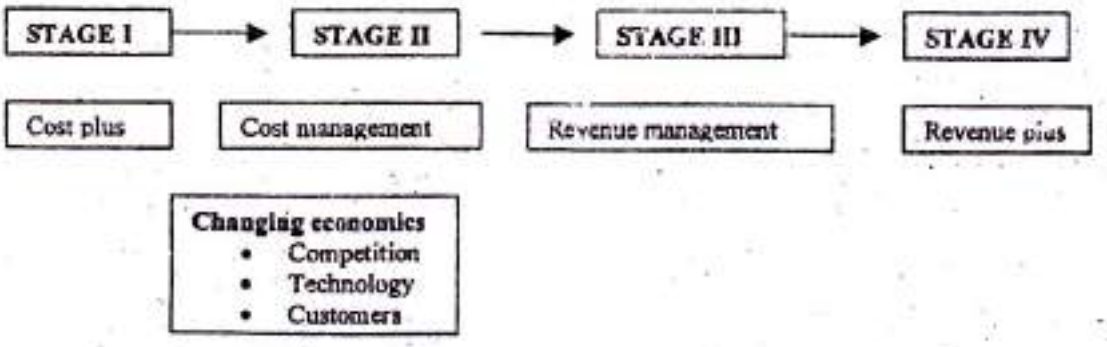
The question @5 has to do with a firm's risk.Uncertainty prevails in everyday life. And uncertainty,or risk, is always present in theoperations of abusiness. A company that buys steel can get a pricequote and be certain what it will pay for a ton. Acompany with temporary excess cash to invest for ashort period of time can ascertain the interest rate itwill earn. However, when it comes to future impacts,very few things are certain.We can define it risk or uncertainty. Thus it can be said that risk is thepossibility that the outcomes of an action will turn outto be worse than expected. Typical of the types ofrisk thatbusinesses face would include:

- Changes in demand and supply conditions.
- Technological changes and the effect ofcompetition
- Changes in interest rates and inflationrates.
- Exchange rate changes for companies engaged in international trade,
- Political risk for companies with foreignoperations.

1.4 THE ECONOMICS OF A BUSINESS

The study of managerial economics in abusiness curriculum is to consider how the materialcovered in this text relates to what we call theeconomics of a business. By this we mean "the keyfactors that affect the ability of a firm to earn anacceptable rate of return on its owner's investment".The most important of these factors are competition,technology, and customers.

State 1 can be called the good old days for those companies whose dominance in the market isto allow them to achieve high profit margin by simplymarking up their costs to provide them with a suitablelevel of profit. Then changes in technology,competition and customers forced them to enter intostage two by pressuring on their profit margins aswell as market share.



Figures 1.2

Four Stages of Change

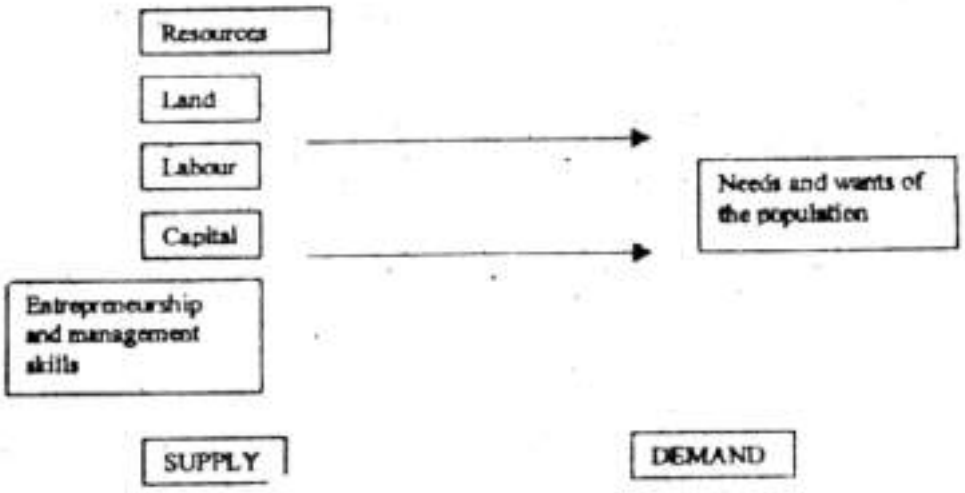
Since mid 1990s the companies sought to enterStage. III when they realized that the continual focuson cost; had limits its ability to increase profits. Afterail, there is only so much money that a company cansave by reducing its work force or by becoming more efficient. Therefore, in Stage II "top-linegrowth" became the major 'focus. Althoughcompanies may have reaffirmed their ability to-growtheir top line. Thus Stage IV becomes a necessarypart of a company's full recovery from the impact ofchanging economics.

The four stages of change model provide morethan just a framework to judge current businessevents. For example, in Stage. I the companydominates the market, the monopoly model wherebyfirms are free to price their products using the"MR-MC rule" would be particularly useful. InStage II, the company engaged in cost cutting in response to changing competition, customers, andtechnology, the material on cost and production and highly competitive markets become vital tounderstand. In Stage III, the company tries to growits way out of its decline to evaluate. Finally in Stage IV, the company strives for profitable growth, justabout all the material in this text can prove helpful.

1.5 IMPORTANT ECONOMIC TERMSAND CONCEPTS

For purposes of study and teaching, economicis divided into two broad categories: microeconomicsand macroeconomics. The former concerns with thestudy of individual consumers and producers inspecific markets, and the later deals with theaggregate economy, Topics in microeconomicsinclude supply and demand in individual markets, thepricing of specific outputs and inputs production andcost structures for individual goods and services, andthe distribution of income and output in thepopulation. Topics in macroeconomics includeanalysis of the gross domestic product,unemployment, inflation, fiscal and monetary policy,and the trade and financial relationships amongnations.

Microeconomics is the category that is mostutilized in managerial economics. However, certain aspects of macroeconomics must also be includedbecause decisions by managers of firms are influenced by their views on the current and future conditions of the macro economy. For companies whose businesses are particularly sensitive to fee business cycle, a, recession would have a very unfavorable effect on their sales, whereas a robust period of economic expansion would be beneficial. But for the most pan, managerial economies based on the variables, models, and concepts that embody microeconomic Sheeny. The relative nature of scarcity is represented in Figure 1.3. As can be seen in the figure, the supply of resources is used to meet the demand for these resources by the population.



Figures 1.3

(a) Supply, Demand and Scarcity

In the presence of a limited supply relative todemand, countries must decide how to allocate theirscarce resources. This decision is centra! to the studyof economics.la fact, economies has been defined as"the science which studies human behavior as arelationship between end and scarce means whichhave alternative uses″ Essentially; theallocation decision can be viewed as comprising three separatechoices:

1. What goods and services should be producedand in what quantities? .
2. How should these goods and services beproduced?
3. For whom should these goods and services beproduced?

There are essentially three ways a country cananswer the questions of what, how, and for whom. These ways, referred as processes, are as follows:

b. Market process: The use of supply, demand,**and material incentives** to answer **the** question **of what, how, and for whom.**

c. Command process: The use of the government or some central authorities to answer the three basic questions.

d. Traditional process : The use of customs and traditions to answer the three basic questions.

Countries generally employ a combination of these three processes to allocate their scare resources. In addition, the government can control the allocation of resources in a more direct way through various laws governing the actions of both consumers and producers.

1.6 THE CIRCULAR FLOW OF ECONOMIC ACTIVITY

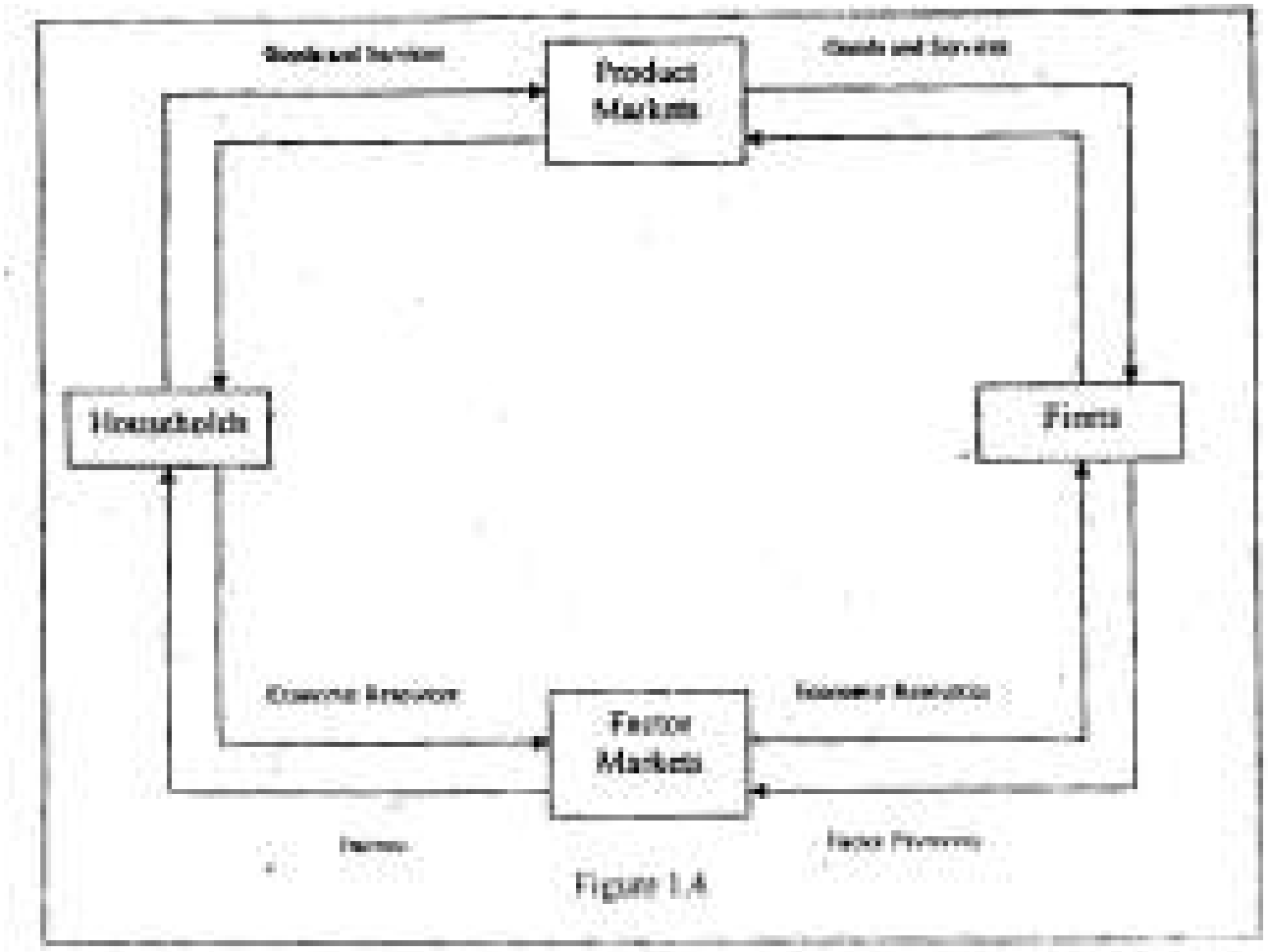


Figure 1.A

Circular Flow of is Income,Output, Resourcesand Factor Payments

Individual and firms are the main participants in market economy, A person own or controltheresources and a necessary input in the production process. These resources one can be classified as under.

1. Land
2. Labour
3. Capital
4. Natural Resources

Most people have labour resources to sell, andmany have owned capital and natural resources thatare rented, loaned or sold to other firms and used asinputs in the production process.

The interaction between an individual and a firm occurs in two different ways.

1. Product market where goods and services are **sold.**

2. Market for factors of production where labour,capital and natural resources are traded.

Figure 1.4 describes the circular flow ofincome, output resources and factor payments in amarket economy. An individual or a person demandgoods and services In order to satisfy theirconsumption needs. In product market, the demandfor these goods and services is known by bidding. Finns earn profits, by responding to these demands bysupplying goodsand services to that market. The consumer performance and income determine thedemand conditions. The interaction of supply anddemand determines the price and quantity sold. Themoneyis apurchasing power of an individual fromconsumers to thefirm in the product market and atthe time the goods and *s*ervices flows in the opposite direction i.e. from a firm to the consumer. The factor market has been shown at the bottom in figure 1.4. Itdepicts the reverse how as is in the product market. Individuals are the suppliers in the factor market. They use to supply input to the firms m terms oflabour services, capital and natural resources andfirm demand them to produce goods and services. The flow of money reflected from turn to theindividuals and factors of production flow from individuals to thefirms. Further more the priceand profits serve as the regulating factors of the flow ofmoney and resources through the factor markets andthe flow of money and goods through the productmarket.

In the era of market economy, individuals andfirms are highly laterdependent to each other. For example there is no value to the individuals labour until or unless no firm is there m the market topay forit. Alternatively, ferns can not justify productionunless some consumers want to 6uy their products.As a result, all fee participants have an incentive to•provide what other want. If some one is not benefited by buying *said* selling in these market, they are not regard to do so. Indeed, the benefits thataccrue to the individual participants form the essenceof a market economy.

1.7 MATHEMATICAL CONCEPTS ECONOMICS

Economics is the most mathematical of allthesocial sciences. Indeed, to the uninitiated reader, many academic journals in economics resemble-amathematics or physics journal. Intended to show thepractical applications of economic theory. On onehand, the economic theory of managerial decisionmaking has evolved along with the rest of economicsto a point where it can be profusely expressed in mathematical terms. On the other hand, industryexperience indicates that managers seldom use themore advanced mathematical expressions ofeconomic theory.

1.8 VARIABLES, FUNCTIONS ANDSLOPES: THE HEART OF ECONOMICANALYSIS

A variable is any entity that can assume differentvalues. Each academic discipline focuses attention onits own set of variables. For example, in the socialsciences, political scientists may study power andauthority, sociologists may study group cohesiveness,and psychologists may study paranoiaEconomistsstudy such variables as price, output, revenue, costand profit. The advantage that economics has overthe other social sciences is that most of its variablescan be measured in a relatively unambiguous manner.Once the variables of interest have been identifiedand measured, economists try to understand howand why the values of these variables change. Theyalso try to determine what conditions will lead tooptimal values. The term optimal refers to the bestpossible value in a particular situation. Optimal mayrefer to the maximum value. In any event, the analysisof the changes in a variable's value, often referred toas a variables "behavior," is almost always earnedout in relation to other variables.

1.9 FUNCTIONAL FORMS

For purposes of illustration it can *be* retied on alinear function to express the relationship amongvariables. This is particularly the case on supply anddemand. But there are many instances

when a linearfunction is not the proper expression for changes inthe value of a dependent variable relative to changesin some independent variable. For example, if afirm's total revenue does not increase at the samerate as additional units of its product are sold, a linearfunction is clearly not appropriate.Let us assume thata turn has the power to set its price atdifferent levelsand that its customers respond to different prices onthe basis of the following schedule.

P	Q
$7	0
6	100
5	200
4	300
3	400
2	500
1	600
0	700

The algebraic and graphical expressions of thisrelationship are shown in Figure (1.5). It assumed alinear relationship between price and quantitydemanded.

Based on the definition of total revenue, asTR = P x Q, we can create a total revenue schedule as well as a total revenue equation and graph. Sinceit is known that the demand curve is I = 700 – 100Pand TR = P x Q, it can be arrived at the values ofthe coefficient and intercept terms as well as thefunctional form in a very straight forward manner.First, we need to express P in terms ofQ so thatwecan substitute this relationship into thetotal revenueequation:

$$Q= 700 – 100P \quad (1.1)$$

or

$$P – 7 - 0.01Q \quad (1.2)$$

Substituting the Equation (1.2) into the totalrevenue equation gives

$$TR = PxQ \quad (1.3)$$

$$= (7-0.011)Q$$

$$= 7Q – 0.01\ Q^2$$

Ascanbe seen, a linear demand function results in a nonlinear total revenue function. More precisely,the functional relationship between total revenue andquantity seen here is expressed as a quadraticequation.

Example of a Step Function: Age. Groups andAdmission Price

(a) Continuous Functional Relationships

In plotting a functional relationship on a graph, itis assumed that changes in the value of the dependentvariables are related in a continuous manner to thechanges in independent variables, intuitively, afunction can be said to be continuousifitcanbe .drawn on a graph without taking the pencil off thepaper. Perhaps the best way to understand acontinuous function is to observe its opposite, afunction with discontinuity. Unless otherwisespecified, the functional relationships analyzed in this text are considered to be continuous. Looking backat our example of the demand and total revenue functions, we can see that 'they indeed indicate a continuous relationship between price and quantityand between total revenue and quantity. However, acloser look at the intervals used in the examplesmight lead you to question the applicability of acontinuous function in actual business situations.

(b) Discrete Intervals in a Continuous Function :

The Example of Total Revenue

Using Calculus

Calculus is a mathematical technique thatenables one to find instantaneous rates of change of acontinuous function.

Finding the Slopes of a Nonlinear Functions

In mathematics, a derivative is a measure of thechange in Y relative to a very small change in X.Using formal mathematical notation, we can definethe derivative as

$$\frac{dY}{dX} = \lim \quad \frac{\Delta Y}{\Delta X}$$

This notation canbe expressed as, "Thederivative of Y with respect to X equals the limit (ifsuch a limit exists) of the change in Y relative to thechange in X as the change in X approaches zero. Itcan be seen from the discussion in the previous twoparagraphs,'the derivative turns out to be the slope ofa line that is tangent to some given point on a curve.By convention, mathematicians use d to representvery small changes in a variable. Hence, $\Delta Y/\Delta X$means" changes .in Y relative to very small changes inX*'. For changes between two distinct points, thedelta sign (A) is used.

(c) Finding the Maximum and Minimum Values of a Function

A primary objective of managerial economics isto find theoptimal values of key variables. Themeans finding "the best" possible amount or valueunder certain circumstances. Marginal analysis andthe concept of the derivative are very helpful infinding optimal values. Forexample, given a totalrevenue function, a firm might want to find thenumber of units it must sell to maximize its revenue.Taking the total revenue function first shown inEquation (1.3), we have. .

$$TR = 7Q - 0.01\ Q^2$$

(1.4)

The derivative of this function (i.e., marginalrevenue) is

(1.5) $$\frac{dTR}{dQ} = 7 - 0.02$$

Setting the first derivative of the total revenuefunction or the marginal revenue function) equal tozero and solving for the revenue-maximizing quantity,Q*, gives us.

7-0.02Q- 0'

(1.6)

Q*=350

Thus, tile firm should sell 350 units of tisproduct if it wants to maximize its total revenue. In addition, if themanagers wish toknow the price thatthe firm should charge to sell the "revenue-maximizing" number of units, they can go back to thedemand equation from which the total revenuefunctionwas derived, that is,

P = 7-0.01Q

(1.7)

By substituting the value of O* into this equation, we obtain

P* = 7 - 0,01 (350)

(1.8)

= $3.50

To further illustrate the use of the derivative infinding the optimum; Suppose a firm wishes to find the price and output levels that will maximize itsprofit. If the firm's revenue and cost functions areknown, it is a relatively simple matter to use thederivative of these functions to find the optimal pricesand quantity. To begin with, let us assume thefollowing demand, revenue, and cost functions:

Q- 17.2- 0.1P

(1.9) .

or

?=172-10Q

(1.10)

$$TR=172Q-10Q^2$$

$$RC- 100 + 65Q +Q^2$$

(1.11)

$$TC = 100 + 65Q + Q^2$$

(1.12)

By definition, profit *(π) is equal* to total revenue minus total cost. That is

π = TR-TC

(1.13)

Substituting Equations (1.11) and (1.12) into(1.13) gives us:

π= 172 - $10Q^2$ - 100 - 65Q - Q^2

(1.14)

$= -l60 + 107Q - 11Q^2$

(d) Demand Functions, Total Revenue Functionand Revenue-Maximizing Price and Quantity

To find the profit-maximizing output level, wesimply follow the same procedure used to find therevenue-maximizing output level. We take the derivative of the total profit function, set it equal tozero, and solve for Q* :

$$\frac{d\pi}{dQ} = 107 - 22Q = 0$$

$$22Q = 107$$

(1.15)

$$Q^* = -4.86$$

Total Revenue, Total Cost and Tots! ProfitFunctions

(e) Five Key Functions

Five key functions will be used in this text: (1)demand (2) total revenue (3) production, (4) totalcost, and (5) profit. The demand function is linear,the total revenue function is quadratic, and theproduction, cost and profit functions are cubic. Notethat the last three functions all refer to economicconditions in the short, run.

1. Demand
2. Total revenue
3. Production (short run)
4. Cost (short run)
5. Profit (snort run)

1.10 SELF CHECK EXERCISE .

1. Define Economics.
2. Define Managerial Economics.
3. Discuss in brief importance of economics in business.
4. Write a short-note on circular flow of economic activity,
5. Discuss importance of mathematical concepts in managerial economics.

1.11 SUMMARY

The essence of economic analysis is the studyof functional relationships between certain dependentvariables and one ormore independent variables. Mathematics is a tool that can greatly facilitate theanalysis of these functional relationships. Forexample, rather than simply saying that "the quantity,of product sold depends on its price," we can use analgebraic equation to state precisely how many units of a product a firm can expect to sell at a particularprice. Moreover, when we engage in a marginalanalysis of fee impact of price on-quantity demanded, we can use the first derivative of this equation tomeasure the change in quantity demanded relative to changes in price. Furthermore, the precise algebraicexpression of the demand function enables us toderive a firm's total revenue and

marginal revenuefunctions. And with the help of calculus, the optimalprice and quantity (e.g., the price and quantity that maximize revenue) can be quickly found.

The more data a firm is able to obtain about its key economic functions (i.e., demand, revenue, production, cost and profit), the more mathematicscan be employed in the analysis. The more thatmathematics utilized, the more precise a manager canbe about such key decisions as fee best pries tocharge, the best markets to complete in, and themost desirablelevels or resource allocation.Unfortunately, in the real world firms do not oftenhave the luxury of accurate or complete data with whichtowork.

1.12 GLOSSARY

- **Business is an** organization where people work together. In a business, people work to make**and** sell products or services. Other people buy the products and services. The business owner is theperson who hires people for work. A business can earn a profit for the products and services it offers.
- **Economic Resources** are the inputs that are used to create things or help you provideservices. Economic resources can be divided into human resources, such as labor and management.and nonhuman resources, such as land, capital goods, financial resources, and technology.
- **Manager** is an expert in his or her field and is a support system for employees. Managers workwithin a business and work together as a team to achieve company goals. It is vital for managers todelegate responsibilities to employees and assist them if they need help.
- **Managerial** economics means the application of economic theory to the problem ofmanagement. Managerial economics may be viewed as economics applied to problem solving at thelevel of the firm. It enables the business executive to assume and analyse things.
- Strategy is an action that managers take to attain one or more of the organization'sgoals. Strategy can also be defined as "A general direction set for the company and its variouscomponents to achieve a desired state in the future.

1.13 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 1.0.
2. For answer refer to section 1.2.
3. For answer refer to section 1.4.
4. For answer refer to section 1.6.
5. For answer refer to section 1.7.

1.14 TERMINAL QUESTIONS

1. Define managerial economics. Discuss how it is related to other disciplines of business?
2. Enumerate circular flow of economic activity.

3. Discuss importance of mathematical concepts in managerial economics.

1.15 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis, Managerial Economics, Prentice Hall of India.
3. Dwivedi D N, Managerial Economics, Vikas Publishing House Pvt. Ltd.
4. Peterson, Lewis and Jain, Managerial Economics, Pearson
5. Sadananda, Managerial Economics, Prentice Hall of India

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29CHAPTER-2

MANAGERIAL ECONOMICS, CONCEPTS SCOPE AND METHODS

STRUCTURE

2.0 INTRODUCTION

Managerial economics and business economicsare the two terms, which at times have been usedinterchangeably. Managerial economics is that branchof economics, which serves as a link betweenabstract theory arid managerial practice. It is basedon economic analysis for identifying problems,organising information andevaluating alternatives.Managerial economics as a science, is concernedwith the problem of allocation of scarce resourcesamong competing firms. It **is** goal oriented by natureand aimed at maximising profits by achieving theobjectives.

2.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand the nature, scope and applications of managerial economics and you can differentiate between managerial economics and economics.

2.2 NATURE OF MANAGERIAL ECONOMICS

Economic-back ground to management:-

The prime function of a management executivein a business organisation is decision-making andforward planning. Decision-making means, the process of selecting one alternative from two or more alternative courses of action whereas forwardplanning means establishing plans for the future. Theresources such as capital,larid,labour andmanagement are limited and can be employed inalternative-uses. Therefore a question of choicearises. The decision-making function thus provide themost efficient means of attaining a desired endsay,profit maximization. Once a decision is made aboutthe particular goal, plans to production, pricing,capital, raw materials, labour etc. are prepared. Forward-planning thus goes hand in hand withdecision making.

A significant characteristic of the conditions inwhich business organisations work is uncertainty.And this fact of uncertainty not only makes thefunction of decision-making and forward planning'complicated but adds a different dimension to it. Ifknowledge of the future were perfect, plans couldbeformulated without error without any need forrevision. In the real world, the business managerrarely has complete information about future sales,costs, profits, capital conditions etc. Therefore thedecisions are made and plans are formulated on thebasis of past data, current information and theestimates. As plans are implemented over time, morefacts becomeknown so that totheir light; plans mayhave to be revised,; and a different course of actioncould be adopted; Managers are thus engaged in acontinuous process of decision-making through an uncertain future.

In fulfilling the function of decision-making inuncertainty framework, with considerable-advantages, economic theory deals with a number ofconcepts and principles relating, to profit, demand,cost, pricing, production, competition, businesscycles, national income etc. It is supported by allieddisciplines like Accounting, Statistics andMathematics to solve or at least throw some lightupon the problems of business management. Theway economic analysis- is used towards solvingbusiness problems constitutes the subject-matter ofManagerial Economics.

According to Me Nair and Meriam,"Managerial Economics consists of the use ofeconomic modes of thought to analyse businesssituation." Spencer and Siegelman have definedManagerial Economics is the integration of economic- theory with business practice for the purpose of'facilitating decision-making and forward planning by;management" Therefore, managerial economics canbe defined as the discipline, which deals with theapplication of economic theory to businessmanagement Managerial Economics thus lies*on* theborderline between economics and businessmanagement and serves as a bridge between the twodisciplines.

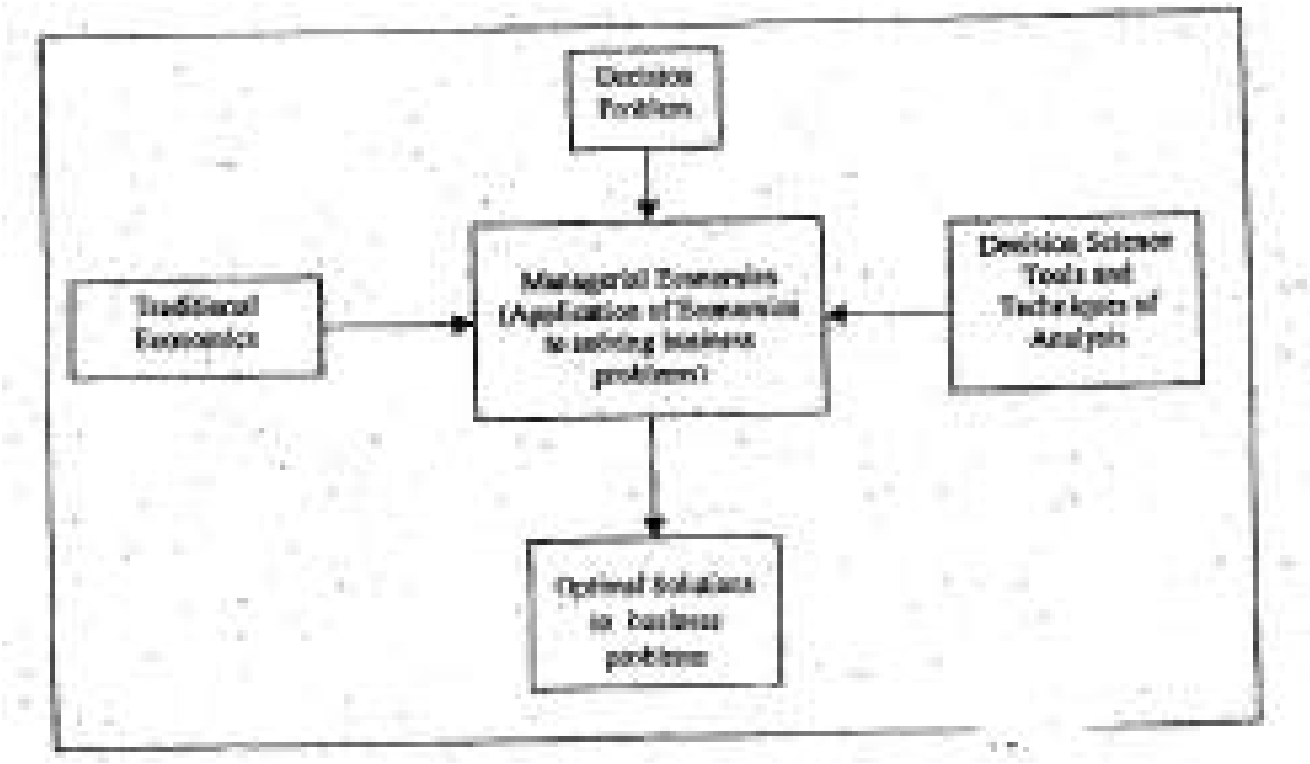


Figure 2.1

2.3 Applications

The application of economic principles is to be the business problems or she integration of economic theory with business practices. The' Spencer and Slegelman have **put** it, the following-aspects:.

1. Reconciling traditional theoretical concepts of economics in relation to the actual business behaviour and conditions. In economic theory; the techniques of analysis is one of model on the basis of which certain assumptions are made and conclusions are drawn regarding behavior of fee firms. The assumptions; fails to provide a satisfactory explanation of what the firms actually do and make the theory of the firm unrealistic. Hence there is a need to reconcile the theoretical principles based on assumptions with actual business practices and to develop appropriate economics theory, if necessary.

To take an example, an assumption usually made is that firms aim at maximizing profits and on that basis, the theory of the firm suggests how much the firm will produce and a£ what price it would sell. In practice, however, firms do not always aim at maximizing profits and, to that extent, the theory of the firm fails to provide a satisfactory explanation of the turn's fails to provide a satisfactory explanation of the firm's actual behaviour.

Malcolm PMc Nair and Richard S. Meriam. Problems **in** Business Economics (Mc Graw Hills, New York, i94i P.V,

Milton H Spencer and Louis Siegelman.Managerial Economics (Irwin. iilinois. 1969). P.I

Moreover in actual business practices, certainterms like profits and costs have distinguishedaccounting concepts from economic concepts. In Managerial Economics, an attempt has been made toreconcile the accounting concept with the economic concepts so that financial data pertaining to profitsand costs could be used more effectivelyto facilitatedecision- making andforward planning,

2. **Estimating economic relationships:**Itincludes measurement of various types ofelasticity, of demand such as price elasticity, income elasticity, cross elasticity, promotionalelasticity, cost-output relationships etc. Theestimates of these economic relationships isused for the purpose of forecasting.
3. Predicting relevant economic quantitiest it consists of profit, demand, production costs,capital etc., In numerical terms together withtheir probabilities. The business manager has towork in an environment of uncertainty and future estimates are future to be predicted. Therefore the decision-making, and forwardplanning may be possible in the light of thesepredicted estimates.
4. **Using economic quantities in decision making and forward planning :**It includesExamination of business policies and establishing business plans, for the future, pertaining to profit, prices,costs, capital etc. The nature ofeconomic forecasting indicates the degree ofprobability ofvarious possible outcomes likelosses or gains as aresult of each strategiesavailable. The business manager evaluate the number of courses, open, their possible outcomes and the qualified probability of each outcome. Keeping all these factors. Inconsideration he decides about the strategy tobe choosen.

Understanding significant external forcesconstituting the environment in which thebusiness is operating. **It** includes business.cycles, national income and government policiespertaining to taxation, foreign trade, labourrelations, antimonopoly measures, industriallicensing, price controls etc. The businessmanager has to appraise the relevance andimpact of these external forces in relation to theparticular business unit and its business policies.

2.4 CHIEF CHARACTERISTICS;

These can be explained as under:Managerial Economics is Micro-economic in character. This is because the *wait* of study **is a**firm; Managerial Economics does not deal withthe entire economy as a unit of study.

Managerial Economics largely uses thebody ofeconomic concepts and principles which Isknown as 'Theory of the Firm or 'Economicsof the Firm'. It seeks to apply Profit Theory is Economics.

Managerial Economics is pragmatic in nature, itavoids difficult abstract, issues of economictheory butinvolves complications ignored ineconomic theory to face the overall situation in which decisions are made. ManagerialEconomics condition the particular environment of decision-making.

4. Managerial Economics in nonmative economics rather than positive economics. It is prescriptive rather than descriptive. It confines descriptive hypothesis and attempting to generalize about the relations among different varieties without judgement about what is desirable or undesirable. For instance, the law of demand states that as price increases, demand goes down or vice-versa but This does not tell whether the outcome is good or bad. Managerial Economics, however, is concerned with what decisions ought to be made

and hence involves value judgement. This has two aspects: first, it tells what aims and objectives and secondly, it tells how est to achieve these aims in a particular situations. Therefore Managerial Economics, has also been known as 'normative micro-economics of the firm'.

5. Mecro-economics is also useful to Managerial Economics since it provides on intelligent understanding of the environment in which the business operations are carried out. This enable a business operations are carded out Thisenablea business firm to adjust in the best possiblemanner with external forces. It consists ofbusiness cycles, national income, accountingand economic policies of the governmentrelating to taxation, foreign made and labour relations, etc.

2.5 DIFFERENCE BETWEEN MANAGERIAL ECONOMICS AND ECONOMICS ?

1. Managerial economics involves application ofeconomic principles to the problems of the firmwhereas Economics deals with the body of life principles itself.
2. Managerial economics is micro in naturewhereas economies is both macro economicand micro-economic in character.
3. Managerial economics, deals only with the firmand has nothing to do with an individual'seconomic problems-but micro economics dealswith both economics oftheindividual as well aseconomics of the firm.
4. **In** micro-economics distribution, theories, likewages interest and profit, are dealt. Whereas inmanagerial economics, mainly Profit Theory isstudied. Other theories have not been muchused in managerial economics.
5. Economics gives the simplified model, whereasmanagerial economics modifies and enlarges itEconomic theory hypothesizes economicrelationships and builds economic models butmanagerial economics adopts, modifies andreformulates economics models to suit thespecific conditions and serves the specificproblem solving process.
6. Economic theory makes certain assumptionswhereas managerial economics introducescontain feedbacks such as objectives of the firm,'multi-product nature of manufacture,behaviouralconstraints, environmentalaspects,legal constraints, constraints, on resourceavailability etc..

2.6 SCOPE OF MANAGERIAL ECONOMICS.

Managerial economics has a close connectionwith economic theory, operations research, statistics,mathematics and the theory of decision making.Managerial economics draws ideas from variousfunctional areas of management like production,marketing, finance, accounting etc. A managerialeconomists has to integrate concepts andmethods from all these functional areas and disciplines in orderto understand and analyse practical managerialproblems. The following aspects constitute thesubjectmatter of managerial economics.

Demand Analysis arid Forecasting, Cost andProduction Analysis, Pricing Decisions, Policies andPractices, Profit Management, and Capital Management

These aspects may also be called as the'subject-matter of Managerial Economics".Inrecentyears, there is a trend toward integration ofManagerial Economics and Operations

Research.Hence techniques such as Linear Programming,Inventory Models, Theory of Games, etc., have alsocome to be regarded as part of ManagerialEconomics.

1. Demand Analysis and Forecasting

A business firm is an economic organism whichtransforms productive resources into goods that areto be sold in a market. A major part ofmanagerialdecision making depends on accurate estimates ofdemand. A forecast of future sales is essential beforeproduction schedules is prepared and resources' areemployed. This forecast also serve as a guide tomanagement for maintaining and strengthening marketposition with theaim of enlarging profits. Demandanalysis helps to identify the various facts influencingthe demand for a firm's product and provides necessary guidelines. Demand Analysis andForecasting, therefore, is essential for businessplanning. It occupies a strategic place in ManagerialEconomics, It consists of discovering the forcesdetermining sales and their measurement. The main -topics covered are: Demand Determinants, Demandand Demand Forecasting.

2. Cost and Production Analysis

A study of economic costs yield significant costestimates which are useful for management, decisions.The factors causing variations in costs, should be recognised and allowed management to arrive at costestimates which aresignificant forplanning purposes. An elementofcost uncertainty always exists. It isbecause all the factors determining costs are notcontrollable always; Discovering economic cost andbeing able to measure them, are necessary steps formore effective profit planning, cost control and oftenfor sound pricing practices. Production analysisfrequently studied in physical term whereas costanalysis deals in monetary terms. The maintopicscovered under cost and production analysis are: CostConcepts and Classifications, Cost-OutputRelationships, Economics and Diseconomies ofScale, Production Functions and Cost Control.

3. Pricing Decisions, Policies and Practices

Pricing is a very important area of ManagerialEconomics.In fact, price is the genesis ofabusinessfirm. The success of a business firm largely dependson the accuracy of the price decisions taken by It.The important aspects dealt under this area are: PriceDetermination in different Market Forms, PricingMethods, Differential Pricing, Product-line Pricingand Price Forecasting.

4. Profit Management

Business firms are generally aimed at of makingprofits and in the long run, profits provide the way tosuccess. In this connection an important point ofconsideration is an element of uncertainty existingabout profits because of variations in costs andrevenues which in turn, are caused by factors bothinternal and external to the firm. If knowledge aboutthe future were perfect, profit analysis would havebeen a very easy task. However, in the time ofuncertainty, expectations are not always realised sothat profit planning and measurement constitute thedifficult area of Managerial Economics. Theimportant topics covered under this area are: Natureand Measurement of Profit, Profit Polities andTechniques of Profit Planning like Break-EvenAnalysis.

5. Capital Management

Capital managementis themost complex andtroublesome for the .business managers, to takedecisions regarding firm’s capital investments. Relatively problems are so complex that theirdisposal; notonly requires considerable time andlabour but also a matter for top-level decision. Inbrief capita! managementimpliesplanning and controlof capital expenditure. The main topics dealt with are:Cost of Capital, Rate of Saturn and Selection ofProjects.

It is evident from above discussion that thevarious aspects outlined above represent the major uncertainties which a business fern has to reckonwith, vis., demand uncertainty, cost uncertainty, priceuncertainty, profit uncertainty and capital uncertainty.Therefore it can be concluded that the subject-matterof managerial economics consists of applyingeconomic principles and concepts toward adjustingwith various uncertainties faced by business fims.

2.7 ECONOMIC 'THEORY AND MANAGERIAL ECONOMICS

Economic theory offers a variety of conceptsand analytical tools, which can be of considerableassistance to the manager in his decision-makingpractices. This is not to say that economics has all theanswers, In fact, actual problem solving in businesshas found that there exists a wide disparity betweenthe economic theory of firm and actual observedpractice necessitating. They use many skills andtools, which are not available, in thetraditionaleconomists kit It would, therefore be quite useful toexamine, the basic tools of managerial economics which it has borrowed from economics and thenature and extent of gap between the economic theory ofthe firm and the managerial theory of thefirm.

1. Basic Economic Tools in Managerial Economics

The most significant contribution of economics to managerial economics firm in certain principles, which are basic to the entire gamut of managerial economics. The basic principles may be identified as :

2. Opportunity Cost Principles

The opportunity cost of a decision is the sacrifice of alternatives required by that decision. This can best be understood with the help of a few illustrations.

(i) The opportunity cost of the business is theinterest that could be earned *on* those foundsthey could have been employed in otherventures;

(ii) The opportunity cost of the time anentrepreneur devotes to his own bushes is the salary he could earn by seeking employment;

(iii) The opportunity cost of using a machine toproduce one product is the earning in forgonewhich would have been possiblefrom otherproducts;

(iv) The opportunity cost of using a machine that isuseless for any other purpose is zero since its:use requires no sacrifice of other opportunities.

(v) If a machine can produce either X or Y,opportunity cost of producing a given quantityof X is therefore the quantity of Y which itwould have produced. If that machine canproduce 10 units ofX or 20 units of Y, theopportunity cost of 1X is 2Y.

(vi) Suppose we have no information aboutquantities produced, but have information abouttheir prices. In this case, the opportunity costscan be computed in terms of the ratios of theirrespective prices say Px/Py

(vii) The opportunity cost of holding Rs. 500 as cashin hand for one year is the 10 percent rate ofinterest, which would have been earned themoney been kept as fixed deposit in a bank.

Thus, if is clear that opportunity cost requireascertainment of sacrifices. If a decision involves nosacrifice, its opportunity cost will be nil. Fordecision-making, opportunity costs are the onlyrelevant

costs. The opportunity cost principle may bestated as under: The cost involvein any decision consists of the sacrifices of alternatives required by the decision. If there, are no sacrifices,'there is nocost.

In macro sense, the opportunity cost of more guns in an economyis less butterContinueddiversion of funds to defence spendingamounts to aheavy tax on alternative spending on growth anddevelopment.

3.Incremental Principles

Incremental concept is closely related to themarginal cost and marginal revenues of economictheory. Incremental concept involves estimating theimpact of decision alternatives on costs and revenues, emphasizing the changes in total cost andtotal revenue resulting from changes in prices,products, procedures, investments or whatever maybe at stake in the decision.The two basiccomponents of incremental cost and incrementalrevenue. Incremental cost may be defined as thechange intotai cost resulting from a particulardecision. Incremental revenue is the change in total revenue resulting from a particular decision.

The incremental principles may be stated as under :

A decision is obviously a profitable one if-

(i) it increases revenue more than costs;

(ii) it decreases some cost to a greater extent thanit increases others;

(iii) it increases some revenues more than itdecreases others; and

(iv) it reduces costs more than revenues.

Some businessmen take the view that to makean overall profit, they must make a profit on everyjob. The result is to refuse orders thatdo not coverfull cost (labour, materials and overhead) plus aprovision for profit. Incremental reasoning indicatesthat this rule may fee inconsistent with profitmaximization in the short run. A refusal to acceptbusiness below foil cost but rather the incrementalcost. A simple problem will illustrate this point.

Illustration

Suppose anew order is estimated to bring in anadditional revenue of Rs. 5,000. The costs areestimatedas under:

Labour	Rs. 1,500
Materials	Rs.2,000
Overhead (allocated at 120% of labour cost)	Rs. 1,800
Selling and administrative expenses (allocated at 20%) of labour material cost.	Rs.700
Full cost.	.Rs. 6,000

The order appears to be unprofitable.However, suppose, there is idle capacity which canbe utilized to execute this order. If the order addsonly Rs. 500 of overhead (that is, the added, use ofheat, power and light, the added wear and tear anmachinery, the added costs of supervision, and soon).only Rs. 1,000 by way of labour cost becausesome of the idle workers already on the payroll willbe deployed without added pay, and no extra selling and administrative cost, the incremental cost ofaccepting tile order will be as follows:

Materials	Rs.2,000
Labour	Rs. 1,000
Overhead	Rs.500
Total Incremental Cost	Rs. 3,500.

While it appeared in the first instance that theorder will result in a loss of Rs.; 1,000, it now appears that it will lead to an addition ofRs. 1,500 (Rs.5,000-Rs. 3,500) to profit.

Incremental reasoning does not means that thefirm should accept all orders at prices which covermerely their incremental costs. The acceptance of theRs. 5,000 order depends upon the existence of idlecapacity and labour that would go unutilized in the absence of more profitable opportunities. Earley*sstudy of" excellently managed" suggests thatprogressive corporations do make formal use ofincremental analysis. It is however, impossible togeneralise on the observed behaviour being variable.

4. Principle of Time Perspective

The economic concepts of the long run and theshort run have become language. Managerialeconomists are also concerned with the long-runeffects of decisions on revenues as well as costs. Thereal important problem in decision-making is to maintain the right balance long-run and the short-runconsiderations. A decision may be made on the basisof short-run considerations, but may as lime elapseshave long run repereussions, which make itmore or less profitable than it at first appealed.

5. Discounting Principle

One of the, fundamental ideas in economics isthat arupee-tomorrow is worth less than a ropes*today.* This seems similar to saying that a bird inhandis worth two in the bash. A simple example wouldmake this point clear. Suppose a person isoffered achoice to make a gift of Rs. 100 today or Rs.100next year. Naturally he will choose Rs. 100 today.This is true for two reasons. First 'the future isuncertainand there may be uncertainty in getting Rs..100 if the present opportunity is not availed of. Secondly, even if he is sure to receive the gift infuture, today's Rs. 100 can be, invested so as to earninterest,say at 8 percent so that one year after theRs. 100 of today will become Rs. 108 whereas if hedoes not accept Rs. 100 today, he will get Rs. 100only year hence. Naturally, he would preferthe firstalternative because he is likely to gain by Rs. 8 infuture. Another way of saying the same thing is thatRs. 100 one year hence is not equal to Rs. 100 oftoday but less than that. But then how much moneytoday is equal to Rs. 100 one year hence. To find itout, we shall have to find out the relevant rate ofinterest which one would earn if one decides to investthe money. Suppose the rate of interest Is 8 percent. Then we shall have to discount Rs. 100 at 8 percentin order to ascertain how much money today will**become** Rs. **100 one year after. The** formulais:

V=Rs. 100/l + 1. .

