



# VELS



INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)  
(Deemed to be University Estd. u/s 3 of the UGC Act, 1956)  
PALLAVARAM - CHENNAI  
INSTITUTION WITH UGC 12B STATUS

**DCBEC-13**

# Managerial Economics



**B.Com, BBA**  
**ODL MODE**  
**(Semester Pattern)**

**School of Management Studies and Commerce**

Centre for Distance and Online Education

Vels Institute of Science, Technology and Advanced Studies (VISTAS)

Pallavaram, Chennai - 600117

**Vels Institute of Science, Technology  
and Advanced Studies**

**Centre for Distance and Online Education**

**BBA / B.Com- ODL Mode**  
(Semester Pattern)

**DCBEC-13: Managerial Economics**

(4 Credits)

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## FOREWORD



**Dr. Ishari K Ganesh**  
**Chancellor**

Vels Institute of Science, Technology and Advanced Studies (VISTAS), deemed to be a university, was established in 2008 under section 3 of the Act of 1956 of the University Grants Commission, Government of India, New Delhi.

VISTAS has blossomed into a multi-disciplinary Institute offering more than 100 UG & PG Programmes, besides Doctoral Programmes, through 18 Schools and 46 Departments. All the Programmes have the approval of the relevant Statutory Regulating Authorities such as UGC, UGC-DEB, AICTE, PCI, BCI, NCTE and DGS.

The deemed to be University aims to provide innovative syllabi and industry-oriented courses, and hence, the revision of curricula is a continuous and ongoing process. The revision is initiated by the faculty depending on the requirement and approved by the Board of Studies of the concerned Department/School. The courses are under Choice Based Credit Systems that enable students to get adequate freedom in choosing subjects.

I am pleased to inform you that VISTAS has been rendering its services to society to democratize the opportunities of higher education for those who are in need through Open and Distance Learning (ODL) mode.

VISTAS ODL Programmes offered have been approved by the University Grants Commission (UGC) – Distance Education Bureau (DEB), New Delhi.

The curriculum and syllabi have been approved by the Board of Studies, Academic Council, and the Executive Committee of the VISTAS, and they are designed to help provide employment opportunities to the students.

The ODL Programme (B.Com., BBA and MBA) study material have been prepared in the Self Instructional Mode (SIM) format as per the UGC-DEB (ODL & OL) Regulations 2020. It is highly helpful to the students, faculties and other professionals. It gives me immense pleasure to bring out the ODL programme with a noble cause of enriching learners' knowledge. I extend my congratulations and appreciation to the Programme Coordinator and the entire team for bringing up the ODL Programme in an elegant manner.

At this juncture, I am glad to announce that the syllabus of this ODL Programme has been made available on our website, [www.vistas.ac.in](http://www.vistas.ac.in), for the benefit of the student fraternity and other knowledge seekers. I wish that this Self Learning Materials (SLM) would be a nice treatise to the academic community and everyone.

**CHANCELLOR**

## FOREWORD



**Dr.S.Sriman Narayanan**  
**Vice-Chancellor**

My Dear Students!

Open and Distance Learning (ODL) of VISTAS gives you the flexibility to acquire a University degree without the need to visit the campus often. VISTAS-CDOE involves the creation of an educational experience of qualitative value for the learner that is best suited to the needs outside the classroom. My wholehearted congratulations and delightful greetings to all those who have availed themselves of the wonderful leveraged opportunity of pursuing higher education through this Open and Distance Learning Programme.

Across the world, pursuing higher education through Open and Distance Learning Systems is on the rise. In India, distance education constitutes a considerable portion of the total enrollment in higher education, and innovative approaches and programmes are needed to improve it further, comparable to Western countries where close to 50% of students are enrolled in higher education through ODL systems.

Recent advancements in information and communications technologies, as well as digital teaching and e-learning, provide an opportunity for non-traditional learners who are at a disadvantage in the conventional system due to age, occupation, and social background to upgrade their skills.

VISTAS has a noble intent to take higher education closer to the oppressed, underprivileged women and the rural folk to whom higher education has remained a dream for a long time.

I assure you all that the Vels Institute of Science, Technology and Advanced Studies would extend all possible support to every registered student of this deemed to be university to pursue her/his education without any constraints. We will facilitate an excellent ambience for your pleasant learning and satisfy your learning needs through our professionally designed curriculum, providing Open Educational Resources, continuous mentoring and assessments by faculty members through interactive counselling sessions.

This university brings to reality the dreams of the great poet of modern times, Mahakavi Bharathi, who envisioned that all our citizens be offered education so that the globe grows and advances forever.

I hope that you achieve all your dreams, aspirations, and goals by associating yourself with our ODL System for never-ending continuous learning.

With warm regards,

**VICE-CHANCELLOR**

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## Course Introduction

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The DCBEC-13 Course, **Managerial Economics** has been divided in to five Blocks consisting of 20 Units. The concept of Introduction to Managerial Economics has been given in Block-1.

The Block-1 **Introduction to Managerial Economics** has been divided in to four Units (Unit-1 to Unit-4). Unit-1 describes about the Introduction to Managerial Economics and various definitions given by eminent Economists, Unit-2 gives you Nature and Scope of Managerial Economics, Unit- 3 explains about the fundamental Principles of Managerial Economics and Unit-4 comprises the risk and uncertainty.

The Block-2 **Demand and Supply Analysis** is classified into four Units (Unit-5 to Unit-8). Unit 5 discuss about demand, law of demand and elasticity of demand, Unit-6 includes the concepts in supply and elasticity of supply, Unit- 7 explains about the concept of demand forecasting and the Unit-8 gives you the concept of pricing policy.

The Block-3 **Production and Cost Analysis** is divided in to four Units (Unit-9 to Unit-12). Unit-9 gives you the concept of production, production function, economies and diseconomies of scale, Unit-10 describes about the theory of production, Unit-11 presents about cost of production and the Unit 12 gives you the detailed explanation of cost output relationship.

The Block-4 **Markets** is divided into four Units (Unit-13 to Unit-16). Unit-13 explains about Perfect Competition, Unit-14 describes about Monopoly Competition, Unit-15 explains about Monopolistic Competition and Unit-16 explain you about the Oligopoly Competition.

The Block-5 **Factor Pricing** is divided into four Units (Unit-17 to Unit-20). Unit-17 explains about Marginal Productivity Theory of Distribution, Unit-18 describes about Ricardian Theory of Rent, Unit-19 describes about the Classical theory of interest and finally the Unit-20 explains about the Profit concepts.

### DCBEC-13: Managerial Economics

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## **Block-1: Introduction**

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Block-1: Introduction to Managerial Economics consists of four Units and the Unit- 1: **Managerial Economics- Introduction** deals with Introduction, Definition, Features of Managerial Economics, Difference between Managerial and Traditional Economics, Role of Managerial Economist in Business and the Decision Making Process.

Unit- 2: **Nature and Scope of Managerial Economics** describes about the Nature of Managerial Economics, the Significance of Managerial Economics, the Contribution of other subjects in Managerial Economics and the Scope of Managerial Economics.

Unit- 3: **Fundamental Principles of Managerial Economics** presents the Introduction to fundamental concepts of Managerial Economics, the Incremental Concept, the Concept of time Perspective, Discounting Principle, Opportunity Cost Principle, Equi-marginal Principle and the Explanation for fundamental concepts.

Unit- 4: **Risk and Uncertainty** explain about the Introduction, Uncertainty, Types of Risk, the Difference between Risk and Uncertainty.

In all the units of Block -1 Introduction to Managerial Economics, the Check your progress, Glossary, Answers to Check your progress and Suggested Reading has been provided and the Learners are expected to attempt all the Check your progress as part of study.



# Unit-1

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## Managerial Economics-Introduction

### STRUCTURE

Overview

Objectives

1.1. Introduction

1.2. Definition

1.3. Features of Managerial Economics

1.4. Difference between Managerial and Traditional Economics

1.5. Role of Managerial Economist in Business

1.6. Decision Making Process

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings.

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### Overview

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In this unit, the meaning, Definition and features of Managerial Economics, Differences between Managerial and Traditional Economics, Role of Managerial Economist in Business and the decision Making Process has been very clearly explained.