Where V = present value

1 = rate of interest,

Now, applying the formula. We get

V = Rs. 100/1.08 = Rs. 92.59

As a cross-check, if we multiply **Rs.** 92.59 by1.08, we shallget themoney which will accumulateat 8 percent after one year:

92.59x1.08 = 99.9972 = Rs. 100

The **same reasoning applies to longer** periods.A sum ofRs. 100 two years from now is worth

$V = Rs.\ 100 / 1 + 1)^2 = Rs.\ 100 / (1.08)^2 = Rs.\ 100 / 1.1664 = Rs.\ 85.73$

Again, we can check by computing how much the commutative interestwill be after two years.

The principle-involved in the foregoingdiscussion can be called the discounting principle andmay be stated as wader: "if a decision affects costsand revenues at future dates, it is necessary todiscount those costs and revenues to present values before a valid comparison of alternatives is possible."

6. Equl-marginal Principle

This principle deals with the allocation of theavailable resources among fee alternatives activities.According to this principle, an input should be soallocated that the value added by **the last**unit is the same in all cases. This generalization is called the equal marginal principle.

Suppose a firm has 100 units of labour at its disposal. The firm is engaged in four activities which need labour services, viz. A, B, C and it can enhance any one of these activities by adding more labour but only at the cost of other activities.

It should be clear that if the value of themarginal product is higher in one activity thananother, an optimum allocationhas not been attained. it would, therefore, be profitable to shift labour fromlow marginal value activity to high marginalvalue activity, thus increasing the total value of all products taken together. To take an example, if in activity A,the value of marginal product of labour is Rs. 20.while that in activity B it is Rs. 30, is profitable toshift labour from activity A to activity B therebyexpanding activity and reducing activity A. Theoptimum will be reached when the value of the marginal product is equal in all the four activities or,symbolically expressed, when

$VMP_{LA} = VMP_{LB} = VMP_{LC} = VMP_{LD}$

Whereby the subscripts indicate labour inrespective activities.

Certainaspects of the equi-marginal principleneed clarification. First, the values of marginalproducts are net of incremental costs. In activity' B we may add one" unit of labour with an increase inphysical output of 100 units. Eachunit is worth 50 paise so thatthe100 units will be sold for Rs. 59. But the increased outputconscious law materials, fuel and other inputs so that variable costs in activity (not counting the labour cost) are higher. Let us say that the incremental costs are Rs. 30 leaving a net addition of Rs. 20. The value of the marginal product relevant for our purpose is thus Rs. 20.

Secondly, if the revenues resulting from the addition of labour are to occur in future, these revenues ought to be discounted before comparisonsin the alternative activities are possible. Activity A may produce revenue immediately but activities B, C and D may take 2.3 and 5 years respectively.

Thirdly, the measurement of the value of the marginal product may have to be corrected if the reduction in the prices of the output. If activity B represents the production of radios and it is not possible to sell more radios without of reduction in price, it is necessary to make adjustment for the fall to price.

Fourthly, the equl-marginal principle may break under sociological pressures. For instance, due to inerlia, activities and continued simple because they exist. Again, motivated by empire building, managers may keep on expanding activities to fulfil their ambition for power. Departments which are already overbudgeted often use some of their excess-resources to build up oropoganda machines

(public relations offices) to win additional support. Governmental agencies are more prone to bureaucratic self-perpetuation and inertia.

2.8 GAPS BETWEEN THEORY OF THE FIRM ANDMANAGERIAL ECONOMICS

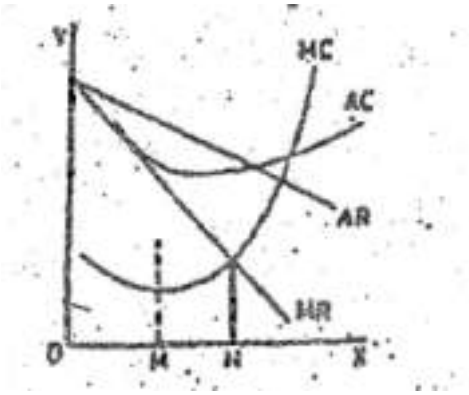
The theory of the **firm is a body oftheory which**contains certain assumptions, theorems andconclusions regarding the way in which businessmenmake decisions about pricing ana production underprescribed market conditions. It is concerned withthe study of the optimization process. In essence foroptimalityto exist, profit must be maximised and thiscan occur only when marginal cost equal marginalrevenue. Thus the optimumposition of the firm is thatposition which maximizes net revenue.

Managerial Economics, on the other hand,areas at developing a managerial theory of the filmand for this purpose it takes the help of economictheory of the firm. However, there are certaindifficulties in using economic theory as an aid to the.study of decision making at the level of the firm, failsto provide sufficient analytical tools that are useful tomanagers. Some of the reasons are noted below :

1. Underlying all economic theories is theassumption that the decision maker isomniscient and rational or omniscient meansthat he knows the alternatives mat are availableto him as well as the outcome of any action hechooses. The typical business decision-makerusually has limited information at his disposal,limited computing ability and a limited numberof feasible alternatives involving varying degreesof risk. Further, the net *revenue*function whichhe is expected to equate, assume a knowledgeof information which is not known and cannotbe obtained even by the most careful analysis. 'Hence it is absurd to expect a manager tomaximise, and equalize certain critical functional elationships which he does not even know andcannot find out.

2. in micro-economic theory, the most profitableoutput is feat where marginal cost and marginalrevenue are equal. In fig. 2.2, the profitableoutput will be at ON where MR = MC. This isthe point at which the slope of the profit function or marginal profit is zero. .

This is highlighted in Fig. 2.3 where the mostprofitable output will be again at ON. In economictheory, the decision maker has to identify this unique output level which maximizes profit.



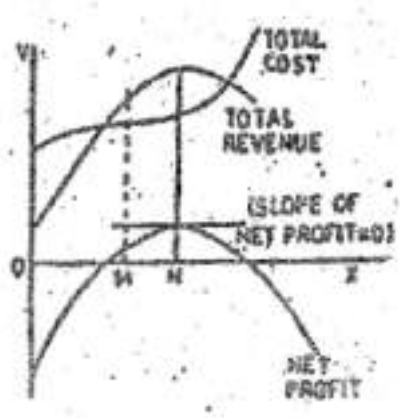


Figure 2.2 and 2.3

In real world, however, a complexity oftenarises, viz., certain resource limitations exist. As aresult, it is not possible to uttain the maximum output level ON, rather the maximum output is possible as a result of resource limitations say, OM. Now dieproblem before decision-maker is to find out whetherthe output which maximizes profit is OM or someother level ofoutputto the left of OM. A managerialeconomist here has to take the aid of LinearProgramming which enables him to optimize orsearch for the best values within the limits set byinequality conditions.

1. To take another example, a central, assumptionin the economic theory of the firm is that theentrepreneur strives tomaximize his residual share, or profit. Several criticisms of thisassumption have been made:
   (i) The theory is ambiguous as towhether it isshort orlong-rum profit that is to be maximized.
   (ii) Certain questionscreate some confusion around the concept of profit maximization. Should the fain: seek to maximize theamountof profit or the rate of profit?What is the rate of profit-point In relationto total capital or profit in relation toshareholder's equity?etc.
   (iii) There is no allowance for the existence of"psychic income" which the entrepreneurmightobtain 'from thefirm, quite apartfrom his monetary income.
   (iv) The theory does not recognize that undermodem conditions, ownersand managersare separate and distinct groups of peopleand the latter may not he motivated tomaximise profits.
   (v) he entrepreneur may not care to receive maximum profits but may simply want toearn ‘satisfactory profits".

The notion of satiation plays-no role in classicaleconomic theory'. But if we seek to explain businessbehaviour in leans of this theory, we must expect thefirm's goals to not maximize profit, but attaining acertain level or rateof profit, holding a certain shareof the market or certain level of sales. Firms has tosatisfies rather than maximize. On this last basis, viz., notion of satiation, it appears that one of the mainunderpinningsof classical economic theory hasbeenseriously weekend.

(vi) Most corporate undertakings involve theinvestment of funds, which are expected to generate revenues over a number of years.The profit maximization criterion provides no basis for comparing alternativespromising varying flows of revenue andexpenditure over time.

(vii) Another problem associated with thepractical application of profitmaximization concept is that it provides no explicit way of considering the risk associated withalternative decisions. Two projectsgenerating identical future expectedrevenues and requiring identical outlaysmay vastly be different with respect to thedegree of uncertainty with which thebenefits and the greater risk associatedwith the project.

2. Empirical studies of pricing behaviour also giveresultsdifferent from that of the economictheory of the firm as can be seen from feefollowing examples:

   (a) Several studies of the pricing practices ofbusiness firmshave indicated that managers tend to set price's by applying somesort of a standard mark-up on costs,rather than attempt to estimate marginal revenues or demand elasticities, even ifthese could be accurately measured.

   (b) For many firms, prices are more often setto attain a particular target return oninvestment, say, 10 percent, than tomaximize short or long-run profits.

   (c) There is some evidence that firmsexperiencing declining market shares intheir industry strive more vigorously toincrease their sales than to competing firmswhich are experiencing steady or,increasing market shares.

3. An alternative model to profit maximization isthe concept of wealth maximization whichpostulates thatfirms seek to maximize thepresent valueof expected net revenues over allperiods within the forecastable future.

4. As pointed out by Haynes and Henry, a study of the behaviour of actual firms shows that theirdecisions are not completely determined bythe market and that they have some freedom todevelop decisions, strategies or rules whichbecome part of the decision-making systemwithin the firm.Thisgapin economic theory hasled to what has come to known as BehaviouralTheory of the Finn, This theory, however, does not supersede the former but rather powerfullysupplements it.

The Behavioural Theory represents the firmas an adoptive institution. It learns from experience andhas a memory. Organisational behavior which'works' isembodied into decision roles and standardoperating procedures. These may be altered overlong run as the firm reacts, of 'feedback' fromexperience. However, in the short run, decisions ofthe Organisation are dominated by its rules of thumband standard methods.

2.9 SELF CHECK EXERCISE

1. Write a short-note on nature of managerial economics.
2. Define Managerial Economics.

3. What are the applications of Economics? Discuss in brief.
4. Write a short-note on characteristics of managerial economics.
5. Write a short-note on discounting principle.

2.10 SUMMARY

The various gaps between the economic theoryof thefirm and actiondecision-making process at the firm level have far from exhausted the list that could have been complied. They do, however; stressthat economic theory has been found in serious needof major overhaul and substantial changes are well under way towards disclosing better and different'models. Thus the classical economic model ofrational man is undergoing important changes; Thenation of statisficing pushing aside the aim ofmaximization and newer lines and patterns ofthoughts are underway for finding improvedapplications to managerial decision-making. A strongemphasis is being laid on quantitative model, newertechniques and concepts such as linear programming,game theory, statistical decision-making etc., arebeing pressed into service to revolutionize theapproaches to problem solving in business and economics.

2.11 GLOSSARY

- **Applied economics** is the study of economics in world situations as opposed to the theoryof economics. It is the application of economic principles and theories to real situations, and trying topredict the outcomes, in other words, applied economics prevents making situations appear better orworse than they are.
- **Capital management** (CM) is a financial strategy aimed at ensuring maximum efficiency in acompany's cash flow. Its aim is for the business to have adequate means to meet its day to dayexpenses, as well as financial obligations in the short-term.
- **Firm** is a tor-profit business organization—such as a corporation, limited liability company(LLC), or partnership--that provides professional services.
- **Managerial Economics** can be defined as amalgamation of economic theory with businesspractices so as to ease decision-making and future planning by management. ManagerialEconomics assists the managers of a firm in a rational solution of obstacles faced in the firm'sactivities.
- **Opportunity cost means** a benefit, profit, or value of something that must be given up toacquire or achieve something else. Since every resource (land, money, time, etc.) can be put toalternative uses, every action, choice, or decision has an associated opportunity cost.

2.12 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 2.1.
2. For answer refer to section 2.1.
3. For answer refer to section **2.3.**
4. For answer refer to section 2.4.
5. For answer refer to section 2.5.

2.13 TERMINAL QUESTIONS

1. What do you understand by managerial economics? Discuss the features and characteristicsof managerial economics.
2. Enumerate the applications of economics in business.
3. Discuss scope of managerial economics.

2.14 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis. Managerial Economics, Prentice HaSi of India.
3. Dwivedi D N, Manageria; Economics, Vikas Publishing House **Pvt. Ltd.**
4. Peterson, Lew's and Jain, Managerial Economics, Pearson

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CHAPTER-3

THE FIRM AND ITS OBJECTIVES

STRUCTURE

3.0 INTRODUCTION

The traditional theory of economics defined firmas a collection of resources that is transformed intoproducts demanded by consumers. The costs *axe*governed by the available technology, and theamount it produces and prices are influenced by thestructure of the markets in which it operates. Thedifference between the revenue receive and fee costsis profit. The aim of the firm is to maximise its profit. The preceding theory of the firm leaves the reasonfor its existence unanswered that why does a firmperform certain factionsinternally, while it conductsother actions through the market. The size of the firmis not determined strictly by technologicalconsideration. Then why are some firms very smalland others large?If there were no costs of dealingwith the outside. In dealing through the market, the firmincurs, transaction costs. Transaction costs areinclined when a company enters into a contract withothers. These costs include the original investigationto find the outside firm, cost of negotiating a contract,and enforcing the contract and coordinatingtransactions. Transaction costs are influenced byuncertainly, frequency of recurrence, and asset-specificity. When transaction costs are high, acompany may choose to provide the service orproduct Itself. The firm incurs monitoring andsupervision costs toensure that the work. is done efficiently. Quite possibly, employees who work for afixed wages or salary may have less incentive to workefficiently than an outside contractor.

Employers, **try** to decrease **monitoring**costs by using **incentives** so increase employees **output.**Stock ownership, using stock options **and employee** stock **plans.** Stock ownership Is also **used to** attract newemployees.

3.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand the concept, meaning of firm. The usage of managerial economics and what is the role and responsibilities of managerial economist.

3.2 OBJECTIVES OF THEFIRMS :

Economic theory underscores the fact that each firm in thes industry operates under competitive environment.Under competitive conditions, each firmtries to operate more efficiently than the others and to drive out weak and inefficient firms from the market. The major indicator of efficiency is considered to beprofits. The assumption here is that each firm has one man show. His sole aim is to maximise the profits. As time passed by, the one-man firm were increasingly challenged and replaced by partnershiporganisations and other big giant corporations. As aresult, the functions of one owner and manager couldnot be easily discharged because of the fact thatowners or shareholders are different from managersin modem work. In other words, shareholders do notlook after the day-to-day business affairs of theirfirms. It is the manager who looks after them. Thisprocess of change from one-man firms tocorporations raises some very pertinent questions. Ifthe functions of shareholders and the managers aredifferent, what are those functions? Who performswhat? Samuclson refers to this process and theemergence ofgiant firms as the managerial revolution. He asks: “Who makes corporate decisions?Primarily,the increasingly important class of professionalmanagers. Generally speaking, there will be no clashof goals between the management and thestockholders." It is obvious, that with the emergence of modern firms, the responsibilities of theshareholders and the managers have been bifurcated.Secondly, these responsibilities of goals generally donot clash though they do clash at times.

3.3 PROBLEMS INVOLVED

When the one-man firm gave way to giant firms,the goal of the one-man firm, of profit maximising,was pushed into the background. The goals havebeen redefined. The expansion of the market, theincrease in the market share etc., have gainedImportance and attracted the attention of

modernfirms. Galbraith says: For any organisation, the goal orobjective that has a natural assumption of pre-eminence is the. organisations's own survival. Galbraith believes that survival means nothing less than the minimum level of earnings. Once this isensuredthe next goal is the expansion of output,which means more responsibility, higher promotionsand greater returns. This goal of expansion isfollowed by growth and then by technological'advancement. This technological virtuosity refers, inessence to innovation. By innovations a firm is able toretain its customers and market new products. Inother words, to manufacture and market newproducts is nothing but building a bushes empire.

There are certain goals and firms strive hard toachieve them. The maximisation of profits is nolonger considered to be the main goal. With theemergence of corporations, the functions of theshareholders and managers have been changed. 'Withthis bifurcation, the goals are differentiated and arereferred to as organisational and managerial goals.But then, what is the distinction between the twogoats? How are they defined? These questionsgenerally crop up. Simon has defined and explainedthe concept of the organisational goal. According tohim: "The goal of an action is seldom unitary butgenerally consists of a whole set of constraints theactions must satisfy. It appears convenient lo usetheterm, organisational goal', to refer to constraints, orsets of constraints, imposed by the organizational role; that have only an Indirect role. More narrowly, organisational goal may be used to-referparticularly to the constraint sets that define roles atthe upper levels of fee administrative hierarchy.

'in an organisation, the decision makingmechanism, is aloosely coupled, partiallydecentralised structure in which different sets ofconstraints may impinge on decisions at differentorganisational locations. Although the description oforganisational goal is consequently complex. Theconcept of the goal can still be introduced in anentirely operation manner".

Simon refers to these goals as constraints. When an individual 'has a goal, he has naturally tocross some hurdles to achieve it These hurdles areconstraints, in their narrow sense, he says that theseconstraints refer to particularly the upper levels ofhierarchy that is, the shareholders. He declares thatthe concept of the goal can be introduced inanentirely operational manner.

3.4 ORGANISATIONAL GOAL

Organisational Goals are of Five Kinds

Production goal, Inventory goal, Sales goalMarket share goal, Profit goal

"A firm or company has several departments.Every department functions for the betterment of thecompany. Therefore, the five sub-goals, which wereindicated earlierthe production goal, the inventorygoal, the sales goal, the market share goal and theprofit goalare the aims or objectives of therespective department. The production goal relates to the production departments the inventory goalrefers to fee stores department, the sales and market share goals-refer to the sales and marketing department The profit maximization is a commongoal to all the four departments. If a firm does notmake profits, it will have to close down. In such as event, the question of sub-goals or departmentalgoals would notarise, Therefore, a firm’s profit goalis its prime goal for its survival. All the departments strive hand to achieve this goal; ever though theirindividual goals may appearto be different. Eachgoal is linked with the ultimate profit goal. Thesegoals are a conglomeration of forces, whichareconstantlyacting one upon the other so that's firm may make profits and survive.

(a) Production Goal :

The production department is responsible for the production of commodities. Generally speaking the production department of every firm chalks out a plan of production, which ahs two aspects: First, how much to produce, that is, the volume of production. In how many days will the target volume, be producted ?

(b) The Objectives of the Firm

The management decision can only be evaluated against the goal that the firm is attempting to achieve. Traditionally, economists have assumed thatthe objective of the firm is to maximize profit Itis assumed that managers consistently makedecisions in order to *maximize* profit. But profit, in which, period? This year? The next five years? Often managers are observed making decisions that reduce current year profits in an effort to increase-profits.

Most of fee large firms m market economies are colorations where ownership is spread amongliterally thousands of individuals, *each* of whom ownsshares of stock that represent that ownership.Theseowners elect a board of directors that in turn, hiresexecutives who will manage the firm. It is nowcommon to hear these managers talk in terms of making decisions that will maximize shareholdersvalue. This is simply another way of stating the goalof profitmaximization.

Some critics of the profit-maximizationassumption argue that it is unrealistic becausemanagers must 'function in an environmentcharacterized by inadequate information anduncertainty about the outcome of any strategy thatmight be adopted. Therefore, as a practical matter, it is really impossible to maximize profit. Although*some* managers may have other goals, most of the criticism leveled at the profit-maximization assumptionmay be irreievant Economics *is* less interested in how some managers really act than in understanding theeconomic environmentin which managers mustfunction and, more importantly, in developing aframework for predicting managerial responses to important changes in that environment. Most economist agree that the principles of managerial economics do indeed allow accurate predictions of managerial decisions and that profit maximization provides a useful assumption in that context. Indeed, no general theory has yet been proves to predict more accurately than the models based on profit maximization. Thus, it is assumed that the objective of the firm is to maximize profit or, equivalently, to maximize the value of the firm.

(c) The Economic Goal of the Firm and Optional Decision Making

Every business has a goal. The primary goal of a business is to earn a certain amount of profit and in fact, the economic theory of the firm assumes that the principal objective of a firm is to maximize its profits. Thus, throughout this text, unless otherwise stated, this same objective, known among economists as the profit-maximization hypothesis. To be sure, there are other goals that a firm can pursue, relating to market share, this same objective, known among economics as the profit-maximization hypothesis. To be sure, there are other goals that a firm can pursue, relating to market share, revenue growth, profit margin, return on investment, technology, customer satisfaction, and shareholder value. It is crucial to be aware of precisely what a firm" goals are. Different goals can lead to very different marginal decisions given the same limited amount of resources. For example, if the main goal of the firm is so maximize market share rather than profit, the firm might decide to reduce its prices. If the main goal is to provide the most technologically advanced products,the turn mightwell decide to allocate more resources to researchand development. If the main goal of the firm is tocarry a complete line of products and services, it maychoose to sell certain products even though, theymight not be earning a profit. Given the goal (orgoals) that the firm is pursuing. It can be said that theoptimal decision in managerial economics is one thatbrings the firm closest to this goal.

One additional concept should be presented inthe discussion of a firm's goals. In economics, *a*distinction is made between the "short-run" timeperiod and the "long-run*' time period. These time periods actually havenothing directly to do withcalendar time. During the short run,, we assume that afirm can vary the amount of atleast one of itsresources. Theoretically, in the long run, a firmis ableto vary the quantities of all resources being utilized. Inthis context both short-run and long-run decisionsmade by the firm. It is assumed that a company'sgoal is to maximize profits both in the short and longrun. However, it must be understood that a businesswill, at times, sacrifice profitability in the short run with the anticipation of maximized long-runprofits.The production target is the outcome of the activitiesof the department, which books orders. Onceas order is booked, goods have to be delivered on aspecified date. The marketing department sends the requisition to the production department. Therequisition contains the quantity required and the time period within which the quantity is required. To keep up both the volume of production and the deadline,the production department plans its productionschedule,But it has its own problems. For example, the casual labour required to be put on overtime, basis may not be available, The raw materials maynotbe available. Faults may develop in the plantSometimes machinesmay go out of order, and theproduction tempo may be slowed down. Powerfailures, too, may affect the volume ofproduction. These' are some of the problems whichtheproduction department ha*s* to face. But at thesame time, it cannot afford to advance these excuses, for, if it does, the firm will lose its reputation and ultimately its market its market. Therefore, it has to find out way and means of countering these difficulties. One way of doing so is to produce above a certain level, so that the difficulties referred to above do not hamper the efforts of the marketing department.

(d) Inventory Goal :

What exactly is meant by an inventory ? An inventory may mean a stock of raw materials. It may mean a stock of raw materials. It may mean a stock of spare parts and a stock of finished goods. Now an inventory may create some problems. The production department and the sales/marketing department would like to keep larger stocks, while the finance department would like to reduce them. But if larger stocks are maintained, what happens ?or if a lower level of stocks are maintained. What is the consequence?The production department andthe sales /marketing department want tomaintain ahigher level of stocks, so that production may keeppace with the demand in the market. The financedepartment, on the other hand, wants to reduce the stocks to the bare minimum so that capital is notblocked up in stocks. The production departmentmay feel that a certain level of stocks is necessary,while the finance department may be of the view thata lower level of stocks would be adequate for theproduction department. Thus, there can be adifference of opinion regarding the level of stocks tobe maintained as inventory.

An inventory is therefore, always expressed interms of its monetary value; that is, in terms of costs.Thus Acre are two extreme ends of the scale. At oneend arethe higher stocklevels, which are expressedas the cost of holding the stocks. But how does thiscost arise? When a firm purchaseraw materialsspare parts etc. It invests some capital; and it paysinterest on the capital. This is one type of cost. Thenthe stocks have to be stored. There is the rent for thegodown. Some precautions will have to be taken toensure that the stocks are not spoiled by rats, rain,excessive sunlight etc. Again, electricity charges forthe godown will have to be computed. Theappointment of watchmen too, would be essential.All these expenses will have to be incurred and theseare known as inventory costs. Therefore, the higher the level of stocks to be maintained, the greater will be the cost of maintaining them. This cost is known as the cost of holding he stocks.

Then there is the cost of what is known asstock-out.The finance department always tries to reduce the inventory because the higher the level ofstocks, the greater the investment; that is, a largeramount of capital tied up in the inventory. But capitalis scarce and has alternate uses. Therefore, if theinventory *is* reduced, some of the capital tied up in itis released and pat tosome productive use. In thissense, the finance department tries to reduce the levelof stocks and the cost of bolding them. But to ensureanuninterrupted flow **of** production, the production:department insists that the stocks should be ampleand sufficient. In this sense, it always tries to keep thestocks above the margin. What is the margin orrather, the fair margin which would ensure that capitalis not unnecessarily tied up end at the same time, production does not suffer ? In other words, abalance has to be struck between the maximumquantity of stocks to be kept; that is, a balance has to be struck between the cost of holding the stocks andthe cost of the stockout.This is also known as theoptimum point of the inventory. Of course, there areseveral methods of inventory control and management. The inventory goal has to strike abalance between the cost of stock-out and the costof holding the stocks. .

(e) Sale Goal;

The sales department generally keeps a sales target and every year, it tries to achieve that target. For example, the sales department of a pharmaceutical concern works out the target of salesto be achieved. Divisional managers are then briefedand instructed to achieve the sales target for the year.Bach divisional manager is given a particular target.Then the divisional manager, in their turn, fix thetargets of their sales representatives; and each salesrepresentatives has to meet his target in order tosurvive. The sum total of the sales of all therepresentatives of a division indicates the quantum ofdivisional sales and the sum total the sale of all the divisions indicates the total sales target of thecompany for the year.

The sales department, too tries to push the sales beyond fee sales target. What is the implication of allthis ? Every firm tries to increase its output. A stagecomes when the output is optimum and that theprofits are at level, it iosses losses. The first stage thatis, when the profits Increase with anincreases in output, is known as increasing return. The level of output at which the profits are at the maximum is known as constant returns. When the output is increased beyond a certain point, resulting in a decline of profits, the process of decreasing returns sets in. In the partance of managerial economics, we say that if the sales department pushes the sales beyond the profit-maximizing point.

(f) Market-Share Goad :

It refers to the share of a company's sales of a particular product in the total sales of that product of all the companies. For example, there are several brands of toothpastes in the market. These sales are expressed as a percentage of the total sales of all the toothpastes. This percentage is known as the market share. This market share is shown in Table (3.1)

Table 3.1
Market Share of Toothpastes A, B,C, & D for the Month of June

Name of Company	Bread Name	Sales in Value During June 06 (in Rupees)	Percentage of Market Share to the Total Daring June 06
P	A	500,000	10
Q	B	1,000,000	20
R	C	1,500,000	30
S	D	2,00,000	40
Total Sales		5,00,000	100

If our company is C, we say that the marketshare of our company's toothpaste for the month ofJune 2006 is 80 percent. New every companyconstantly strives to increase its market share.Therefore, the goal of market share is linkedwith the goals of those persons is a firm who are interested inincreasing the market share so that their companymay occupy a better position in the market than itscompetitors.

(g) Profit Goal

Profit **is** the residue which accrues to acompany after all the 'factors of production are paid.The profit which a 'firm makes is satisfactory only when its shareholders are paid an adequate dividendarid when something is still left *over* to be ploughedback into the business for purposes of expansionand/or diversification. In other words,the interest ofthe shareholders who expect a fair safeguard. Thereal indicator of the success of any businessenterprise is the quantum of its profits.

After therole of each goal has been examined,it is apparent that the profit goal is the most importantone, for without profits on firm can survive.Nevertheless in the modern context, it is not true tosay that the profit gool is its only concern. When, forexample, a firm decides to drive weak and inefficientunit out of business, it also tries to ensure that no new'firms take their place. To achieve this end, itformulates a strategy of pegging the price of productsat a tow level. In this context, it would be wrong tosay that its objective or goal is profitmaximisation. Inthis situation, the profit goal does not occupy almbleplace is its business strategy. Nevertheless, itis the most important goal of any firm. The traditionaleconomic thinking was to maximise profits.

Every firmlikes to grow and expand. For thispurpose, it invests some portion of its profits in thebusiness. This is known as the ploughing back ofprofits. The firm is also interested in research, development and innovation, which lead either to an improvement in its existing product line or to manufacture and marketing of new products. Take the case of Hindustan Lever to Sunlight Soap, which is a washing soap, is already in the market. Notsatisfied with this, it introduced Rin, another washing soap. Why ? Obviously, it was interested in growthand in larger profits. That is why a firm earns profitsto pay dividends to its shareholders, to plough backsome past of the profits into the business in order togrow and expand. In this sense, the profit goaloccupies the most important placein

a company'sbusiness operations. However, the goals which wehave so far discussed-namely, the production goal,the inventory goal, the sales goal, the market sharegoal and the profit goal are interlinked. This is evidentfrom the fact that the four goalsthat is; theproduction goal; the inventory goal/the sales goaland the market-share goal-are not mutually exclusive. Without an increase in production, anincreasesinsales is not possible. Therefore, sales and productionare interlinked. An excessive production without aproportionate increase in sales would result m thepilling up of the inventory. The inventory departmentwould react to such a situation; the production andinventory departments are therefore interlinked. Thesales department naturally likes to boost sales. In thiscase, the market share of the company may go up,but only in terms of the cost of diminishing returns. Inother words, if the production department goes on producing,the inventory goes on piling up, resultingin the typing up of capital. The sales departmentwould not be able to market the entire production.There might, therefore be losses. If the salesdepartment, goes on increasing its sales, diseconomies of scale may come about, and the firm might incur losses. No shareholder would toleratesuch a situation. Therefore, a firm aims at makingprofits, in this sense, all the four goals or rather sub-goals, the production goal, the inventory goal, thesales goal and the market-share goal-rotate roundthe profit goal. In order words, these four sub-goalsare subservient to the profit goal.

The second goal is to maximise sales or growthup to a point which an increase in sales andtherefore, in-output, would result m diseconomices;that is, while the sales manager is interested inincreasing sales, the firm has to ensure that sales arenot pushed beyond a certain point. But why?Assales increase, the output increases in order to matchthe sales pressure. Therefore, the production department steps up production to counter thepressure on the sales department.In this process ofstepping up production, however, a stage reachedwhen the scale of economies has to be lateen intoaccount. To begin with, a film is subjected to thelaws of increasing returns followed by constantreturns. If the output goes beyond the point ofconstant returns, the process of diminishing returnssets in, In other words, losses *axe* incurred. No firmwants to enter this phase of its operations, because itwants to make profits. In this sense, the managerialgoal rotates round profits.

To sum up: Though the goals are divided intotwo types namely, organizationally and managerial- they are inseparable. It cannot be said that profit-maximising *is* the fashion of the day; but it may besaid with conviction that a minimum levelof profits must be maintained. .

3.5 MANAGERIAL ECONOMICS ANDOTHER SUBJECTS

Yet another useful method of throwing lightupon the nature and scope of managerial economicsis to examines its relationship with other subjects. Inthis connection, Economics. Statistics, Mathematicsand Accounting deserve special mention.

(a) Managerial Economics And Economics

Managerial Economics has been described **as**economies applied to decision-making. It may **be**viewed *as* a special branch of economics bridging thegap between pure economic theory and managerialpractice. Economics has two main divisions;microeconomics and macro-economics. Micro-economics has been defined as that branch where the unit of study is an individual or a firm.. Macro-economics, on the other hand, is aggregative, incharacter and has the entire economy as aunit ofstudy.

3.6 USES OF MANAGERIAL ECONOMICS

Managerial economics accomplishes several objectives. First, it present those aspects of traditionaleconomics which are relevant for business decision making in real life. For the purpose, it

calls fromeconomic theory the concepts, principles andtechniques of analysis, which have a bearing on thedecision making process. These are, if necessaryadapted or modified with a view to enable themanager take better decisions. Thus, managerialeconomics accomplishes the objective of building asuitable tool kit from traditional economics.

. Secondly, it also incorporatesuseful ideas fromother disciplines such as psychology, sociology etc.,if they are found relevant for decision-making. Infact, managerial economics takes the aid of otheracademic disciplines having a bearing upon thebusiness decisions of a manager in view of thevarious explicit and implicit constraints subject towhich resource allocation is to be optimized.

Thirdly, managerial economics helps in leachinga variety of business decisions in a complicatedenvironmentCertain examples are:

(i) What products sand services should beproduced?

(ii) What inputs and production techniques shouldbe used?.

(iii) How much output should be produced and atwhat pricesit should be sold'?

(iv) What are the best sizes and locations of anew plants?

(v) When should equipment be replaced ?

(vi) How should the available capital be allocated ?

Fourthly, managerial economics makes amanager a more competent model builder. Thus hecan capture,' the essential relationship whichcharacterize a situation while leaving out the clutteringdetails andperipheral relationships.

Fifthly, at the level of the firm, where for variousfunctional areas, functional specialists or functionaldepartments exist, e.g., finance, marketing,personnel, production, etc., managerial economicsserves as an integrating agent by coordinating thedifferent areas and bringing to bear on the decision ofeach department or specialist the implicationspertaining to other functional areas. It thus enablesbusiness decision-making not in water-tightcompartments but In an integrated perspective, thesignificance of which lies la the fact that the functionaldepartments or specialists often enjoy considerableautonomy and achieve conflicting goals.

Finally, managerial economics takes cognizanceof the interaction between the firm and society andaccomplishes the key role of business as an agent inthe attainment of social and economic welfare. It hascome to realised that business, apart from itsobligations to shareholders, has certain social obligations. Managerial economics focuses attentionon these social obligations as constraints subject towhich business decisions are to be taken. In doingso, it serves as an instrument in furthering theeconomic welfare of the society through sociallyoriented business decisions.

To conclude the usefulness of managerialeconomics lies in borrowing and adopting tile tool-kit from economic theory. incorporating relevantideas from other; disciplines to achieve betterbusiness decisions, serving a catalytic agent in titlecourse of decision-making by different functionaldepartments/specialist at the firm's level and finallyaccomplishing a social purpose through orientingbusiness decisions towards social-obligations.

3.7 MANAGERIAL ECONOMIST-ROLEANDRESPONSIBILITIES

. A managerial economist can play a veryimportant role by assisting the management in usingthe increasingly specialized skills and sophisticated.techniques which' are required to solve the

difficult problems of successful decision-making and forwardplanning. In advanced countries like U.S.A.,largecompanies employ one or more economists. In Indiatoo, big industrial houses have courseto recognise theneed for managerial economists, and there an;frequent advertisements for such positions. Tatas,DCM and Hindustan Lever employee economists.India Pharmaceutical Corporation Ltd., a Governmentof India undertaking, also keep a economist. In thisconnection, two important questions need to be'considered:

1. What role does he play in business, what particular management problems tendthemselves to solution through economicanalyses ?
2. Howcan tile managerial economist best serve management, that is what are the responsibilitiesof a successful managerialeconomist?

3.8 ROLE OF AMANAGERIAL ECONOMIST

One of the principalobjective of anymanagement in its decision-making process is todetermine the key factors which will influence the business over the period ahead. In general, thesefactors can be divided into two categories;(i) external and (it) internal The external factors lieoutside the control of management because they areexternal to the firm and are said to constitute businessenvironment. The internal factors lie within thescopeand operations *of* a firm and hence within the concent *of* management, and they *are* known as businessoperations.

To illustrate, a business firm is free to takedecisions about what to invest, where to invest, howmuch labour to employ and what to pay for it, howto prise its products, and so on. But all thesedecisions are taken within the framework of aparticular business environment and the firm's degreeof freedom depends on such factors as thegovernment's economic policy, the actions of itscompetitors and the like.

(a) Environmental Studies :

An analysis and forecast of external factorsconstitutionsgeneral business conditions, e.g. prices,national income and output volume of trade, etc., areof great significance since every business firm isaffected by them. Certain important relevantquestions in this connection are as follows:•

1. What is the outlook for the national economy ?
2. What are the most important local, regional orworld-wide economic trends? What phase of the business cycle lies immediately ahead?
3. What are the demand prospects in new as wellas established markets? Will changes in socialbehayiour and fashions tend to expand or limitthe sales of a company's products, or possiblymake the products obsolete?
4. Where are the market and customeropportunities likely to expand or contract mostrapidly?
5. Will overseas markets expand or contract, andhow will new foreign government legislation'saffect operation of the overseas plants?
6. Will the availabilityand cost of credit tent toincrease or decrease buying? Are money orcredit conditions ahead likely to be easy ortight?
7. What the prices of raw materials and finishedproducts ate likely to be?
8. Is competition likely to increase or decrease?

9. What are the **main** components of the five-yearplan? What are the areas where outlays hays been increased? What are the segments whichhave suffered a cut in their outlays?
10. What is the outlook regarding government'seconomic policies and regulations? What aboutchanges in defence expenditure, rates; tariffsandimport restriction?
11. Will Reserve Bank's decisions stimulate Ordepress industrial production and consumer spending? How will these decisions affect feecompany's cost, credit, sales and profits?

Reasonably accurate answers to these andsimilar questions can enable managements to chalkout more wisely and to determine the timing oftheir specific actions.

The managerial economist has not only to studythe economic trends at the macro-level but must alsointerpret their relevance to the particular industry/firmwhere he works. He has to digest the evergrowingeconomic literature and advise top management bymeans of short business-like practical notes.

In a mixed economy like India, the managerialeconomist pragmatically interprets me intentions ofcontrols and evaluates their impact He act as abridge between the government and the industry,translatingthegovernments intentions and transmittingthe reactions of die industry. In fact, governmentpolicies emerge out of the performance of industry,the expectations of the people and politicalexpediency,

(b) Business Operations:

A managerial economist can also be helpful tothe management in making decisions relating to theinternal operations of a firm in respect of suchproblems as price, rate of operations, investmentexpansion or contraction- Certain relevant questionsin this context would be as follows:

1. What will be a reasonable sales and profitbudget for the next year?
2. What will be the most appropriate productionschedules and inventory policies for the next sixmonths?
3. What changes in wage the price policies shouldbe made now?
4. How much cash willbe available next monthand how should it be invested?

(c) Specific Functions:

A further idea of the role managerial economistscan play, the following specific function performed bythem as revealed by a survey pertaining to Britainconduce by K.J.W. Alexander and Alexander C.Kemp:

1. Sales forecasting. .
2. Industrial market research.
3. Economic analysis of competing companies.
4. Pricing problems of industry.
5. Capital projects. .
6. Production programmes.
7. Security/investment analysis and forecasts.
8. Advice on trade and public relations.

9. Advice on primary commodities.
10. Advice on foreign exchange. .
11. Economic analysis of agriculture.
12. Analysis of underdeveloped economies.
13. Environmental forecasting.

It is thus clear that in practice, managerialeconomists perform many and varied functions.However of these. Marketing functions, i.e., salesforecasting and industrial market research, has beenthe most 'important. For this purpose, they maycompile statistical records of the sales performanceof their own business and those relating to their rivals,carry out analysis of these, records and reports ontrends m demand, their market shares, and therelative efficiency of their retail outlets. Thus whilecarrying out their functions, they may have to undertake detailed statical analysis.

(d) Economic Intelligence:

Besides these functions involving sophisticatedanalysis, managerial economist may also providegeneral intelligence service supplying management with economic information of general interest such ascompetitors' prices and products, tax rates, tariffrates etc. In fact a good deal of published material isalready available and it would be useful for a firm to have someone who understands it. The managerialeconomist can do the job with competence.

(e) Participating in Public Debates :

Many well-known, business economistsparticipate in public debates. Their advice and viewsare being sought by the government and societyalike. Their practical experience in" business andindustry adds stature to their views. Their publicrecognition enhances their status in the organization itself.

(f) Indian Context:

In the Indian context, a managerial economist isexpected to perform the following functions:

1. Macro-forecasting for demand and supply.
2. Production planning at macro and micro levels.
3. Capacity planning and product-mixdetermination. . .
4. Economics of variousproduction lines.
5. Economics feasibility of new production lines processes and projects.
6. Assistance in preparation of overalldevelopment plans.
7. Preparation of periodical economic reports bearing on various matters such as thecompany's product-lines, future growthopportunities, market pricing situation, generalbusiness and various national internationalfactors affecting industry and business.
8. Preparing briefs, speeches, articles and papers,for top management for various Chambers.Committees, Seminars, Conferences etc.
9. Keeping management informed of variousnational and international development oneconomic/industrial matters.

With the adoption of the New Economic Policy,the macro-economic environment is changing fast at a pace that has been rarely witnessed before. Themanagerial, economist has. to play a much

moresignificant role. He has to constantly gauge thepossibilities of translating the rapidly changingeconomic scenario into viable business opportunities.As India marches towards globalizaiion.he will have to interpret the global economic events and find outhow his firm can avail itself of the various exportopportunities or of establishing plants abroad eitherwholly owned or in association with local partners.

3.9 RESPONSIBILITIES OF MANAGERIAL ECONOMIST

Having examined the significant opportunitiesbefore a managerial economist to contribute to managerial decision-making, he must have torecognise his responsibilities and obligations.

A managerial economist can serve, managementbest only if he always keeps in mind the mainobjectives of his business. Viz., to make a profit onits invested capital. His academic training and thecritical comments from people outside the businessmay lead, a managerial economist to adopt anapologetic or defensive attitude towards profits.Once management notices this, his effectiveness isalmost sure to be lost. In fact he cannot expectsuccess in serving management unless hehas a strongpersonal conviction that profits are essential and thathis chief obligation is to help and enhance the abilityof the firm to make profits. It is, therefore, absolutelyessential that a managerial economist recognises his responsibility to make successful forecasts. By making best possibleforecasts and through constantefforts to improve upon them, he should aim atminimizing if not completely eliminating, theminimizing, if not completely eliminating. At fanes, hewill have to reassure the management that animportant trend will continue, in other cases, he may have to pointout the probabilities of a turning point insome activity of importance to management. In anycase he must be wiling to make considered but fairly positive statements about impending economicdevelopments,based upon the best possibleinformations and analysis. Nothing will buildmanagement confidence in a managerial economistmore quickly and thoroughly than a record ofsuccessful forecasts, well documented in advanceand modestly evaluated when the actual resultsbecome available. "

A few corollaries to (he above proposition needalso be emphasised here. First, he has a majorresponsibility to alert management at the earliestpossible moment in case he discovers an error in hisforecast. By promptly drawing attentionto changes Inforecasting 'conditions, he will not only assistmanagement in making appropriate adjustment inpolicies and programmes but will also be able tostrengthen his own position as a member of themanagement team by keeping his fingers on theeconomic pulse, of the Business.

Secondly, he must establish and maintain manycontacts with individuals and data sources whichwould not be immediately available to the other members of the management. Within any business,there may be a wealth of knowledge and experiencebut the managerial economist would be really useful ifhe can supplement the existing know-how withadditional information and in the quickest possiblemanner. :

Again, if a managerial economist is to be reallyhelpful to the management in successful decision-making and forward planning. He must be able toearn full status on the business team. He should beready and even offer himself to take up specialassignments, be that in study teams, committees orspecial projects-. Of course, he should be able toexpress himself clearly and simply and

must alwaystry to minimize the use of technical terminology incommunicating with his managementexecutives.

3.10 SELF CHECK EXERCISE

1. Define firm.
2. What are the objectives of the firm? Write a short-note.
3. Write in brief on organisational goal.
4. What are the usages of managerial economics? Discuss **in brief.**
5. Discuss in brief the responsibilities of managerial economics.

3.11 SUMMARY

To conclude, a managerial economist has a veryimportant role to play by helping management insuccessful decision-making and forward planning.But to discharge his role successfully he mustrecognize his responsibilities and obligations. Tosome business executives, however, a managerialeconomist is still a luxuary or perhaps even anecessary evil. It is not surprising, therefore, to findthat while their status is improving and theirimportance is gradually rising, managerial economistsin certain firms still feel quite insecure. Nevertheless,there is a definite and growing realisation that theycan contribute significantly to the profitable growth offirms and effective solution of their problems.

3.12 GLOSSARY

- **Economist** is an expert who studies the relationship between a society's resources and itsproduction or output The societies studied may range from the smallest of local communities to anentire nation or even the global economy.
- **Firm** is a commercial enterprise, a company that buys and sells products and/or servicestoconsumers with the aim of making a profit.
- **Management** is the process of leading an organization to achieve **its** goals, hiring andsupervising the people in it, administering processes, allocating resources, assigning projects, andmaking key decisions to ensure the success of the organization.
- **Managerial economist** plays a vital role in the decision-making process of an organization.He/she is responsible for assisting the top management of an organization to make efficient businessdecisions. A managerial economist is also called business economist or economic advisor.
- **Organizational goals** are strategically set objectives that outline expected results and guideemployees' efforts. There are three types of organizational goals are strategic, tactical, andoperational goals. Purposes of organizational goals are to provide direction to employees ofthe organization.

3.13 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 3.0.
2. For answer refer to section 3.2.
3. For answer refer to section 3.4.

4. For answer refer to section 3.6.

5'. For answer refer to section 3.8.

3.14 TERMINAL QUESTIONS

1. Define firm. Discuss the objectives and importance of firm.
2. Discuss the uses of managerial economics.
3. Enumerate the role and responsibilities of managerial economist.

3.15 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis, Managerial Economics, Prentice Hall of India.
3. Dwivedi D N, Managerial Economics, Vikas Publishing House Pvt. Ltd.
4 peterson, Lewis and Jain, Managerial Economics, Pearson
5. Sadananda, Managerial Economics, Prentice Hall of India

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CHAPTER-4

DEMAND ANALYSIS

STRUCTURE

4.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand the concept, meaning, types and law of demand. The various assumptions of law of demand and demand schedule. The determinants of demand and importance of demand analysis in business.