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### Objectives

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After reading this unit, students should be able:

- To understand the fundamental concepts of Managerial Economics
  - To know the role and responsibilities of a manager
  - To use economic concepts to understand business and solve managerial problems.
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### 1.1. Introduction

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Managerial Economics is a subject which deals with decision making tools in business practices. It is a branch of micro economics which bridges the economic theories with business practices. Managerial Economics is an integral part of economics which allows all the concepts

that are useful for the business decision making in business. In easy words, it is an economic discipline dealing with both economic and non-economic concepts which are used in business practices in order to make optimal decision making. The other synonymised used for Managerial Economics are Business economics, Decision-making Economics, Executive Economics and Management economics.

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## **1.2. Definitions**

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Different authors have defined the term Managerial Economics in different ways. The following definitions are in practice to define the Managerial Economics.

1. Milton H. Spencer and Louis Siegelman.

According to them, “Managerial Economics is the integration of economic theory with business practices for the purpose of facilitating decision making and forward planning by management”<sup>1</sup>

2. E.F Brigham and J.L Pappas.

E.F Brigham and J.L Pappas defined as, “Managerial Economics is the application of Economic theory and methodology to business administration practices”<sup>2</sup>

From the above definitions, we understand that

- a. Managerial Economics integrates economic theory and business practices
- b. It facilitates the decision making process in business
- c. It enhances the business practice through forward planning
- d. It is a subject used by the management for the business decisions
- e. It is the application of theory and methodology in business administration. It is to be noted that Managerial Economics uses not only includes the economics concepts but also some selected non-economic concepts which are useful for business decision making process. In comprehensive view,
- f. Managerial Economics is a hybrid discipline extracted mainly from Economics for Business Administration and Management, along with selective topics from Mathematics, Statistics, Accounts and Operation Research which are useful for Business decision making.

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### 1.3. Features of Managerial Economics

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Managerial Economics is an integration of economic theory with business practices. The features of Managerial Economics are

1. Managerial Economics is practical, realistic and pragmatic for business
2. It is a science for business practice in decision making process
3. It is both theoretical and practical in content, which helps in decision making process.
4. It is micro in nature but it provides room for macroeconomic concepts like national income accounting, inflation, deflation and trade cycles etc.
5. It deals with not only the economic concepts but also non-economic concepts which are useful for business practice.
6. Consideration of technology-knowhow, external factors of business like environmental impacts, social elements, political factors and cultural values etc.
7. The economic implications of other disciplines like mathematics, statistics, engineering, accounting, operation research and psychology etc., for facilitating the managerial decisions.

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### 1.4. Difference between Managerial Economics and Traditional Economics

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The differences between the Managerial Economics and traditional economics are summarized as

**Table 1.1. Managerial Economics vs Traditional Economics**

S. No.	Factors	Managerial Economics	Traditional Economics
1	Nature	It is micro in Nature	It is both micro and macro in nature
2	Approach	It is a normative approach	It is both positive and normative approach
3	Factors of Production	It deals with only one factors of production, the Organization	It deals with all factors of production, Land, Labour, Capital and Organisation

4	Factor Remuneration	It involves with only one factor remuneration, the profit (organization)	It includes all the factor remunerations, Rent, Wage, Interest and profit the factors of production Land, Labour, Capital and organization respectively
5	Content	It includes only the practical aspects of economics for the business	It includes both theory and practical aspects of economics.
6	Concepts	It includes both economic and non-economic concepts	It includes only economic concepts
7	Subjects	It includes many topics from other subjects which are useful for the business practice	It consists only the economic theory and practice
8	Aim	The aim of managerial economics is to make effective decision in business	Aim of the economics is to attain the development and growth for the nation.
9	Optimization	The main object of managerial economics is to maximize the profit and minimize the cost	The main object of economics is social welfare and developmental activity in an economy.
10	Scope	The scope is limited with business decision making	The scope is wide as it deals with all economic issues

Mentioned differences there are many other differences between Managerial Economics and Traditional Economics. For example,

economics had its origin from several centuries back while Managerial Economics started only from a few decades back. Generally, a specialist in Managerial Economics is called Manager, Administrator, Businessman or Entrepreneur whereas specialist in economics is called Economist.

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### **1.5. Role of Managerial Economist in Business**

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The Managerial Economics guides the managers in business as it is developed for the purpose of making effective decision making process in business or corporate world. This subject is a mainly derived from micro economics for conducting business within focus and on macroeconomic concepts mainly for dealing with external environment of business. By using required concepts mainly from economics and inclusion from other subjects, are related to business practice. Normally the roles of managers are divided into three categories, viz., general duties, specific duties and business responsibilities. The routine and day today affairs of business are categorized under general duties. The specific tasks decided by the management are categorized under specific duties, whereas all other works are considered as business responsibilities. Instead of mentioning the work of the manager into general, specific or business responsibilities, the role of manager in business can be expressed in the following manner.