4.0 INTRODUCTION

Demand is a function of price; and this can bestated in the following equation

$$D=1[p)^{;}$$

The other factors which affected the demandwere considered; are income, tastes, and preferenceof buyers; and itcan be stated as under:

D=f(P,L,T.)

This aspect needs to be explored in depth. Theprice-quantity relationship is presented as a demandschedule or a demand curve. The demand scheduleor demand curve-merely states the quantities of acommodity that would be sold at different prices at agiven-place andat a given point to time. Classicaleconomists were aware ofthe fact that the price isnot only factor which determines sales but otherfactors too have an'important effect on them. Thesefactors are, the income of the consumers, their tastes,habits, preferences, etc. When these factors influencedemand, the demand will shift accordingly. But thisprice demand relationship is not as important to themanagement as me shifts in demand, which constitutethe demand function. These factors are related todemand, the demand function. The question arises:What are these factors? In other words, are thesefactors only the income and the tastes and habits ofconsumers ? In fact, there is a multiplicity of factorswhich influence demand. The demand functiontherefore has a variety which consistently andconstantly exert influence on demand.

An example will clarify the question of thedemand function. Take an example of Murphyradios. The number of radio sets sold by the,company is determined by the following factors.

(i) The price of a Murphy radio set;

(ii) The prices of rival sets;

(iii) The effectiveness ofMurphy's advertising;

(iv) The design of Murphy's products in relation tothe rival's products;

(v) The amount of purchasing power;

(vi) The terms of payment;

(vii) The expectation of the buyers with regard toinnovations in the different makes of radios.

Which factors should now be included in thedemand function? In other words, should all thefactors listed above be included?Or only samefactors? If only some factors are to be included?There is no definite answer to these questions.However, there are certain factors which arecommon to all the products for example, income,sales promotion, price, etc. In respect of consumerwhich has a strong bearing on demand.

4.2 CONSUMER GOODS AND PRODUCERGOODS

Commodities are generally divided into twocategories, namely, producer goods and consumergoods. Producer goods are those goods, which aregenerally .purchased by producers in order tomanufacture some consumer goods; that is to say,producer goods are not meant for final consumption,while consumption goods are those goods, which areconsumed finally by consumers. In the context ofdemand forecasting, producer goods pose altogetherdifficult and different problems because a forecast ofthe demand for producer goods is more complicatedthan that of the demand for consumer goods. Thereare three distinct reasons, which have to be kept inmind when the demand forecast of producer goods isattempted. .

(i) The buyers of producer goods areprofessionally experts* Therefore, price-wisethey are sensitive to substitutes.

(ii) The attitude and motives of the buyers ofproducer goods are purely economical becausethe products are bought by them with a view ofmaking profits.

(iii) The demand for producer goods is a deriveddemand from the consumer goods. Therefore,the demand for them is directly related to thedemand for consumergoods. In other words, ifthe demand for a commodity falls, the demandfor producer goods, top, would register adecline. Again, if the demand for consumer-goods shoots up, the demand tor-producergoods would rise as well.

It has been pointed out that the demand forconsumer goods depends upon several factors.Which have already been discussed, in producergoods, these factors have to be constantly kept inmind with a view to ensuring the precision and accuracy of any analysis of demand forecast.

4.3 DURABLE AND PERISHABLEGOODS

Durable products present more complicated'problems when a demand analysis is made vis-à-vis products which render one-time service. The non durable are meant to meet current conditions of'demand. The purchase of durable is always a addition to a stock if there are existing goods inpractice. Therefore, the current demand for durableis aggregated. Moreover, the demand for durable ismore volatile for their current services demanded ofthose kinds of products. For example, automobileproduction replaces existing old cars and increasesthe number of ears. on the roads. Durablecommodities pose no. problem because manyconstraints act on demand determinants. Thereplacement demand for cars depends upon thevalues of the cars in existences, for transportation isrelative to the value of scrap iron. If for some reason,demand shoots up the; used cars would fetch higherprices than scrap. Now, this has a chain effect. Scraprates will go up. Therefore, in the demand for cars,the value of old cars, which are not plying and thenecessary costs of producing new cars are factorswhich have to be taken into account. In thesecircumstances, the replacement determinant becomesthe obsolescense rate, which determines the price ofsecond hand products in the market.

However, some products are so closely relatedto others in their use that there is no distinctionamong demand determinants. If a product has gotonly one use and its proportion to the parentcommodity is a constant one. The separate demandcannot be distinguished from demand for the parentproduct. Take the example of a television set. Anantenna will be purchased for each unit This antennahas no alternative use. It can be used only for a television, if the parent product and the antenna is aderived one. On the other hands, it is 'variability inthe proportions and the increase in the number ofuses is evident, it would be difficult to tie up thedemand to the parent product. For example, smallelectric motors have no other primary uses; but if wetry to analyse the demand for them in terms of their many alternative uses. The task becomes tedious.

Demand is one of the force which determineprice. The theory of demand is related to theeconomic activities of' a consumer, that isconsumption. The process through which a consumerobtains the goodsand services is known as demand.

4.4 DEFINITION OF DEMAND

In the words of VeeraAnstey, "The demandfor a particular good is an amount that will bepurchased at a given price at a given time."

It is apparent from the above definition ofdemand that there are five constituents of demand

(1) Desire for a thing (2) Money to *satisfy* the desire(3) Willingness to spend the money (4) Relationshipof the price and the quantity ofthe commoditydemanded and (5) Relationship of time and thequantity of the commodity demanded.

4.5 TYPES OF DEMAND :

Main types of demand are as under:

(i) Price Demand : It refers to the relationshipbetween price and demand. It indicates howmuch quantity of a commoditywill bedemanded at its different prices. Thisrelationship can also be expressed in terms ofan equation, known asprice-demand function.

$$DA=f(P_A)$$

R signifies that demand for commodity 'A' (D_A)is a function (i) of price of commodity "A'(P_A).

(ii) **Income Demand :** Income demand expressesthe relationship between income of theconsumer and demand, if other things remainingconstant. It indicates how much-quantity will bedemanded by the consumer at different levels oflIls income. Income demand can be expressed' in terms of an equation is called Income-

Demand Function: Da = f(Y)

It signifies that demand for commodity .'a'(Da)is a function (f) of the income of the consumer (Y).

(iii) Cross**Demand :** Cross demand refers to merelationship between quantity demanded of goods 'A' and the price of related goods 'B'. Itindicates how much quantity of goods 'A' willbe demanded at different prices of goods 'B'. Itcan be expressed in the form of the followingequation:

$$D=f(P_b)\ .$$

It signifies that demand for goods 'a' (D_a) is afunction (f) of price of related good 'B' (P_b). Relatedgoods are either (i) Substitutes, or (ii)Complementary goods. For example, cross demandfor tea is a function of the price of its substitutecoffee.

4.6 LAW OF DEMANDS

Law of demand states, that if other things beingequal, the demand for a good, increases with a fell inprice and decreases with a rise in price. There is anadverse relationship between price of the commodity and its quantity demanded.

Law of demand has been defined by someeminent economists as under:

(i) In the words ofBilas, "The law of demandstates that if other things being' equal, thequantity demanded per unit of time will begreater if prices are less smaller if prices arehigher".

(ii) Marshall defines it as, "The law of demandstates that amount demanded increases with afall in prices and diminishes when priceincreases."

4.7 ASSUMPTIONS OF LAW OF DEMAND

Law of demand holds good when "other thingsremain the same." It means factors influencingdemand other than price are assumed to be constant. These constitute the following assumptions of the law.

(1) There should be no change in the tastes andpreferences of consumer.

(2) There should be no change in fee income of theconsumer.

(3) There should be no change in the prices ofrelated goods.

(4) There shouldbe no expectations of any changein the future*price*of the commodity.

4.8 EXPLANATION OF LAW OF DEMAND

According 10 law of demand there is an inverserelationship between price 'and demand for acommodity. However, this relation is notproportional, meaning thereby that it is not necessarythatwhen price falls by one-half, demand for goods will be doubled. Law of demand simply indicates thedirection of change in demand as a result of change in price.

4.8.1 Demand Schedule :

The schedule through which the relationship• between price and quantity demanded is expressed iscalled demand schedule. It shows various amounts ofa commodity that the consumer is willing to buy atdifferent possible prices of that commodity at a giventime. It is of two types:

(1) Individual Demand Schedule, and

(2) Market Demand Schedule.

(1) Individual Demand schedule :

Individual demand schedule is defined as thequantity of a given commodity which a consumer willbuy at all. Possible prices at a given time. Table Ishows Individual Demand Schedule. It indicatesdifferent quantities of Ice Cream that are demandedby a consumer at different prices :

Table 4.1

Individual Demand Schedule

Price per unit (in Rs).	Quantity Demanded (Units)
1	3
2	4
3	3
4	2
5	1

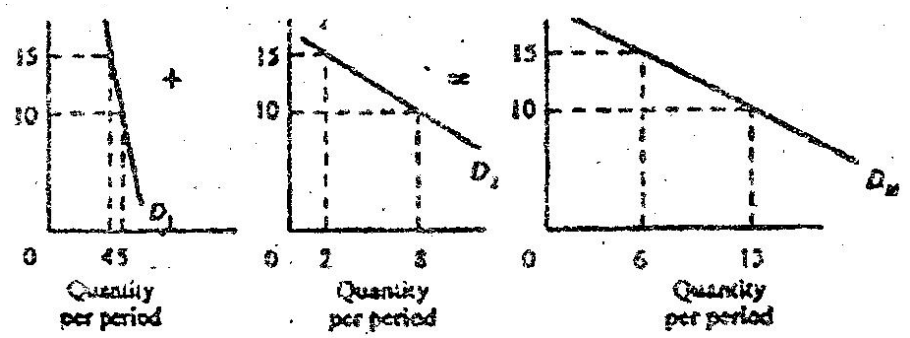
It is evident from the above schedule that as theprices of Ice Cream increase, if demand tends tocontract. When price of Ice Cream is Rs. 100demand is: for 5 units and when pries goes up to Rs. 5.00 demand contracts to I unit only. Its graphicrepresentation is known as individual demand Curve.

(2) Market Demand Schedule :

The schedule indicating the quantity demandedby all the consumers of a commodity collectively atits different prices is called market demand schedule.In other words, it is the aggregate demand of allconsumers at different prices of one particularcommodity.

. The demand curves for these two consumersare depicted in Figure 4.1. These demand curvesshows the relationship between price and quantitydemanded. Consumer's Fs demand curve is shownin the first panel (D,D_1) and that of consumer 2.

Figure 4.1



In the second panel (D_2D_2). At a price of 10,the individual quantities demandedare 5 and 8 units,respectively. Hence the total market demand (D_MD_M) as shown in the third panel) is 13 units. Themarket demand at any price is the sum of theindividual quantities demanded at that, price.

The marketdemand curve*is* thehorizontal summation of the individual demand curve.That is, for any given price, the market demand curveis the sum of the horizontal distances from the verticalaxis to each individual demand curve.

4.9 DETERMINANTS OF DEMAND :

Demand of a consumer for a particularcommodity at any given time is determined by thefollowing factors

(i) Price of the commodity.

(ii) Price of the related goods.

(iii) Income of the consumer.

(iv) Tastes and preferences of the consumers.

(v) Size of population and its composition.

(vi) Change of demand.

Various determinants of the market demand fora commodity are discussed as under,

1. **Price of Commodity:** Ordinarily, the demandfor, a good is governed by its price. Otherdeterminants remaining constant. The change inthe price of a good causes an inverse change inits demand as well. Normally, extension in priceis accompanied by contraction in demand andfall in price is accompanied by rise in demand.This relationship between price and demand iscalled law of demand.

2. **Price of Related Goods :** Demand for a goodis also influenced by change in the price ofrelated goods, which are of two types(i) substitutes and (ii) Complementary goodsSubstitutes are used in place of one another e.g.tea arid coffee. Change in the price of oneanother e.g. tea and coffee. Change in the priceof one has a positive effect on the demand forthe substitute extends and if price of one falls,demand for the substitute contracts. Rise inprice of coffee will lead to more demand for itssubstitute i.e. tea. (ii) When to satisfy one'swants, and two or more goods are demanded,it iscalled demand for complementary goods.**For example, pen and ink are complementary**goods. If price of the pen rises demand for penwill rises demand for pen will fall and along withit, demand

forinkwill also fall. On the otherhand, when prices of pen falls demand for it willrise and along with it demand for ink too willrise, irrespective of price of ink.

3. **Income of theconsumers :** Normally, there isa direct relation between (he income ofconsumers and their demand. Demand fornormal goods rises with the increase in incomeand falls with decrease in income. Demand forsome goods is influenced than other, by changein income. On the other hand, demand forinferior goods tends to falls with the increase inincome and rises with the decrease in income'.

4. **Taste and preference :** These terms **are usedin broad sense.** They include fashion, **habit,**custom etc. Taste and preferences of theconsumers are influenced by advertisement,climate, new inventions etc. Other things beingequal demand for those goods goes up forwhich consumers develop taste.

5. **Size and Composition of Population :**Market demand is influenced by change inpopulation, increase in population leads tomore demand for all types of *goods* anddecrease in population means less demand forthem. Composition of population also effects itsdemand Composition, refers to the number ofchildren, adults, males, females etc. in thepopulation. When the composition changes,e.g.; if number of females exceeds that of 'males,then there will be more demand for goodsrequired by women-folk.

6. **Change in Demand :** Changes in demand canbe reflected in the demand curve in two ways:

   (i) Movement along a demand c*urve,* and(ii) Shift of the demand curve.

   (i) Movement along a demand curve: If otherthings remaining the same, when demandchanges consequent upon the change in priceonly, then this change in demand is shown bydifferent points along the same demand curve. It is also 'known as "change in quantitydemanded." Fall in price **is** followed bycontraction of demand.

   (ii) Shift of the demand curve : When demandchanges due to change in factors other thanprice then the entire demand curve either shifts to the right or the left of its original position. Inthis case, price remains constant but otherthings do not remain the same. It is also called"change in the level of demand." When demandchanges due to change in factors other thanprice, then rise in demand is referred to"increase in demand" and fall in demand isreferred to "decrease in demand."

Change in demand are discussed in detail asunder;

4.10 EXTENSION OF DEMANDS :

Extension of demandrefers to rise in' quantity demanded as a result offall in price if other things remaining the same.As shown in the following table, when price ofapples is Rs. 5.00 per Kg, demand is for 1 Kg of apples when it falls to Rs. 1.00 per Kg. demand extends to 5 Kg. of apples.

EXTENSION OF DEMAND

Price (Rs.)	Quantity Demand	Description
5.00	1 Kg.	Fall in price
1.00	5 Kg.	Extension in Demand

Extension of demand can also be illustrated withthehelpofadiagramasshown in Fig. 4.2.

In the diagram AB is the demand curve ofapples. When price of apples is Rs. 5.00 per Kg.demand is for oneKg. The consumer is at point 'A'of the demand curve. As the price of apples falls toRs. 1.00 per Kg. demand extends to five kg. Andthe consumer moves to print 'B' of the demand curve. Movement along the demand curve from highpoint (A) to lower point '(B) is called extension ofdemand.

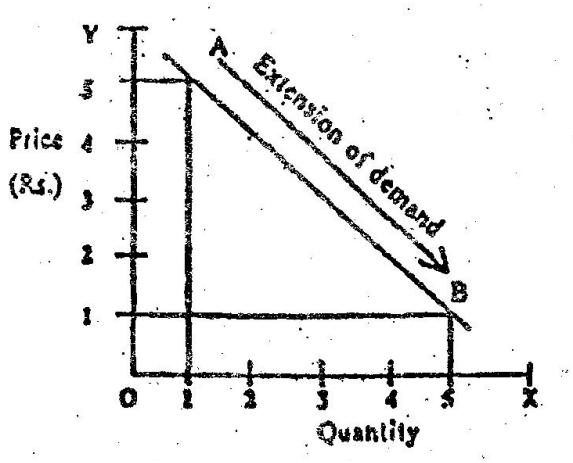


Figure 4.2

4.11 CONTRACTION OF DEMAND

Contraction ofdemand refers to a fall in quantity demanded asa result of rise in price if other things remainingthe same. As shown in the following table, whenprice of apples is Rs. 100 per kg, demand isfor 5 kg. of apples, as it rises to Rs. 5.00 perkg demand contracts to 1 kg. of apples.

CONTRACTION OF DEMAND

Price (Rs.)	Quantity Demanded	Description
1.00	5 Kg.	Rise in price
5.00	1 Kg.	Contraction in Demand

Contraction of demand can also be illustratedwith the help of a diagram as in Fig. 4.3.

In the above diagram AB is the demand curve of apples. When price is Rs. 1.00.per kg, demand isfor 5 Kg. of apples. As the price of apples rises toRs. 5.00 per Kg, demand contracts to one and theconsumer moves to point 'A' of the demand curve.

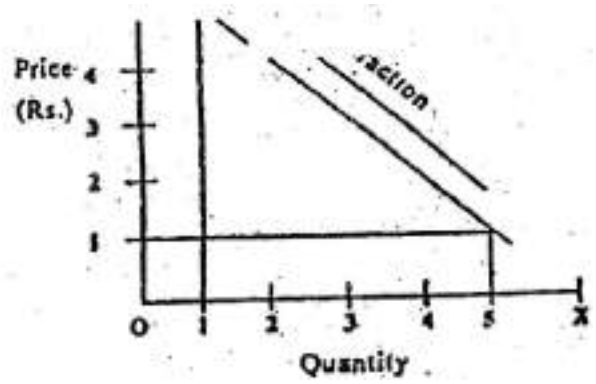


Figure 4.3

Movement along the demand curve from lowerpoint 'B* to higher point *A* is called contraction ofdemand.

4.12 SELF CHECK EXERCISE

Define the following terms: -

1. Consumer goods
2. Producer goods
3. Durable goods
4. Demand
5. Price demand
6. Law of demand
7. Extension of demand
8. Contraction of demand

4.13 SUMMARY

A business manager must have background knowledge of demand because all other business decisions are largely based on it. Demand theory is undoubtedly one of the manager's essential tools inbusiness planning both short run and long run. The objective of corporate planning is to identify newareas of investment. Demand considerations may directly and indirectly affect day-to-day financial,production and marketing decisions of the firm. Demand (sales) forecasts do provide some basis forprojecting cash flowsand net incomes periodically. Moreover, expectations regarding the demand fora product do affect production scheduling and inventory planning.

4.14 GLOSSARY

- **Demand** is an economic principle referring to a consumer's desire to purchase goods andservices and willingness to pay a price for a specific good or service. Holding all other factorsconstant, an increase in the price of a good or service will decrease the quantity demanded, and viceversa.
- **Demand** analysis is a research done to estimate or find out the customer demand for aproduct or service in a particular market. Demand analysis covers both future

andretrospective analysis so that they can analyse the demand better and understand theproduct/service's past success and failure too.

- **Goods** are tangible things that are produced, bought or sold, then finally consumed.
- **Law of demand** states that other factors being constant, price and quantity demand of anygood and service are inversely related to each other. When the price of a product increases,the demand for the same product will fall.
- **Price** is the amount of money that has to be paid to acquire a given product. Insofar as theamount people are prepared to pay for a product represents its value, price is also a measure ofvalue.

4.15 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 4.2.
2. For answer refer to section 4.2.
3. For answer refer to section 4.3.
4. For answer refer to section 4.4.
5. For answer refer to section 4.5.
6. For answer refer to section 4.6.
7. For answer refer to section 4.10.
8. For answer refer to section 4.11.

4.16 TERMINAL QUESTIONS

1. Define Demand. Discuss the various types of demand.
2. Discuss law of demand with assumptions and importance.
3. What do you understand by demand schedule? Discuss its significance.
4. Enumerate determinants of demand by taking into consideration the Indian corporate scenario.

4.17 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis, Managerial Economics, Prentice Hall of India.
3. Dwivedi D N, Managerial Economics, Vikas Publishing House Pvt. Ltd.
4.. Peterson, Lewis and Jain, Managerial Economics, Pearson
5. Sadananda, Managerial Economics, Prentice Hall of India

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CHAPTER-5

ELASTICITY OF DEMAND

STRUCTURE

5.0 INTRODUCTION

Demand usually varieswifh price. But the extentof variation is not uniform in all cases. In some cases,the variation is extremely wide; in some others, it mayjust be nominal. That means sometimes demand isgreatly responsive to changes in price; at other times,it may not be so responsive. The extent of variation iscalled "elasticity." In measuring the elasticity of demand, two variables are considered: (I) demand,and (ii) the determinants of demand.

5.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand the concept, types, and factors of elasticity of demand. How to measure elasticity of demand? What is income elasticity and its applications and the cross elasticity of demand.

5.2 ELASTICITY OF DEMAND

Elasticity of Demand is referred to thePercentage change in quantity demanded/Percentagechange in determinant of demand. The term 'elasticityof demand', when used without qualifications, iscommonly referred to as price elasticity of demand.However, the concept of elasticity of demandmeasure the responsiveness of demand for acommodity to changes in the variables confined to itsdemand function. The attribute of demand by virtueof which it extends or contracts under the pressure ofa change in pries, is known as elasticity of demand.According to Prof. A.L. Meyers, "The elasticity ofdemand is a measure of the relative change inamount purchased in response to a relative change inprice on a given demand curve." .

E = The proportional change in quantity demanded/The proportional change in price

Representing it in symbols, the price elasticitycanbe stated as:

$e = \frac{\Delta Q/_Q}{\Delta P/_P}$ Alternatively $e = \frac{\Delta Q}{Q} \; x \; \frac{P}{\Delta P}$ or by ***rearranging :*** $e = \frac{\Delta Q}{Q} \; x \; \frac{P}{\Delta P}$

Where :

Q = the original demand (Say Q_1) .

P = theoriginalprice (say P_1)

ΔQ = the change in demand. It is measured asthe difference between the new demand and the olddemand (Q_1); Thus,$\Delta(Q = Q_2 – Q_1$.

ΔP= the change in price. It is measured as thedifference between the new price P_2 andthe old price. Thus $\Delta P= P_2 – P_1$.

The above formula, in fact, relates to pointelasticity of demand, that is the co-efficient signifiesvery small or marginal changes only. To illustrate theuse of the formula, suppose the following information is available from a demand schedule:

Price of Apples (Rs.)	Quantity Demanded (Kgs.)
20(P_1)	100 (Q_1)
21(P_2)	96 (Q_2)

Thus,

$\Delta P=P_2 – P_1$= 2l – 20=l,and $P=P_1$=20

$\Delta Q = Q_2 – Q_1$ = 96 – 100=4, and $Q=Q_1$=100

(Here, minus sign are ignored).

Elasticity of demand

$$e = \frac{\Delta Q}{Q}\ x\ \frac{P}{\Delta P} = \frac{-4}{100}\ x\ \frac{20}{1} = -0.8$$

Demand for some goods have more responsive'to the change in price whilesome others are not so.For example, a fall in the price of bananas may causea sufficient extension in their demand, while aconsiderable, fall in the price of salt may not cause an appreciable extension in its demand. Thus, we seethat different commodities have different degree ofresponsiveness elasticity of demand with the changein price. That is because the demand for some goodsis more elastic, while for othersit is less elastic orinelastic. In the examples given above, the demandfor bananas is more elastic than that of salt.

5.3 TYPES OF PRICE ELASTICITY

Marshall has suggested three types of priceelasticity of demand, viewing the numerical co-efficient of price elasticity in terms of unity or 1.Marshal's classification of Price elasticity is as under.

Unit elasticity of demand (e = I) .

Elastic demand (e>I), i.e. elasticity »s greaterthanunity.

Inelastic demand (e<I),i.e. elasticity is less than unity.

Marshall treats unit elasticity as normal orstandard elasticity and all economists commonly holdthe same notion. By elastic demand, it mean thatdemands respond relatively more to a price change.This simply means that a relatively large change indemand is caused by a smaller changes in price.Similarly, inelastic demand means that the relativechange in demand is less than that of price. Modemeconomists have stated five kinds of price elasticityasunder:

Perfectly elastic demand;

Perfectly inelastic demand;

Relatively elastic demand;

Unitary inelasticdemand; and

Relatively elastic demand.

(a) Perfectly Elastic Demand

An endless demand at the given pries is thecase of perfectly elastic demand. When demand isperfectly elastic, die consumer stops buying it. The perfectly elastic demand is infinity (e = α).

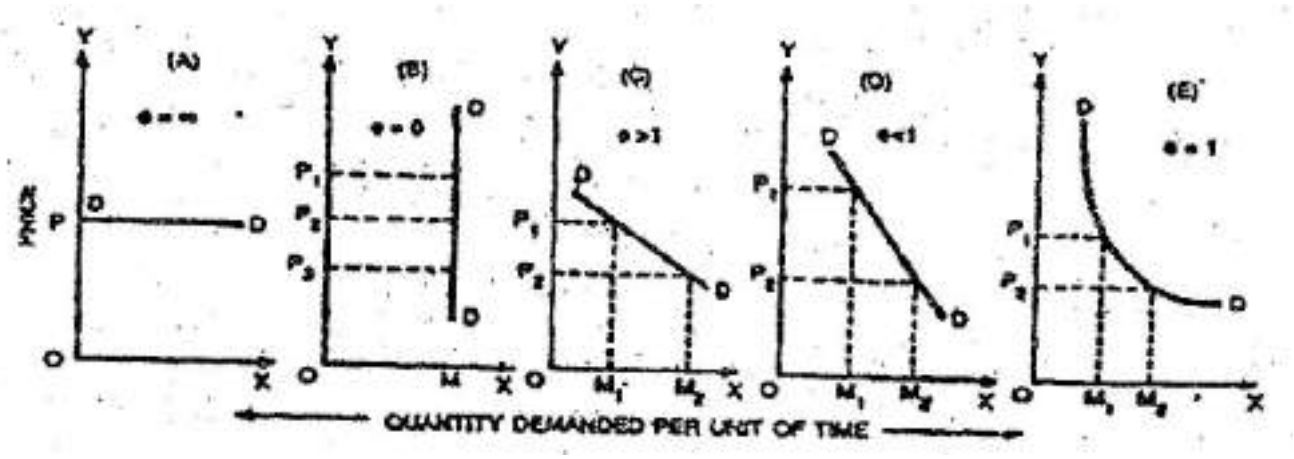

Figure 5.1

Figure 5.1(A) indicates that at price OP aperson would buy as much of the given commodityas can be obtained, i.e., an infinite quantity, and thateven at a slightly raised price he would buy nothing.While, it is assumed that when price is lowered, thedemand curve shifts down, at this pricethe demandcurve remaining horizontal. Perfectly elastic demandis a case of theoretical extremity. It is hardlyencountered in practice.

(b) Perfectly Inelastic Demand

When the demand for a commodity shows no'response at all to a change in price, it is called aperfectly inelastic demand Perfectly inelastic demandis, thus, zero elasticity (e=o). In this case, thedemand curve would be a straight vertical line as inFigure 5.1 (B) indicates mat whether the price movesform OP_2 to OF_1 or OP_3. The quantity demandedremains the same, OM only.

(c) Elastic Demand

When the proportionate change in the quantitydemanded is greater than that of price, the demand issaid to be elastic. The numerical value of relativelyelastic demand lies between one and infinity. Arelatively elastic demand will be represented by agradually sloping, i.e. rather a flatter, demand curveas shown in Figure 5.1 ©. m Figure 5.1 © when theprice falls from OP_1 to OP_2 the demand rises toOM_1 which is relatively large in proportion to thechange in price $\frac{\Delta Q}{Q} > \left| \frac{P}{\Delta P} \right.$ hence elasticity isgreater than one.

(d) Relatively Inelastic Demand

When the proportionate change in the quantitydemanded is less than that of price, the demand isconsidered to be relatively inelastic. In Figure 5.1 (D)when the price falls by P_1P_2 the demand is extendedjust by M_1M_2 which is relatively very less inproportion to the change in price $\frac{\Delta Q}{Q} > \frac{P}{\Delta P}$hence elasticity is less than one. This is also a veryrealistic concept.

5.3.5 Unitary Elastic Demand

When the proportionate change in demand is exactly the same as the change in price, the demandis said to be unitary elastic.

In Figure 5.1 (E) when (he price falls by P_1P_2 the demand is extended by M_1M_2 which is in the same proportion to change in price, $\frac{\Delta Q}{Q} > \frac{P}{\Delta P}$hence elasticity is equal to unity.

The different kinds of price elasticity of demand discussed above can be summarized as in the following table:

TABLE 5.1

PRICE ELASTICITY OF DEMAND

Numerical Value	Terminology.	Description
E=α	Perfectly elastic	
	(or infinitely)	Consumers have infinite demand at a particular price and none at all at an even slightly higher than this given price.
E=o	Perfectly inelastic (or completely)	Demand remains unchanged,.whatever be the change in price.
E >I	Relatively elastic	Quantity demanded changes by a larger percentage than does price.
E<1	Relatively inelastic	Quantity demanded changes by a smaller percentage than does price.
E = I	Unitary elastic	Quantity demanded changes by exactly the same percentage as does price.

5.4 FACTORS DETERMININGELASTICITYOF DEMAND

The elasticity of demand differs fromcommodity to commodity. It also differs from personto person and time to time. Practically, it is verydifficult to classify commodities according to theelasticity of their demand. Elasticity of demand is onlya relative term. For one person, the demand for acommodity may be elastic, while for another it maybe less elastic or inelastic. Thus, it is very difficult tosay that the demand for a commodity is highly elastic,relatively elastic or less elastic.In order to pronounceany judgement for elasticity of demand for somecommodity, the following factors must be kept intoconsideration:

(a) Nature of the Commodity : The demand fornecessary goods is generally less elastic. Wehave to buy them in a fix quantities, irrespectiveof their rise or fall in prices. For example, thedemand for wheat, will remain practically thesame. If its price falls say by 50 percent, itsdemand will rise proportionately, i.e. roughly bythe same percent and vice-versa. The demandfor luxuries is more elastic. A little decline in theprice of these things (e.g., T.V. sets,refrigerators, room coolers, etc.) stimulatespeople to have more demand for these things.On the other hand, a little rise in the price ofthem much to have a demand for them.

It has to be kept in mind that necessaries,comforts and luxuries are relative-terms. A thingof necessary for a person may betaken as thethingof comfort by one, and of luxury byanother.

(b) Proportion ofTotal Expenditure: If theexpenditure on a commodity is only a smallproportion of the total expenditure, then achange in its price will not affect its demandmuch. Hence its demand will be inelastic. Incontrast to this, if the expenditure on acommodity absorbed, is large proportion of a person's total expenditure. Then its demandwill be elastic. For example, the expenditure on newspaper or matchboxes absorbs only a smallquantity of the total expenditure so, a rise intheir prices doesnot reduce their demand: thatis, their demand is inelastic. Contrary to this, theexpenditure on milk absorbs quite a good.proportion of total expenditure. So, if the priceof milk rises, its demand will be less; and. If itsprice tails,its demand will be more, that is itsdemand is elastic.'

(c) Substitutes *:* The demand for commodities,which have .substitutes, is more elastic incomparison to those commodities which haveno substitutes. For example, if the price of tearise we may curtail its purchase and take coffeeand vice-versa. In such a case, fall in the priceof tea leads to a contraction or expansion in itsdemand. This means its demand is elastic.Contrary to this, common salt has no substitute;so a rise or fall in its price will have very little orno effect on its demand. This means, its demandis inelastic.

(d) Several Uses of a Commodity : The demandfor a commoditythat can be put to several uses,is elastic; whereas the demand for a commoditywhich has only one use, is less elastic orinelastic. For example, electricity canbe used **in**homes in several ways. So, if the charges ofelectricity go down, people will consume itmore and vice-versa. Thus its demand is elastic.On a contrary, a pair of shoes can be used forone purpose only. So, a rise or fall in its pricewill not effect much on its demand i.e. itsdemand is less elastic or inelastic.

(e) Prices : The demand for very expensive orvery cheap .commodities is inelastic, while thedemand for commodities of moderate prices iselastic. Take the case of refrigerator. It is anexpensive commodity. If there is a rise or fall ofRs. 200 in its price it will have no effect on itsdemand. Again, take the case of needles orshirt buttons, which are very cheap, In case ofthese commodities, if there is even 100 percentchange in their prices, it will have no effect ontheir demands. But in the caseof a commodityof moderate price, a change in "price hasconsiderable effect on its demand.

(f) Income : If there is unequal distribution ofincome, i.e., some people are very rich, andsome are very poor, then the demand on thepart of poor people will be more sensitive toprice changes, whereas the demand of richpeople will not be affected by the change inprices. This is because the poor people runafter the cheaper commodities, as they meagerincome. The rich, onthe other hand, do not runafter the cheaper things. It is because even atnormal; price level or higher price level theyderive maximum benefit, from them because oftheir higher income. Thus, it can be said that thedemand for various commodities among thepoor people is elastic whereas the demari forcommodities among the rich people is elastic orinelastic.

(g) Habit andTaste : Some people are habituatedto use a particular variety of commodity. In sucha case, their demand for that commodity willremain quite unaffected by a rise or a fall in theprice. Thus, in case of habit or taste for aparticular brand, quality or a commodity, thedemand of the consumer remains almostinelastic.

(h) Possibility of Postponement of Use : If acommodity is such that its use can bepostponed for a certain period, then its elasticitywill be more. This type of commodity will havemore demand when the price falls and lessdemand when the price rises. In case of acommodity, whose use cannot be postponed, the demand will be less elastic or inelastic. Theuse of different design of shirts or shoes can bepostponed. So their demand is elastic. But theuse of common salt cannot he postponed, so itsdemand is inelastic.

5.5 MEASUREMENT OF THE ELASTICITYOFDEMAND

When we say that the demand for a particularcommodity is highly elastic, or inelastic, we do notknow its extent; and unless we have some method tomeasure the .extent of elasticity of demand there is nopractical use of **this** concept. The economists, assuch, have suggested various methods to measureelasticity of demand. But the following are someimportant methods:

a. Total Outlay Method .

b. Arc elasticity.

c. Point elasticity.

a. Total Outlay or Expenditure Method :

This method is based upon the change in priceand consequent change in outlay as a result ofpurchase of the commodity. If for instance a givenchange in price does not cause any change in thetotal amount of money Spent on the commodity,elasticity of demand is said to be "equal to unity". Ifas its result of given change in price, the total outlay isincreases, elasticity of demand is to be "greater thanunity". If oh the contrary, as a result of a givenchange in price, the total outlay is diminished, theelasticity .of demand is said to be "less than unity".The easiest way of ascertaining whether ornotdemand is elastic, is thechange in total outlay or totalexpenditure method.

Total Outlay= Price x (Quantity Purchased or sold)

When, with a change in price, the total revenue(TR) remains unchanged, demand is unit elastic(e=l). It is because the demand changes in the sameproportion as the price. This has been illustrated inTable 5.2.

TABLE 5.2

TOTAL OUTLAYMETHOD				
	Price Rs.	**Quantity (Units): (e)**	**Total Expenditure (e)**	**Elasticity of Demand.**
Original	2	10	20	—
1. . Change	4 1	5 20	20 20	B = I (unit)
2. Change •	.4 1	4 24	16 24	e > 1 (elastic)
3. , Change	4 1	6 16	24 16	E < 1 inelastic)

When, with a rise in price, the total revenue falls or with a fall in price, the total revenue rise, elasticity of demand is greater than unity. In short, when the price and total outlay move in opposite direction, demand is relatively elastic. With a rise in price, the total revenue also rises and with a fall in price, the total revenue falls, elasticity of demand is less than unity.It may be because the proportion of change indemand is relatively less than the proportion ofchange in price. When the. price and total outlaymove in, the same direction, demand is relativelyinelastic.

TOTAL REVENUE METHOD

Price	Total Revenue (TR)	Type of Elasticity (e)
1. Increases Decreases	Constant Constant	E = 1 (unitary)
2. Increases Decreases	Decreases Increases.	E >I (relatively elastic)
3. Increases Decreases	Increases- Decreases	E<1 (Relatively elastic)

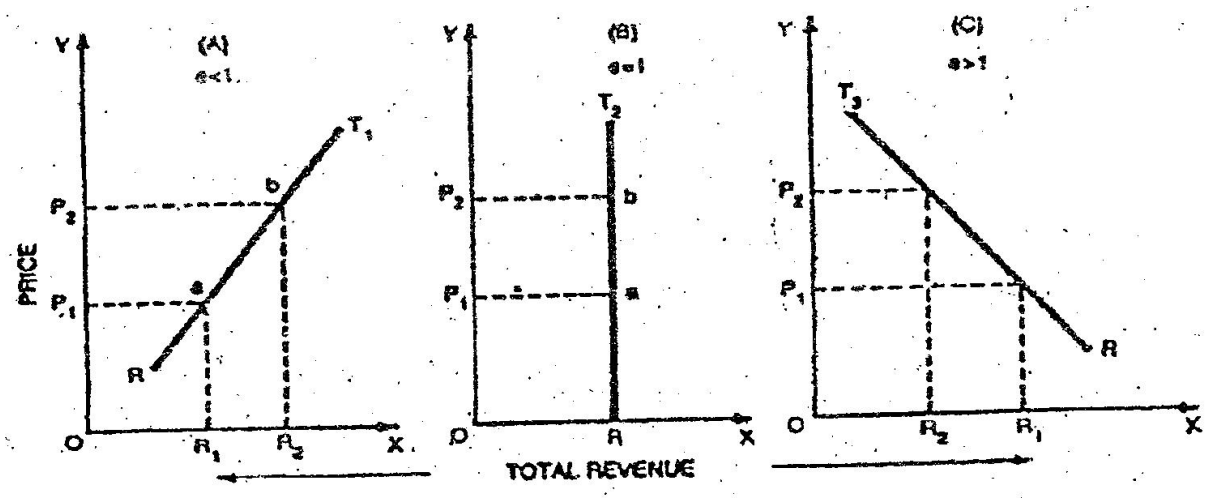

FIGURE 5.2 : TOTAL OUTLAY(REVENUE AND ELASTICITY OF DEMAND

TABLE 5.4

PRICE CHANGES, ELASTICITY AND TOTAL REVENUE

Change in	.Change in Total Revenue When:		
Price	E < 1	E > 1	E = 1
Rise	Rise.	Fall	No change
Fall	Fall	Rise	No Change

The total revenue method of measuring elasticityhowever less **exact.** It indicate only the class of elasticity but not its exact numerical value. However,ie total revenue method gives the value of elasticitys equal to one, greater than one and less than one. Itloes not give correctly the numerical value ofelasticity and therefore, the second method, i.e. formula' method, is used. Thus according to this method, elasticity of demand is equal to unity whenoutlay remains the same. If outlay increases, elasticityof demand will be greater than unity and on thecontrary if outlay falls, elasticity of demand will beless than utility.

b. Arc elasticity :- An arc is a portion or asegment of a demand curve. Most demand curveshave different elasticity from point to point, a notableexception being that of demand has unit elasticity andhas the shape of a rectangular hyperbola. Arcelasticity becomes important when we seek to findout elasticity of demand for a commodity in givenprice range. Arc elasticity is the average elasticityover an arc of a demand curve. It is the averageelasticity between two points. The usual formula forarc elasticity is

$\frac{Q1-Q2}{Q1+Q2} : \frac{P1-P2}{P1+P2}$where P_1 and P_2 aretwo prices and Q_1 and $Q_2$are the correspondingquantities,

.

An alternative formation for arc elasticity is

$$\frac{Q'}{Q1+Q2} : \frac{P}{P1+P2}$$

(c) Pointelasticity:-Point elasticity of demand iselasticity at a point on the demand curve. Figure 5.3shows how to find elasticity at a point on a demand curve. Take a point P. Draw a tangent tothe demandcurve at p. The ratio PA/PB gives elasticity at pointP. In this figure, demand at P is elastic because PA islonger than PB. It is twice as long so that thecoefficient is 2. Whenthe arc shirks to a point, weget point elasticity.

The simplest way of explaining the pointelasticity method is to consider a linear (straight line)demand curve. Let the straight line demand curve beextended to meet the two axes, as in Figure $.3.When a point is plotted on the demand curve likepoint P in Figure 5.3, it divides the curve into twosegments. The point elasticity is thus, measured bythe ratio of die lower segment of the curve below thegiven point to the upper segment of the curve above thepoint.

For brevity, we may again putthat :

Point Elasticity = Lower segment of the demandcurve below the given point / .Upper segment of thedemand curve above the point -

Or, to remember through symbols, we mayputas:

E = L/U

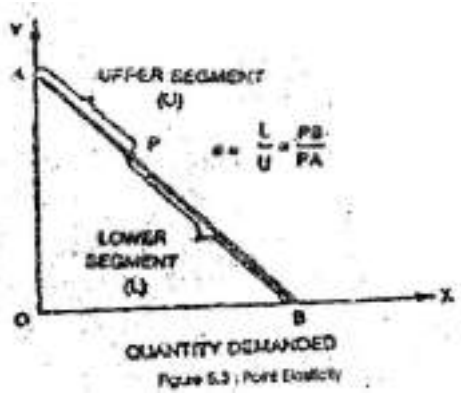

Figure 5.3 : Point Elasticity

Where, E stands for point elasticity, L stand forlower segment, and U for the upper segment. InFigure 5.3 AB is the straight line demand curve andP is agiven point. Thus, PB is the lower segmentand PA the upper segment.

E</U=PB/PA

If after the actual measurement of the two partsof the demand curve, we find that PB=3 cms andPA= 2 cms. then elasticity at point P is 3/2 =1.5.This measure is called a 'point' elasticitymeasurement because it effectively measureselasticity at a point on the demand curve assuminginfinitely small changes in price and quantity variables.

5.6 IMPORTANCE OF ELASTICITY OF DEMAND

The concept of elasticity of demand is of greatimportance bothin theoretical as well as practicalfields. The theoretical importance lies in the fact thatits knowledge helps us to know how and under whatcircumstances the elasticity of demand of differentcommodities respond to the change in their prices.From the practical point of view, the concept ofelasticity of demand is usefulin the following fields.

a. **For the Government:** The finance minister ofa country, imposes taxes **on** variouscommodities in order to increase the revenue ofthe state. The policy in this respect **is** decidedby the finance minister keeping in view theelasticity of demand of various commodities.Taxes are imposed or their rates are increaseson those commodities and services whosedemand is generally inelastic e.g., salt, sugar,matches, kerosene oil, electricity etc. The taxeson these commodities can easily be shifted byproduces to consumers. Taxes on commodities,whose demand is inelastic, cannot be easilyshifted by producers to consumers. As such,finance minister, generally, does not impose hightax rates on the commodities having elastic orhighly elastic demand.

b. **For Businessmen, Producers andMonopolists :** The businessmen can be highlybenefited by study, of the concept of elasticity ofdemand. It guides the business **to** fix high pricesof those commodities whose demand is inelasticand fix less price of those commodities whosedemand is elastic. If me businessman orproducer is a monopolist, he can make a rightplan of fixing the prices of his goods andthereby earning the maximum net profit. If hehas the knowledge of the concept of elasticityof demand. The producers, after the study ofthe nature of demand, can reduce or increasethe prices of their products.

c. **In International Trade** : The concept ofelasticity of demand is of great importance inthe matter of country's importsand exports. A country will be highly benefited, if its demandfor imported goods is inelastic and the demandof its goods by other countries is inelastic. Atpresent, India is not benefited by internationaltrade because its demand for imports ofpetroleum, machines etc. is more or lessinelastic while the demand for its exports isquite-elastic.

5.7 INCOME ELASTICITY OF DEMAND

Income is a major determinant of demand for anumber of goods.

D=f(M);

The demand may change due to a change in theconsumer's income, other factors remainingconstant The concept of income elasticity ascertaintheextentofsuchchange. The income elasticity ofdemand measures the degree of responsiveness ofdemand for a good to changes in the consumer'sincome. The income elasticity may be denned as aproportional change in the quantity demanded to thepercentage or proportional change in income.Income elasticity = Percentage change in quantitydemanded / Percentage change in income.

Symbolically, $e_m = \frac{\%\Delta|Q}{\%\Delta M}$

Where, % ∆Q signifies the percentage changein demand, and % ∆M the percentage change **in**income.

$$e_m = |\frac{\Delta Q}{Q} X \frac{M}{\Delta M}$$

Where,

Q = change in demand

Q= initial demand

M" initial income

M = change in income

5.8 TYPES OF INCOME ELASTICITY

Income elasticity **on** the basis of its co-efficient (e_m),

may thus be classified as under:

Unitary income elasticity of demand; (e_m = 1);

Income elasticity ofdemand greater than unity;**(e_m>I);**

Income elasticity of demand less than unity; (e_m< 1);

Zero income elasticity of demand; (e_m=o); and

Negative income elasticity of demand. (e_m<0);

(a) Unitary Income Elasticity

When the percentage change in demand isequal to the percentage change in income, thedemand is unitary income elastic. Thus, e_m =I.

(b) Income Elasticity Greater Than Unity

When the percentage change in quantitydemanded is greater than the percentage change inincome, the income elasticity of demand is greaterthanunity. . .

(c) Income Elasticity Less Than Unity

When the percentage change in demand is lessthan the percentage change in income, me incomeelasticity of demand is greater than unity. When thepercentage changein demand is less than thepercentage change in price, the income elasticity ofdemand is less than unity.

(d) Zero Income Elasticity

When the income change in any direction or inany proportion but carries no effect on demand Thus, e_m =o. The demand curve in this case is avertical line like D_e in Figure 5.12.

(e) Negative **Income Elasticity**

When an increase in income causes a decreasein the demand for a commodity, the demand is saidto be negative elastic'.The income elasticity co-efficient, e_m<0. Income elasticity is generallypositive, as there is a positive correlation betweenincome and demand. Other things remaining thesame, with an increase in income, there will be anincrease in demand and vice-versa.

Sometimes,however, negative income elasticity is also observed.Especially, in the case of Giffen goods and certainkinds of inferior goods, income elasticity .is negative.That is to say, when with a rise in income theconsumer buys less of a commodity, then there isnegative incomes effect But in most cases, the amountdemanded increases with a rise in the consumer'sincome and decreases with a fall in income. Thus,income elasticity, which is a numerical expression ofincome effect on demand, is found to **lie** positive inthe case of most commodities. Income elasticity ofdemand depends upon per capita income and theprevailing standard of living of a community. Inindustrially advanced countries of the West, with highliving standards the elasticity of demand for homeappliances and gadgets, cars, new house, etc., isusually very high. Comparatively, for necessariessuch as potatoes, salt, bread, income elasticity ofdemand is quite low.

5.9 APPLICATIONS OF INCOME ELASTICITY

Income elasticityof demand is applicable tomany planning and strategy problem, such as:

(a) Long-term Business Planning. In the longrun, demand for comforts and luxury goods may tendto be highly income elastic. Hence, prospects forlong run growth in sales for these goods are verybright. The firm can plan out its business accordingly.

(b) MarketStrategy. Income elasticity of demandis helpful in developing market strategies.

Housing Development Strategies. On the basisof income elasticity, housing .developmentrequirement can be predicted and construction workcan be effectively launched upon.

5.10 CROSS ELASTICITY OF DEMAND

The concept of cross elasticity is important in case of substitutes and complementary commodities,tea and coffee are substitutes for each other, pen andink, car and petrol are complementary goods. Thecross elasticity demand refers, to the degree ofresponsiveness of demand for a commodity to agiven change in uie price of some related commodity.The cross elasticity of demand between any twogoods X-and y is measured by dividing theproportionate change in the quantity demanded ofXby the proportionate change in the price of Y. Thus:

Cross elasticity of Demand = Proportionate orpercentage change in Demand for X Proportionateor percentage change in Price of Y

Symbolically,

$$e_c \; or \; e_{xy} = \frac{\Delta Q_x}{Q_x} + \frac{\Delta P_x}{P_x}$$

E_c or e_{xy}= cross elasticity of demand-(demand for X in relation to the price of Y) '

Q_x= change in quantity demanded forcommodity X.

Q_y= initial demand for X

P_y= Initialprice of commodity Y

P_x= changein the price ofcommodity Y, (Preferably dinstead of D is used to representa point change.)

Thecross elasticity ofdemand measures theextent to which products, are substitute orcomplementary. A positive cross elasticity of demandindicates that the two products in consideration aresubstitutes, since an increase/decrease in the price ofone causes an increase/decrease in the

quantitydemand of the other. A negative cross elasticity ofdemand indicates that the two products inconsideration are complementary to each other, sincean increase/decrease in the price of one leads to a contraction/extension in demand for the other. Thenature of the goods relative to their uses mainlydetermines the cross elasticity of demand. The crosselasticity tends to be high when two goods satisfy thesame wants equally well.

5.11 SELF CHECK EXERCISE

1. Define elasticity.
2. Define elasticity of demand.
3. Discuss in brief the elastic demand.
4. Discuss in brief the factors determining elasticity of demand.
5. Write a short-note on arc elasticity.
6. Write a short-note on significance of elasticity of demand.
7. Discuss in brief negative income elasticity.

5.12 SUMMARY

Demand extends or contracts respectively with a fall or rise in price. This quality of demand by virtueof which it changes (increases or decreases) when price changes (decreases or increases) is calledElasticity of Demand. Elasticity means sensitiveness or responsiveness of demand to the change inprice. This change, sensitiveness or responsiveness, may be small or great. Take the case of salt.Even a big fall in its price may not induce an appreciable ex appreciable extension in its demand. Thedemand is elastic when with a small change in price there is a great change in demand; it is inelasticor less elastic when even a big change in price induces only a slight change in demand. In the wordsof Dr. Marshall, "The elasticity (or responsiveness) of demand in a market is great or small accordingas the amount demanded increases much or little for a given fall in price, and diminishes much orlittle for a given rise in price."But the demand cannot be perfectly 'elastic' or 'inelastic'.

5.13 GLOSSARY

- **Demand** in economics is the consumer's desire and ability to purchase a good or service. It'sthe underlying force that drives economic growth and expansion. Without demand, no business wouldever bother producing anything.
- **Elasticity** refers to the degree to which individuals, consumers or producers change their demand or the amount supplied in response to price or income changes.
- **Elasticity of demand** is an economic principle that measures the extent of consumerresponse to changes in quantity demanded as a result of a price change, as long as all other factorsare equal.
- Quantity demanded is a term used in economics to describe the total amount of a good orservice that consumer's demand over a given interval of time. It depends on the price of a good orservice in a marketplace, regardless of whether that market is in equilibrium.
- **Quantity supplied** is the quantity of a commodity that producers are willing to sell at aparticular price at a particular point of time. Quantity demanded is the quantity of a commodity thatpeople are willing to buy at a particular price at a particular point of time.

5.14 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 5.0.
2. For answer refer to section 5.2.
3. For answer refer to section 5.3.
4. For answer refer to section 5.4.
5. For answer refer to section 5.5 (b).
6. For answer refer to section 5.7
7. For answer refer to section 5.8 (e).

5.15 TERMINAL QUESTIONS

1. What do you understand by elasticity of demand? Discuss the types of Price Elasticity.
2. Discuss in detail the factors determining elasticity of demand.
3. Define Income elasticity of demand. Discuss the different types of income elasticity.

5.16 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis, Managerial Economics, Prentice Hall of India.
3. Dwivedi D N, Managerial Economics, Vikas Publishing House Pvt. Ltd.
4. Peterson, Lewis and Jain, Managerial Economics, Pearson
5. Sadananda, Managerial Economics, Prentice Hall of India

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CHAPTER-6

DEMAND FORCASTING

STRUCTURE

6.0 INTRODUCTION

Forecasting means estimations about futurecourse of development. One can predict the futureevents. Demand forecasting means estimations aboutfuture course of market demand for a product.Demand forecasting is based upon the statistical dataabout past behaviour and empirical relationships of'the demand determinants. Thus demand forecastingis a reasonable judgment of future probabilities of themarket demand for a product based on scientificbackground.Demand forecasting is an estimate ofthe future demand. It cannot be hundred percentprecise. But, it gives a reliable approximationregarding the possible outcome, with a reasonableaccuracy.

Demand forecasting can be studied at thefollowing levels:

Micro level. It refers to the demandforecasting by the individual business firm forestimating the demand for its product.

Industry level. It refers to the demandestimate for the product of the industry as a whole. Itrelates to the market demand as a whole.

Macro level. It refers to the aggregate demandfor the industrial output by the nation as a whole. It isbased upon the national income or aggregateexpenditureof the country.

6.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand the concept, meaning and types **of** demand forecasting. The significance and methods of demand forecasting.

6.2 SIGNIFICANCE OF DEMANDFORECASTING

Demand forecasting is very essential in thecourse of business decision making. Its significancecan be studied as under:

(a) Production Planning. Demand forecasting is aprerequisite for the production planning of a businessfirm. Expansion of output of the firm is based on theestimates, otherwise it may cause overproductionand consequent losses.

(b) Sales Forecasting. Sales forecasting is basedon the demand forecasting. Promotional, efforts of thefirm should be based on sales forecasting.

(c) Control of Business. It is essential to have awell conceived budgeting of costs and profits whichis based on the forecast of annual demand/sales andprices.

(d) Inventory Control. A satisfactory control ofbusiness inventories, raw materials, intermediategoods, semi-financed product, finished products,spare parts, etc.,'requires satisfactory estimates ofthe future requirements which can be traced throughdemand forecasting.

(e) Growth and Long-term Investment. Programmes. Demand forecasting is necessary fordetermining the growth rate of the firm and its long-term investment programmes and planning.

(f) Stability. Stability is production andemployment over a period of time can be madeeffective by the management in the lightly of thesuitable forecasting about market demand and other business, variables and smoothening of the businessoperations through counter-cyclical and seasonallyadjusted business programmes.

(g) Economic Planning and Policy Making. Demand forecasting at macro-level help the planners and policy makers for the better planning and rationalallocation of the country's production resources. TheGovernment can determine its import and exportpolicies in view of the long-term demand forecastingfor various goods in the country.

6.3 SHORT-TERM AND LONG-TERMFORECASTING

For business decision making purposes, a firmmay undertake short-term and long-term forecastingof demand arid other variables.

(a) Short-term Forecasting

Short-Term forecasting normally relates to aperiod not exceeding a year. It is related to the day-to-day informations which are concerned withtactical decisions under the given resourceconstraints.

Short-term forecasting may serve the followingpurposes

Evolving a Sales Policy.

Determining Price Policy. .

Evolving a Purchase Policy.

Fixation of Sales Targets.

Determining Short-Term Financial Planning.

(b) Long-Term Forecasting

Long-term forecasting refers to the forecastsprepared for long period during which the firm'sscale of operations or the production capacity maybe expanded or reduced. It is normally concernedwith the periods exceeding a year, usually 3-5 yearsor even a decade or more. Functionally the longperiods permit alternations in the scale of production.If differ from industry to industry and firm to firm. Inbusiness decision making/long-term forecasting mayserve the following purposes: Business Planning andManpower Planning.

(c) Long-Term Financial Planning.

The importance of demand or sales forecastingto business planning can hardly be over-emphasized,Sales constitute the primary source of revenue for thebusiness, and production for sales gives rise to mostof the costs incurred by the firm. Since output is tobe sold and virtually nothing can be producedovernight, sales forecasts are needed to decide thequantum of production. Production requires servicesof various other factors which have to be employed.This requires finance, manpower etc., which will haveto be arranged. Thus, sales forecast is crucial forbusiness planning. Thus the firm has no choicebetween forecast and not to forecast. The area ofchoice only**concerned** with the way, theforecast ismade, and what resources are devoted to it.

A forecast is a prediction or estimation of afuture situation. Since the future is uncertain, noforecast can be 100 percent correct. Thus, there is aparadox in forecasting. Every firm needs salesforecasts but none can predict its sales accurately.Nevertheless, every firm aims to obtain as precise aforecast as possible.

There are two kinds of forecasts: passiveforecasts and active forecasts. Passive forecastspredict the future situation in the absence of anyaction by the firm while Active forecasts estimate thefuture situation taking into account the likely futureactions of the firm. For example, iftheBata ShoeCompany takes no policy action to influence its future sales in 2006; what would be its sales in2007? The answer to this will give a passive salesforecast However, the forecast of sales may not bethe desirable level therefore the Bata Company maydesire to initiate some actions with a view to influenceits future sales. The expected sales denote the activeforecasts. A business firm would be interested in both passive and active forecasts. In fact, just these may not be enough; The firm may like to examine thesensitivity of its sales in relation to a host of itsalternative policy decisions. For example, it may wishto predict its sales volume at different prices for itsproduct, at varying advertisement outlays, at differentprices ofsubstitutes and complements of its product,and so on. All this is needed for business firm whichhas to strive hard for its viability and long-termsurvival. It also calls for a clear assessment of thesensitivity of it sales to various internal and externalfactors.

6.4 FORECASTING METHODS;

Since forecasting play an important role indecision making, it is crucial to use the best available techniques to minimize forecast inaccuracy. However,there is no unique method which always guaranteesthe best result. Furthermore, the choice of a methodis often dictated by data availability and by theurgency with whichforecasts are needed. Many timeforecasters are forced to use a less reliable method,If the use of better techniques.is time consuming orthe forecasting are needed urgently, forecasts aremade on the basis of less reliable techniques.Therefore, it is important to get acquainted with thewhole range of techniques of forecasting.

Broadly, there are two approaches to theproblem of business forecasting. One is to obtaininformation about the intentions of spenders throughcollecting expert's opinion or by conducting interviews with consumers. The otheris to use pastexperience as a guide and, by extrapolating paststatistical relationships to suggest the level of futuredemand. Both these methods rely in varying degreesof judgement. The first method is usually foundappropriate for short-term forecasting while thesecond method suits for long term forecasting.

(a) Expert's Opinion Survey Method

In this-method, the experts opinion on theparticular product are requested about the likelysales in the future period. These are the person whohave been dealing in these types of related productsfor years and are thus able to predict the likely levelsof sales in future period under different conditionsbased on their experience. If the number of suchexperts are more and their opinion are different, thenan average, simple weightage, is found to lead tounique forecasts. This method isalso called hunchmethod, for it generated forecast based on thehunches of experts.

The advantage of this method is its simplicity.Itrequires minimum of statistical work. Nevertheless, itincorporates a number of different viewpoints inarriving at final forecasts. The limitation of thismethod is that it tends to substitute opinion foranalysis of the situation. It is purely subjective, anddifferent experts may have significantly differentforecasts and yet no one of them may beable toconvince others to accepts his judgement. Expertsmay be biased for a host of reasons or they mayhave their opinion on simple guesswork or the vaguereconciliation of conflicting opinions rather than onwell ordered and valid information.

(b) Consumer Survey Methods

The most direct approach to demandforecasting is to ask the consumers themselves abouttheir future consumption plans. This may beattempted through a complete survey of allconsumers or a sleeted group of consumers. If thecommodity whose demand is under study happens tobe largely an intermediate product, the survey of itsend user industries may be attempted for generatingsales forecasts.

(c) Consumer's Survey Method-Complete Enumeration

Under the complete enumeration surveymethod, the forecaster undertakes a complete surveyofall consumers of the commodity whose demand hewishes to forecast. He asks every consumer, theamount of that commodity he would like to buy in theforecast period. Once this information is collected,the sales forecasts are obtained by simply adding theprobable demands of all consumers. For example, ifthere are n consumers and their probable' demandsfor commodity X in the forecast period arex_1, x_2, x_3.....x_n, the sales forecast wouldbe .

$$X = x_1 + x_2 + \ldots\ldots + X_n \qquad (2\text{-}11)$$

The principlemerit of this method is that theforecaster does not introduce any bias of his own.He just collects information and aggregates. If theexpectations of all individual consumers prove to beone hundred percent correct, the sales forecast will be accurate. The major limitation of this method isthat it is tedious and combersome and that ifs usemay not *even be* feasible for products havingnumerous consumers. Furthermore, there is a dangerthat the data may have been wrongly recorded andcompiled and there veracity may be in doubt.Nevertheless, sales forecasts-for products haying afew consumers may be attempted through thismethod.

(d) Consumers'Survey Method-Sample Survey

Underthe sample survey method, the forecasterselects a few units out of the relevant population andthen estimate the probable demands of each of theselected units in the forecast period. The totaldemand of sample units is finally blown up togenerate the total demand of all consumers in meforecast period. Let there be 1,000 consumers ofgood X whose demand forecast is being attemptedsay, 50 consumers out of these. If the probabledemands, of these selected units in the predictionperiod are x_1, x_2,.....x_{50}, receptively, the forecast foraggregate demand will*be* given by

$$N_1x_1 + n_2x_2 + \ldots\ldots + n_{50}\, x_{50}$$

Where n_1 is the number of consuming units ingroup I, and $n_1+n_2+;....:+n_{50}$=I,000. If allconsumers are alike with respect to the demand forthe commodity whose salesforecasts is beingattempted, the selection may be done on a randombasis and the aggregate demand will be given by ($x_1 + x_2 +\ldots\ldots + x_{50}$) 1000/50

The sample survey method is better than thecomplete enumeration survey method, as the formeris less tidious, less costly, and subject to less errorsthan the later. This is where the role of statistics hasto be appreciated. If a sample is properly chosen, thesample survey method will yield good results.However, if there are biases in the choice of samples,the two forecasters using the same method may getaltogether different forecasts. This method is quitepopular for new products or new brands, this is themost appropriate method of forecasting. Also, thelarger the sample size, the smaller the sampling errorwill be. However, the larger the sample size, themore tedious and costly the survey is. The forecasterhas to strike a balance between these two, and thendecide his appropriate sample size.

(e) Consumer's Survey Method-End Use Method

Under, the end-use method, the sales of acommodity X are projected through surveyof its endusers. A commodity is used forfinal consumptionand as an intermediate goods in the production ofvarious goods in the domestic market, and it may beexported as well as imported. The demands for finalconsumption and exports are estimated through someother forecasting method, and its demand forintermediate use is estimated through a survey of itsuser industries regarding their production plans andinput-output coefficients. For example, the forecastsof demand for steel in India in 2007 can be obtainedas :

$$(S)_{2007} = (S_c)_{2007} – (S_m)_{2007} + a_{s1} + X_1)_{2007} + a_{n2}$$

where S= aggregate steel demand, S_c= finalconsumption demand for steel, S_c= export demandfor steel, X_1 = output of industry using steel as itsintermediary goods; A_{si} = steel requirement ofindustry I per unit of its output, 1=1,2,....,n, andsubscript 2007 stands for the year. To which the databelongs; $(S)_{2007}$ is to be read, for example, asaggregate steel demand in the year 2007.

Given the input-output coefficients of allindustries and their production plans, the sum of finalconsumption, demand and exports demand net ofimports of any commodity can be obtained with thehelp of an input-output mode.

The input-output method of estimating the sumof consumption and exports, net of imports demandfor any commodity is convenient for the nationalplanning organization only. At an industry level, thismethod is neither desirable nor feasible. Theindividual industry will have to rely on some othermethods to estimate the future demand of itsproducts for final consumption. Thus, only theintermediate demand or the input demand part oftotal demand for a commodity can be predicted bythe end-use method. Producers goods have only theintermediate demands for them. The forecastingmethod under discussion is convenient for predictingtheir demands; Furthermore, if the,

number of end-users of a product are limited, it will be convenient touse the end-use method for purposes of its demandforecasting. Demands, for commodities; likeautomotive batteries could very well be predicted byusing this method. This method can also be used forproducts which are largely producers goods, likesteel. Further more the demands of consumer goodscannot be easily forecasted through this method.

The principle advantage of this method is that itprovides sector-wise demand forecasts, Intheprocess of obtaining the forecast of aggregatedemand, the forecaster obtains separately, thedemand by the individual consuming industries, byfinal consumer categories, and by export and importsectors. This information may be useful inmanipulating future demand. The major weakness ofthis method is that it requires to furnish its plan ofproduction correctly and well ahead of time.

(f) Statistical Methods

There exists a large .quantum of historical dataon the sales of various commodities, and on otherrelevant variables, hi fact, most industries and firmsthemselves collect and preserve such data verysystematically. The various statistical methods,discussed below, make varying uses to such data toproject future demands.

(g) Tread Method

Under the trend method, the time series dataused by fitting a trend line cither graphically or bymeans of a statistical techniques known as the LeastSquares method. The time series data arechronologically arranged data from a population atdifferent points of time. Based nh the data plotted onthe graph, a line can be drawn upto the presentperiod, or upto the period for which data is available.it can then be extrapolated to the forecast period.

Thegraphical method has a limitationthat theextrapolation of the graph is somewhat subjective. Toovercome this problem ifs modem version, the trendmethod is recommended. Under the trend method, atrend equation is fitted, to the time series data withthe aid of an estimation method. The trend eqdationcould take either a linear or any kind ofnon linearform. Some of the most suitable trend equations forbusiness, forecasting are the following:

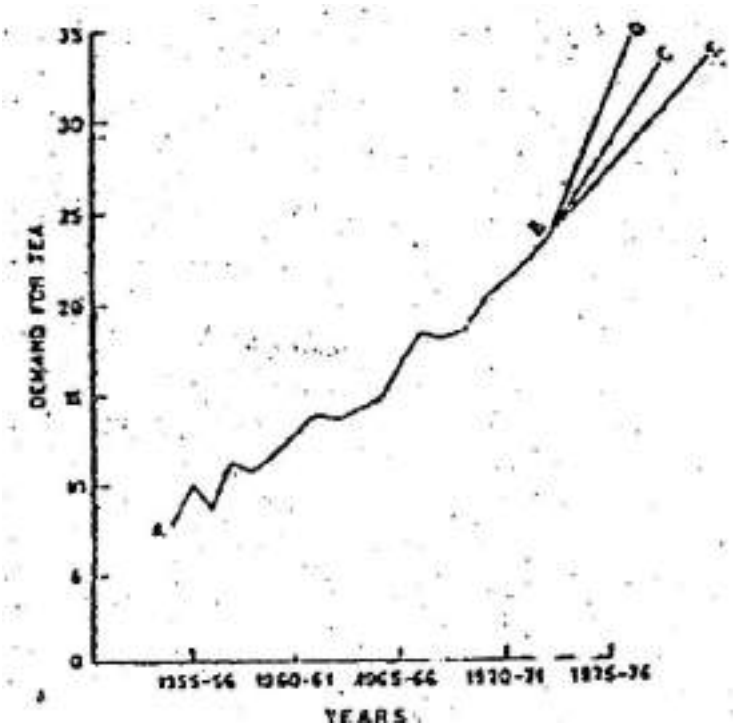

Figure : 6.2

a. Linear trend: Y = a+bT, where y is the variableunder forecast; T is the trend variable whichmay be normalized to take the value of 1 in thefirst period. 2 in the second period, 3 the thirdperiod, arid son on; and a and b are parameterswhich can be estimate. .

b. Exponential trend: $Y= ae^{bt}$ or $\log_c Y= \log_c a+bT$. This semi-log function assumes a constantgrowth rate each period.

c. Double-log trend: $Y = aT^b$or log Y=loga+b log T.

This equation assumes a constant value ofelasticity over the period.

4. Second and higher degree polynomials trend:The second degree polynomial is called aparabola. Its equation is $Y = a + bT+cT^2$. Thecharacteristic ofaparatbola is that its slope dY/dT changes direction once and only once-frompositive to negative or vice- versa. The shapeand location with respect to the axes will varyaccording to the values of the constants a,band c.

Both theoretical and empirical considerationshelp in the selection of the most appropriate growthcurve. Theoretically, logic might support a particulargrowth pattern. Empirically, the curve that best fitsthe past movement of the data is the mostappropriate curve. **Once** the best trend equation hasbeen estimated, forecasts can be, derived easily.

Thus, the trend method is very simple. It is verypopular in business forecasting not only because itvery often yields good forecasts. This is becausemost time series follow a particular tend in he longrun. As seen above, the method does not require theknowledge of economic theory and the market, andit need the time series data only on the variablewhose future values are .to be forecast. The majorlimitation of the trend method comes from its assumptions that the past rate of change of thevariable under forecast will continue in the future. Itsassumption that the trend equation obtained by thebest fit on past data will hold good in the prediction period is not always appropriate. In the long-run,

itmay be a good assumption but surely short-runfluctuations in most time-series do not warrant thisassumption.'It is because of this that the trend'method is often found appropriate for long-termforecasts and inappropriate for short-term forecasts.This method cannot usually explain the turning pointsof a business cycle.

It the time series of a particular sales variabledoes not reveal significant trend of any kind, themoving average method or exponentially weightedmoving average method is used to smoothen theseries. Once a smooth time series is obtained eitherthrough moving averages, the trend method can beapplied **to** this series to generate demand forecasts.

(h) Regression Method

The regression method makes use of botheconomic theory and estimation techniques togenerate forecasts from historical data. Fromeconomic theory, the researcher identifies thevariables which determine the variable underforecast. He then estimates the alternative forms ofthe dependent relationship between the dependentvariable and the casual variable, using the historicaldata on them. The least squares method is usuallyused for estimation purposes. He selects the form ofequation both on the basis of economic theory andstatistical/inference. The selected supposed todescribe the past causal relationship adequately. Thestatistic R^2 (coefficient of determination) gives the measure of the goodness of fit. The closer tounity, the better is the fit. If the forecaster cansomehow obtain the likely value^0 of casual variables in the prediction period, he can then feed thosevalues into the estimated equation to obtain theforecast.

The principal advantage of this method is that itis prescriptive as well as descriptive. That is, besidesgenerating demand forecasts, it explains why demandhas been at the level it is. The Variation in demand isexplained through variations in its casual variables.Demand has varied by a certain amount orpercentage because its determining variables havevaried by certain amounts or percentages. This isindicated by the regression equation itself. Theregression method is neither mechanistic like thetrend method nor as subjective as the experts opinionsurvey method. Though, there is a possibility of twoforecasters choosing two different forecastingequations to obtain different forecasts. The differencewill not be significant if the model is properlyformulated. Any social scientist possessing sufficientknowledge of economic theory and econometricmethods can use this method for forecastingpurposes. Usually time series data are used in thismethod. However, unlike the trend method, evencross-section data may be used to predict salesthrough the regression method. The cross-sectiondata may be used to predict sales through, theregression method. The cross section data are dataof different populations (individual consumers,consumers from different regions of a country orconsumers from different countries etc.) measured at the same, point of time.

The major limitation of the regression method offorecasting is that it requires the use of some otherforecasting methods to estimate the values of theexplanatory variables for the prediction period. Tothe extent that forecasts of the values of explanatoryvariables are wrong, the forecasts based on thismethod will also be wrong. As is true for all statisticalmethods, the regression method forecasts on thebasis of the past average relationship and so to theextent the future relationship deviates from the pastaverage, the forecast will also be wrong.

(i) Barometric Forecasting

Trend projection and exponential smoothinguses time-series data to predict the future, based onpast relationships. If there is no clear pattern: in a timeseries, the data are of little value for forecasting. Analternative approach is to find a second series of datathat is correlated with the first. Hence, by

observingchanges in the second series, it may be possible topredict changes in the first-A time series that iscorrelated with another time series is sometimescalled an indicator of the second series.

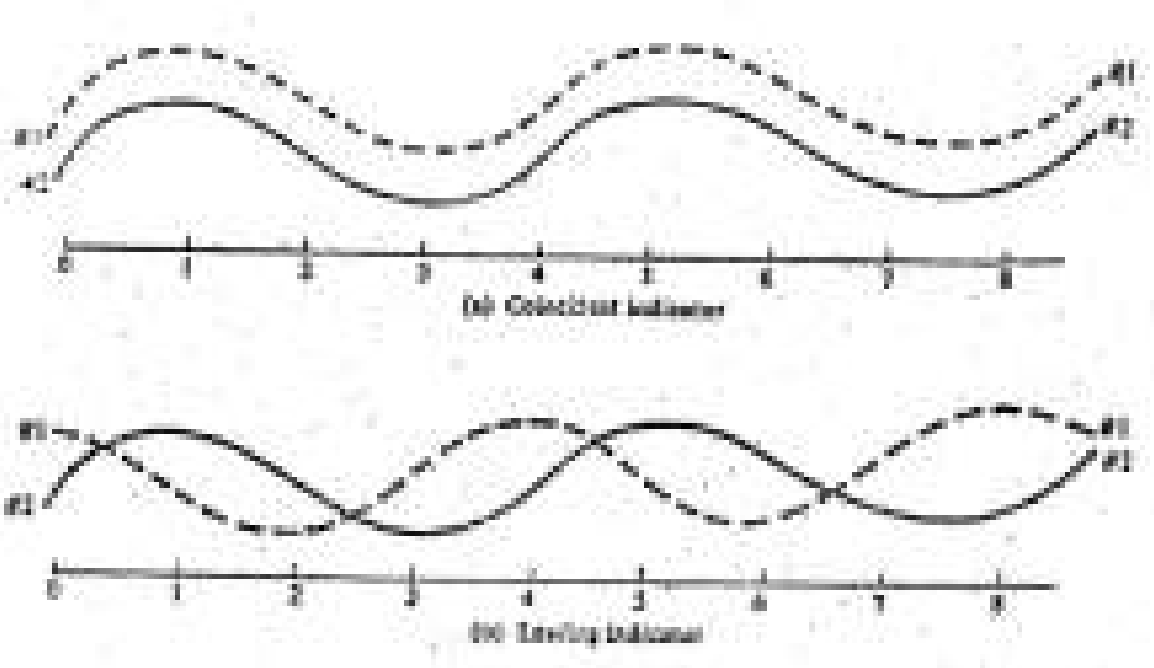

Fig. 6.3

(j) Leading Indicators

If two series of data frequently increase ordecrease at the same time, one series may beregarded as a coincident indicator of the other. For example, in Figure 6.3 a, series 1 is a coincidentindicator of series 2 because the two series have theirpeaks and troughs the same periods.

If changes in one series consistently occur priorto changes in another series, a leading indicator hasbeen identified. In 6.3 b, series 1 can be considered a leading indicator of series 2 because the peaks andtroughs of series 1 consistently occur before thecorresponding peaks and troughs of series 2.

It is used to study changes in barometricpressure to predict the weather, leading indicatorscan be used-to forecast changes in generaleconomicconditions. Consequently, the use of such indicatorsis commonly referred to as barometric forecasting.

The value of a leading indicator depends onseveral factors. First, the indicator must be accurate.Fourth; there should be a logical explanation as towhy one series predicts another. However, unlessthere is a causal relationship between the two series,the historical pattern may not be very useful inforecasting future events because there is no reasonto expect the pattern to be repeated. A time seriesthat can be maintained only at a very high cost aynot be worth the expense. Similarly, if there is a longdelay before the data are available, the effective leadtime of the indicator may be too short to be useful.For some of the indicators, it is more difficult toexplain the correlation between the two series.Historically, indices of common stock prices havebeen a relatively accurate predictor of cycles inbusiness activity.

(k) Composite and Diffusion Indices

Although a time series showing the changes in stock prices may be somewhat useful in predicting general economic conditions, no single, leading indicator has yet been identified.

That comes close to having a perfectforecasting record. The basic problem is that anytime series made up of a number of individual leadingindicators. **Composite Indices :-** A compositeindices are a weighted average of individual indicators. The weights are based on the predictions of each series. That is, a series that does a better job of predictions would be given greater weight than a less accurate series.**DiffusionIndices**. This index is a measure of the proportion of the individual time series that increase from one month to the next.

Selected Leading Indicators

	Leading Indicators		**Economic Variables Predicted by the Indicator**
1.	Average workweek		Manufacturing output .
2.	Average weekly initial unemployment claims		State unemployment insurance payments
3.	New orders for durable goods		Sales of durable goods
4.	New orders for capital goods		Sales of capital goods
4.	New building permits		Private housing starts .
5.	Change in manufacturing and trade inventories		General economic conditions
6.	Industrial material prices		Consumerprices
7.	Common stock prices	,	General economic conditions

The use of indices improves the accuracy ofbarometric forecasting. However, the predictionrecord of this techniques is far from perfect.Variability in lead-time is another weakness. A thirdproblem isthat while the **barometric approach**signals, the likely direction of changes in economicconditions, it says little about the magnitude of suchchanges. Finally the managers of individual firms mayfind it difficult to identify leading indicators thatprovide accurate forecasts for their specific needs.

(I) Simultaneous Equations Method

The simultaneous equations methods, alsocalled the complete system approach of forecasting,is a very sophisticated statistical method offorecasting. Suffice it to say that it involves thedevelopment of a complete model which can explainthe behaviour ofallthe variables which the decisionunit, firm or industry, can control. The number ofequations in such a model equals the number ofdependent (controllable) variables. Inevitable, alsoaffect the behaviour of dependent variables. Forexample, the sales of cigarettes depend not only oninternal factors such as prices and advertisement.outlay, but also on external factors such as consumerincome.

After the model is theoretically developed, it isestimated through some appropriate methods such asthe two-stage least squares method. The model istheft solvedfor each of .the endogenous

variables interms of the exogenous and the lagged endogenousvariables,' if any. The values of the laggedendogenous variables are obviously known and thoseof the erogenous variables and erogenous variablesare fed into the equation corresponding to the valuevariables whose forecasts are needed to generate therequired forecasts.

The principal merit of this method over theregression method is that, the forecaster needs toestimate the future values of only the erogenousvariables unlike the regression method where he hasto predict the future values of all, endogenous andexogenous. The values of erogenous variables aresupposed to be easier to predict than those of theendogenous variables. Its limitations are similar tothose of the regression method. For instance; itassumes that past statistical relationships will holdgood in the prediction period. It is a highlycomplicated, rather timeconsuming and costlymethod, and' it requires historical' data on all thevariables concerningthe decision units. 'Although thismethod is theoretically better than any other statisticalmethod, its unpopularity. With the improvements indata collection and the availability of high poweredcomputers, its use is likely to increase in future.

6.5 ACCURACY OF FORECASTS

Since forecast is going to be completelycorrect, the forecaster may be interested inmeasuring the accuracy of this forecasts. This would, of course, be possible only when the actual valuesbecome available, i.e., when forecast periodsbecome the present or past periods. If the forecast ismade for one period only, .then the differencebetween the actual value and forecast value wouldmeasure the forecasting error. If forecasts are madefor more than one period, then one can find the

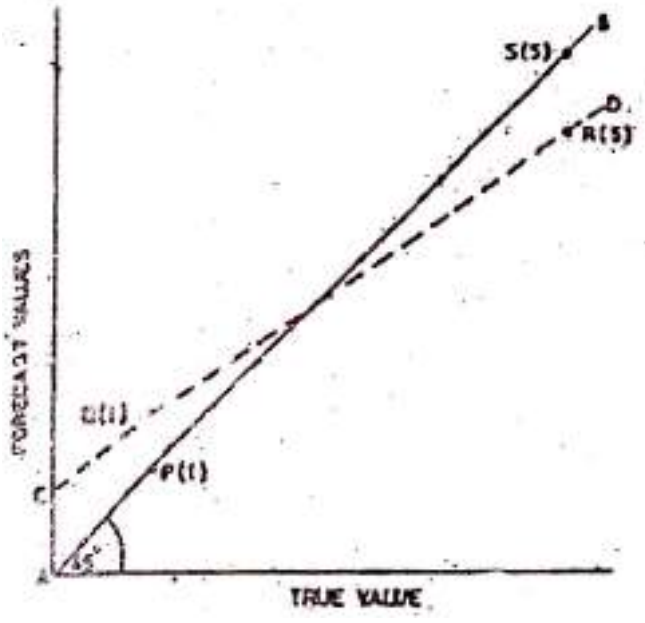

Figure: 6.4

average error by simply taking their arithmetic means**of** the absolute values of forecasting errors **of**different periods. The errors on positive side as wellas negative side are both undesirable and thereforethe direction of the error is ignored in calculating theaverage error. An absolute look at an error

does notgive a good idea of its intensity. For example, avariable whose true value is '100 was forecast at 110,the error is +10. The other variable whose true valueis 10 was forecast at 12, the error is +2. The formererror is larger than the later one. However, in termsof percentage, the first error is plus 10 percent andthe second is plus 20 percent and the second is moreserious than the first Obviously, one should comparethe percentage errors and not the absolute errors forexamining the forecast inaccuracy. In figure 6.4, ABis the 45° line and CD is the line showing therelationship between true and forecast values. Thevertical distances between these two lines measurethe forecasting errors.

6.6 SELF CHECK EXERCISE

1. Define forecasting.
2. Discuss in brief significance of forecasting.
3. Write a short-note on Long-term forecasting.
4. Discuss in brief the expert's opinion survey method.
5. Write a short-note on Trend Method of demand forecasting.
6. Discuss in brief barometric forecasting.

6.7 SUMMARY :

There is no unique method for forecasting thesales of any commodity or any other variable. Theforecaster may try .one or the other methoddepending upon his objective, data availability theurgency with which forecasts are needed, resourceshe intends to devote to this work, and the type ofcommodity whose demand he wand to forecast If.his objective is short-term forecasts, he may try anyone of the survey method or the leading indicatormethod. However, if he aims at long-term forecasts,he might wish to use the trendmethod of forecasting.If the commodity whose sales he seeks to predicthappens to be new product, he will have to use anyone of the survey methods of forecasting. For oldproducts, he has an option to use even statisticalmethod. For producers of capital good, andparticularly those, with limited uses, the end-usemethod may be more convenient than any othermethod. For consumer goods, the end-use method isgenerally not feasible. If forecasts are needed ratherquickly and /or at low cost, the trend method may bethe most appropriate one. When the lead-legrelationship can be identified, the leading indicatormethod will be the most appropriate one.Sometimes, it is advisable to use a combination ofmethods. .

The variousmethods discussed above may beused to derive macro-or micro-forecasts. In case thedata permit the use of this methods for macroforecasts only, the demand for a firm's output may bederived by using the share of this firm in the industryoutput. The past average share may be computedchange in it in the prediction period, the expectedshare of the turn's sales in total industry sales 'maybe estimated. The computed share may then bemultiplied by the forecast legal of macro sales to inferthe demand facing mat firm. On a similar basis, theexpected regional demands can be derived from theforecast demand in the country as a whole.

Although some light has been thrown on thesuitability of one method over the others in differentcircumstances, the forecaster will have to use his judgement in selecting one or the other method forhis purpose. Depending on resources and time, hemust use more than one method to cross check theaccuracy - of his predictions. Furthermore, aforecaster will never blindly accept the forecastsarrived at through" any scientific or unscientificmethod. After he derives the forecasts from any oneor more of these methods, he will assess theirappropriateness by reference to other factors. If inhis

judgement, the forecasts are wrong, he mustmodify them. This is where the crucial role ofjudgement comes in forecasts derived from statisticalmethods. These methods assume that past relationswill hold good in future. If the forecast feelsotherwise he must revise for forecasts using hisjudgement and knowledge of specific and likelyfuture events. If fact, he could even go to the extentofexaminingthe sensitivity of this forecasts. Thus, hecould estimate alternative forecasts, one for eachassumption about probable future developments.

6.8 GLOSSARY

- **Demand Forecasting** refers to the process of predicting the future demand for the firm's product. In other words, demand forecasting is comprised of a series of steps that involves the anticipation of demand for a product in future under both controllable and non-controllable factors.
- **Forecasting** is a process of predicting or estimating the future based on past and present data. It may not reduce the complications and uncertainty of the future. However, it increases the confidence of the management to make important decisions.
- **Long-Term Forecasting** means forecasting trends in the long term is a different story. Speedy updates are less vital to some businesses than accuracy and significant time to onset. Accurate forecasts allow a business to position itself competitively, and advance notice gives the business time to implement new strategies.
- **Short term Forecasting** in Business means forecasts are for periods of less than one year, with a normal range between one and three months.
- Trend Projection Method is the most classical method of business forecasting, which is concerned with the movement of variables through time. This method requires a long time-series data. Under this method, it is assumed that future sales will assume the same trend as followed by the past sales records.

6.9 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 6.0.
2. For answer refer to section 6.2.
3. For answer refer to section 6.3 (b).
4. For answer refer to section 6.4 (a).
5. For answer refer to section 6.4 (g).
6 For answer refer to section 6.4 (i).

6.10 TERMINAL QUESTIONS

1. Define demand forecasting. Discuss the significance and features of demand forecasting.
2. Differentiate between short-term and long-term demand forecasting.
3. Enumerate different methods used for demand forecasting.

6.11 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis, Managerial Economics, Prentice Hall of India.

3. Dwivedi D N, Managerial Economics, Vikas Publishing House Pvt. Ltd.
4. Peterson, Lewis and Jain, Managerial Economics, Pearson
5. Sadananda, Managerial Economics, Prentice Hall of India.

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CHAPTER-7

PRODUCTION FUNCTION

STRUCTURE

7.0 INTRODUCTION

A production function expresses thetechnological or engineering relationship betweentheoutput of a commodity and its inputs. Traditionaleconomic theory speaks of four factors ofproduction, viz., land, labour, capital and organizationor management. Technology also contributes tooutput growth and it is now regarded as an additionaldeterminant of output. Thus, the output of anindustry is a positive function of land, labour and'capital. The quality of management and fee level oftechnology that is employed in its production.Symbolically, it can be expressed denoted as under:

X -f(L,L,K,M,T) .

f1, f2, f3, f4, f5 > 0

where x = outputof commodity X .

L = land employed in the production ofX

L = labour employed in the production ofX

K = capital employed in the production ofX

M = management employed in the production of X

T = technology employed in me production of X

f = unspecified-function .

fl = partial derivative of with respect to **the**independent variable.

It describes a general production function. In aspecific situation, one or the other of these variousfactor inputs may not be important. Land is perhapsthe most important input factor in the case of anagricultural product while it is of minor importance inthe case of a manufacturing product. Production ofwheat can be increased through the use of more andbetter quality of fertilizers, more and timely irrigation,etc., buy beyond a point. Increase in land becomesnecessary for a further increase in its production. Incontrast to this, the production of steel, can beincreased significantly without any increase in the landoccupied by the steel industry. Besides, more landmay not even be available near a steel factory andoccupying land at any other place may not beconvenient or a profitable. Furthermore, theinvestment in land is a significant part of me total costof wheat production while it is an insignificantcomponent of the total cost of steel: Similarly, therole of management and technology may be morecrucial in case of an industrial product than in case ofan agricultural product.

For a good exposition of production decisionproblems, it is convenient to work with two inputfactors for an output. If labour and capital are theonly two inputs, the production function can beexpressed as x = f(L,K.)

It has three variables; output of commodity X(x), units of labour (L) and units of capital (K). For agiven value of x, there will be alternativecombinations of L&K. These combinations of Land K. will with variation in x. Both labour and capitalare necessary for the production of a commodity andthey are substitutes to each other. Thus for any givenlevel of output, an entrepreneur will need to hire bothlabour and capital but he would have an option toemploy any one combination of these factors out ofseveral possible combinations. The alternativecombination of factors for a given output level will besuch that it the use of one factor input is increasedthat of another will decrease and vice versa. Toillustrate this consider the hypothetical example of aentrepreneur engaged in making shoes. In order **to**make shoes, he need at least one cobbler, and somecapital which consists of leather, thread, sewing tools,machines etc. For making a given number of shoes,he would have alternative combinations of labour(cobbler) and capital, for labour and capital aresubstitutes to a certain extent. For example; acobbler having the minimum tools would hardly beable to complete one pair of shoes in a day whileanother cobbler of the same efficiency having asewing machine and other useful tools, could perhapsmake two pairs of shoes in a single day. Thealternative combinations of labour and capital formaking different numbers of shoes per dayareillustrated in Table 7.1 : .

Table 7.1

Input-Output Relationships

x =2		x -5		x=9		x=l2		x=14	
L		L		L		L		L	
K		K		K		K		K	
1	20	2	20	3	20	4	20	5	20
2	12	3	14	4	13	5	15	6	17

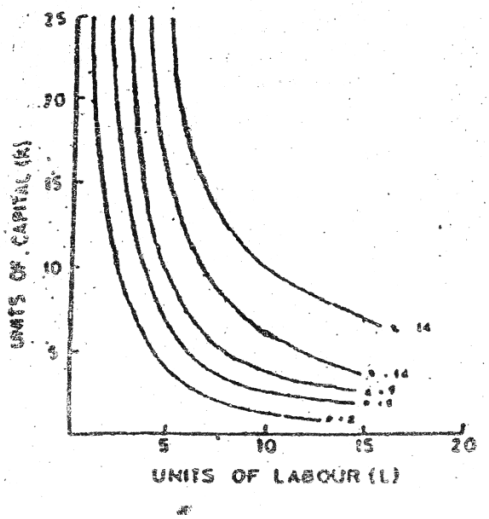
3	8	4	10	5	106	12	7	15	
4	6	5	7	6	8	7	10	8	13
5	4	6	5	7	6	8	8	9	11
6	3	7	4	8	5	9	7	10	10

7.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand the concept of isoquants, alternative combination of factors of production, factor productivity and return to scale. The statistical production function and what are the uses of production functions?

7.2 ISOQUANTS

An isoquant by definition is the locus of all thosecombinations of labour and capital which yield thesame output. The entrepreneur can employ 1cobbler and 20 units of capital, 2 cobblers and 12units of capital, 3 cobblers and 8 units of capital, or 6cobblers and 3 units of capital to manufacture 2 pairsof shoes. If he aims at producing 5 pairs of shoes,the alternative input combinations open to him are 2cobblers and 20 units capital, 3 cobblers and 1-4 units of capital, and so on. If we plot thesealternative input combinations for a given output andassume a continuous variation, in the possiblecombinations for a given output and assume acontinuous variation in the possible combinations oflabour and capital, we can draw a curve calledisoquants for the given units of output The isoquantsfor various output levels of Table 7.1 are shown inFigure 7.1.



The family of isoquants makes up all thepossible combinations of labour and capital that canbe employed to produce different output of acommodity. Thus, they are a geometricrepresentation of a production function. Theisoquants in Figure 7.1 represent the productionfunction. The higher the isoquant is, the higher theoutput it represents, they do not intersect each other,and they are convex to the origin.

An isoquant is felling, for it can neither be risingnor constant. A rising isoquant implies that outputdoes not increase with increase in labour and,capital,which is obviously not true. A horizontal or verticalisoquant means that output does not respond tovariations in one of the input factors, other remainingconstant. This is also not true because usually outputincreases with an increase in any one factor, ofproduction, others remaining the same. For similarreasons, a higher isoquant represent a higher level ofoutput.

An isoquant never intersects another isoquant,for if they did it would mean that with the same unitsof labour and capital, two different levels of outputcan be produced, which is absurd. The isoquantsare convex from below because substitution oflabour for capital becomes more andrnore difficult asmore of labour is substituted for capital.