There are thirteen prescribed functions for the manager extracted from Managerial Economics. The key is applicable for all disciplines however it is apt for Managerial Economics to specify the role of managers

The key word of Managerial Economics is '**act**', an instruction to manager, which is present in all the key factors of Management and administration of business. The business economy relies on four **factors**, Land, Labour, Capital and Organization. These four are called **factors** of Production. With the help of these four factors of production, a manager should start the production of products, called '**Manufacturing**'. Once he/she needs to manufacture a product, it demands the place to produce, called '**Factory**'. The purpose of manufacturing a product in a factory is to "**Transact**". Transacting the manufactured product in a factory must be up to the expectation of the consumer, called "**Satisfaction**". In order to know the expectation of the consumer, a manager should reach the consumer, through '**Contact**'. After understanding the requirement of the consumer, it is the duty of the manager to enter a legal binding with suppliers and distributors, called '**Contract**'. After production and distribution of the product, a manager should know the feedback from the customer, in order to improve or expand the business, called '**Impact**'. For the purpose of endorsing the parties related to business, a manager should proceed the work called '**Enact**'. It is the duty of the manager to maintain the quality of

the product, by initiating the legislation, called 'Act'. Keeping the accounts for the business and sharing the essence of business report, called 'Abstract'. The overall governance of business depends on the particular deed, known as 'Interact', which may pave way to innovate new strategies and policies for the business via 'Practice'. Therefore the role of manager starts before with the handling the raw materials i.e., the factors of production and ends with after sale service of the product i.e., new business practices. In other way, his work starts from forecasting the demand for the product, before producing the product and ends with maintaining the customers who have received the finished product.

In easy words, the role of managerial starts from the preparatory work for manufacturing and ends with Practice.

**The Table 1.2 .Portrays the role and responsibilities of a Manager**

<b>S. No.</b>	<b>A C T</b>	<b>Subjects in Management Studies</b>	<b>Role of Managers</b>
1	Factors of Production	Business Economics for decision making	Dealing with Land, Labour, Capital and Organisation
2.	Manufacture	Materials Management	Dealing with material handling, i.e., raw materials, semi-finished goods and finished goods
3	Factory	Production Management	Dealing with production process and Production layouts and type of industries.
4	Satisfaction	Total Quality Management and Supply chain management	Dealing with quality control measures, from production process to distribution process
5	Transact	Marketing Management	Dealing with supplier, Distributors and Consumers
6	Contact	Human Resource Management	Dealing not only with the customer but also with the employees
7	Contract	Business law – Indian contract act 1972	Dealing with the legal Issues and other statutory provisions

8	Impact	Strategic Management	Dealing with new methods and strategies for Improving the business
9	Enact	Legislations relating to industry – Industrial development act, industrial dispute act etc.	Dealing with employees and completion of legal formalities like industrial approval and industrial License
10	Act	Legal system for business	Dealing with government affairs, like registering the company, preparing the prospectus, filing the returns etc.
11	Abstract	Financial accounts and management accounts	Dealing with book keeping accounts for the purpose of auditing which includes financial, management and corporate accounts maintenance.
12	Interact	CRM - Customer Relationship Management and Business Communication	Dealing with customer – conducting market survey and demand forecasting for the product
13	Practice	Business Organization and Management	System management for materials and production. Planning, organizing, staffing directing and controlling.

## **1.6. Decision Making Process**

### **Definition of Decision Making:**

**The important definitions of management are as follows:**

#### **1. In Simple word:**

“Decision-making is the selection of one course of action from two or more alternative courses of action. It is a choice-making activity and the choice determines our action or inaction.”

#### **2. According to George R. Terry:**

“Decision-making is the selection based on some criteria from two

or more possible alternatives.”

### **3. Philip Kotler has defined decision-making as under:**

“A decision-making is a conscious choice among alternative courses of action.”

It is clear from the above definitions that if there is only one course of action, the question of decision-making does not arise. But when more than one alternative courses are open before us then the selection of the best alternative is called decision-making.”