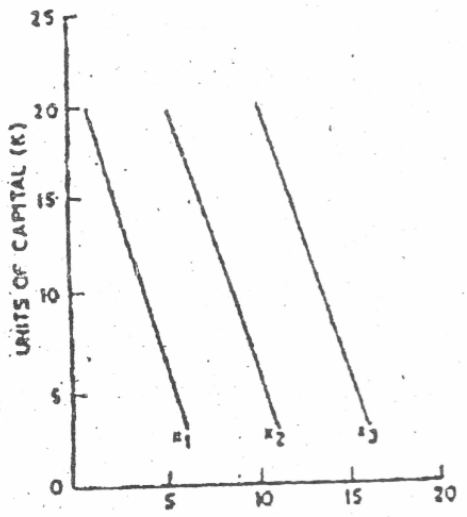


Figure : 7.2

On the other hand, if one factor of productioncould not be substituted for another at all, isoquantswould be rectangular as in Figure 7.3,

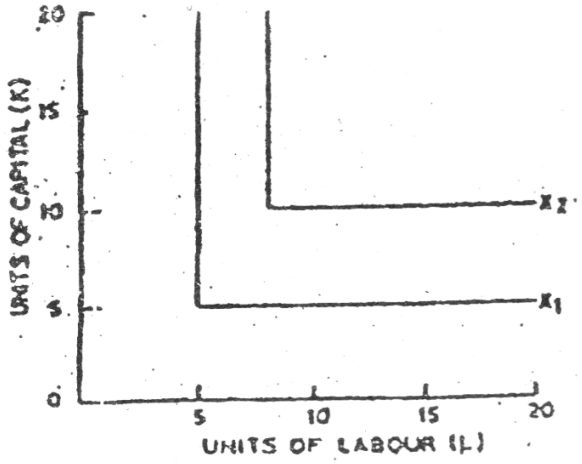


Figure 7.3

Since labour and capital are not perfectsubstitutes and their substitutability becomes moreand more difficult as one factor is substituted foranother isoquants are convex from below. In additionto the above properties of isoquants, it may be noted that they do not touch either the labour or the capital-axis. This is because, as stated above, both labourand capital are necessary for the production of anycommodity.

7.3 LEAST-COSTCOMBINATION OF INPUTS

The production function indicates the alternativecombinations of various factors of production whichcan produce a given output An entrepreneur wouldlike to choose that combination of input factors,which costs him the least For example, let the priceof labour (PL) be Rs. 9 per unit and the price ofcapital (C) be Rs. 6 per unit. Assume that anyamount of labour and capital can be bought at theserespective fixed prices. Let our entrepreneur makenine pairs of shoes. The alternative combinations oflabour and capital open to him are as given in thecolumns headed by x - 9 in Table 7.1 and Isoquant x= 9 Figure 7.1. Let us now determine his least costcombination.

There are two ways to determine the least costcombination of inputs for a given output. One way isto find the cost of each input combination and to choose which has the least cost The cost of an inputcombination is found by multiplying the price of eachinput by its quantity. There are six alternativecombinations of labour andcapital to produce ninepairs of shoes. The cost of each of thesecombinations will be as follows:

Combination	Input (funds) L	K	Cost (Rs)
1	3	20	3x9+20x6=147
2	4	13	4 x.9+ 13 x 6= 114
3	5	10	5x9+10 – 6=105
4	6	8	6x9+8x6=102
5	7	6	7x9+6x6=99
6	*8*	5	8x9+5x6=02 •

Combination 5 represents the least cost forproducing 9 pairs of shoes, The least total cost ofproducing various other quantities can be determinedin a similar way. A more general way to determinethe least cost combination is geometrical in nature.We first draw isocost lines as follows. With a givensum of money C and only two factors of production,labour and capital one can purchase are given by

$C = LP_2 + KP_K$

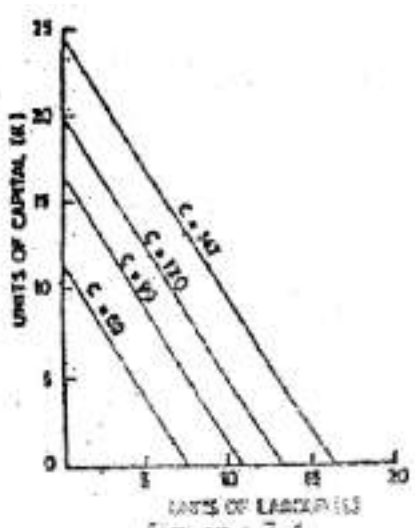


Figure : 7.4

Line C = 99 Is an iso-cost line. It is the locusof all those combinations oflabour and capital whichcould be bought for Rs. 99, Similar isoquant linescan be drawn for different sums of money. Figure7.4 gives afew iso-cost lines. It may be noted that allthese iso-cost lines are parallel, for factor prices arethe same in all cases. .

In order to determine tile least cost inputcombination or the maximum output for a given cost, we suprimpose the isoquant map on the iso-cost map as shown in Figure 7.5.

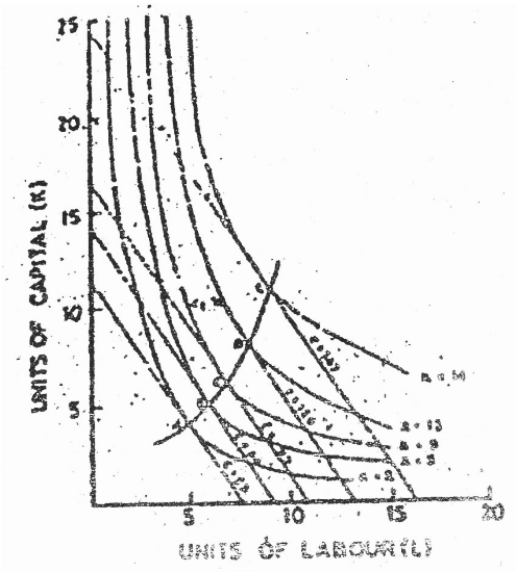


Figure 7.5

It is seen that the maximum output that can beobtained with an outlay ofRs. 99 is 9 pairs of shoes,where the iso-cost line C= 99 is tangent to theisoquant x = 9 at point C. Rs. 99 is the least cost ofproducing 9 pairs of shoes, and the least costcombination of inputs for this output is 7 units oflabour arid 6 unitsof capital. Any other inputcombination on isoquant x= 9 will have a cost higherthan Rs. 99. Tor example, input combinations at'points C, and C2 would cost Rs. 105 and Rs. 102,respectively.

Similarly, the least-cost inputcombinations for output level 2,5,12 and 14 aregiven by points A, B, D and E, respectively in Figure7.5. Thus, the line ABCDE represents the least costcombinations of inputs for different levels of outputIt denotes the expansion path and is called the scaleline.

7.4 FACTOR PRODUCTIVITIES ANDRETURNS TO SCALE

The production function is a long-termrelationship. It allows all factors of production to bevariable. The special type of production functionwith two factor inputs represented either by anunspecified function or by an isoquant map. It hasonly two factor inputs, each of which may be variedin magnitude. The short-run relationships betweeninputs and output are denoted by the productivity ofa factor of production.

(a) Factor Productivity

Three type of productivities of an input factorare distinguished. They are total, averageandmarginal physical productivities.. The total physicalproduct (TPP) of a factor of production is defined asthe total production, it can be obtained by employing

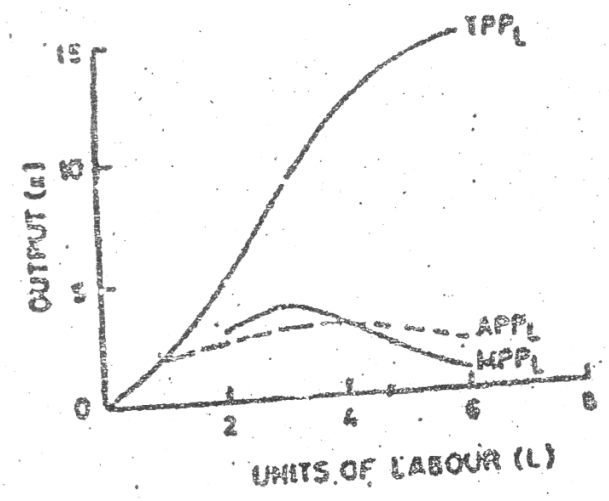


Figure **7.6**

different amounts of that factors, keeping all otherfactors constant. The average physical product(APP) of a factor is the total physical productdivided by the quantity of that factor, with all otherfactors held constant.

It can be seen that the total physical product oflabour (TPP) increases as more and more units oflabour are used with a constant amount of capital.However, the rate of increase is not constant. TheTPP first increase at an increasing rate and then aftera point its rate of increase declines-monotonically. Inthe example, TPP increases at increasing rates and ata diminishing rate after that point. This is because ofthe operation of the Law of Diminishing Returns. According to this law, as more and more units of afactor of production are used together with constantamounts of other factors of production, the totalphysical product increases-but the increment in itgives on diminishing after a certain point. The lawoperates because in the beginning as more labour is used, fixed capital is utilized better and more efficiently. This continues until fixed capital is utilizedoptimally. After this point, the additional labourwould find the fixed amount of capital inadequate andhence the increment in output would be at adiminishing rate.

Table 7.2

Total, Average and Marginal Products **of Labour (K == 20)**

Units of Labour	Total PhysicalProduct of Labour OPP)	Average Physical Product of Labour (APP)	Marginal Physical Product of Labour (MPP)
1	*2*	2	.
2	5	2.5	3
3	9	3	*4*
4	12	3	*3*
5	14	2.8	*2*

Corresponding to the described behaviour ofTPP above, the behaviour of average physicalproductivity of labour (APP) and of marginal physicalproductivity of labour (MPP) will be such that eachof these will first increase reach their respectivemaximum values and decline thereafter. It may benoted that the behaviours of APP and MPP are suchthat these two are equal when the former takes itsmaximum value.

The total, average and marginal productivities oflabour, as given in Table 7.2 and Figure 7.2, are for agiven amount of capital, i.e., K = 20. For differentamount of capital, these could be different. Theproductivities of different levels .of capital can bedetermined similarly by holding labour constant andvarying the capital input.

(b) Returns to Scale

In contrast to the law of diminishing returns which is a short-term concept, returns to scale is a long-term concept. Under the former, one examines the behaviour of output when any one of the inputfactors varies while all others are held constantUnder the latter,the behaviour of output is studiedwhen all factors of production are changed in thesame direction and in the same proportion. Returnsto scale are said to be increasing if output increasesmore than proportionate to the increase in all inputs,constant if output increases by the same percentageas all inputs, and diminishing if increase in output isless than proportionate to the increase in ail inputs.For example, if all factors of production increase by10 percent and output increases by 15 percentincreases in each of the input factors causes 8percent increase in output, there are diminishingreturns to scale. Constant returns to scale will bewitnessed if the increase in output is exactly 1-0percent.

7.5 STATISTICAL PRODUCTION FUNCTION

The production function denotes an engineeringrelationship. However it can be estimated bystatistical techniques using historical data on input andoutput. One can hypothesize several alternativeforms for this function, but the empirical studies onthe subject have found the form first used by Cobband Douglas to be the most appropriate form. Cobband Douglas estimated a production function for American manufacturing industries using annual time series data for the period 1899 to 1922. Their estimated function was .

$$x = 1.01L^{0.75}K^{0.25}$$

It can be used to generate isoquants for variouslevel of output. For example, the isoquantcorresponding to an output of 100 units will be givenby

100=1.01 L0.75K0.25

or 99 = L0.75K0.25

By substituting any value of L (or K) in thisequation, we can obtain the associated value of K(or L). For example, ifL = 50, the value of K willbe given by

99 = (50)0.75 K0.25

or, log 99 = 0.75. log 50+0.25 log K

i.e., 1.9956 = 0.75 (1.6990) = 0.25 log K

or, log K= 1 (1.9956-1.2743)

0.25

=2.8852.

i.e. K = anri log 2.8852

= 768

In a similar way, we can derive the value of Kfor any other value ofL. Thus, an isoquant for anygiven output level can be derived from an estimatedproduction function. If we repeat this procedure forany other output, level, we will derive anotherisoquant corresponding, to thatoutput An estimatedproduction function can also be used to compute theleast cost input combination for a given output. Asbefore, we need factor prices. This is illustratedbelow for factor prices PL = Rs. 2 and Pk = Rs.0,15 and for output X = 1000.

Determination for the least-cost inputcombination is a constrained optimization problem.It can be stated as follows:

Minimize C = 2L+ 6.15 K

subject to 1000 = **1.01** L0.25 K0.25

This can be solved through the Lagragianmultiplier technique. The Lagragian expressionwould be

V = 2L + 0:15K +λ [(0.01)(0.75) L0.25 K0.25.]=0

2

or, λ = 0.7575L0.25 K0.25

Thus, L= 683 and K = 3005.2 is the least-costinput combination for x =1000; The least-costcombination for any other output can be determinedsimilarly.

The least-cost can be computed by substitutingthese values ofL andK :

C= 2(683) +0.15 (3905,3)

= 1355+450+450.780

= 1816.78

Thus, the minimum cost of producing 1000 units isRs. 1816.98.

Various factor productivities and factorelasticities can easily be computed from an estimatedproduction function. Suffice it to mention here thatthe exponents in function are factor elasticities. Theelasticity of output with respect,to labour is 0.75while that with respect of capital is 0.25. This meansthat a 10 percent increase in labour with no change incapital input causes a 7.5 percent increase in output,and a similar increase in capital with no change inlabour input brings about a 2.5 percent increase inoutput. A measure of the returns to scale is given by the sum of allfactor elasticities. The sum of bothlabour and capital elasticities of output equal unity(0.75+0.25). This means that if each of the factors ofproduction increases/decreases by a givenpercentage,output will increase/decrease by thesame percentage. Thus, it implies returns to scale. .

7.6 MANAGERIAL USES OF PRODUCTION FUNCTION

There are several managerial uses of theproduction function. As seen above, it can be usedto compute the least-cost input combination for agiven Output or the maximum-output-inputcombination for a given cost. There are severalfeasible combinations of input factors and it is highlyuseful for decision makers to find out the most appropriate among them. A knowledge ofproduction functions is useful in deciding on the valueof employing a variable input factor in the productionprocess. So long as the marginal revenue productivityof a variable factor exceeds its price, it may be worth

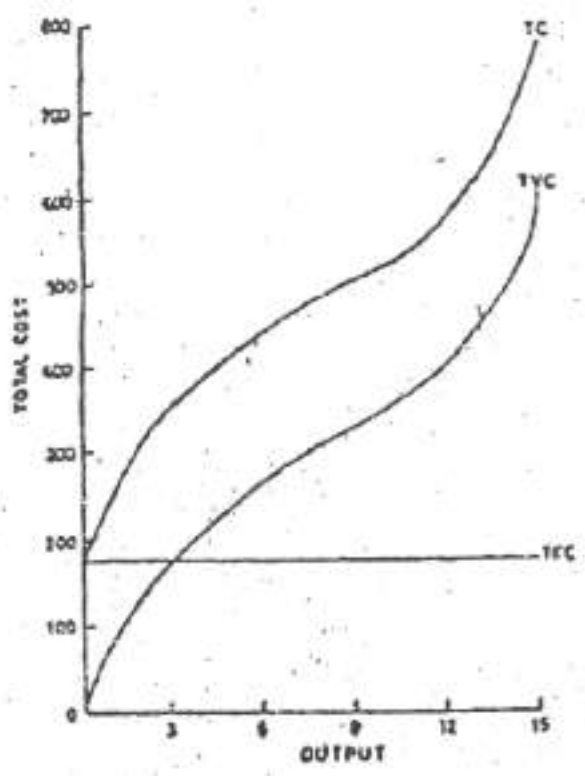


Figure: 8.1

while to increase its use. The additional use of aninput factor should be stopped when its marginalrevenue productivity just equals its price. Productionfunctions also aid long run decision making. If returnsto scale are increasing, it will be worthwhile **to**increase production through a proportionate increasein all factors of production, provided, **of** course,there is enough market for the product. Quite theopposite will be true if there is enough market **for** theproduct Quite the opposite will

be true if there arediminishing returns to scale. It should be indifferent toa producer whether to increase or decrease production in the presence of constant returns toscale, if demand is not constraint.

7.7 SELF CHECK EXERCISE

1. Write a short-note on production function.
2. Define Isoquants.
3. Discuss in brief return to scale.
4. Write a short-note on usage of production function.

7.8 SUMMARY

Production is the result of co-operation of four factors of production viz., land, labour, capital andorganization. This is evident from the fact that no single commodity can be produced without the helpof any one of these four factors of production. Therefore, the producer combines all the four factors ofproduction in a technical proportion. The aim of the producer is to maximize his profit. For this sake,he decides to maximize the production at minimum cost by means of the best combination of factorsof production. The producer secures the best combination by applying the principles of equimarginalreturns and substitution. According to the principle of equimarginal returns, any producer can havemaximum production only when the marginal returns of all the factors of production are equal to oneanother.

7.9 GLOSSARY

- **Manager** is a, person who manages or is in charge of something. Managers can controldepartments in companies, or guide the people who work for them. Managers must often makedecisions about things. According to Henri Fayol, a French management theorist, managers must beable to do planning.
- **Production** is the process of making, harvesting or creating something or the amount ofsomething that was made or harvested. An example of production is the creation of furniture.An example of production is harvesting corn to eat. An example of production is the amount of cornproduced.
- **Production function** relates physical output of a production process to physical inputs **or**factors of production. It is a mathematical function that relates the maximum amount of output thatcan be obtained from a given number of inputs - generally capital and labour.
- **Production function** refers to the functional relationship between the quantity of a goodproduced (output) and factors of production (inputs). In this way, production function reflects howmuch output we can expect if we have so much of labour and so much of capital as well as of labouretc.
- **Returns to scale**refers to the rate by which output changes if all inputs are changed by thesame factor. Constant returns to scale: a k-fold change in all inputs leads to a k-fold change in output.

7.10 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 7.0.
2. For answer refer to section 7.2.

3. For answer refer to section 7.4 (b).
4. For answer refer to section 7.6.

7.11 TERMINAL QUESTIONS

1. Discuss the significance and usage of isoquants in managerial economics.
2. What do you understand by factor productivities? Discuss various types of productivities.
3. What are the uses of production function for manager? Discuss

7.12 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis, Managerial Economics, Prentice Hall of India.
3. Dwivedi D N, Managerial Economics, Vikas Publishing House Pvt. Ltd.
4. Peterson, Lewis and Jain, Managerial Economics, Pearson
5. Sadananda, Managerial Economics, Prentice Hall of India

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CHAPTER-8

COST ANALYSIS

STRUCTURE

8.0 INTRODUCTION

The cost which a firm incurs in the process ofproduction of its goods and services is an importantvariable for decision making. Total cost togetherwith total revenue determine the profit level of abusiness concern. In order to maximize profits, afirm endeavours to increase its revenue and lower itscost. To this end manager try to produce optimumlevels of output, use the least-cost combination factorof production, increase factor productivities, andimprove organizational efficiency.

Cost of production provides the floor to pricing.It provides a basis for managerial decisions with respect to the price the -firm must quote to itsprospective, customers, in deciding whether to accepta particular order or not, orwhether to abandon anold or establish a new product line, whether or hotincrease the volume of specific outputs, to use idlecapacity or rent facilities to outsiders, and whether tomake a particular product or buy it. The costs whichfirms incur are payments to various factors ofproduction and hence they indicate incomes of thesefactors also.

Production and cost analysis is. concerned withthe supply side of the market Production analysis isdone in physical terms, while cost analysis isdiscussed in monetary terms. The former relatesphysical output to physical units of factors ofproduction, and studies the least cost combination offactor inputs, factor productivities and return toweek. The later deals with various types of costsand

their role in decision making, determinants ofcosts both in the short and long-run, and thedetermination of cost function and relatedconceptsfirst, and then goes on to cost analysis.

8.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand: the concept, meaning and determinants of cost. The cost-output relationship and economies or diseconomies of scale and estimation of cost-output relationship.

8.2 COST CONCEPTS

Cost considerations enter into almost everybusiness decision, and it is important to use the rightanalysis of cost. The kind of cost concept to be usedin a particular situation depends upon the type ofbusiness decision to be made. Thus, it is imperativeto understand what these various cost of conceptsare, how these concepts can be operationalized andhow they are useful in. different business decisions.

(a) Total Cost, Average Cost and Marginal Cost

Total Cost (TC) includes all cash paymentsmade to hire factors of production and all cashcharges imputed for the use of the factors ofproduction in producing a good or service. Forexample, a shoe-maker's cost will include theamount he spends on leather, 'thread, rent for hisworkshop, interest on borrowed capital; wages andsalaries of employees etc., and the amount hecharges for his services and his own funds invested inthebusiness.

Average Cost (AC) is the cost per unit ofoutput It is obtained by dividing the total cost by thetotal quantity produced *(X).* If TC -100, and X = 1AC = 10. Marginal Cost (MC)} is the extra cost ofproducing one additional unit. At a given level ofoutput, one examines the additional costs beingincurred in producing one extra unit and this yieldsthe marginal cost. for example, ifTC of producing101 units is Rs. 10,050 while that of producing 100units is Rs.10,000 the MC at X = 101 equals Rs. 50.

Often/management is interested in incrementalcost instead of marginal cost. This is particularly truewhen production of a commodity is not conceived insmall units. For example, if a firm produces, 10,000metresof cloth, it may not be possible to determinethe change in cost involved in producing 10,001metres of cloth. This difficulty is solved either bytaking units of significant size or by computingincremental cost per unit. If cloth is measured inhundred of metres, then if TC of producing 101 hundred metre lots is R. 1,01,000 and that ofproducing 100 hundred metre lots is Rs. 1,00,000the marginal cost is Rs. 1,000. The incremental costdivided by the increment in units produced. In theabove example, the incremental cost per unit isRs.10.

The total cost concept is useful in break-evenanalysis and in finding out whether a firm is making profits or not The average cost concept is significant for calculating the per unit profit of a businessconcern. The marginal and incremental cost 'concepts are needed in deciding whether a firm needto expand its production or not. In fact, the relevantcosts to be considered will differ from one situationto the other depending on the problem faced by themanager.

(b) Fixed and Variable Costs

Costs are placed in two broad categories, fixed and variable. Fixed costs are as those which remainsame at a given capacity and do not vary with output.These costs will exist even if no output is produced.Variable costs, on the other hand, vary directly asoutput changes with the changes in rent on

factoryand office buildings, interest payments on bonds, anddepreciation of plant and equipment are examples offixed costs.

The difference between fixed and Valuablecosts, though it appears very simple. For, there aresome costs which fall between these two extremes.They are called semi-variable costs. They are neitherperfectly variable nor absolutely fixed in relation tochanges in output For example, electricity bills oftenincludе a minimum charge which the firm is bound topay irrespective of its consumption and the actual billincreases. Similarly/salesmen are often paid a fixedsalary and a variable commissions depending uponthe sales they make- If the factory is shut down, suchcharges will disappear. Salaries of other executivesand administrative staff will be fixed costs if the filmis not in operation, assuming these employees can beretrenched. Similarly, there are two components ofdepreciation costs. One corresponds to the physicalwear and tear and theother corresponds toobsolescencs. The former component varies directlywith utilization and thus is a variable cot while thelatter components is independent of output and thusis a fixed cost. The other problem with the distinctionof costs into fixed and variable costs is that someexpenses increase in a trairstep fashion. They remainfixed over a range of output but jump to a new higherlevel when Output exceeds, a given level. Forexample, foremen's salaries-may remain constant asoutput increases upto the point at which management will add an additional foreman, causing the expenses of supervision to rise in a single step.

Thus, there are difficulties in classifying fixedand variable costs. Nevertheless the distinction made is very useful in decision-making it is essentialfor forecasting the effect of short-run changes involume upon costs and profits. In the short-run, aprofit maximising firm will continue its operation solong as its total variable cost is covered but in thelong-run both fixed as well as variable costs must becovered.

(c) Acquisition and Opportunity Costs

Acquisition costs mean cash outflowscommitted to acquire or produce a good or 'service.These costs are the costs that are generally recordedin the books of account. It include actual expenses ofhiring land, labour, capital and management. Opportunity costs, on the other hand, are cashinflows prevented by taking one course of actioninstead of another. It include returns which theinterpreneur could have earned in an alternative useof his services and capital. Since opportunity costsrepresents the national costs of an action, it cannotbe recorded inthe book of account. However, thesecosts must be considered for decision-making.

The opportunity cost concept applies to allsituations where a thing can have alternative uses. Inthe absence of an alternative use, the opportunitycost of an item is measured by the return it will fetchin the alternative use. If alternative uses are many, anestimate of its earnings in 'next best use will be its'opportunity cost. In order to remain in business, afirm must make profits which are not less than what itcan make in an alternative business.

(d) Out-of-Pocket and Book Costs

Out-of-pocket costs refer to costs that involveimmediate payments to outsiders opposite to bookcosts that do not require current cash expenditure.For example, wages and salaries paid to theemployees are out-of-pocket cost while salary of theowner manager, if not paid, is a book cost. Theinterest cost of owner's own fund and depreciationcost are other examples of book costs. The out-of-pocket costs are also called explicity costs andcorrespondingly book costs are called implicit orimputed costs. Book costs can be converted intoout-of-pocket costs by selling assets and leasingthem back from the buyer. Thus, the differencebetween these categories of cost is in terms

ofwhether the company owns it or not. If a factor ofproduction is owned, its cost is a book cost while if ithired. It is an out-of-pocket-cost.

Both implicit and explicity costs are actual costsof a business firm and so both these must berecorded and considered for all decisions. Smallfirms very often ignore implicit costs and to thatextent they overestimate their profits. If a clothmerchant earns Rs. 2,000 per month net of all explicitcosts, while he could have got a salary ofRs, 1,00&per month elsewhere and his own capital invested inthe business could have earned Rs. 200 a month asinterest, then his true profit is Rs. 800 and not Rs.2,000. If instead the opportunity cost of his workingin his cloth shop were Rs.2,000, he would, in fact,incure a loss of Rs.200 per month, in this case, itwould be wise for himto wind up his business andtake up a job outside. If he ignores the implicit cost,he would estimate his profit at Rs. 2,000, and itwould be a matter of indifference to him whether heran his own business, which is obviously a wrongdecision unless he attaches^ special value to beingan independent entrepreneur. Thus, ignoring bookcosts may lead to faulty business decisions.

(e) Historical and Replacement Costs

The historical cost of an asset is the actual costincurred at the time that asset was originally acquired. In contrast to this, replacement cost is the cost whichwill have to be incurred if that asset is purchasednow. If the price of the asset does not change overtime, the historical cost will be the same as thereplacement'cost. If the price rises the replacementcost will exceed the historical cost and vice-versa.During periods of substantial price, variations,historical costs are poor indicators of actual costs.

Historical costs and replacement costsrepresent two ways of reflecting the costs of assetsin the balance sheet and establishing the costs thatare used to determine net income. Managerialdecisions must be based on replacement cost ratherthan historical costs. The historical cost of an asset isknown, for it is actually incurred while acquiring thatasset. Replacement cost relates to the current priceof that asset and it will be known only if an inquiry ismade in the market.

(f) Past and Future Costs

Past costs are actual costs incurred in the pastand they are always contained in the incomestatements. Their measurement is essentially arecord keeping activity. These costs can only beobserved and evaluated in retrospect. If they areregarded as excessive, management can indulge inpostmortem checks just to find out the factorsresponsible for the excessive costs, if any, 'withoutbeing able to do anything about reducing them.Future costs are costs which are likely to be incurredinfuture periods. Since the future is uncertain, these*costs* have to be estimated and cannot be expectedto be absolutely correct figures. Past costs serve asthe basis for projecting future costs. In periods ofinflation and deflation, the two costs concepts differsignificantly.

Managerial decisions are always forwardlooking and therefore they require estimates of futurecost and not past costs. Unlike past costs, futurecosts are subject to management control, they can be planned or avoided. If the future costs arecoosidered too high, management can either plan toreduce them or find out ways and means to meetthem; Management needs to estimate future cots fora variety of reasons such as expense control, pricing,projecting future profits and capital budgetingdecisions. When historical costs are used instead ofexplicit projections, the assumption is made thatfuture costs will be the same as past costs. In periodsof significant price variations, such as assumptionmay lead to wrong managerial decisions.

(g) Separate and Common Costs

Costs are also classified on the basis of theirtraceability. Separable costs are those which can beattributed to a product, a department, or a process.On the other hand, common costs are those whichcannot be traced to any one unit if operation. Forexample, electricity charges may not be separabledepartment-wise in a single product firm of evenproduce-wise in a multiple product firm or evenproduct-wise in a multiple product firm. The cost ofraw material may be traceable product-wise even ina multiple product firm. In a university, the salary ofa vice-chancellor is not traceable department-wisewhile that to a professor may be traceabledepartment-wise; The separable and commoncostsare also known as direct and indirect costs;respectively. This is because direct costs can beidentified while indirect costs cannot be attributeddirectly to a unit of operation.

Common costs may create problems in case of joint products. The enterpreneur might like to knowthe total cost of each product line. Thus, managementmay desire to distribute the common costs intovarious product lines. Therefore, judgement has tobe used to allocate such costs. This is a problem fordecision makers. Many firms usually distributecommon costs on the basis of their approximate useor turnover m each product line.

(h) Short-Run and Long-Run Cost

The terms short-run and long-run costs areclassification of costs involvingtime. In economics,short-run is defined as a period during which at leastone element of factor input is fixed. A short-run costis that cost which varies with output when fixed plantand capital equipment remain the same while a long-run cost is that which Varies with output when allfactor inputs, including plant and equipment vary.Long-run cost assumes variable plant size and itactually consists of short-run cost for various plantsizes. This is because, in the long-run, all costs arevariable. The plant may be fixed today, but in futurewe may decide to increase its size to any leveldesired within the range of possible alternatives.

Both short-run and long-run costs are useful indecision making. Short run cost is relevant when afirm has to decide whether or not to produce moreor less with a given plant If the-firm is considering inincrease in plant size, it must examine the long runcost of expansion. Long-run cost analysis is useful ininvestment decisions.

No form keeps its records in such a flexible anddetailed form as to turn out estimates for various costconcepts. However, most of these costs are easilymeasureable and often available in company balancesheets and income statements. Other costs have tobe compiled or even estimated through guesses asand when heeded to give management the right costtools for its decisions.

(i) Accounting Costs and Economic Costs

Accountants and economists tend to look atcosts to suit their own particular interest andpurposes. Accountants classification of costs areusually set up for legal, financial control and auditingpurposes while economists classifications aredesigned to provide decision making guidelines formanagement to achieve the firm's economic goals.The classifications of costs into fixed and variablecosts, out-of-pocket and book costs, separable andcommon costs, controllable and uncontrollable costs,urgent and postponable costs and escapable andunavoidable costs is the accountants" classification ofcosts. The remaining distinctions into total, averageand marginal costs, actual and opportunity costs,historical and replacement costs, past and future,costs arid short and long-run costs are based on aview of the cost problem from an economic point ofview.

Traditional accounting data are not directlysuitable for decision making. For example, inmeasuring the cost involved the use of resources suchas materials or equipment, the accountant concernshimself with the acquisition cost of these resources.But decision making is necessarily concerned withfuture costs and revenues; the past is not always anaccurate guide for the future. Furthermore, thetraditional accounting procedure for valuing assets inthe balance sheet is at acquisition cost minusdepreciation. These values may differ from their true,i.e., current market values for three reasons :

(a) Current market price of allasset may bedifferent from their past market price.

(b) Accounting depreciation may be different fromthe true depreciation of the assets, the timevalue of money is not taken into account.

Traditional accounting data ignore the imputedor implicit costs. Surely, such costs are relevant todecision making. For example, an investment projectmay prove to be worth undertaking if the salary ofowner entrepreneurs and the interest cost of equitycapital are ignored while the same may not beeconomically viable when such costs are added toexplicit costs. Accounting data on overhead costs donot always clearly indicate which of these are fixedcosts and which are variable ones. A clear distinctionbetween fixed and variable cost is essentialparticularly for short-run managerial decisions.Because of ail these limitations, accounting cost dataare not directly useful for all managerial decisions.

8.3 DETERMINANTS OF COST

Managerial economics devotes to great deal of attention to the behaviour of costs. The cost ofproduction and distribution of goods and servicesdepends *on* many forces and the list of these forcesmay vary from firm to firm in an industry and alsofrom one type of industry to another. The generaldeterminants of cost are output level. Prices offactors of production.Productivities of factors ofproduction and Technology.

In what follows, the influence of each of thesefour factors on cost will be analyzed. It may be notedthat the analysis will be partial in the sense that whenthe analysis is presented with respect to only oneparticular determinant, all but this determinant will beassumed to take a fixed value.

(a) Output and Cost

Total cost varies directly with output. Themore output a firm produces, the higher will be itsproduction cost and vice versa. The relationshipbetween cost and output is rather important andhence will be discussed in detail in a separate sectionlater.

(b) Prices of Factors of Production and Cost

It is customary and economists to say that theinputs for all goods and services are derived fromfour factors of production: land, labour, capital andorganization or management. Corresponding tothese four input factors, there are four input prices, rent, wages, interest and profit.' Profit is not acomponent of costs. However, in economics, thesalaries of management staff, which may include theowner manager, are treated as part of costs. Production of any commodity requires the use ofIntermediate goods, called raw materials. The cost ofraw materials is also a component of productioncost. Thus, the total production cost includes therent on land, wages of labour, cost of raw materials,interest on capital, and salaries of all supervisory andmanagerial staff including that of even theowner ormanager if he is spending his time in running his firm.When there is an increase in any one or more of these factor prices, all other factor's prices, input-requirements, technology, output,

etc., remaining constant, total production cost increases. This isbecause more will have to be paid to those factorinputs whose prices have increased and there will beno simultaneous reduction in the costs from any othersource. Thus, the cost of production varies directlywith the prices of .factors of production. Factors ofproduction are substitutes to a certain extent in most'industries. One of the determinants of factorsubstitutability is the relative factor prices. A changein relative factor prices, say making labourarelatively cheaper factor of production will induceentrepreneurs to substitute labour for capital andvice-versa. However, the effect of a change inrelative factor prices on total production cost isambiguous. If the price of one input increases whilethat of another input decreases. The exact effectdepends on the extent of substitution. If greatersubstitution is feasible and practised, total cost willdecrease, otherwise it may remain constant oreven increase.

(c) Productivities of Factors of Production andCost

Productivity of a factor of production meansthe contribution of a unit of that factor to output. Thehigher the productivity of an input factor, the smallerthe quantum of that factor, other factor inputsremaining the same, that one needs to produce agiven output and vice versa. Given the factor prices,technology, output level, etc., an increase in factorproductivities would decrease the total productioncost thus, production cost varies inversely with theproductivities of factors of production. Like prices offactor inputs, if productivity of one input factor increases while that of another decreases, its effecton total cost will be uncertain. The total cost willdecrease if and only if the factor whose productivityhas increased in substituted by the factor whoseproductivity has decreased to a significant extent.Productivity is used here as Synonymous with"efficiency". Increase in factor efficiency could arisethrough several ways. For example, the efficiency ofa machine could be increased by increasing its speed,number of hours it is operated per day and/ornumber of day, it is operated per month. An increase in the efficiency of a factor input leads to a reductionin the total production cost for a given output.

(d) Technology and Cost

Technology is a significant force underlyingproduction. Technological progress is conductive to increased production while technological stagnationmay impede production. By definition, technologicalimprovement leads to an increase in the efficiency orproductivity of factors of production, which in turncauses a reduction in production cost. Thus, costvaries inversely with technological progress.

8.4 COSTOUTPUT RELATIONSHIP

The cost-output relationship is the mostimportant component considered for decisionmaking. The cost function usually refers to therelationship between cost and rate of output alone,and thus assumes that all other independent variablesare kept constant. Economists emphasis on thisrelationship is reasonable because it subject to faster and more frequent changes. Furthermore, once thecost-output function is determined, estimates offuture costs of production at various output levels canusually be obtained by adjusting the cost function toreflect the effect of other forces/such as wage rates,material prices and productivity of labour. As seenabove, there are: two kinds of costs, variable andfixed. The former varies positively with output whilethe later is constant. Therefore, to understand cost-output relationship properly, this distinction isimportant. The distinction between fixed andvariable costs is significant only in the short-run,where both exist and not in the long-run, where allcosts are variable. Thus, it is convenient to discussthe cost-output relationship separately for the short-run and long-run.

(a) Short-Run Cost-Output Relationship

The short-run cost, output relationship refers toa particular scale of operation or to a fixed plant. Itindicates variations in cost over output for the plantof a given capacity and this relationship will, vary withplants of varying capacity. Thus, the short runfunction relating cost to output variations is of thefollowingtype:

TC=f(x)+A

where TC = total cost ;

x= output, and

A = total fixed cost

For decision making, one needs to know not only the relationship between total cost and outputbut also separately between various types of costs and output. Thus, the short-run cost-outputrelationship needs to be discussed in terms of fixedcost and output, variable cost and output, and totalcost and output.

(b) Fixed Cost and Output

Fixed cost does not vary with output. Thus, thelarger the quantity produced, the lower will be thefixed cost. In the example, the total fixed cost is**Rs.** 176 irrespective of the units of output, and theaverage fixed cost declines monotonically asoutputincreases. AFC is Rs. 176 if output is one unit,Rs. 88 if output is 2 units..., and 12 if output is 15units. Correspondingly, the TFC curve is horizontal atRs. 176 and AFC curve is falling continuously in Figure 8.2. Incidentally, it may be noted that the shape of the AFC curve is that of a rectangular hyperbola, (all costs m rupees).

TABLE 8.1

COST-OUTPUTRELATIONSHIP" (RS.)

Units of Output (X)	Total Fixed Cost CITQ	Total Variable Cost (TVS)	Total Cost (TC)	Marginal Cost (MC)	Average Fixed Cost (AFC)	Average Variable Cost . (AVC)	Average Total Cost (ATC)
0	176	0	176				
1	176	75	251	15	176	75	251
2	176	130	305	55	83	65	153
3	176	175	351	45	59	58	117
4	176	209	385	34	44.	52	96 .
5	176	238	414	29	35	48	83
6	176	265	441	27	29	44	74
7	176	289	465	*24*	25	41	66

8	176	312	488 .	23	22	39	61
9	176	328	504	16	20	36.	56
10	176	344	520	16	20	36	56
11	176.	367	543	23	16	'33	49
12	176	400	576	3	15	33	48 .
13	176.	448	624	48	14	34	48
14	176	510	686	62	13	36	49
15 .	176	600	776	90	12	40	52

* Figures are rounded to the closed integers.

(c) Variable Cost and Output:

The total variable cost increases as outputincreases. However, the relationship may not belinear, i.e., cost may not increase by the same amountfor every unit increase in output. As per economictheory, its nature is such that in the beginning, asoutput increases, total variable cost increases at adecreasing rate, then 'at a constant rate and eventuallyat an increasing rate. Thus, the increase in 'totalvariable cost goes on diminishing upon a certain levelof output, then remains constant for some range ofoutput, and then it starts rising. This is so because theneed for variable factor inputs for increased outputbehaves in a similar fashion, and there is theoperation of the law of diminishing returns. A firmmay need minimum number of workers for even oneunit of its output and if may not need any extra labouruntil it exceeds a given range of output. Again anexpansion of production beyond this range of outputmay require a given increase in working force, whichmay be sufficient for producing any level of output inthe next output range, and so on. As against this, theraw material cost usually varies directly andproportionately with output. A firm may have still other variable costs like stationery, electricity bills,etc., which vary at different levels of output. Oncethe output has reached a reasonable level, theincrease in output may become increasingly costlybecause the variable factor inputs may not be easily availableor they may have to be paid at higher pricethan before. Thus, given the factor prices, the increment in total variable cost first falls as outputincreases, then remains constant and eventuallyincreases as output increases.

It should be noted that though the generalbehaviour of the variable cost function is of the naturedescribed above, its exact behaviour may vary fromproduct to product and will have to be verifiedempirically. In particular, the output level upto whichtotal variable cost is proportional to that of output,and the output level beyond which total variable costincreases at an increasing rate may differ fromproduct to product. For capital incentive products,in general, the first phase may be longer than that is labour intensive products.

Corresponding to the total variable cost andoutput relationship, the behaviour of average variablecost function will be such that it will first fall as outputincreases, then remain constant for some outputrange; and it win eventually rise with every increase inoutput. The total fixed cost does not change withoutput, marginal cost, change in total variable cost.The variations in marginal cost in relation to outputwill be similar to that in average variable cost.

The hypothetical example about cost-outputrelationships in Table 8.1, and Figures 8.1 and 8.2 is consistent with the theoretical relationships betweenvariable cost and output. The total variable costincreases monotonically from' 0 at output zero to

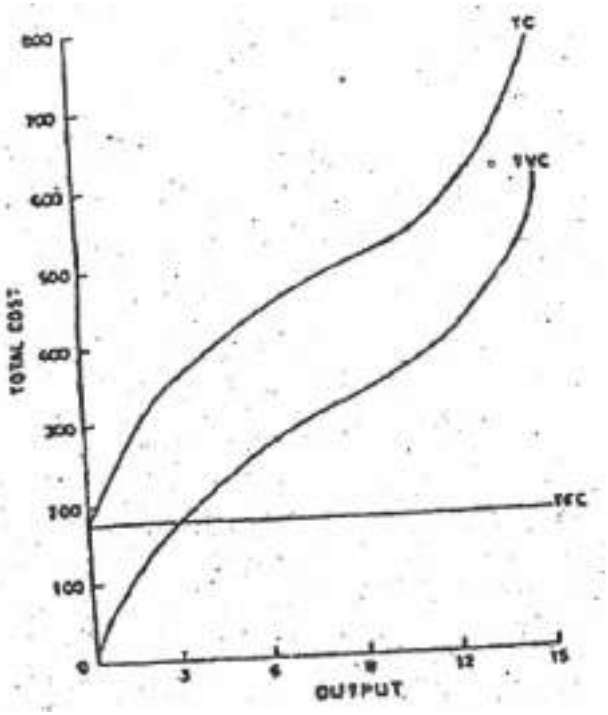

Figure: 8.1

Rs. 600 at output of 15 units of output It increasesat a diminishing rate between zero output and 9 units,the rate of increase fall form Rs. 75 to Rs. 16; itsrate of increase is the same (Rs. 16) when output is

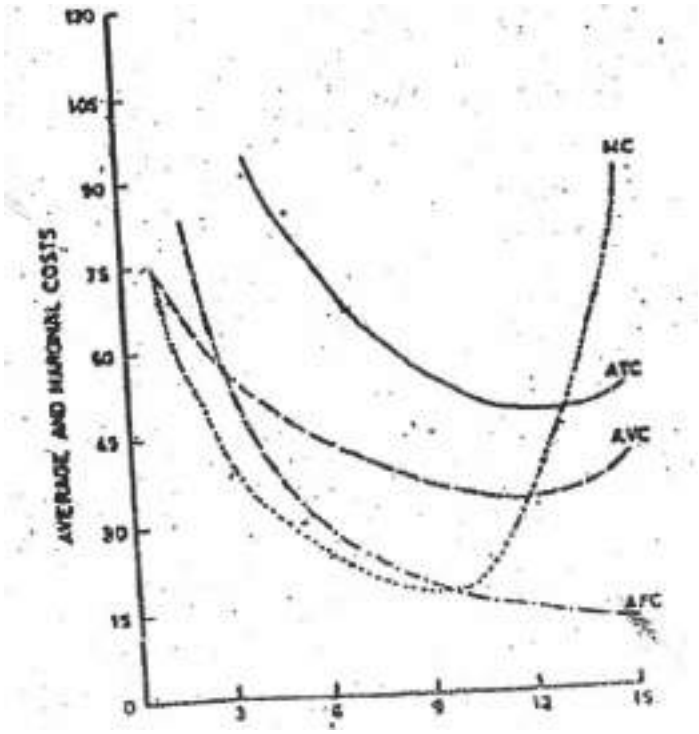

Figure: 8.2

increased from 8 to 9 or 9 to 10 units. Beyond 10units of output, the increase in total variable cost is atan increasing rate. This is reflected in the TVC curvein Figure 8.1 it should be noted that the TV,C curveemanates from origin and that it is concave frombelow. The average variable cost (vide Table 8.1) falls monotopically in output range 0 to 11, remainsconstant at output levels 11' and 12, and risesmonotonically beyond 12 units of output Thecorresponding AVC curve in Figure 8.2 is U-shaped.The marginal cost behaves the same way as AVC. Itis minimum at outputs 9 and 10. The correspondingMC curve in Figure 8.2 is also U-shaped.

(d) Total Cost and Output

The total cost increases as output increases, forone of its components (TVC) is an increasingfunction of output. In table 8.1 TC is Rs. 176 when output is zero and it increases nionotonically is Rs.776 when output equals 15 units. The rate of changein TC follows the same trend as that in TVC. Accordingly, the TC curve is parallel to TVC curvein Figure 8.1.Like the TVC curve, it is concave fromthe below but unlike theformer it cuts the cost axis ata positive point, which equals the total fixed cost.

The average total cost (ATC), also calledaverage cost, first falls as output increases, thenremains constant for some output range andeventually rises with every increases in output. Suchbehaviour is reflected **in** the example presented **in** Table 8.1 and Figure 8.2. The resulting ATC curve isU-shaped, this is due to the behaviour of its twocomponents, AFC and AVC. At very low quantities,ATC is high because fixed costs are spread over afew units. As quantity increases, fixed costs arespread over more units. In addition, variable factorscan be used more efficiently, relative to the fixedplant and relative at each other as quantity increases.A point is reached forany given plant size,

however,where ATC is a minimum. This point gives theoptimum level of output from thecost point of view.After this point, ATC increases. Tf*' increase occursbecause variable factors cannot be used as efficientlyas before. When the advantage of lower AFC isoutweighed by the increase in AVC, ATC increases.The relationships among AVC, ATC and MC canbriefly be described as follows:

All three cost measures first fall, then remainconstant and eventually rise as output increases. Therats of change in MC is greater than that in AVC andhencethe minimum MC is at an output lower than theoutput at which AVC is minimum. The ATC falls for alonger range of output than the AVC and hence the minimum ATC is at a. larger output than die minimumAVC.

AVC = MC, when-AVC is the least

ATC = MC, when ATC is the least

Long-Run Cost-Output Relationship

In the long-run, there is no fixed factor ofproduction and hence there is no fixed cost. .Thepartial total cost function will be of the followingfirm ; -

$$TC=f(x,k)$$

where the new notation k stand for the plantsize.

As k changes, TC changes. Thus, tie long-runcost function contains a family of short-run costfunctions, one for each value ofk. The pertinentquestion here is, what is the relationship betweentotal cost for a given output and plant size?. If theoutput is small, the total cost is less for a small plantsize than for a large plantsize and quite the reverse .

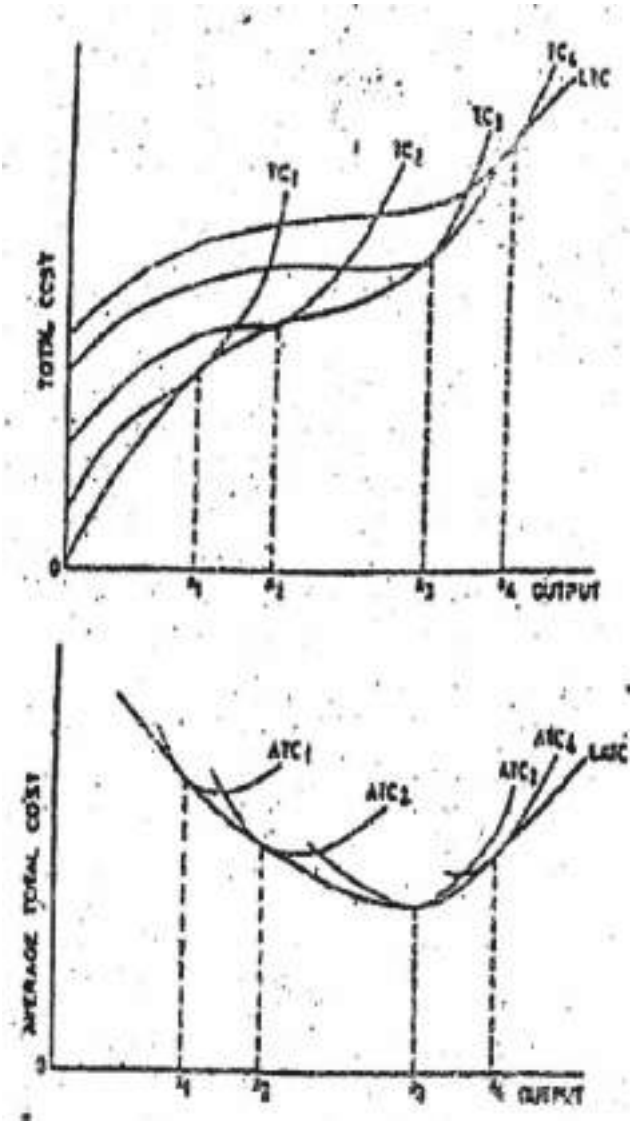

Figure: 8.3

holds good for large outputs. This is so because itslarge plant is installed, it will remain under-utilizedwhen output is small while a small plant will beinadequate or insufficient for large outputs. Thus, thefamily of short-run total' cost curves, one for eachplant size, will be of the type shown in Figure8.3. Inthe short-run, variations of output are possible onlywithin the range permitted by the existing plant. But, in the long-run, even the-plant size can change and hence all conceivable variation in outputarefeasible.

Thus the long-run costs refer to the *costs* ofproducing different levels of output by changes in the scale of production or the size of plant Sincein practice, no entrepreneur will change this plant sizetherefore, the concept of long-run cost is onlyhypothetical. The short-run cost is the minimum costat which the entrepreneur can produce any desiredoutput with a given size of plant. As against this, thelong-run cost is the minimum cost at which the firmcan produce any output from a plant of any size. Inthis figure, TC1,TC2, and TC3 are short-run totalcost curves when the plant size is 1,2 and 3

units,respectively, and LTC is the long-run total costcurve. It is seen that the LTC is lower than TC1 forall quantities except xl, is lower than TC2 for allquantities except X2, and so on. The correspondingshort-run average total cost curves (ATC1, ATC2,etc.) and the' long-term average total cost curve(LATC) will be as shown in the lower part of Figure8.3. It is seen that the long-run and short-run averagecost curves are equal only at XI, X2 and X3 pointsof tangency between LATC and short-run ATCcurves, These points oftendency represent minimumATC. The long run average total cost curve is U-shaped as are short-run average total cost curves but the former is flatter than the latter. The existence ofeconomies and diseconomies of scale are responsiblefor the U-shaped LATC curve.

8.5 ECONOMIES AND DISECONOMIESOF SCALE

Economies and diseconomies of scale are concerned with the behaviour of average cost as theplant size changes. There exist economies of scale ifaverage cost fails as plant size increases and thediseconomies of scale prevail if the opposite is thecase. For example, if the average cost at a givenoutput with a plant size k = 1 (say 100 unitscapacity) is Rs. 8.00 and that with a plant size k = 2(200 units capacity) is. Rs. 8.50, then there areeconomies of scale between plant sizes 1 and 2. Ifthe average cost rises to, say, Rs. 8.00 for a plantsize of k = 3(300 units capacity) there arediseconomies of scale between plant sizes 2 and 8.

The scale of enterprise or size of plant reflectsthe amount of investment made in the relatively fixedfactor of production, i.e., plant and fixed equipmentThis varies only in the long-run and hence economiesand diseconomies of scale are associated with thelong-run average cost curve only. The long-run

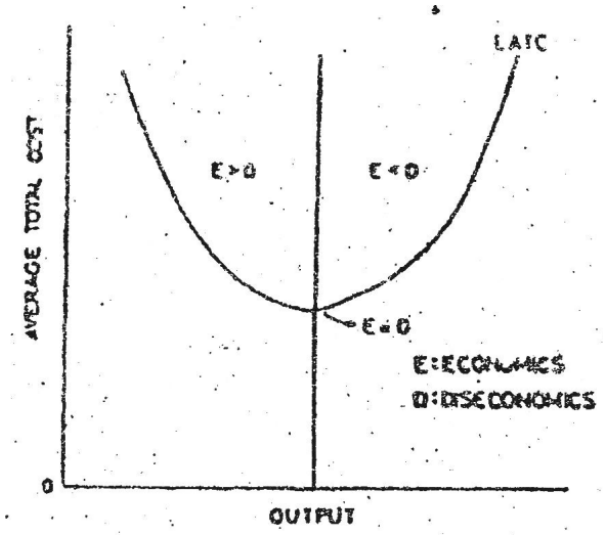

Figure :8.4

average total cost curve is U-shaped, i.e., it falls for awhile, reaches a minimum; and increases thereafter. The fall is explained by economies of scale, and theincrease by diseconomies of scale. This is shown infigure,8.4.

Marshall classified economies anddiseconomies of large scale production into twotypes: internal and external. Internal economies anddiseconomies arises due to the firm's own expansion.This include labour, technical, managerial, financialand marketing economies. Once the output hasexpanded to a reasonable level, further expansionleads to problems of over-crowding, which renderscontrol and

coordination of the labour force difficult,and lack of a sense of responsibility, which endangersefficiency. Thus, beyond a point, there arediseconomies of labour. Technical, economies arisebecause large output permits introductionof newmethods of production. Again these turn intodiseconomies beyond a certain output, level.Managerial economies often permit increase inproduction per employees and thus lower cost perunit, A film may require only one manager so long asits output is within a given range and it may need anextra manager as soon as output expands beyondthat range. There may be divergent views concerningpolicy problems among specialists in managementand reconciliation may be difficult to arrive at. Themanagement thus gets out of hand with consequentadverse affects on total efficiency. Thus, after a pointeconomies turn into diseconomies in managementalso. Similar reasoning holds good with respect tospecific, functions such as purchase and sales. Thus,there are limits to "nanagerability" in anyorganisation.

External economies and diseconomies mayarise due to the expansion of the industry as a whole.For example, industry may lead to *the* construction ofa railway line in a certain region resulting in areduction in transport cost for all the firms. Researchand development undertaken jointly may lead to thediscovery of new processes and machinery whichmay be purchased by all firms. The emergence ofrepair, industries, and the establishment of specialtechnical schools for training skilled labour areexample of external economies which arise whenseveral firms are located near one another. Externaleconomies, like internal economies may turn intodiseconomies beyond a certain output level. Since internal economies (diseconomies) are available to aparticular firm only, they give it an advantage(disadvantage) over other firms in the industry. Incontrast to these, external economies do notdiscriminate between firms. From the managerialpoint of view, internal economies are more importantthan external ones, while the former can be affectedby managerial decisions of an individual firm changingis size on scale, the latter are not subject to suchinfluences. Although in theory, the production ofevery commodity is subject to economies anddiseconomies of scale. Their relative magnitude mayvary from firm to firm industry to industry.

8.6 ESTIMATION OF COSTOUTPUTRELATIONSHIP:

In the previous section, the nature of the cost-output relationship was explained. It was shown thattotal cost varies directly with output. Total cost firstincreases at a diminishing rates, then at a constantrate and eventually at an increasing rates. Theresulting behaviour of the average cost and marginalcost are such that both these first fall, reach theirrespective minimum levels, and rise thereafter. Thisknowledge is useful for decisions making. However,in addition to this, a decision maker would like toknow the exact amount by which his total costincreases when he increases his output from oneparticular level to another, the output level at whichaverage cost is minimum, the most appropriate plantsize which the should install, and so on, this calls foran empirical determination of the cost-outputrelationship facing his firm.

The cost-output relationship earl be estimatedthrough the following three appropriates:

- Accounting method
- Engineering method
- Econometric method

(a) Accounting Method

Under the accounting method, cost-outputrelationship is estimated by classifying the total costinto fixed, variable and 'semi-variable costs. These components are then separately estimated.

"Theaverage variable cost, the ranges of output within which fee semi-variable output ranges, and theamount of fixed cost are determined on the basis ofinspection and experience. One all this is done, thetotal cost and then the average and marginal costs foreach output level are obtained through simplearithmetic. The accounting approach appears quitesimple.

(b) Engineering Method

The engineering estimate of the cost-output relationship is derived by estimating the physical of various input factors, i.e... plant size, man-hours,consumption of materials, and other inputs, be a given output. This is done on the basis ofthe ratedcapacity of plant and equipment, and on the basis ofinput-output norms, which sue derived from thepooled judgements of practical operators. Once thephysical units for an output level are determined, theyare multiplied by the respective current or expectedfactor prices an added together to yield costestimates for that output level.

A successful use of this method requires goodexperience of input-output norms and consistency offactor prices. It may be preferred to the accountingmethod when the records of accounts do not providea systematic historical basis for estimating costbehaviour and when it is required to project costbehaviour beyond the range of past outputexperience, or when significant technological changesare expected.

(c) Econometric Method

Under the econometric method, the historicaldata on cost and output are used to estimate thecost-output relationships First me functional form ischosen and then the least squares method is appliedto estimate the chosen form. The common forms ofthis purpose are:

(a) Linear TC=al+b2+c3x2.

(b) Quadratic TC= a2+b2x+C2x2

(c) Cubic TC = a3+b3x+c3X2 +d3X3

where TC = total cost

x= output

a1, a2, a3, b1, b2, b3,c2, c3 and d3 are constants.

The linear total cost function would give aconstant marginal cost and a monotonically fallingaverage cost curve. The quadratic function couldyieldaU-shaped average cost curve but it wouldimply a monotonically rising managerial rising marginal cost curve. Thecubic cost function is consistent both with aU-shaped average cost curve and; a U-shapedmarginal cost curve. Thus, to check the, validity ofthe theoretical' cost-output relationship, one shouldhypothesize a cubic cost function.

Either time series or cross-section data can beused to estimate the cost-output relationship by theeconometric method. This is done simply byintroducing factor prices, factor productivities andtechnology as separate casual variable in the function.The only limitation of this method is that it needshistorical data either for a fairly long time period orfrom a fairly large number of producers of thecommodity whose costfunction is to be quantified.The accounting and engineering method are moreappropriate than the econometric method forestimating the cost function at the firm level, while thelater method is more suitable for estimating thisfunction at the industry or national level. There hasbeen a growing applications of the, econometricmethod at the macro level and there are goodprospects for its use even at the micro level.

There are various uses of an estimated cost-output relationship. For example.it can be used..

- **to** determine the optimum scale of size of thefixed plant arid equipment,
- to determine the optimum output for a givenplant size, .
- to determine the supply function

The short-run cost-output relationship helps indetermining the optimum output level and the short-run supply function, and the long-run supplyrelationship is needed for estimating the optimum sizeof the plant and the long-run supply function. Theknowledge of optimum output is significant when anentrepreneur considers expansion or contraction ofthis output and that of the optimum scale or plant sizeis crucial when he contemplates an expansion of anold plant or installation of a new plant.

8.7 SELF CHECK EXERCISE

Write short-note on the following: -

1. Total cost
2. Fixed cost
3. Acquisition cost
4. Replacement cost
5. Economic cost
6. Determinants of cost
7. Diseconomies of scale
8. Econometric method

8.8 SUMMARY

Cost analysis is all about the study of the behavior of cost with respect to various production criteria likethe scale of operations, prices of the factors of production, size of output, etc. It is all aboutthe financial aspects of production. The cost analysis is concerned with determining money value ofinputs (labor, raw material), called as the overall cost of production which helps in deciding theoptimum level of production. The Cost Analysis refers to the measure of the cost – outputrelationship, i.e. the economists are concerned with determining the cost incurred in hiring the inputsand how well these can be re-arranged to increase the productivity (output) of the firm.

8.9 GLOSSARY

- **Cost** can be defined as a monetary valuation of efforts, material, resources, time and utilitiesconsumed, risks incurred, and opportunity forgone in the production of a good or service.
- **Cost analysis** is the act of breaking down a cost summary into its constituents and studyingand reporting on each factor and the comparison of costs (as of standard with actual or for a givenperiod with another) for the purpose of disclosing and reporting on conditions subject to improvement.

- **Cost Determinants** means the cost of production of goods and services depends on variousinput factors used by the organization and it differs from firm to firm. The major cost determinants arelevel of output and the cost of production varies according to the quantum of output.
- **Cost-Output Relationship** is defined as that period during which the physical capacity of thefirm is fixed and the output can be increased only by using the existing capacity allows to bringchanges in output by physical capacity of the firm.
- **Econometrics** is the application of statistical methods to economic data in order to giveempirical content to economic relationships. More precisely, it is "the quantitative analysis ofactual economic phenomena based on the concurrent development of theory and observation,related by appropriate methods of inference".

8.10 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 8.2 (a).
2. For answer refer to section 8.2 (b).
3. For answer refer to section 8.2 (c).
4. For answer refer to section 8.2 (e)
5. For answer refer to section 8.2 (i)
6. For answer refer to section 8.3.
7. For answer refer to section 8.5.
8. For answer refer to section 8.6 (c).

8.11 TERMINAL QUESTIONS

1. Discuss the concept of cost and also the different types of costs.
2. What are the determinants of cost? Discuss.
3. The Cost-Output relationship is important component considered for decision-making. Discuss.
4. Discuss different methods of estimating cost-output relationship.

8.12 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis, Managerial Economics, Prentice Hall of India.
3. Dwivedi D N, Managerial Economics, Vikas Publishing House Pvt. Ltd.
4. Peterson, Lewis and Jain, Managerial Economics, Pearson
5. Sadananda, Managerial Economics, Prentice Hall of India

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CHAPTER-9

EQUILIRIUM OUTPUT AND PRICE DETERMINATION UNDER PERFECT COMPETITION

STRUCTURE

9.0 INTRODUCTION

It has been noted that an increase in the price ofa commodity causes contraction of its demand and a decrease in the price of a commodity cause extensionin its demand. In case of supply, the quantity of anygoods which people are ready to offer for sale, atany given time, varies directly with the price, i.e.When the price decreases,the supply contracts andwhen the price increases, the supply extends. Thedemand andsupply force behave or react differentlyin different market conditions.

9.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand the concept and meaning of market, you will understand the extent of market, the perfect competition and what are the determinants of price under this competition? The short-run equilibrium of the firm and industry, and the long-run equilibrium of the firm and industry.

9.2 CONCEPT OF MARKET:

Ordinarily the word 'market' refers, to placewhere buyers and sellers generally meet in order to buy and sell a particular commodity. EconomicMarket refers to place where a particular commoditywhich is sold and purchased. Any effectivearrangement for bringing buyers and sellers intocontact .with another is defined as market ineconomics.

9.3 EXTENT (OR SIZE) OF MARKET;

A market can be local confined to a village,**or** it can cover whole of the country or may bespread throughout the globe. If buyers and sellers ofa given product are scattered throughout the world,there will be a world market, e.g. for oil, jute, tea,etc. there are many factors, which contribute towardsthe extension of a market. These can be classifiedinto two parts: (a) quality of a commodity and (b)internal conditions of a country:

(A) Quality of a Commodity-The most importantfactor influencing the extent of market is thequality of a commodity. The essentialcharacteristics determining the quality of acommodity are as follows:

(a) Size of Demand-A commodity which enjoys auniversal demand, is likely to have a windermarket. Oil is one such commodity that has aworld market. Market for those commoditieson the other hand, shall be limited that cateronly to individual nac;

(b) **Portability'-Those** commodities which can beeasily transported to different places shall havelarge market Cosmetics, toilet goods, industrial machinery etc. have a large market; On the other hand, commodities like sand, bricks, etc.have a limited market because of heavy costsinvolved in their transportation.

(c) Durability-A community, which is durable innature, shall have a wider market: Fragile andperishable goods like delicate glassware, with the development of cold-storage, refrigerationand packaging service, etc. It is becoming'possible even for these commodities to havespread-out-markets. .

(d) Cognizability-Graded andsrandardised products have a wide market Goods which can be easily identified by their brand and namehave large market.

(e) Adequate Supply-For a wide market, it isessential that the production must be in hugequantity to feed the wide market for theproduct. (B)Internal conditions of a country. The second important determinant of the extentofmarket is the internal conditions of a countryInternal conditions of a country include thefollowing:

(i) Level of National and the Per CapitaIncome- The countries with higher national andper capita income tend to offer larger marketsfor its products. Limited purchasing power offee people restricts die size of the market.

(ii) 'Peace, Security and Stable Government inthe Country"Peace and stability areconductive to the growth of market's in acountry. World peace as security offers a betterclimate for expression of world market.

(iii) **Means of Transportation and Communication -** Efficient and cheaper means oftransportationfacilitate the expansion of market.Likewise availability of telephones, telegrams, telex services, etc. brings into contact the newbuyers of a product and thus helps and expandits market

(iv) **Development*of*** Monetary**and** Banking**Institutions.** A well developedcurrency andcredit system helps in the expansion oftradeand commerce and thus facilitates the expansionofamarkets.

(v) **Government policy -** A restrictive trade mayhamper the growth of markets in a country. Ifthe governments of the different countriesimpose restrictions on export and import ofcommodities it will have different effect on thedevelopment of markets.

In brief, internal conditions of a country takentogether with the nature of the commoditiesdetermine the extent of market.

The determination of prices can be studied infollowings market structures :

(a) Perfect Competition market

(b) Monopoly

(c) Imperfect Market Conditions

9.4 PRICING UNDER PERFECTCOMPETITION

In order to understand the price determinationunder perfect, competition. There is a need tounderstand the meaning of 'Perfect competition'. Perfect competition is the state of market where allthe sellers, and buyers are promptly aware of theprices, at which transactions take place and all theoffers made by other sellers and buyers and whenany buyer, can purchase from any seller andconversely. Under such conditions, the price of acommodity will tend to be the same (after allowingthe cost of production, etc.) all over the market.Perfect competition is said to exist when thefollowing conditions are fulfilled in a market for a commodity:

a. Large **Numbers of Buyers and Sellers-**There are larger number of buyers and sellers.It is difficult for any one seller or buyer or evena group of buyers and sellers to effect the price.Thus in the perfectly competitive market, thereis no control of individuals buyer or seller overtheprice.

b. **Homogeneous product-** The products offeredfor sale must be homogenous. If the productsare homogenous, buyers can buy them from anyseller. As such, no seller can raise the price ofhis product. If any seller raises his price slightlyabove the current level, he will lose ail hiscustomers.

c. **Perfect** Knowledge - Buyers and seller havethe perfect knowledge about (be marketconditions. The buyers know the nature of theproduct as well as the price, at which it is sold. They would never be prepared to pay a pricehigher than the ruling price. The sellers shouldalso have perfect knowledge of potential salesat various price levels, and also perfectknowledge of the cost behaviour. In a perfectmarket, there should be only price throughout.

d. **Factors of Production are Perfectly*Mobile*-** In a perfectly competitive market,factors of production are perfectly mobile. Newfirms must be free to enter any desired industry,and resource must be free to move amongalternative uses to those where they desireemployment; Seller must be able to sell theirgoods and services wherever the price ishighest. Resources must be able **to** secureemployment at their highest paid uses.

e. **Free Entry and Free Exit for Firms-**Freedom of entry or exit is one of the principlefeatures of a competitive market. It means thatif the existing firms are earning super normalprofits in the short run, then in the long run newfirms will enter the industry to compete away the profits. If on the other hand, the existingfirms are making losses in the short run, then ofthe existing firms will leave the industry in thelong run and each firmwill earn only the normalprofits.

f. Absence of **Transport Costs-** Under perfectcompetition, it is assumed that transport costsdo not exist, if the cost of transport is there,prices must differ in different sectors of themarket.

g. **One Price-** Under perfect competition, therecannot be more than one price, at any particulartime in the market. It is accepted by all thebuyers and sellers present in the market.

All the above mentioned features must be there,if a market is to be regarded as a perfectlycompetitive market. If any of these features is lackingthe market would not remain perfect It wouldbecome imperfect. For example, if the nature ofproducts, which are bought and sold, is nothomogeneous, its price would not be uniform. In fact,in real life, perfect competition is seldom met with. Itis because there is no commodity which has all thesefeatures. However, the markets for agriculturalproducts, like wheat, rice, pulses, cotton, jute etc.can be said to be perfect to some extent. There arelarge number of buyers and sellers of these productsand the products are also very much similar in thecase of these products, therefore, buyers and sellersare enabling to influence the market price by theirindividual action.

9.5 Determination of Price Under PerfectCompetition;

Under conditions of perfect competition, theprice of a commodity is determined by the equilibrium of the forces of demand and supply. Theearly economists had different views regarding theimportance of the forces of demand and supply indetermining the price of commodity.

According to some economists, the demandwas more important, while some others attachedmore importance to both demand and supply in thedetermination of price. Just as the two blades of pairofscience areequally important for cutting a piece ofcloth. In the same way, for the determination of theprice of commodity, both its demand and supply areequally important. Therefore, the forces of demandand supply can be analysed separately forunderstanding their inter-action at the equilibriumpoint

Perfect competition **is** an ideal market structuremodel in economic theory. Basically, it is an abstractidea which is not subject to empirical verification.The business motive of the entire firm under perfectcompetition is to maximize its profits and no othergoals are pursued. Under these assumptions, theequilibrium of the firm and the industry can be studiedin the short run and in the long run in a perfectlycompetitive market.

9.6 SHORT RUN EQUILIBRIUM OF THE FIRM

Assumptions:

- Large number of buyers and sellers.
- Homogeneous **(identical) products.**
- Free entry or exit of firms in the industry.
- The sellers and buyers have perfect knowledge, about the market conditions.
- Perfect mobility of factors of production.
- No government intervention. The competitive **firm is thus, a price-taker.** It has a perfectly elastic demand **for** its **product.**

Profit' is maximized when MC = MR.

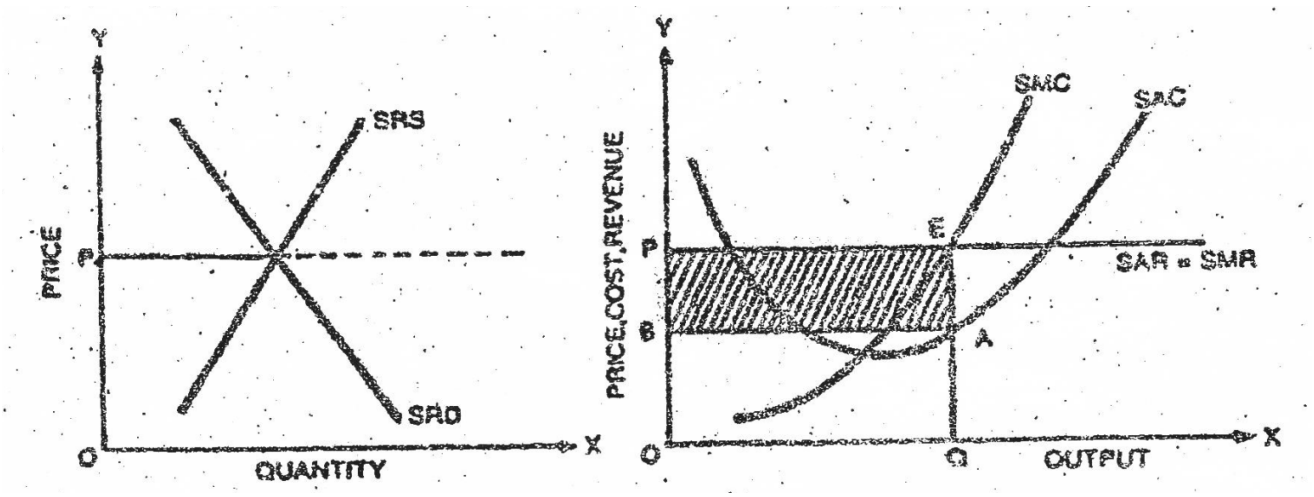

Figure 9.1

Short run is operational time period duringwhich the film cannot change its size, as certain fixedfactors cannot .be altered. The firm produces more only with the help*of* variable inputs along with thegiven fixed factorinputs, To determine fee equilibriumlevel of output she firm compares its short runmarginal cost (SMC) with the short nm marginal revenue (SMR) of the product The short run marginal revenue (SMR) of the firm depends on the priceof the product.

The firm obtains its revenue from the demandcurve for its products. The demand fix the product is perfectly elastic. Thus, at the short period marketprice, OP, the demand curve SRD is a horizontalstraight line, corresponding to which the short runaveragerevenue (SAR) and the short run marginalrevenue (SMR) are depicted. Along with this, theshort run average cost (SAC) and short run marginal cost (SNC) are drawn for comparison. Theequilibrium point is determined*by* the 'intersectionofthe SMC curve from below, so that SMC = SMR.

In Figure 9.1, E is the **equilibrium point,** at**which the SMC** curve intersects the SMC curve frombelow. Consequently, **OQ** is the **equilibrium** level ofoutput determined by the firm in the short run. Theshaded area PEAB represents the maximized profits.

Farther Analysis of the Short Run Equilibrium ofthe Finn.

When the firm attains a short- run equilibriumposition, it does not necessarily imply that it makesexcess or supernormal profits. Its profitabilityposition depends on the conditions of averagerevenue and the level of the average cost functions, inthe short run equilibrium. Thus:

1. When price (or AR)>AC, there is*excess* profit.
2. When AR= AC, only normal profit is yielded.
3. When AR (or price)<AC, losses occur.

Again, the short run equilibrium price is also notstable. With the changing conditions of demand andsupply in the short run, the short-period market pricevaries.

In Figure 9.2.price **P_1, P_2, P_3** etc., arealternatively market determined short run industryprices in different, short run demand and supplysituations. With the corresponding revenue function,such, AR_1 = MR_1, AR_1 =MR_1 etc., the short run per

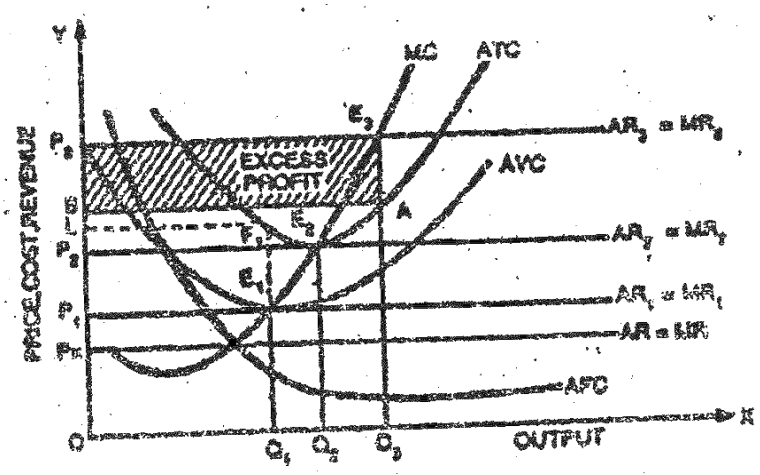

Figure: 9.2

unit cost functions: MC, ATC, AVC, are compared.The firm under perfect competition has aperfectlyelastic demand for its product; hence its demand **or**the average revenue, curve is a horizontal straight lineat a given price. It must be noted that MC curve **in**the figure has the shape of an "umbrella handle." Thefirm's short run output is thus, influenced solely byvariable costs. The firm has to recover its variablecosts or the current business expenses for its survivalFrom the diagram, the following analytical pointsbecome explicit:

- **Loss.** If the market price of the commodity isless than me short run average total costs at allpossible output levels, there will be losses rather**than** profits **to the firm.**
- Normal **Profit. When the price**is **equal** toaverage total costs in the short run, the turn getsonly normal profits.
- **Excess Profit.** When the short run market isabove the short run average total costs, thefirm makes excess (or super-normal) profits..

9.7 THE SHORT RUN SUPPLY CURVE OFTHE FIRM AND INDUSTRY

From the equilibrium output levels, it is easy toderive the supply curve of the firm and industry.

Short Run Supply Curveof a Firm

Under perfect competition, the firm supplieswhat it produces at a given market price. It producesthat level ofoutputat which MR- MC Thus, firm's supply curve can be derived from its equilibriumpoints, i.e. the points of intersection of its MC curvewith alternative demand curves at different prices. Itis easy to see from me figure that at various prices,different amounts of equilibrium output are producedby the firm. Whatever is produced is supplied at thegiven price, because the demand is perfectly elasticfor the firm's output Hence, me equilibrium pointsE_1, E_2, E_3 become the points of supply curve and joiningthem we get the SS supply curve, as shown in the parallel diagram. (Figure 9.3.)

It must be noted that only the rising path ofMCcan serve as the supply curve of the firm while thefalling path cannot, for the obvious reason of its being insignificant in equilibrium process. The supply curve of the firm in the short run however, is that portion of the marginal cost curve that lies above the average variable cast curve. The; MC curve lying below the AVC curve cannot be regarded as the supply curve because at this point, the firm stops production altogether. The firm produces either at a loss or profit at any point as per the given price, where the short run MC curve equals the price only when the price is above AVC, In short, a competitive firm's marginal cost curve above the AVC curve is its supply curve in the short run when following conditions satisfied.

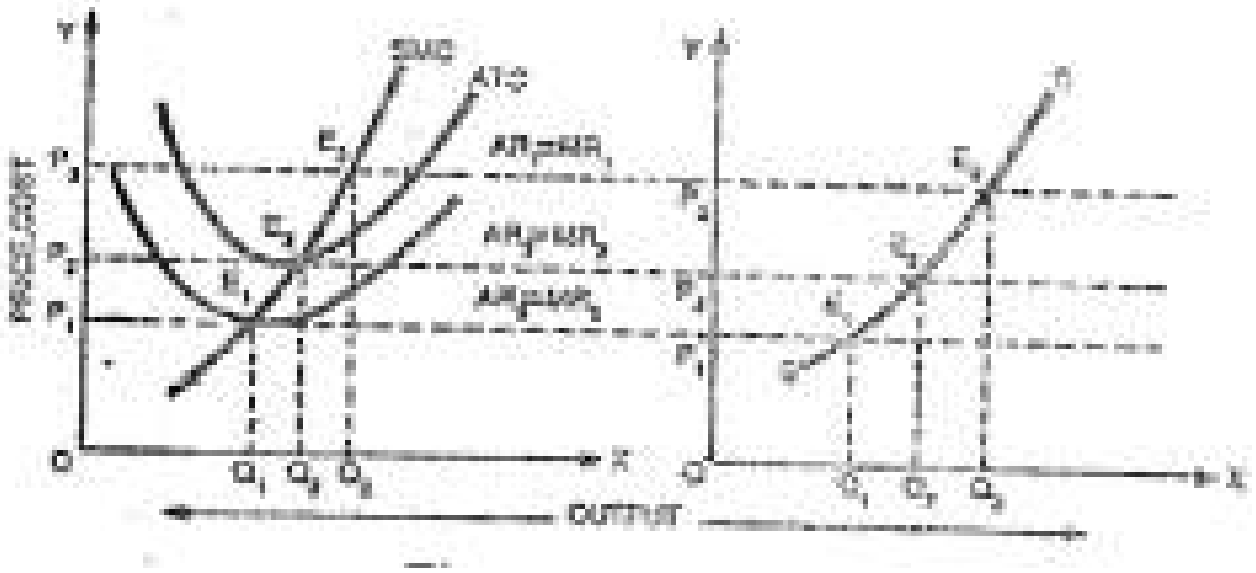

Figure : 9.3

9.8 THE SHORT PERIOD EQUILIBRIUMOF THE INDUSTRY

All industry isin equilibrium is the short run when following three conditions are satisfied.

1. MR = MC, No existing firmwill vary its output
2. It is not necessary that each film in the industryshould be earning normal profits in the shortrun. Some firms may be incurringlossesdepending on their cost functions.
3. The short period market price and ifsdetermining factors, viz., short period demand and short period supply, are in equilibrium.

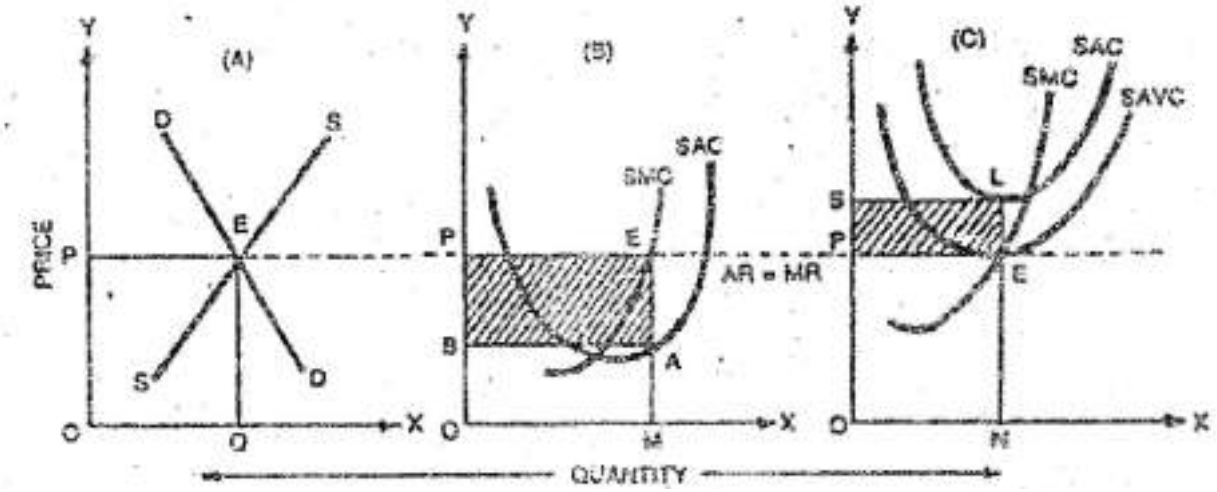

Figure: 9.4

In figure 9.4, curve *SS* represents short runindustry supply and *DD* represents short run industrydemand. Both the curves intersect at E determining*OP* as the short run equilibrium price, at which *OQ is*the quantity demanded equal to the quantity suppliedin the entire market. At this price, industry is inequilibrium. The firms are also in equilibrium byequating MR with MC. But, they may be making profits or losses as in Figure panels B sad C respectively.

9.9 LONG RUN EQUILIBRIUM OF FIRM

In the Song run, the firm can adjust its output by changing the scales of plant; the long run average

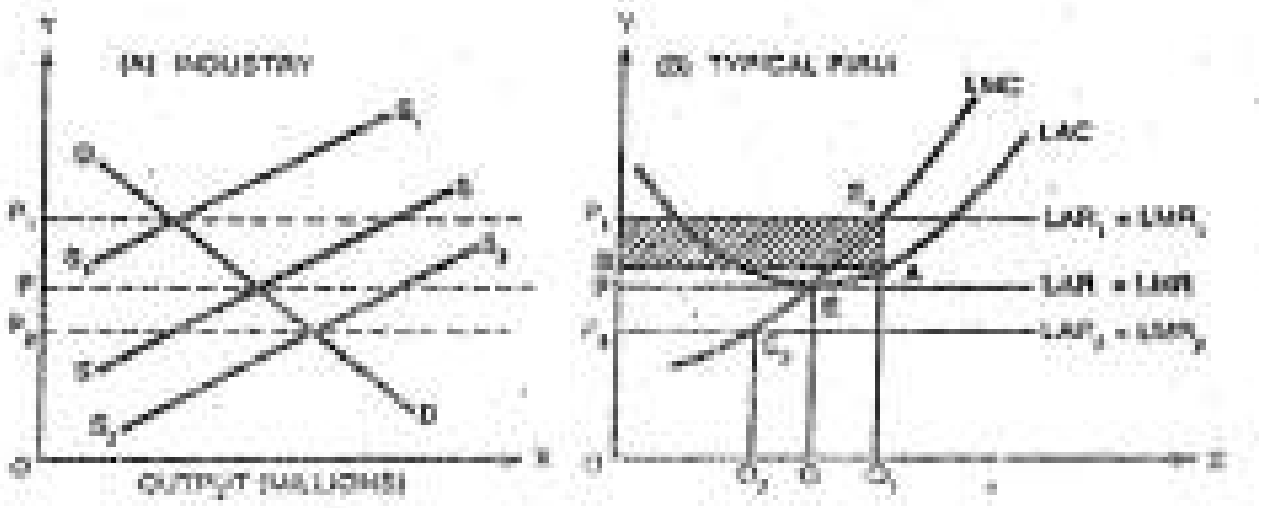

Figure: 9.5

cost curve is disc-shaped. In the long ran, the firmadjusts its output and the scales of its plant so as toequate long run marginal costs with price. Entry-and equate exit of firms from industry is the key to long-runequilibrium under perfect competition.

In figure 9.5 (A) represents the market demand and industry's supply position of a given product inthe long run; panel 9.5 (B) represents a given firm's LAC and LMR at various P_1, P, etc. the firm is a

price-taker and the market price in the long run (thenormalprice) is determined by theintersection of the demand curve DD and supply curve SS of the industry. Initially suppose S_1S_2 in the supply curve which intersects the DD curve so that OP_1 is the equilibrium price. At this price, the firm gets LMR_1 curveswhich intersect the LMC curve at point E_1. The firm produces OQ_1 of output. At this point, the firm gets excess profits. When the new firms enter the industry under consideration, the supply of the

Industry increases so that the supply curve shifts to the right. Then the long run equilibrium price will obviously decline with the increase in supply, the demand being unchanged. With the fall in price, the firm contracts its output also, and obviously its excess profits will decline. But still the firms may yield some excess profit. This attracts new producers to enter the industry. The firm can also incur losses. Due to this some firms quit the industry. When some firms find it difficult to carry on, they may quit or shift to another industry. If this happens, decreases supply. At his price, the firm producer equilibrium output, which gives just normal profits. At this position, the firm will find itself in a stable condition and will not change its output any further in the long run. Thus, under perfect competition, long run equilibrium is attained when the number of firms is to adjusted that an individual firm can get neither excess profit not suffers any low, but only normal profit. (Figure 9.6)

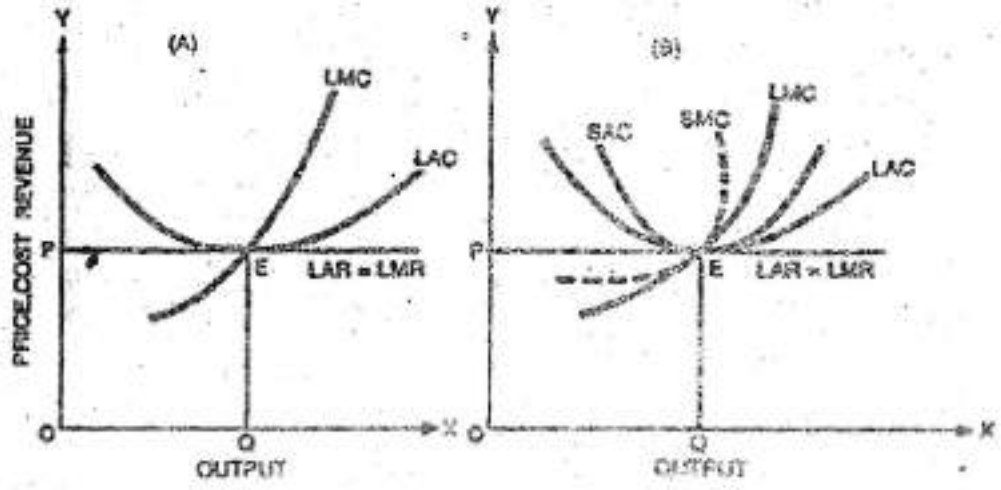

Figure-9.6 : Long Run Equilibrium

9.10 EQUILIBRIUM OF THE INDUSTRYIN THE LONG RUN

The equilibrium in a perfectly competitiveindustry is established under fhefollowing conditions:

1. MC=MR
2. LAR = IAC.

Unless all the firms are earning just the normalprofits, industry will not attain a stable equilibrium in the long run. Because, if some firms are earning excess profits, it would encourage new content in the industry which will lead to changes in the industry supplies and market prices in the long run. Thus, it is essential that all the firms must earn normal profits in the long run so that the industry attains an equilibrium position. (Figure 9.7)

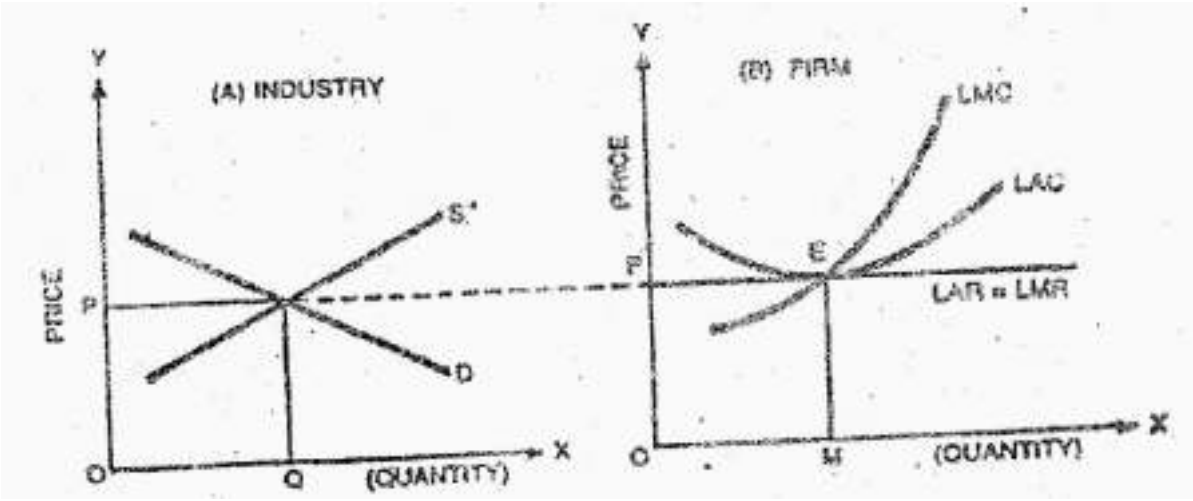

Figure 9.7

When all the firms are in equilibrium, and allof them earn normal profits, or their number beingstable, the market supply position becomes stable inthe long run and tinder the given demand conditionthe long run equilibrium price (OP) is establishedmaking industry in the long run equilibrium. Thosefirms which are inefficient so that their cost-functionsare at a higher level, i.e. LAC price, have to quitthe industry inthe long run as they fail to earn normalprofits and losses are not sustainable by them. Tosum up, industry andfirm*s equilibrium conditions inthe longrun are Long Run Equilibrium Price = LAR = LAC=LMR = LMC.

9.11 SELF CHECK EXERCISE

1. Define market.
2. Discuss in brief pricing under perfect competition.
3. How price has been determined under perfect competition? Discuss in brief.
4. Write a short-note on conditions of equilibrium in a perfectly competitive industry.

9.12 SUMMARY

In a perfectly competitive market, there will be a large number of buyers and sellers. Large numberhere denotes that the number of producers is so numerous that they cannot combine and influencethe market price by their combined action and decisions. The individual action will not affect themarket price because, the quantity offered by the individual producer will be so small when comparedto the total quantity offered in the market, that the action of the individuals will be very insignificantand it cannot influence the market price. Output of a single firm may not influence the demand andprice to a great deal in market as it is only a small percentage of overall output. Similarly, on the partof the buyers, the number is so large that there are no possibilities for them to dictate conditions inthe market and influence the price by altering the demand. The individual demand will be so smallthat it will be insignificant if there is any change. So the market price cannot be altered either bysellers or by buyers by their actions individually; nor are there possibilities for a few of them tocombine, !n a perfectly competitive market, the individual firm is only a 'Price taker' and not

'Pricemaker'. They cannot have a price policy of their own and will pay attention mostly to reduce the costof production. They will adjust output to the market price.

9.13 GLOSSARY

- **Firm** is a commercial enterprise, a company that buys and sells products and/or services toconsumers with the aim of making a profit. ... In early Latin, Firmare meant 'to make firm, affirm' andthen in Late Latin had the added meaning of 'confirm (by signature)'.
- **Industry** is a group of companies that are related based on their primary business activities.For example, while an automobile manufacturer might have a financing division that contributes 10%to the firm's overall revenues, the company would be classified in the automaker industry by mostclassification systems.
- Market is any place where sellers of particular goods or services can meet with buyers ofthose goods and services. It creates the potential for a transaction to take place. The buyers musthave something they can offer in exchange for the product to create a successful transaction.
- **Perfect competition** describes a market structure where competition is at its greatest possiblelevel. Perfect competition is a hypothetical situation which cannot possibly exist in a market. However,perfect competition is used as a base to compare with other forms of market structure.
- Price is the quantity of payment or compensation given by one party to another in return forone unit of goods or services. A price is influenced by both production costs and demand for theproduct. A price may be determined by a monopolist or may be imposed on the firm by marketconditions.

9.14 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 9.2.
2. For answer refer to section 9.4.
3. For answer refer to section 9.5.
4. For answer refer to section 9.10.

9.15 TERMINAL QUESTIONS

1. Define the term market. Discuss the internal conditions of a country to determine the extent ofmarket.
2. What do you mean by perfect competition? Discuss the conditions.
3. Discuss the conditions of short-term equilibrium of the industry.
4. Differentiate between long-term and short-term equilibrium of firm.

9.16 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis, Managerial Economics, Prentice Hall of India.
3. Dwivedi D N, Managerial Economics, Vikas Publishing House Pvt. Ltd.
4. Peterson, Lewis and Jain, Managerial Economics, Pearson
5. Sadananda, Managerial Economics, Prentice Hall of India

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CHAPTER-10

PRICING UNDER MONOPOLY

STRUCTURE

10.0 INTRODUCTION

Monopoly, refers to a market situation wherethere is only one producer or seller, who has acomplete control over the supply of a product, whichhas no close substitutes. A monopolist; therefore,has considerable influence over the price of thecommodity. He can fix price. He can alsosuccessfully charge different prices from differentpeople. A good example of monopoly is the electricsupply undertaking which supplies electricity to yourtown.

10.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand the concept, meaning and types of monopoly. The slope of demand curve under monopoly and equilibrium.The price determination and degrees of price discrimination and dumping.

10.2 KINDS OF MONOPOLY :

Monopoly can exist only when there are strongbarriers to the entry of rivals. Keeping this point inview monopoly can be classified as follows:

(a) Natural Monopoly -

When a region has some natural advantages ofproducing a particular product of vegetation,agriculture of mineral product, it is known as thenatural monopoly, of that product. For example,before the partition of the country, India was themonopoly Jute and Jute products. Similarly,SouthWest Africa is said to have the monopoly ofdiamonds.

(b) Social Monopoly -

In the case of public utilities, like electric power,posts and telegraphs, telephones, railwaystransportation etc., public interest is a very importantfactor. If these public utilities are supplied by more than one company, 'it would result in enormouswaste, inconvenience and high cost to consumer. Thus, it is in the social interest that the supply of theseutilities is undertaken by a single company. Hencethey are known as Social Monopolies.

(c) Legal Monopoly -

These are created as a result of the legalbacking of the Government. The laws ofGovernment grants, patent, trade marks, copy rightetc., to inventors of new articles, new processes andnew devises. When a firm quires patent rights for-theproduction a particular commodity, it gets anabsolute monopoly on its production.

(d) Voluntary Monopolies -

When some competing firms in an industrymerge together and become one firm, they form avoluntary monopoly. Voluntary monopolies are alsoformed when different firms agree about the price **to**be charge or about the quantity to be produced andeliminate competition. Voluntary monopolies are oftypes*:*

(e) Horizontal Voluntary Monopoly ~

When different firms, producing similar goods,combine and eliminate their competition, they formhorizontal voluntary monopoly. The Coal Authorityof India, Which has been formed by combining all thecoal miners of India, is a good example of horizontalmonopoly.

(f) Vertical Voluntary Monopoly -

This type of monopoly is formed when anumber of dissimilar firms, which are engaged indifferent stages in production of a factory, arebrought under one management, the basic aim offorming this kind of combination of firms is tointegrate the various processes of production fromraw materials finished goods.

10.3 DEMAND CURVES UNDERMONOPOLY;

The monopoly demand curve being the marketdemand curve has a negative slope as in diagram 1(a) which is unlike the individual horizontal demandcure that confronts the individual firms under perfectcompetition; as in diagram 1 (b). It has the samegeneral properties as the industry demand curve in aperfectly competitive market is an aggregate of thedemand curve of the individual consumers and slopesdown from left to right to show that the monopolisthas to reduce the price to sell more. The quantity ofits sales is a function of the price he charges, q = f**(p). It** represents his marking

possibilities';consumed taste and their incomes are builtinto thisdemand curve; and so are the availabilities andprocess of substitutes. The firm elasticity of demandis the market elasticity of demand. A 20 percentchange is the firm's output is a 20 percent change inthe industry output. Since monopoly demand curveand has, therefore, a negative slope, monopoly **AR**curve also has a negative slope, for price equalsaverage revenue (P = AR).

The competitive of seller controls neithermarket supply nor market demand. He, acceptsprice as a parameter and maximizes his profit byvarying Ins output alone. But a Monopolist can veryhis output also his price. But, at any given time hecan fix only any one of the two. If he fixes outputdemand will determine .the price. If the fixes theprice, demand will determine the quantity sold.

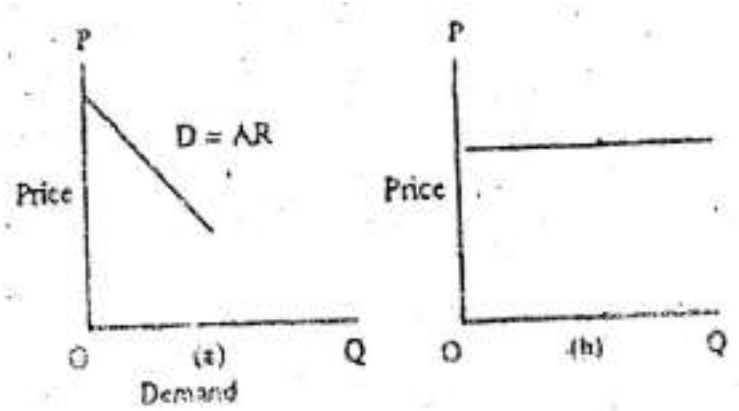

FIGURE 10.1

(a) The total average and marginal revenuesunder monopoly. : Under perfect .competition thedemand curve which an individual seller faces is ahorizontal straight line with AR=MR, the monopoly demand curve has a negative slope and its AR curvehas also a negative slope and downward curve hasalso a negative slope and downward sloping AR has its MR below it. Under competition, price equals demand, P = AR = MR = d, but monopoly, price equals average revenue which is higher than marginal revenue. The following is a hypothetical table of total, average and marginal revenues under monopoly:

Quantity in units	Price revenue	Total	Average revenue	Marginal review
1	10	10	10	10
2	9	18	9	8
3	8	24	8	6
4	7	28	7	4
5	6	30	6	2
6	5	30	5	0
7	4	28	4	-2
8	3	24	*3*	*-4*
9	*2*	18	2	-6

10	*1*	10	1	-8

Total revenue is price quantity sold; averagerevenue is total revenue divided by quantity ornumber ofunits sold are marginal revenue is the extrarevenue (or addition to total revenue) form the lastunit sold. Figure 10.2.is based on the data in theabove table. TR first rises, reaches at its maximumand decline thereafter. It continues to rise so long asMR is positive, reaches its highest point when MRdrops to zero and declines as MR become negative.It has the shape of an inverted U because priceconstantly falls as the quantity demand increases.After the first unitMR*is* below AR. .

The monopolist under the pure competition can sell all he wants to sell at the established 'marketprice; hence his marginal revenue equals to his price.The monopolist, however, has to face the marketdemand curve for his product 'The more he wants tosell, the lower must be his price. The fall in NMderives from the fall in price. MR is the derivative ofhis TR from his output and is less than price.Suppose 100 units of a good are sold at Rs. 5.00per unit, total revenue-will be Rs.500 Under perfectcompetition, 110 unit are also sold at Rs. 500 perunit and yield a total revenue of Rs. 50.

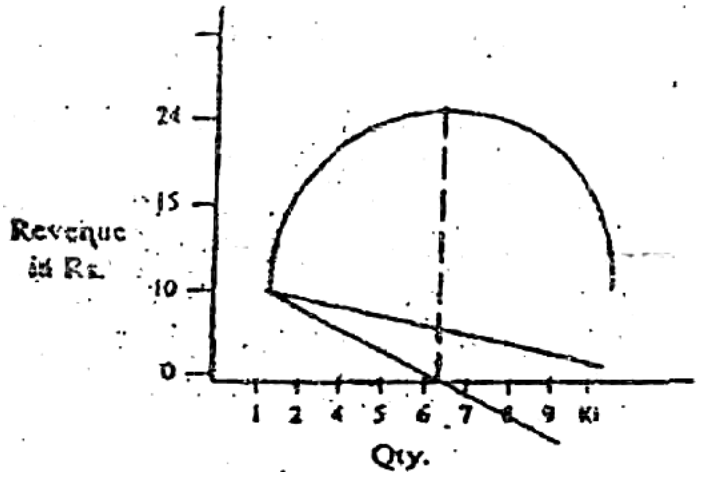

Figure: 10.2

The average revenue is Rs 550/110 = Rs. 5.00.Marginal revenue is the case of an additional range isderived form the average of the range. In this case, the additional range is 10 units. These 10 units fetcha revenue prRs. 50. Marginal revenue, therefore, isRs 50/10 = Rs. 5.00 Under competition, AR - MR.But under monopoly that is not the case. If .100 unitsare sold at Rs. 500,100 units can be sold only at Rs4.90 per unit. This would fetch a total revenue ofRs. 539 the addition to total revenue form the sale ofthe additional 10 units, is Rs. 539 and the marginalrevenue is Rs. 39/ 10 = Rs. 3.90, while the price-average revenue is Rs. 4.90, the marginal revenue isonly Rs. 3,90. under monopoly, mammal revenue issmaller than price because a larger outputs lowersthe price not only on the additional output on theentire output sold. The addition of one unit to theoutput, increases the total revenue by the amount ofits prices; but it reduces the price ofal! fee units soldand makes the net addition to total revenue smallerthan the price MRP = AR = d. .

The marginal revenue curve, as per table givenon page 172 is plotted in figure 10.3.

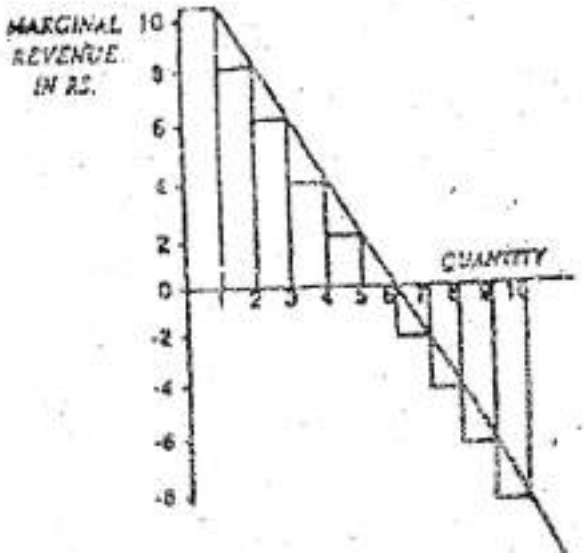

Figure 10.3

Thevolume of sales**in** units is put the **horizontal axis and**the **marginal**revenue declines with ***every*** increases **in the volume** of sales unit, at thesixth unit, it; crops to zero, and becomes negative thereafter.At any given level of sales, total, revenueis equal to the area under the marginal revenue curveup to the area under the marginal revenue curve up toquantity sold. When five units are sold, total revenueof five units sold equal to Rs. 30, while the marginalrevenue of fifth units is Rs. 2. The sale of 6 unitsyields the same total revenue ofRs.30, marginalrevenue at that sales level being zero. If sales arepushed beyond the sixth unit, marginal revenuebecomes negative and total revenue itself declines.MR is the rate of increase ofTR;MR = TR. This isbroadly the meaning of the statement that MR is thefirst derivative of TR with reference of output.

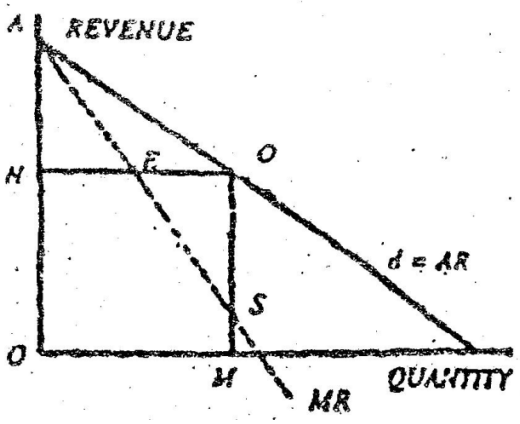

Figure 10.4

Figure 10.4 depicts the relation between AR and MR under monopoly. Under perfectcompetition AR is horizontal and therefore AR=MR, but under monopoly R is downward slopingand a downward sloping ARhas its MR below it.The demand curve is the AR curve. The MR from.the sale of a given, unit is less than the price obtainedfor the unit. MR <P = AR. This disparity

stems frommonopoly power. If the monopolist attempts toincrease the volume of his sales, he will, be exploiting.the market for quantity he is already selling.

10.4 SHORT-RUN EQUILIBRIUM UNDERMONOPOLY

The price output decision of pure monopoly aresimilar to those of pure competition. In the long run,the monopolist seeks to maximize the surplus of totalrevenue over total cost while in the short run heseeks to maximize such surplus, subject to the floorset by variable cost. Figure 10.5 illustrates short-runmonopoly equilibrium in terms of total revenue andtotal cost. STR is the short-run total revenue curveand STC is me short-run total cost. Maximum profitis earned at output Qq because AB is the line thatcan be drawn between the total revenue and the totalcost curves. That AB is the longest line that could bedrawn between the tangents at A and B are parallel.Profits are maximized when the slope of the totalrevenue curve is equal to me slope of the short-runtotal cost curve, or where MR =SMC,

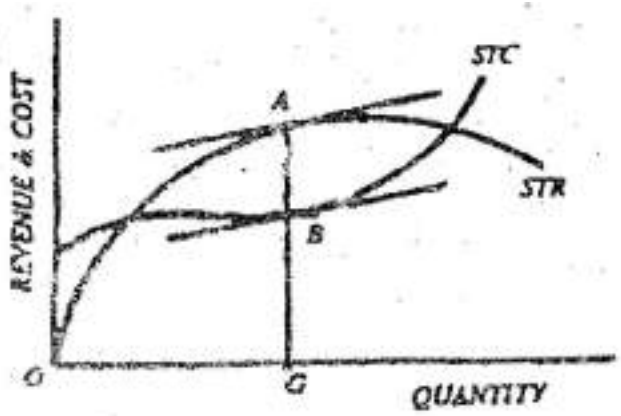

Figure 10.5

Figure 10.5 depicts short run monopolyequilibrium in terms of unit curve, d is the AR curvewith its associated MR curve lying below it. SAC is.the short-run average cost curve and SMC iscorresponding short-run marginal cost curve. Theintersection of SMC and MR at E vied equilibriumoutput Qq at equilibrium price OP with unit profit SRand aggregate profit equal to the rectangle NPRS.Equilibrium is set by the equality of MR and MC.Total profit is maximum at Qq. Output will beexpanded up to E because such expansion addsmore to revenue than to cost. Output will not beexpanded beyond E because such expansion adsmore to cost than to revenue and entails a loss. ThusP> SAC MR = MR = SMC at output q. P> SACgives pure profit which is at a maximum because ofthe equality of MR and SMC.

This occurs when there is a shift of the demand curve to the left, indicating a decrease ofdemand. To the monopolist as to the competitiveseller, demand is. a parameter, which he has to acceptas given. In the short run, it may incur losses butcontinues to produce so long. as price covers averagevariable cost. Losses are at a minimum at outputOq. Thus, the monopolist is making supernormalprofits or incurring losses in the short period.

10.5 MONOPOLY EQUILIBRIUM IN THELONGRUN;

The monopolist is the sale producer in anindustry. Monopoly profit depends on theeffectiveness of the barriers to entry. In purecompetition, free entry differentiates the short fromthe longrun. In monopoly barriers to entry tendto perpetuate pure profit. This is portrayed in figure10.6.dand MR show

the market demand andmarginal revenue confronting a monopolist LAC inlong, run envelope cost curve and LMC is thecorresponding long run marginal cost curve.

Profit maximum output readied at E where longrun marginal cost equals marginal revenue. The optimum rate of output is QQ and price QR. LACshows that the plant capable of producing OQ outputat the least unit costs. Unit cost is QS, unit profit SK and the long-run maximum profit the rectangleNPRS. The monopolist stands fully adjusted. Thefirm maximizes profit in the long run by producingthat rate output for which long-run marginal cost equals marginal revenue. The optimal plants is theone whose SAC curve is tangent to the LAC curveat the point corresponding to long run equilibriumoutput. Atthis point short-run marginal cost SMC)equals marginal revenue. At equilibrium point E.SMC = LMC - MR NPRS is the pure profit thataccrues to monopoly as such and is protected byblocked entry. The monopolist's equilibrium may besummarized in the fomula, Price P>SAC MR =SMC at output Qq. price is higher that average cost and yields profit. This profit being maximizedbecause MC =: MR. Expansion of outputbeingmaximized because MC = MR. Expansion of outputbeyond q would add more to cost than to revenueami so reduce profit. Expansion of output upto 1would, add more to revenue than to cost and thusIncrease profit Thus profits are maximized at q.Another variant of long-run monopoly equilibriumoccurs where the monopolists does not make a pureprofit but a normal return on Investment. Thissituation is portrayed in Figure 10.6 where demandcurve is target So LAC. Tangency shows there arepure profits. The monopolist is getting only normalprofit' As usual, equilibrium is set at the point ofintersection ofLMC and MR and Eat which SMC =LMC. This yield equilibrium output Oq atequilibrium price qR, which is also long-run, average,cost and short-run cost. Here P = PAC - SAC; andthere is no pure profit. But the monopolist just thinksit worthwhile to continue because he gets normalprofit.

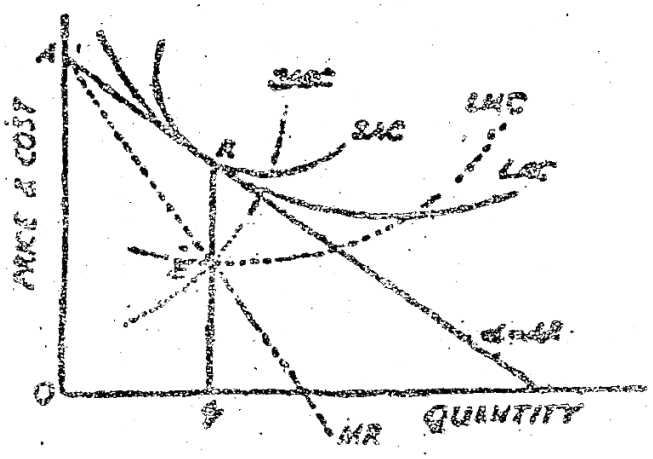

Figure 10.6

10.6 PRICE DETERMINATION UNDERDISCRIMINATION MONOPOLY

By the term Price discrimination we mean,when the monopolist charges 'different price In thedifferent, markets by selling the same product.The discriminating monopolist, like the simple monopolistalso seeks to maximize his profits, and to ensure this, that he fixed his outputin such a manner as to equatehis MR with MC. Monopolist will equalize MB and MC in both the markets,, Let us assume market A and B, If he is to maximize Iris profits, it is furtherassumed that there are many customer in eachmarket. It also assumed that monopolist, is amonopolist m both the markets andconsequently AK curve slopes downwards to the right in both themarkets. The questions nowis:

Howshall be fix prices and outputs *vs.* both of these markets so as toearn maximum profits?. For this,' two separateconditions must be fulfilled. Firstly marginal revenuein all the markets must be fee same. Secondly,marginal revenuesin all fee markets must be equal tomarginal cost of the monopolist's whole output. Ifthese two conditions arenot fulfilled simultaneously the discriminatingmonopolist cannot archive equilibrium. Further, elasticity of demand for theproduct should, be different in the different markets.Suppose the elasticity of demand for the produce ishigh in market B and low In market A. Thediscrimination monopolist will transferhis output formlow priced market to be a high priced market? Thistransfer, will continue tillthe MR in both the market is nor equalized. Similarly, MR in the two markets(markets A and B) 'must also be equal to be MC ofhis total output. The two conditions of discriminating in an equation form asbelow:

Marginal revenue in markets A = Marginalrevenue in market B = Marginal cost of total output.

Price discrimination may takes many forms.The common forms of price discrimination may bestated as under:

(a) **Personal discrimination :-** Different pricesmay be charged 'to different buyers in theproviding similar services. For example, asurgeon may charge a high operation fee to arich patient and a, lower fee to a poor one.Similarly, lawyers may charge different feesfrom different types of clients depending ontheir income status.

(b) Age**discrimination ;-** Price discriminationmay be on the basis of age of the buyers.Usually, buyers are grouped into children andadults. In railways and bus transport services,It is a commonly adopted. A person below 12years of age are charged at half the rates.

(c) Sex**discrimination :- In** selling certain goods,producers may discriminate between male andfemale buyers by charging low prices fromfemales. In certain cinema houses in smalltowns, a Zanana show may be arranged atconcessional rates for ladies only.

(d) **Territorial discrimination:—** When amonopolist charges different prices in differentmarkets located at different places, it is calledlocation or geographical discrimination.Similarly, a firm may discriminate "betweendomestic markets and export markets for itsproducts.

(e) **Size discrimination :**- On the basis of size orquantity of the product, differentprices may becharged. For instance a product is sold in theretail market at a higher price: than in the•wholesale market by the producer.

(f) **Quality variation discrimination :~**On thebasis of some qualitative differences, differentprices may be charged for the same product,For instance, a publisher may sell a deluxeedition of the same book at a higher price thanits paperback edition.

(g) **Specialservice or comforts ;—**Pricediscrimination may also be resorted on thebasisof special facilities or comforts. Railways, for.instance, charge different fares for the first classand other classes.

(h) Uses**discrimination;-** Sometimes, dependingon the kind of use of the product, different rates may be charged. For instance, an electricitydistribution company may charge lowrates fordomestic consumption of electricity ascompared to commercial use customers.

(i) Nature of commodity ;- discrimination. Sometimes, may be made, on the basis ofnature of Commodity. For instance, freightcharges by the railways are different for coal and iron for the same distance.

10.7 DEGREES OF PRICE DISCRIMINATION

The extent of price discrimination depend on circumstances. However, there are three degrees ofprice discrimination, viz, : (i) First degree pricediscrimination, (ii) Second-degree pricediscrimination, and (iii) Third-degree pricediscrimination.

(a) First Degree Price Discrimination.

It is the extreme case of price discrimination.Under this, the monopolist charges different prices todifferent buyers for each different unit of the sameproduct. The price charged for each unit, in eachbuyer, is set in accordance with the marginal utility, the buyer estimates and thus at what maximum price,

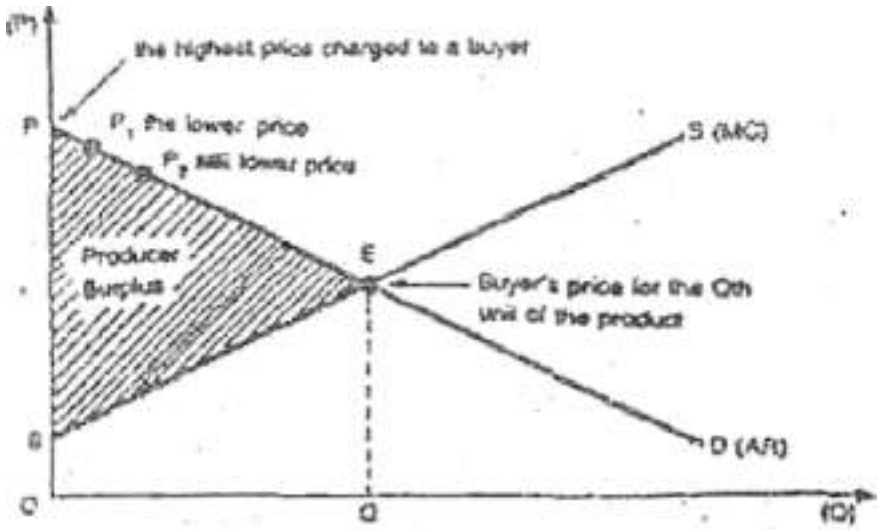

Figure 10.8

he is willing to pay for it It is possible only whenbuyers are few so that each one can be dealtindividually and the, monopolist fully knows, whatmaximum they would pay for each unit of hisproduct.

(b) Second - Degree Price Discrimination

Under this category of price discrimination, themonopolist sells blocks of output at different prices.Here, the possible maximum price is charged forsome given minimum blocks of output purchased bythe buyers and then the additional blocks are sold successively at lower prices. However, the units in aparticular blocks will be uniformly priced. This sortof price discrimination is feasible when the totalmarket for the product is very wide, with a largenumber of buyers having different tastes, differentincomes, and different conditions, so that subdivisionof the market or groups of buyers can be easilymade.

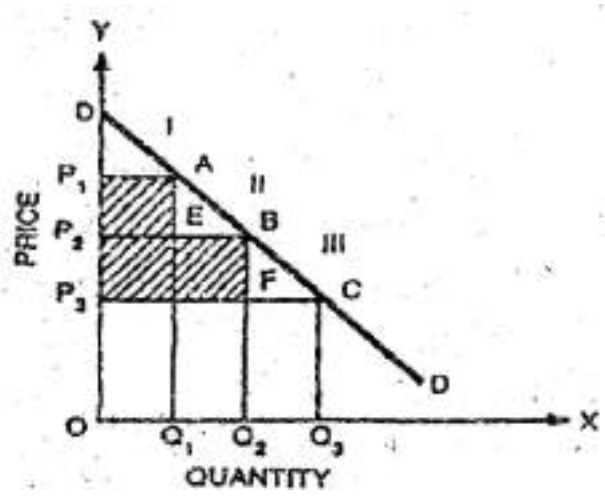

Figure 10.9

(c) Third Degree Price Discrimination.

Third degree price discrimination is the mostcommon type of discrimination which the firmdivides its total output into many sub-markets andsets different prices for its products in each market inrelation to the demand elasticities. For allocations ofoutput, the total output in each market will bedistributed for sale in such a way that from eachmarket, the resulting marginal revenue should beequal, *so* that the revenue is the maximum. Differentprices charged in different market but in each marketbuyers are treated equally.

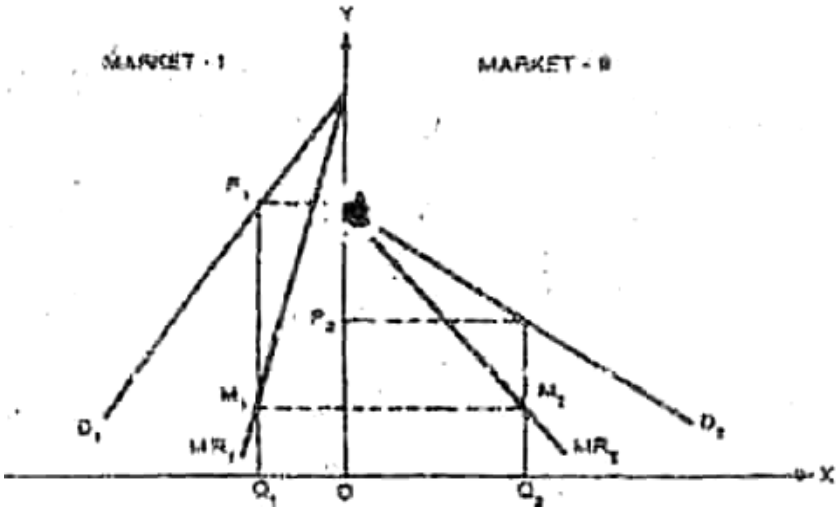

Figure 10.10

10.8 THE INGREDIENTS FOR DISCRIMINATION MONOPOLY: CONDITIONSESSENTIAL FOR PRICE DISCRIMINATION

The following are the essential conditionsenabling the firm to resort to price discrimination

- **Monopoly:-** Monopoly is a requisite of pricediscrimination. Undoubtedly, price discrimination is incompatible with perfect competition,if one seller quotes a higher price to a group ofbuyers, who know the ruling market price.

- **Segmentation of themarket :-** Themonopolist should be in a position to segmentthe market by classifying the buyers intoseparate groups'.
- **Product differentiation :-**Through artificialdifferences in the same product, such asdifferences in packaging, brand name, etc.,price discrimination, with productdifferentiation,is foliated fey buyers.
- **Non-transferability characteristics of goods :--**There, are some goods which, by theirvery nature, are non-tansferable between one buyer and another. 'Obviously, a poorperson cannot go on behalf of the rich to gelmedicaltreatment from a doctor.
- **Legal sanction :-** When, in some cases price discrimination is legally sanctioned, the transfer of me of the produce is legallyprohibited to order to make it effective. For instance, if electricity, for domestic purposesis used for commercial purposes, the customer is liable to pay penalties.

16.9 PRICING AND OUTPUTEQUILIBRIUM UNDER DISCRIMINATING MONOPOLY

In Fig. 10.6 (a) represents the conditions of Markets 1, DI requirements its demand curve, which is relatively inelastic. AR and MRI are the respective average and marginal revenue curve of the market I (b) represents market II. Its demand curve is D2 which is relatively elastic. AR and MR are its monopoly firm CMR represents the combined marginal revenue curve, CMR = MR + MR, the MC curve represents the marginal cost of output. At point E the MC curve intersects SMR curve so atthis point; MC = CMR, it is the profit maximizing equilibrium condition. Thus, QQ is the equilibriumoutput. The monopolist now allocates this 02 outputin such a way that MR =.MR. The line AE crossesthe MR curve at point a and MR. curve at point b,Correspondingly, OQ and OQ2 quantities of outputaxe determined for allocation in these two markets.

PRICE DISCRIMINATION [DISCRIMINATING MONOPOLY]

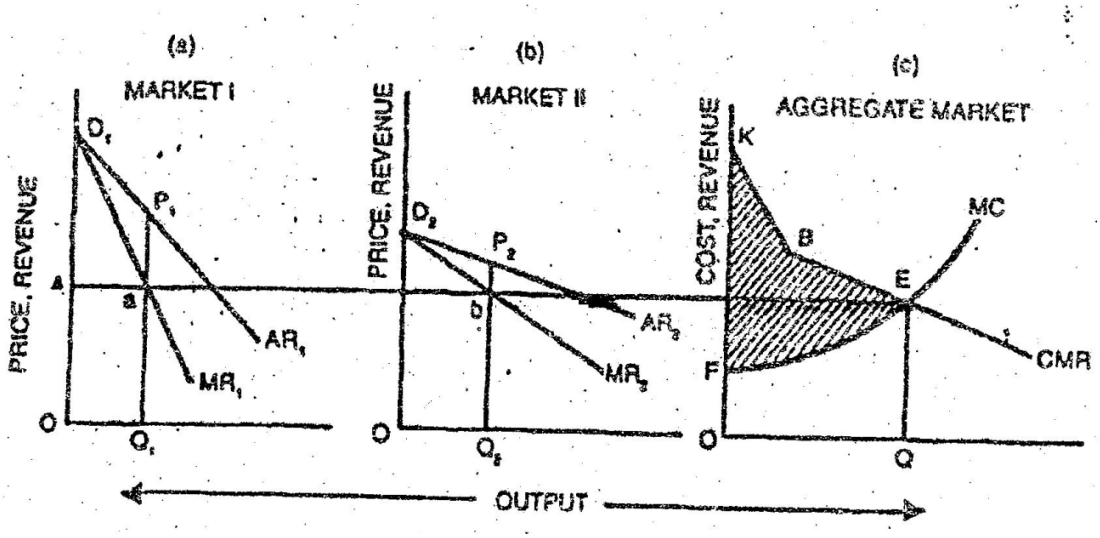

Figure 10.11

In short, OQ is the total output determined,where MC = CMR. It gives profit shown by theareas between the CMR' *we* and the MC curve.Thus, shaded area KBEF measure total profit Ofthe total OQ

output produced OQ us supplied toMarket 1 and sold at price PI QI, The rest OQ1 issupplied to Market H and sold at price P2 Q2.

In the above analysis, we have assumed.position of the firm in both the markets. Sometimes,respectively. When OQ is allocated to Market tin relation to its demand curve AR PI QI price is obtained. Similarly, when OQ2 is to be sold in Market II, P2Q2 can be the price to have this much demand in Market II. It is easy to see that MR for OQ2 output is; aQ1 = OA, MRS for OQ2 output is bQ2 = OA. Again, OQ1 + OQ2 = OQ and, CMR for OQ is EQ = OA. CMR = MR = MR2.

However, the monopolist may face tow markets oneof which is a monopoly market and the other aperfect competition one. Such a situation isobserved in case of a firm dealing with the exportmarket as well as the domestic market.

10.10 DUMPING

The practice of discriminatory monopolypricing implies different prices in the domestic andforeign markets. The sale of goods in abroad at aprice which is lower than the selling price of the samegoods at the same time circumstances at home,taking-account of differences in transport costs."Under dumping, a producer possessing monopoly inthe domestic price in foreign markets "reverse ofdumping" is a situation in which aproducer charges alow competitive price in foreign price for his product. The rationale behind dumping is that it enables theexporter to compete in. the foreign market andcapture the market by selling at a low price, evensometimes below cost and to make up the deficiencyin sales revenue by charging high prices to the home buyers (taking advantage of monopoly power is the home market). In fact, the higher domestic priceserves to subsidies a segment of foreign price, whichconsiderable helps to promote exports.

Dumping, depends upon the followingconditions:

1. The producer must possesses 'a degreemonopoly power at least in the home market.
2. There must be clearly defined separate markets.
3. It should not be possible for the buyers to re-sell the goods from a cheaper market to thedearer one.

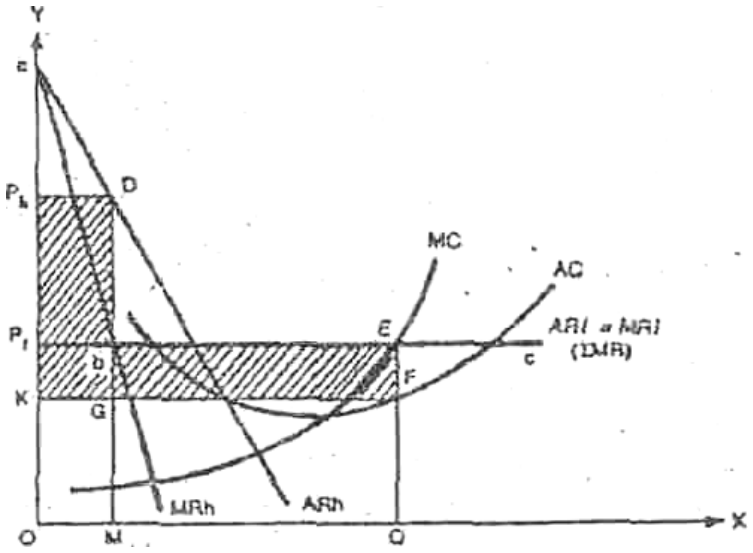

Figure 10.12

The condition of equilibrium in the case ofdumping is depicted diagrammatically in Fig 10.12.

In Figure 10.12 it is assumed that the firm isselling its product in two markets: (i) home marketand (ii) foreign market in the home market, the firmhas a monopoly.

The firm is a price maker in the home market.In the foreign market, however, due to perfectcompetition, the firm has to sell the ruling price.

In the figure 10.12, the MC curve intersects theMR curve (abc) at point E Correspondingly, OQlevel of output is determined. The firm has todistribute this OQ output between the home marketand the foreign market. It will be distributed such away that MRh=MC. At point b on the combinedMR curve, MRf= MRh. That is, bM is the identicalmarginal revenue is both markets, EQ is combinedrevenue. Here, bM = EQ. Thus, the price OPh isdetermined for the home market. For the foreignmarket, the price OPf is already given. At this givenprice, the firm sells MQ output in the foreign marketThus, OM domestic sale + MQ export = OQ totaloutput. The price charged in the home market OPhis higher than the export price OPf. .

10.11 SELF CHECK EXERCISE

1. Define Monopoly.
2. What do you mean by social monopoly? Discuss in brief.
3. Write a short-note on demand curve under monopoly.
4. Discuss in brief any three forms of Price discrimination.
5. Write a short-note on third degree of Price Discrimination.
6. Discuss dumping in brief.

10.12 SUMMARY

Monopolies, as opposed to perfectly competitive markets, have high barriers to entry and a singleproducer that acts as a price maker. Monopoly exists when there is only one producer and manyconsumers. Monopolies are characterized by a lack of economic competition to produce the good of service and a lack of viable substitute goods. As a result, the single producer has control over theprice of a good - in other words, the producer is a price maker that can determine the price level bydeciding what quantity of a good to produce. Public utility companies tend to be monopolies. In thecase of electricity distribution, for example, the cost to put up power lines is so high it is inefficient tohave more than one provider. There are no good substitutes for electricity delivery so consumershave few options. If the electricity distributor decided to raise their prices it is likely that mostconsumers would continue to purchase electricity, so the seller is a price maker.

10.13 GLOSSARY

- **Equilibrium** in Short Run means an organization under monopolistic competition attainsits equilibrium where marginal revenue equals marginal cost and sets its price according to itsdemand curve. This implies that in the short run, profits are maximized when MR=MC.
- **Long Run Equilibrium of Monopolistic Competition** means a firm in a monopolisticcompetitive market wills product the amount of goods where the long run

marginal cost (LRMC) curveintersects marginal revenue (MR). The price will be set where the quantity produced falls on theaverage revenue (AR) curve.

- Monopolistic competition characterizes an industry in which many firms offer products orservices that are similar, but not perfect substitutes. Barriers to entry and exit in a monopolisticcompetitive industry are low, and the decisions of any one firm do not directly affect those ofits competitors.
- **Monopoly** is a market structure characterized by a single seller, selling a unique product in themarket. In a monopoly market, the seller faces no competition, as he is the sole seller of goods withno close substitute. He enjoys the power of setting the price for his goods.

10.14 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 10.0.
2. For answer refer to section 10.1 (b).
3. For answer refer to section 10.3.
4. For answer refer to section 10.6.
5. For answer refer to section 10.7 (c).
6. For answer refer to section 10.10.

10.15 TERMINAL QUESTIONS

1. Define Monopoly. Discuss its types.
2. Enumerate the slope of demand curve under monopoly market.
3. What do you mean by price discrimination? Discuss common forms of price discrimination.
4. Define dumping. What are the different conditions of dumping? Discuss

10.16 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis, Managerial Economics, Prentice Hall of India.
3. Dwivedi D N, Managerial Economics, Vikas Publishing House Pvt. Ltd.
4. Peterson, Lewis and Jain, Managerial Economics, Pearson
5. Sadananda, Managerial Economics, Prentice Hall of India

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CHAPTER-11

THEORY OF PRICING-MONPOLISTIC COMPETITION AND OLIGOPOLY

STRUCTURE

11.0 INTRODUCTION

Monopolistic competition refers to a situation where there are many sellers of a differentiatedproduct. There is competition, which is keen, thoughnot perfect between many firms making very similarproducts.

11.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand the concept, meaning and characteristics of monopolistic competition. The price-output determination of a firm in monopolistic

competition, non-price competition.The meaning, concept and features, types of oligopoly.The price leadership model and its types and kinky demand model.

11.2 CHARACTERISTICS OF MONOPOLISTIC COMPETITION MONOPOLISTICALLY COMPETITIVE MARKET SITUATION HAVE FOLLOWING CHARACTERISTICS :-

(i) Large number of sellers :- The number, ofsellers are "many and small enough". They are•' many in number and no seller isbig enough toinfluence the market price.

(ii) There is no significant interdependence betweensellers.

(iii) Product differentiation :- There are manyfirms producing a particular product, but eachfirm introduces its product as different fromothers. The basis for this differentiation maytake the form of quality difference, advertisement, patent rights, trade marks, etc.

- Advertisement is used as an instrument toimpress upon the consumers the superiority, of the product
- Patent rights and trade marks.
- **Quality differentiation :- The**monopolistic competitor tries to distinguishhis product on the side of production by introducing changes in its quality.

(iv) Free entry of the new firms and exist of the oldfirms.

(v) Higher, elasticity of demand. Due to differentiated product, each individual firm possesses some, but not complete, monopolypower and therefore its demand curve is elasticthan that of a monopoly firm. Productdifferentiation leads some consumers to prefer a specific product which implies that the firmexercises some monopoly or degree of controlon those customers.

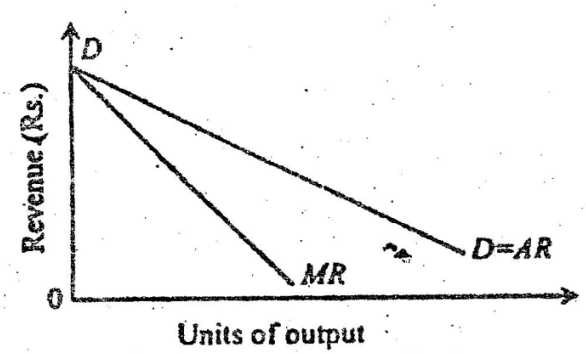


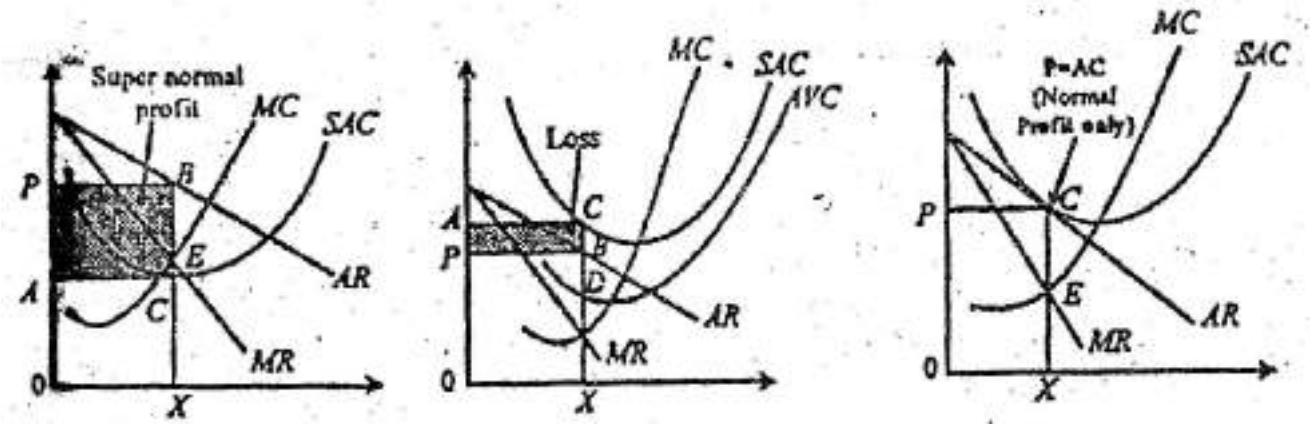
Figure 11.1

11.3 PRICE-OUTPUT DETERMINATIONOF A FIRM IN MONOPOLISTICCOMPETITION.

Given the general conditions of monopolisticcompetition can be studied in the short run and the Long run.

(a) Short run Equilibrium

Short-run equilibrium of the firm is based on an assumption that entry and exit of firms is not possible. Each firms aims at that level of price and output maximizes its profits. Equilibrium price and. output is determined at the point, where its marginal cost equals marginal revenue. In Fig. 11.2 (a), E is the point of equilibrium. Since the average cost of OX output is OA, the average profit equals AP and the total profit is ACBP. The supernormal profit is earned by the firm.



a b c

Figure 11.2

It is not necessary that all the firms in theindustry must earn super-normal profit. Some otherfirms may be earning only normal profits (Fig. 11.2©) since at equilibrium level of output (OX), firm'sAR=AC. On the other hand, in Fig. 11.2'(beneficiaries), at equilibrium the firm produces OXoutput at OA average cost and sells at OP price.Thus incurring an average loss of AP and atotal loss ofAPCB, But given the demand and cost conditions,this equilibrium output minimises the loss. In fact, inthe short run, the firm continues production until theprice falls so low that the firm can cover up only itsvariable cost. The loss making firm will continueproducing till it is able to recover some part of thefixedcost after recovering its total variablecost.

(b) Long-run Equilibrium.

If firms in monopolistic competition areobserved to be making economic profits, other filmswill be tempted to enter the market. The entry is notcompletely free, but is relatively easy.

Let us start with the assumption that each firm inthe industry is maximising its profits at abnormallyhigh level. The point of equilibrium is E_1. The firmearns a supernormal profit LCNP. But the abnormalprofits will attract new firms into the market, as aresult of which thesupply of the product willincrease and the market share of the existing firm willdecline. This will shift the demand curve d_1d_1 downwards, thus reducing abnormal profits. Since profits are just normal.

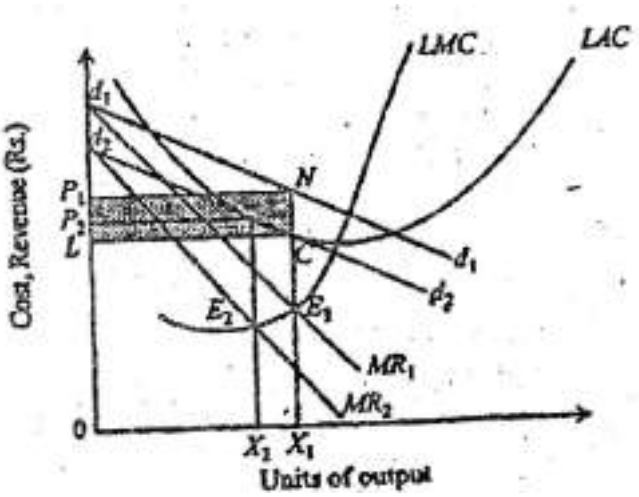


Figure 11.3

(c) "Group" Equilibrium.

Chamberlain, replaced the term 'industry' by'group' A. Group includes all those firms thatproduce closely related goods, i.e., the productswhich are close technological and economicsubstitutes. The products in a 'group' must have highown price elasticity and cross elasticity. It us obviousthat product differentiation helps each firm in charginga different price for its product. Similarly, efficiencydifferences among firms will result in different costcurves for the firms in the group. Chamberlain makesthe heroic assumption that both demand and costcurves for all 'products* are uniform throughout thegroup. He made this assumption in order to be ableto show the equilibrium of the firm and the group onthe same diagram. The other assumption of theGroup Equilibrium Model of Chamberlain are thefollowing.

- Products of firms are differentiated but theseare close substitutes.
- Profit-maximisation is the motive of firm both inthe short run and long run.
- Price for factors of production and technologyaregiven.
- free entry and exit of firms in the group.

Given the above assumptions, chamberlainexplained the Group Equilibrium in the long run in thefollowing manner.

The firm showed in Fig. 11.3 may be earningsupernormal profits. There will, therefore, beincentive for new firms to enter the industry. As newfirms enter the industry, the total market demand forthe product will be shared out amongst large numberof firms now. Consequently, each firm can expect tosell less now as compared to the sales before thenew firms had entered the industry. This leftward shiftin the demand curve will continue until supernormalprofits are eliminated, because there is an attractionfor new firms to enter.

11.4 EXCESS CAPACITY AND MONOPOLISTIC COMPETITION

One of the important predictions of the theoryof monopolistic competition is that in such acompetition, the equilibrium output of the firm occursat an output less than the one at which average totalcost is minimum. This is popularly known as theexcess capacity hypothesis.

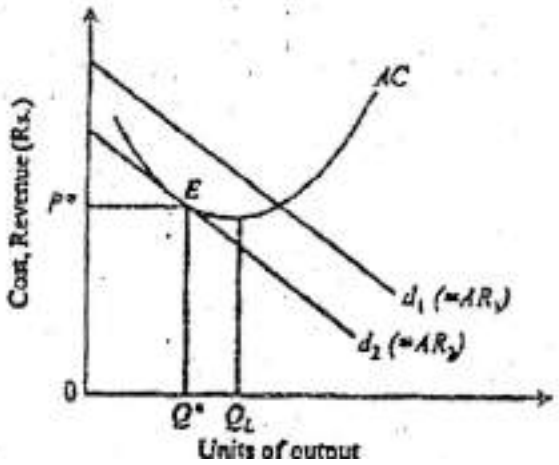


Figure 11.4

According to the theory, firms in monopolisticcompetition earn only normal profit in the long-run.The equilibrium output of the firm is QQ, while the least-cost output would be QQ. The firm couldexpand output from QQ to QQ_1 and reduce averagecosts but it does not make use of this productivecapacity because by doing so the firm would reduceaverage revenue more than it would reduce averagecost thereby incurring loss; But on the other hand bystopping at QQ output the firm is will be earningmore. Hence the exercise capacity utilization remainshypothesis only.

11.5 NON-PRICE COMPETITION: PRODUCT DIFFERENTIATION ANDADVERTISING.

(a) Selling Costs and Equilibrium of the Firm.

Selling costs include the costs on advertisementsales network and sales promotion. These costs arean important instrument used by the monopolisticcompetitor to achieve product differentiation.According to Chamberlain, the selling costs are "thecosts incurred in order to alter the position or shapeof the demand curve for a product."

Advertisement, the main form of selling cost, isof two types: Informative Advertisement andCompetitive Advertisement. The InformativeAdvertisement mainly aims at informing thecustomers about the existence and uses of the product. Such advertisements are not meant **to**persuade or influence buyers in 'favour of anyparticular seller. The aim of such advertisements is topush the sales of one firm at the cost of the others.

. Under Monopolistic Competition the firms haveto incur both the production and selling costs,Production Costs include all expenses incurred inmaking a particular product and transporting it to itsdestination for consumers. Selling costs are incurredto create and raise demand for one product at thecost of other products. In fact, the two types of costsare interrelated and it is not possible to isolate theproduction costs from selling costs.

(b) Shape of the Selling Cost Curve

According to Chamberlain, average selling cost curve isU-shaped, as shown inFig. 11.5. There areeconomies and diseconomies of advertising as outputchanges/The average selling cost curve shows that inthe initial stages of output, as output increases theselling cost per unit decreases, it becomes minimumat a particular level of output When output is pushedbeyond the point, the average selling cost startsincreasing. After reaching its minimum level, the ASCcurve rises, indicating that the

diseconomies in sellingcosts have set in. The determinants of the shape andposition of the selling cost curve are :

1. The price of the product;
2. Availability and closeness of substitutes;
3. Income of existing consumers in the market andof the potential consumers; and
4. Tastes and preferences of the consumers.

A change in any one of the above factorsaffects the shape and position of the ASC curve.

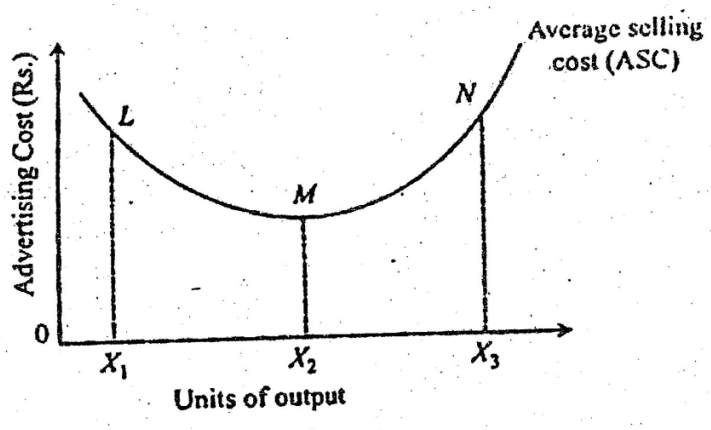


Figure 11.5

(c) Monopolistic Competition, An Evaluation

The model of monopolistic competition hasbeen criticized chiefly on the ground-that it cannot be empirically verified or demonstrated. If products are slightly differentiated and there are a large number ofsmall sellers, the firm has to behave like a perfectlycompetitive firm.

From the point of view of economic efficiency,the main wastes of monopolistic or imperfectcompetition are the following:

1. One of the most significant limitation ofmonopolistic competition is the heavy expenditure on advertisement and other sellingexpenses by the firms. These expenditures mayhelp the firms in building up the loyalty ofcustomers.
2. The product differentiation achieved with thehelp of selling costs, cannot substantially benefitany individual firm in the long run.
3. In perfect competition, all firms fend to be at anequal level of efficiency. But in case ofmonopolistic competition, even the inefficientfirms may stay in the market on thestrength oftheir product differentiation.
4. Lastly by producing at less than optimum level,the firm in monopolistic competition keep theiraverage costs and high prices.

11.6 OLIGOPOLY

Oligopoly is a situation where few firmscompete against each other and there is an elementof interdependence in the decision-making of thesefirms. Each firm in the oligopoly recognises thisinterdependence. .The element of interdependence offirms has made me formulation of a

systematicanalysis of oligopoly very difficult. Theinterdependence makes predictions difficult and thus,makes it very cumbersome to reach at any optimaldecision.

11.7 MAIN FEATURES OF OLIGOPOLY

(a) Small number of sellers :- The number, ofsellers dealing in a homogeneous or differentiatedproduct are small and each seller is catering to asignificant part of the market demand.

(b) Interdependence:- The oligopoly firm takeinto consideration the actions and reactions of hisrival while determining its price and output policies.

(c) Price rigidity :- If a firm tries to reduce theprice, its rivals will also do. If a firm tries to raise theprice, other firms" will not do so. Hence, the firmwould not try to either reduce or raise the price. Soprice rigidity will prevail.

(d) Presence of monopoly element:- So long asproducts are differentiated the firms enjoy somemonopoly power, as each product will have someloyal customer.

(e) Advertising ;~ Advertisement as well asvariations in design/quality of product are both usedsimultaneously to maintain and increase the marketshare of an oligopoly firm.

11.8 Types of Oligopoly

The oligopoly can beclassified on the following bases:

(a) Perfect and imperfectoligopoly : Oligopolymay be classified into perfect (or pure) andimperfect (or, differentiated) oligopoly. If theproducts in the industry are homogeneous, theoligopoly is called perfect or pure oligopoly. While if the firms in the industry produce differentiated products which are closesubstitutes this situation is called as imperfect ofdifferentiated oligopoly.

(b) Open or closed oligopoly : On the basis ofentry of new firms, the oligopoly can beclassified as open or closed. In case of openoligopoly, the new firms are' free to enter theindustry, while in case of closed oligopoly, newfirms do not have a free entry into the industry.

(c) Full and Partial oligopoly : The oligopolysituation can be classifiedas partial or fulloligopoly. Partial oligopoly refers to a situationwhereone large firm dominate the industry andthe other firms follow the leader with regard to"the policy of price. Full oligopoly is a situation where no firm is dominant enough to take therole of a price leader.

(d) Collusive and non-collusive oligopoly : It isa situation where the firms, followa commonprice policy, is called collusive oligopoly. It maybe in the nature of an agreement or anunderstanding between the firms. On the otherhand, the firms may be acting independently;that is, no agreement or understanding betweenoligopoly firms. Such a situation is known asnon-collusive oligopoly.

All models of oligopoly recognise theinterdependence of firms, but there is no generalmodel which can explain pricing and output decisionsin all kinds of oligopoly situations broadly classifiedas perfect collusion, imperfect collusion and independent action. Therefore, there is a need todiscuss separately the following oligopoly situations:

(i) Differentiated oligopoly;

(ii) Perfect collusion in oligopoly;

(iii) Imperfect collusion in oligopoly;

(iv) Independent action by oligopoly firms.

(i) Differentiated Oligopoly

Firms under oligopoly are .often not found to produce homogeneous goods. They produce closesubstitutes. On the other hand, the firms generallycannot act independently; and, property of sticknessof price forces, oligopoly firms to stick to theprevailing prices. Under these conditions, the onlyway open for oligopolyfirms to push up theories to concentrate their attention on non-priceinstruments like advertisement and improvement inthe design and quality of the product.

Each firm tries to encroach upon the shares ofothers through non-price competition rather than byprice-war. In such asituation if a firm has to obtainpermanent increase in its market share, it must haveto keep itself ahead of its rivals m. non-pricecompetition.

11.9 PRICE-OUTPUT DETERMINATIONUNDER DIFFERENTIATED OLIGOPOLY

In case of differentiated oligopoly firmsgenerally operate under non-collusive conditions and mainly resort to non-price instruments rather than price change in order to maintain and extend their market share. If these conclusions are extended to &e oligopoly situation. There can be two possibilities. in such a situation :

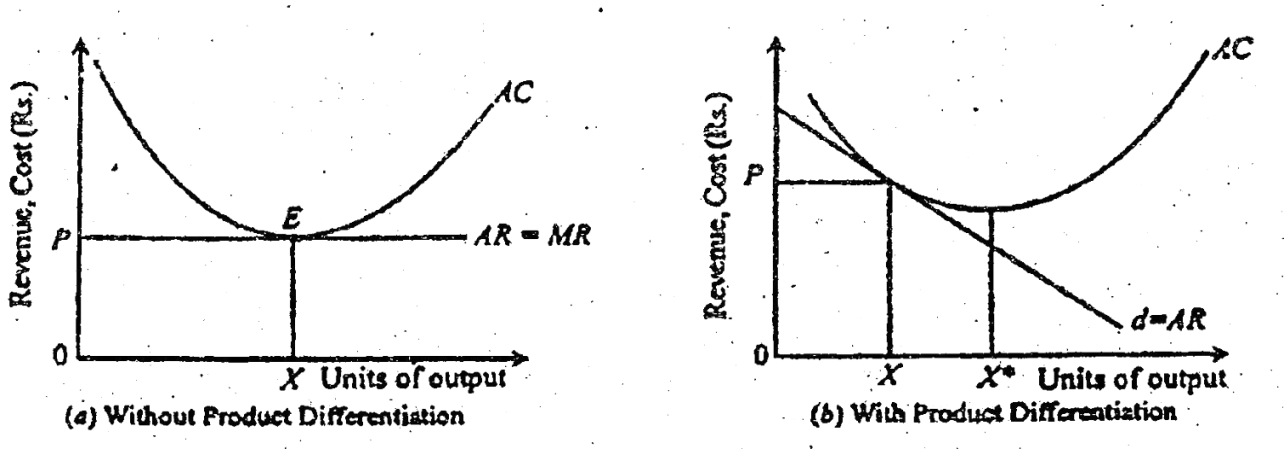


Figure-11.6

(1) Price war between the-firms and

(2) Monopoly behaviour of the oligopolist.

These can be shown diagrammatically.

A firm producing under conditions of oligopolywithout differentiation is shown with the help ofaverage cost and average revenue curves. Sincethere is no product differentiation, there will be aprice war among firms.

The case of oligopoly, with productdifferentiation is depicted. After-a price war, thelong-run'price comes down to OP. The firmproduced OX units, sellset OP price and earns onlya normal profit. Here the equilibrium is identical tothat of the monopolistic competition.

(a) Pricing Under Perfect Collusion.

Collusion is just the opposite of competition. Itmeans that the firms co-operate with each other intaking joint actions to keep their bargaining positionstranger against the consumer. Perfect collusion primarily consists of cartels arrangements. The desireof the firms to have large joint profits gives impulse toform cartels. There are mainly two types of cartels:

(1) Centralized cartels, and,

(2) Market-sharing cartels.

(b) Non-collusive Oligopoly

When firms have no collusion, they actindependently and each of them is being closelywatched by rivals. The firms, therefore, decide onprice-output policy keeping in View the reaction ofthe other firm in the industry. Due to productdifferentiation, each firm has some monopoly controlover the market and, therefore, fixes near-monopolyprice. On the other hand, if the price-war breaks outbetween the rivals, each firm may fix price at mecompetitive level.

11.10 PRICE LEADERSHIP MODEL:

A Case of Imperfect Collusion. Perfect,collusion is often not possible in practice. There are anumber of forms of imperfect collusion bus; the mostimportant is usually or always followed with similarprice changes by other sellers, price competition maybe said to involve price leadership."

11.11 KINDS OF PRICE LEADERSHIP.

Three kinds of price leadership are commonlydistinguished in theliterature:

(a) Dominant price leadership,

(b) Collusive price leadership; and

(c) Barometric price leadership.

(a) Dominant firm price leadership. This modelrests on die assumption that the oligopolyindustry is composed of one large firm togetherwith many small firms. The large firm is the dominant firm which, if it desires, can drive outits rivals by a price war. To avoid any suchpossibility, a tacit collusion may be arrived atbetween the dominant firm and thesmall firms.This collusion may occur in the form of price'leadership by the dominant firm. The dominantfirm, on the other hand,supplies the remainderof the market, which is not satisfied by the smallfirms. Thus, although the dominant firm is aprice leader, it is a quantity follower.

This situation is essentially one of unstableequilibrium. If the price set by the dominant firm givesprofits to small firms in the industry, entry will beencouraged leading to reduction in the share of thedominantfirm. If the dominant firm, on the otherhand, deviates from the pattern of 'leadership in priceand followership in quantity* and changes itsobjective to long-run profits instead of short runprofits, the dominant firm will theft resort to pricecutting which will enable it to put many a small firmsout of business, thus enjoying near monopoly shareof the market.

(b) The low-cost Price Leader. This is alsoknows as price leadership by the efficient firm. Here, firms with relatively higher costs fear thatthe competition with the efficient firm will resultin price war which may resultin the erosion oftheir market share and may eliminate them in the long run if the price fell lower man the averagecost.

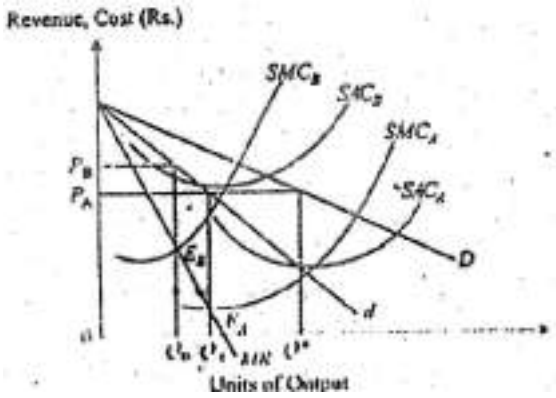


Figure 11.7

(c) Barometric price leadership. Barometricprice leadership getsits name from the fact thatone firm acts as a 'barometer', reflectingchanging market conditions or costs ofproduction that require a change in price. Itmight be possible thatthe firm with a large shareof the market or a low cost firm finds difficultiesin playing 'careful' role in the price monocurves.The barometric price leadership may, therefore,move from one firm to another or at the worstthe price parallelism may even break down.

11.12 "KINKY DEMAND" MODEL

The kinked demand curve was first used byPaul M. Sweezy to explain price rigidity. 'Theassumption behind the theory of kinked demand isthat each oligopolist will act and react in a way thatkeeps conditions tolerable for all members oftheindustry. Such a situation is most likely to occurwhere products are quite similar and, therefore, theirprices, also the same. If one firm is selling ata pricelower than that of its competitors, these competitorswill be compelled to reduce their prices to match thisfirm's price. On the other hand, if one firm decides tosell at a higher price its competitors do not react byraising their price. So, in the first situation (i.e., pricereduction)'the firmdoes not gain, while in the latter(i.e. price rise) the firm loses its customers to itsrivals. The oligopoly, firm probably realise that isbetter to accommodate its rivals rather than start aprice war. Consequently, firms in oligopoly do notraise their prices due to the possibility of losingcustomers to rivals who do not raise their prices. Nordo the firms cut prices because they fear a price war.So prices in oligopoly tend to be sticky.

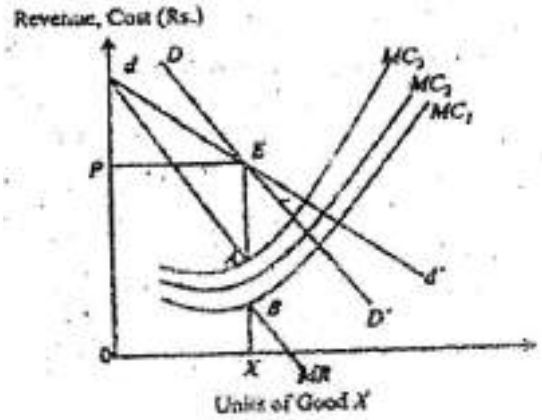


Figure 11.8

This indicates that there is a range within whichcosts may change without affecting the equilibriumprice and output, the kink can explain, why priceand output do not change despite changes in costswithin the range AB. It is pertinent to mention thatgreater the difference between elasticities of theupper and lower parts of the kinked demand curve,wider is the discontinuity in the MR curve; andhence, wider me range of cost conditions, compatiblewith the equilibrium price OP and output OX. It isonly when me costs rise in general and affect all firmequally that the rise in costs will induce an increase in'price.

(a) Reasons for Price Rigidity : An importantfeature of oligopoly is price rigidity. The price underOligopoly remains sticky despite changes in demandand cost conditions in me industry. It is only when thedemand and cost conditions change substantially thatthe price tends to move. The price rigidity inoligopoly may be traced to the following facts:

1. An oligopoly firm will-try to 'stick' to the'going'price.*
2. Any change in the existing price by a largeoligopoly firm may not be economical for thefirm, as this would involve additional salespromotion expenditure in the form of new listsand catalogues, notification to dealers, etc.
3. The 'going' price of the product may have beenthe result of long negotiations, manoeuvers, etc.
4. The firm concentrates on a vigorous salespromotion policy rather than price cut.
5. Even when firms enter into collusion, themutually agreed price is kept low in order tomake the entry of new firms unattractive.

11.13 SELF CHECK EXERCISE

1. Define monopolistic competition.
2. Write a short-note on characteristics of monopolistic competition,
3. Write a short-note on Group equilibrium.
4. Define selling costs.
5. Define oligopoly.
6. Write short-note on open or closed oligopoly.
7. Discuss in brief price leadership model.

11.14 SUMMARY

Monopolistic Competition refers to the market situation **in which there is** a keen competition, butneither perfect nor pure, among a group of a large number of small producers or suppliers havingsome degree of monopoly because of the differentiation of their products. Thus, we can say thatmonopolistic competition (or imperfect competition) is a mixture of competition and a certain degreeof monopoly, on the basis of a correct appraisal of the market situation. The word Oligopoly is derivedfrom two Greek words - 'Oligi' meaning 'few' and 'Polein' meaning 'to sell'. An Oligopoly market situationis also called 'competition among the few'. An oligopoly is an industry which is dominated by a few firms.In this market, there are a few firms which sell homogeneous or differentiated products. Also,

as thereare few sellers in the market, every seller influences the behavior of the other firms and other firmsinfluence it. Oligopoly is either perfect or imperfect/differentiated. In India, some examples of anoligopolistic market are automobiles, cement, steel, aluminum, etc.

11.15 GLOSSARY

- **Group Equilibrium in Monopolistic Competition means** the concept of groupequilibrium was introduced by Chamberlin. Group equilibrium represents the price and output oforganizations having close substitute. However due to product differentiation, it is difficult to formmarket demand schedules and supply.
- **Monopolistic competition** characterizes an industry in which many firms offer products orservices that are similar, but not perfect substitutes. Barriers to entry and exit in a monopolisticcompetitive industryare low, and the decisions of any one firm do not directly affect those ofits competitors.
- **Oligopoly is** a market structure with a small number of firms, none of which can keep theothers from having significant influence. The concentration ratio measures the market share of thelargest firms. A monopoly is one firm, duopoly is two firms and oligopoly is two or more firms.
- **Price leadership** occurs when a pre-eminent firm (the price leader) sets the price of goods orservices in its market. This control can leave the leading firm's rivals with little choice but to follow itslead and match the **prices** if they are to hold on to their market share.
- **Selling costs** are defined as those costs which are incurred by monopolistically competitivefirm 'to alter the position or shape of the demand curve for a product'. The purpose of selling cost is,thus, to capture the saleable markets so as to increase total revenue and, ultimately, profit.

11.16 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 11.0.
2. For answer refer to section 11.2.
3. For answer refer to section 11.3 (c).
4. For answer refer to section 11.5 (a)
5. For answer refer to section 11.6
6. For answer refer to section 11.8 (b).
7. For answer refer to section 11.10.

11.17 TERMINAL QUESTIONS

1. What do you understand by monopolistic competition? Discuss it characteristics.
2. Discuss the assumption of the Group Equilibrium Model Chamberlin.

3. Define Oligopoly. Discuss the features of oligopoly.
4. Discuss the importance and kinds of price leadership model.

11.18 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis, Managerial Economics, Prentice Hall of India.
3. Dwivedi D N, Managerial Economics, Vikas Publishing House Pvt. Ltd.
4. Peterson, Lewis and Jain, Managerial Economics, Pearson
5. Sadananda, Managerial Economics, Prentice Hall of India

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CHAPTER-12

PRICING POLICY AND METHODS

STRUCTURE

12.0 INTRODUCTION:

Pricing is not an easy task. There are manypricing problems with practical consideration. Thefollowing are the general considerations, involved informulating a pricing policy by a manufacturer or afirm.

12.1 LEARNING OBJECTIVES

After studying this lesson you will be able to understand the concept and meaning of market structure, goal of profit, objectives and factors involved in pricing policy. The methods and need for administered prices, the objectives of administered prices, the policies used for pricing and their types.

12.2 KIND OF MARKET STRUCTURE

Pricing policy is set in the light of the market.Ifthe firm is operating under perfect competition, it actsonly as price taker. The firm has a pricing problem,when there is imperfect or monopolistic competition.Under monopoly the firm is a price maker. It has toset its own price policy. Usually, firm today operatesunder imperfect competition. The following are themajor objectives of a business firm:

- **Survival**
- **Rate of Growth and Sales Maximisation.**
- **Market Shares.**
- **Target Return on Investment.**
- **Preventing Competition.**
- **Making Money.**
- **Price Stabilisation.**

In practice, the following interrelated pricing'objectives are set.

- return on investment;
- anticipated rate of growth;
- the market share;
- to stabilise prices and profit margins;

12.3 GOAL OF PROFIT

Pricing should normally aimed at stimulating andmaximization profit. Sometimes, the firm also seekprofit maximization.

(a) Welfare of the Firm

Prices should be set to promote the long runwelfare and well-establishment of the firm inthemarket.

(b) Flexibility

The policy should be flexible enough to meetthe changes of the demand and market situation.

12.4 OBJECTIVES OF PRICE POLICY

The firm may aim at the following objectives: -

(i) Price-Profit Satisfaction : The firms are interested in keeping their prices stable within certain period of time irrespective of changes in demand and costs, so that they may get the expected profit.

(ii) Sales Maximisation and Growth : A firm has to set a price which assures maximum sales of the product. Firms set a price which would enhance the sale of the entire product line. It is only then, it can achieve growth.

(iii) **Making Money :** Some firms want to use their special position in the industry by selling product at a premium and make quick profit as much as possible.

(iv) **Preventing Competition :** Unrestricted competition and lack of planning can result in wasteful duplication of resources. The price system in a competitive economy might not reflect society's real needs. By adopting a suitable price policy the firm can restrict the entry of rivals.

(v) **Market Share :** The firm wants to secure a large share in the market by following a suitable price policy. It wants to acquire a dominating leadership position in the market. Many managers believe that revenue maximisation will lead to long run profit maximisation and market share growth.

(vi) **Survival :** In these days of severe competition and business uncertainties, the firm must set a price which would safeguard the welfare of the firm. A firm is always in its survival stage. For the sake of its continued existence, it must tolerate all kinds of obstacles and challenges from the rivals.

(vii) **Market Penetration :** Some companies want to maximise unit sales. They believe that a higher sales volume will lead to lower unit costs and higher long run profit. They set the lowest price, assuming the market is price sensitive. This is called market penetration pricing.

(viii) **Marketing Skimming :** Many companies favour setting high prices to 'skim' the market. Dupont is a prime practitioner of market skimming pricing. With each innovation, it estimates the highest price it can charge given the comparative benefits **of its new** product versus the available substitutes.

(ix) **Early Cash Recovery :** Some firms set a price which will create a mad rush for the product **and** recover cash early. They may also set a low price as a caution against uncertainty of the future.

(x) **Satisfactory Rate of Return :** Many companies try to set the price that will maximise current profits. To estimate the demand and costs associated with alternative prices, they choose the price that produces maximum current profit, cash flow or rate of return on investment.

12.5 FACTORS INVOLVED IN PRICINGPOLICY

The following are the important factors, determining of a pricing policy of any firm.

- Costs;
- Demand and Consumer Psychology;
- Competition;
- Profit; and
- Government policy;

12.6 PRICING METHODS

There are four important methods of pricing;

- Cost plus or full cost pricing.

- Going rate policy.
- Pricing based on rate of return.
- Administered prices.

(a) Cost Plus Pricing

Cost plus pricing is most commonly adopted.Under this method, cost of a product is determineand a margin of profit is added on the basis of whichthe price is determined.

Cost plus Pricing = Cost = Fair Profit.

In cost plus pricing cost refers to full allocated cost.

- Actual cost;
- Expected cost; and
- Standard cost

Actual cost refers to historical cost for the latest available period. It covers wage bills, raw material costs, and overhead charges at the then currentoutput rate.

Expected cost means a forecast for the pricingperiod on the basis of expected prices; output ratesand productivity.

Standard Cost refers to a normal cost determination at some normal rate of output at a givenlevel.

Profit. Profit is usually meant a fixed percent**age of profit**

Apparently, the profit" cost plus principle inpractical business is fundamentally different from theconcept of'normal profit' in economic analysis.

However, cost plus pricing method is regardedas more suitable when the producers are uncertainabout the market demand.

(a) Shortcomings of the Cost Plus PricingMethods :-

- The following are the major drawbacks of theCost Plus Methods
- It ignores consumer's preference and demand.
- It takes only costs and firm's profit margin intoaccount
- It does not take account competition.
- It ignores rival's reaction in prescribing a pricefor the firm's product.
- It ignores the significance of incremental costs inpricing decision.
- It ignores economic tools altogether.

(b) Rate of Return Pricing

Another method, that the firms use to determine the average profit mark-up on costs method.

Under this methods, price is determined alongwith a planned rate of return on investment. Theprofit margin s determined on the basis of a normalrate of production. The total cost of a year's normalproduction is estimated. The mark-up percentage ofprofit margin is obtained.

Mark-up Profit Margin =? c R where c = capital arid R = return

This method is essentially cost plus pricingmethod but an improved one since it builds price oncost.

(c) Going Rate Pricing

The going rate is opposite of fell cost, or costplus pricing.

The going rate pricing is usually used inoligopoly and monopolistic competition. The goingrate pricing policy tries to adjust its own price policy in time with the general pricing structure.

The going rate pricing is adopted when:

- Costs are difficult to measure; and
- The firm wants to avoid competition from rival
- When there is price leadership of a dominantfirm in the market

(d) Administered Price Method

Administered prices are the prices which are fixed andenforced by the government.

The following are the majorcharacteristics ofadministered prices:

- Administered prices are fixed by me government
- Administered prices are regulatory, i.e., they arelegally enforced by thegovernment.
- Administered prices are regulatoryin nature,
- Administered prices are meant as correctivemeasures.
- Administered prices are the outcome of the pricepolicy of the government.

12.7 NEED FOR ADMINISTERED PRICES

Administered prices imply governmentintervention in the free functioning of the market mechanism.The need for Administered prices or the prices of theprice regulation by the government may be stressedon the following resume.

- To correct the imperfection of the marketmechanism. The government interventionthrough administered price policy is warranted..
- To check the undesirable price rise of essentialconsumption of goods and raw materials.
- To check the undue price rise.
- To provide a relatively stable and assured in-come to the fanners.
- To put a check on high prices charged by theproducers.

12.7 OBJECTIVES OF ADMINISTEREDPRICES:-

The following are the main objectives of a ministered price

- To protect the interest of the weaker sections ofthe society.
- To discourage or encourage the consumption orcertain commodities.
- To mitigate **inflation or** prevent stagflation.
- To raise public revenue.
- To ensure the efficient allocation of resources.

- To ensure equitable distribution of scarcegoods.

(a) Dual Pricing

Dual pricing refers to two types of prices fora commodity, viz., (i) controlled price and (ii) marketprice. Controlled price of the product if directly,fixed up by the government for a certain portion ofthe total output. Its market price is the freely determined market price for the remaining quantity of out-put.

(b) Export Pricing

Export pricing relates to pricing ofproductsexported by the firm.

In determining the export pricing, the firmshould be fully aware of the varied market structuresand changing business environment for the productsin different countries from time to time. Product costis not the only cost for .consideration inexpert pricing. Sales promotion cost is also a crucial faction. Other non-price factors alsoplay significant role inexport marketing. Delivery cost, and demonstrationcosts, display discount costs, rivals prices and business policies, qualities of the products and so onneed to be considered. In a global trading, exportprices are usually decided on the basis of what thetraffic can bear. Pricing of good for exports is oftenunrelated to basic output costs or domestic pricelevel.

(c) Pricing Policy:

A policy frame-work would lead to pricing thatis consistent with the company objectives, costs,competition and demand for the product. A set ofprice policies and strategies will not only make pricesetting easier but also make possible, a series ofprices at various levels of distribution that are rationaland justifiable.

12.9. PRICE VARIATION POLICIES

There can be three variations of such pricevariation policies. These options open to the firm are:

1. Variable price policy.
2. Non-variable price policyand
3. Single price policy.

a. Variable price policy. It is that policy, in whichthe company charges different prices for sale ofits like goods at a given time to similar buyers.The variable price policy is more opted in smallbusiness, where products are not standardized.The greatest advantage of this variable pricepolicy is that it has the highest degree**of**flexibility as a promotional fool. But, it is a timeconsuming affair.

b. Non-variable price policy. It is also called as'one price* policy. The company charges similarprice for sale of like goods at a given time to aclass of buyers. Here, the price charged variesfrom class to class wholesalers, sub-wholesalers, retailers and distributors. It is a popularprice policy followed by all those firms, whichhave indirect marketing arrangements.

c. Single price policy. It is that price policywherein all the buyers irrespective of their class,size or the conditions of purchases are chargedsimilar price. It is equally easy to administer, asthere is no scope for bargaining. This pricepolicy does not find favour with

quantity buyerswho feel that they should have been chargedmuch lower prices than the small-lotpurchasers.

12.10. GEOGRAPHIC PRICE POLICIES

Geographical price policies arc fully reflective ofthe practical<problems of consumers and producersor the sellers locating geographically and the emergent transportation costs of linking them. Takingtransport costs as major thrust, pricing policies aredesigned. The major geographical pricing policiesare: 1. Point of origin price policy. 2. Freight absorption price policy.

a. **Point of origin price policy.** It is that type ofgeographic pricing policy no allowance for thetransportationcosts necessary to move thegoods to the point of destination. There can betwo variations in this policy namely/ex-factory'and 'free on rail' (F.O.R.).

Point of origin price policy leads to the establishment of the geographical monopoly for the firm because, the transportation costs separate thosefirms located in distant areas from competing with thelocal producers.

b. **Freight absorption price policy. Freight**absorption price policy is one that absorbs thetransportation costs fully or partly. That is, theprice quoted is inclusive of transportation costs. There can be three variations of this freightabsorption price policy namely, 1. Uniformdelivered price policy, 2. Zonal policy and 3.Base point price policy.

12.11 PRICE DIFFERENTIAL PRICEPOLICES

Price differentials policies are those policies forwhich the pricing firm accepts the gap between theprice 'quoted to the consumers or dealers and theactual price charged. Such price differentials havebeen accepted as a part of pricing strategies toencourage buyers, to meet competitive pressure. By'price differential we means that the filial price will beless than the quoted price. The forms of pricedifferentials are discount-rebates and premiums.

Discounts: Discount is an allowance made tothe buyers in consideration of marketing services rendered.

'Rebates is a deduction of the quoted price, in order to accommodate the genuine claims, concessions are given in the form of rebate.

12.12 LEADER PRICE POLICY

Leader pricing is one where the firm in the industry initiates the price changes. Itis the one ofprice approximation by followers to that of initiator inthe industry. This pricing policy works on the principle that there is some wisdom in following the established and giant units. It is used by cigarette,sugar, cement, fertilizer, steel, tea, soaps, paints,typewriters etc. companies.

12.13 PSYCHOLOGICAL PRICING

The prices fixed influence the psyche ofcustomer and spur him to action. It is mostlyfollowed to target consumer psychology.

(i) **Skimming price** policy. Skimming pricepolicy sets high price to customers, and then successively lowering the prices, often under increasingcompetitive conditions. It sets prices at high levels to"skimm the cream" the market.

(ii) Penetration price policy. It is an attemptto set low price of the products. It set low initiateprice to establish market share. By setting low initialprices, this makes possible for the firm to enlarge itsmarket share.

12.14 SELF CHECK EXERCISE

1. How Pricing policy is framed by firm? Discuss in brief.
2. What do you understand by profit maximization? Discuss in brief.
3. Write a short-note on factor involved in pricing policy.
4. Define Dual Pricing.
5. Define Discounts.
6. Write a short-note on Psychological Pricing.

12.15 SUMMARY

Pricing policy is a standing answer to recurring question. A systematic approach to pricing requiresthe decision that an individual pricing situation be generalised and codified into a policy coverage ofall the principal pricing problems. Policies can and should be tailored to various competitivesituations. A policy approach which is becoming normal for sales activities is comparatively rare inpricing. Most well managed manufacturing enterprises have a clear cut advertising policy, productcustomer policy and distribution-channel policy. But pricing decision remains a patchwork of ad hocdecisions. In many, otherwise well managed firms, price policy have been dealt with on a crisis basis.This kind of price management by catastrophe discourages the kind of systematic analysis neededfor clear cut pricing policies. Pricing Methods are the ways in which the price of goods and servicescan be calculated by considering all the factors such as the product/service, competition, targetaudience, product's life cycle, firm's vision of expansion, etc. influencing the pricing strategy as awhole. There are several methods of pricing products in the market. While selecting the method offixing prices, a marketer must consider the factors affecting pricing. The pricing methods can bebroadly divided into two groups—cost-oriented method and market-oriented method. The companiescan adopt either of these pricing methods depending on the type of a product it is offering and theultimate objective for which the pricing is being done.

12.16 GLOSSARY

- **Administered prices** are **prices** of goods set by the internal pricing structures of firms thattake into account cost rather than through the market forces of supply and demand and predicted byclassical economics.
- **Economic goals** of full employment, stability, economic growth, efficiency, and equity arewidely considered to be beneficial and worth pursuing. Each goal, achieved by it, improves the overallwell-being of society. Greater employment is typically better than less. Stable prices are better thaninflation.

- **Market structures** include perfect competition, imperfect competition, oligopoly, andmonopoly. Meanwhile, monopolistic competition refers to a market structure, where a large numberof small firms compete against each other with differentiated products.
- **Pricing policy** is a standing answer to recurring question. A systematic approachto pricing requires the decision that an individual pricing situation be generalised and codified intopolicy coverage of all the principal pricing problems. Policies can and should be tailored to variouscompetitive situations.
- **Psychological pricing** is the practice of setting prices slightly lower than a whole number.This practice is based on the belief that customers do not round up these prices, and so will treatthem as lower prices than they really are. This type of pricing is extremely common for consumergoods.

12.17 ANSWERS TO SELF CHECK EXERCISE

1. For answer refer to section 12.1.
2. For answer refer to section 12.3.
3. For answer refer to section 12.5.
4. For answer refer to section 12.8 (a).
5. For answer refer to section 12.10 (c).
6. For answer refer to section 12.13.

12.18 TERMINAL QUESTIONS

1. Discuss the objectives of business firms.
2. Enumerate the different factors involved in pricing policy.
3. Discuss different methods of pricing.
4. What do you understand psychological pricing? How it is different from leader pricing.

12.19 SUGGESTED READINGS

1. Jain, T.R., Business Economics, V K Publications
2. Peterson and Lewis, Managerial Economics, Prentice Hall of India.
3. Dwivedi D N, Managerial Economics, Vikas Publishing House Pvt. Ltd.
4. Peterson, Lewis and Jain, Managerial Economics, Pearson
5. Sadananda, Managerial Economics, Prentice Hall of India

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MASTER OF BUSINESS ADMINISTRATION (MBA)
1st SEMESTER

COURSE NO. 103 **MANAGERIAL ECONOMICS**

OBJECTIVE OF THE COURSE:

The objective of this course is to make the students conversant with such basic concepts and tools of economic analysis, which have an important bearing on managerial decision-making, which would enable the students to understand the economic forces governing industry and business.

Unit-I

ECONOMIC BACKGROUND TO MANAGEMENT:-

Economics as discipline, the economic problem, the circular flow of economic activities, functions of an economic system. The business firm and its objectives.

Unit-II

MANAGERIAL ECONOMICS;

Nature & Scope of Managerial Economics, Five Fundamental Concepts in decision making: incrementalism, Marginalism, The Equimarginal Principle, The Time Perspective, The Discounting Principle, The Opportunity Cost.

Unit-III

DEMAND ANALYSIS:

Types & Determinants of Demand, Law of Demand, The Elasticity of Demand, Elasticity of Demand Demand Forecasting; Approaches to Forecasting, Forecasting Methods.

Unit-IV

COST ANALYSIS:

Cost concept, nature, types and managerial uses of cost, Determinants of Costs Production function. Break-even analysis.

Unit-V

PRICE ANALYSIS:

Pricing, Methods & Strategies of Pricing, Price Discrimination, Psychological Aspects of Pricing.Price determination in Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly.

Recommended Texts:

- DC. Hauge: Managerial Economics, Analysis for Business Decisions.
- H. Craig Petersen
  W. Cris Lewis Managerial Economics.
  M. Adhikari Managerial Economics.
- L. Bobbins :- An Essay on the Nature and Significance of economic Science.
- Christopher:- Savagte and John R. Small: Introduction to Managerial Economics.
- Leftwich Price System and Resources Allocation.
- W.W. Haynes' V. L. Mote and S. Paul: Managerial Economics, Analysis and Cases.
- Peferson, Lewis and Jain, Managerial Economics' Pearson.
- Pousty Sodanauda, Managerial Economies, PHI.
- Ceupster U.S., Managerial Economics, School Kart. Technologies Pvt. Ltd.

ASSIGNMENTS

Q.1 Define economic problem and circular flow of economic activity in an underdeveloped economy like India.

Q.2 How does managerial economics help to decision making for a business firm?What is the scope of managerial economics.

Q.3 Explain the methods of demand forecasting.

Q.4 What do you understand by product line pricing. :

M.B.A. Examination
Managerial Economics
Paper-103

Time allowed : 3 Hours **Max. Marks : 60 (Regular)**
100(ICDEOL)

The candidate shall limit their answers precisely within the answer-book (40 pages) issued to themand no supplementary/continuation sheet will be issued.

Note: Attempt Five questions in all, selecting atleast One questions from each unit. All questionscarry equal marks.

UNIT-I

I. Explain the various functions of economics system and role of price mechanism in thecontext of Indian economy.

II. Why is it important to state a managerial objective? Could the assumption that themanagers objective is profit maximization be useful even if their real objective ismaximizing market share? Discuss.

UNIT-II

III. How is managerial economics related to economics mathematics, statistics andaccounting? Explain, Also bring our theimportance of managerialeconomics.

IV. Write notes on

i) The equimarginal Principle

ii) The discounting Principle.

UNIT-III

V. Whatdo you understand by demand forecasting? Also explain the various methods ofdemand forecasting,

VI. a) Discuss the factor affecting price elasticity of demand.

b) Explaintheimportanceofpriceelasticityofdemandinbusinessdecision-making.

UNIT - IV

VII. a) Distinguish between costs in the short run and costs inthe long run. also explain theimportance of this distinction.

b) Write a brief note on Break-even chart.

VIII. Explain the methods of estimating the long-run average cost curve adopted by economists.

UNIT-V

IX. How pricingof a product is determined in monopolistic competition?

X. Write notes on:

a) Differential Pricing

b) Target Pricing. . .

c) Cost-plus pricing,

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100 (ICDEOL)

The candidate shall limit their answers precisely within the answer-book (40 pages) issued to themand no supplementary/continuation sheet will be issued.

Note: Attempt Five questions in ail, selecting One question from each unit. All questions carry equal marks.

UNIT-I

I. What is a Business firm ? Discuss in detail the production and market share objective of thefirm.

II. Describe with examples the Circular flow of economic activities. Also explain the role ofprice mechanism in an economics system.

UNIT-II

!II. "The purpose of Managerial Economics is to show economic analysis can be used informulating Business Policies." Examine this statement.

IV. What is the significance of Opportunity cost in business decisions?

UNIT-III

V. What do you mean by Demand Analysis ? Describe its objectives. Explain the methods ofDemand Forecasting.

Vl. Explain the degree of 'Price Elasticity of Demand". Discuss main methods adopted tomeasure the elasticity of demand.

UNIT - IV

VII. Define the terms'fixed costs', 'variable costs', semi-variable costs' and give example ofeach one. Why are sunk costs not relevant in decision making ?

VIII. Expenses and Costs are often used interchangeably. Yet they do not always mean thesame thing. Distinguish between the two terms.

UNIT-V

IX. "The prima facie interest of the monopolist is to sell his commodity in such a way as toafford him the greatest revenue." Comment. Discuss the long-term considerations whichaffect the Price policies of a Monopolist.

X. "The success or failure of a Business depends to a large extent on its Price Policy." Discussvarious types of pricing policies.

M.B.A. Examination
Managerial Economics
Paper-103

Time ; 3 Hours **Max. Marks: (Regular) 60**
(ICDEOL) 100

The candidates shall limit their answers precisely within theanswer-book (40 pages) issued to them and nosupplementary/continuation sheet will be issued.

Note : Attempt 5 questions in all, selecting at least onequestion from each unit. All questions carry equalmarks.

Unit-I

1. What is an economic problem? How doesit arise?Explain majorcentralproblemsofan economy.
2. Describe the circular flow of economic activities in a foursector model. State the significance of circular flow ofnational income.
3. Explain the nature & scope of Managerial Economics;
4. Write short notes on:
   i) The opportunity cost.
   ii) Equi - Marginal Principle.

Unit-III

5. What is price elasticity of demand? How can it bemeasured?
6. Explain the need for demand forecasting. Describevarious approaches to demand forecasting.

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