### **Characteristics or Features of Decision Making:**

#### **The important characteristics of decision-making are as follows:**

1. Decision-making is a selective process in which only the best possible alternative is chosen.
2. Decision-making involves careful evaluation and analysis of all the possible alternatives.
3. Decision-making is the responsibility of the management executives at all levels.
4. It is a continuous process which goes on throughout the life of an organisation.
5. It is a mental process which involves deep thinking and foreseeing things.
6. It may be positive to do a certain thing or negative not to do a certain thing.
7. Decisions are normally taken on the basis of past experiences and present circumstances for a future course of action.
8. It is not an end in itself but a means to reach the goal.
9. If necessary experts and specialists should be consulted before making a particular decision.
10. Decisions exert great influence on the success or failure of an organisation. Therefore, they should not be made in a hurry or without close scrutiny and thinking.

### **Main Elements of Decision Making:**

#### **The main elements of decision-making are as follows:**

##### **1. Concept of Best Decision:**

Rational decisions must conform the basic concept of good decision.



**Curdiff and Still:****Mentions three keys to rational decision-making:**

- (i) Conceptualization,
- (ii) Information,
- (iii) Prediction:- are the three main keys to rational decision-making. The problem should be thoroughly analysed and all possible alternatives be fully considered.

**Rational decisions require:**

- (a) Intelligence,
- (b) Insight, and
- (c) Lot of experience.

**2. Organisational Environment of the Company:**

Organisation environment also exert great influence on decision-making. Some organisations believe in rigid centralisation while others have faith in decentralisation and leave the routine decision-making function with the departmental heads.

Further, in the interest of the company it has been suggested that the policy matter decision must be left with the top management and leave the ordinary day to day routine matter decisions to the various departmental heads. External, Social, Political and Economic environment also influence decision-making. But instable political conditions in the country are not conducive to important decision-making.

**3. Psychological Elements:**

In psychological elements personal traits like preferences, intellectual maturity experience, educational standard, social and religious designation and status etc., of the person responsible for the decision-making also exert great influence on decision-making.

Further in company the manager's habits, temperament, social environment, upbringing domestic life and political learning's all have to trace his choice of alternative, consequently on his decisions.

**4. Timing of Decisions:**

Decisions must be taken at the appropriate time keeping in view the prevailing conditions. Marketing aim should also be taken into consideration and time required for achieving the aim. Any decision

taken in time leaves a lasting impression on the mind of those who are affected by the decision.

#### **5. Communication of Decisions:**

When a particular decision has been taken it must be communicated properly in time to the persons concerned. Decision should be communicated to the subordinate executives in a courteous, simple and understandable language. There should not be any ambiguity in the language written. It should be in a very simple language.

#### **6. Participation of Employees:**

Participation of the employees in decision-making makes its implementation easier. Employee's participation has certain advantages and it ensures loyalty of the employees towards the organisation. It arouses the feeling of oneness with the company and the decision taken are considered as superior. It helps in enhancing the efficiency of the organisation which helps in attaining the goals of the organisation.

#### **Importance of Decision Making in Management:**

The Management and decision are two very important activities which cannot be separated. Both move together. Decision-making is the main business of management and it has been considered as soul of management. Decision should always be taken after a great deal of deliberations and it should be taken quickly and as far as possible intuition based.

#### **Sound decisions are always information based and are a combination of:**

- (a) Judgement, and
- (b) Information (on facts) based.

But information based decisions have many major problems, which arise at irregular intervals. Sound decisions live for a long time because it is very difficult and awkward to change decisions once they are made.

#### **Scientific Process of Decision Making:**

#### **The process of decision-making has been divided under two heads:**

1. Traditional method or Symptomatic Diagnosis.
2. Scientific method.

## **1. Traditional or Symptomatic Diagnosis:**

This decision is taken on the basis of—limited knowledge, experience and intuitions. There is no scientific analysis involved in this. In this decision taken are not logical. This method is also known as “**Symptomatic Diagnosis**”. The Physicians in ancient times diagnosed the ailment on the basis of symptoms only.

In the same way the management also resolves the various problems facing the organisation on the basis of symptoms. Now-a-days an expert doctor relies not only on external symptoms but makes use of accurate X-ray, E.C.G. reports etc.

## **2. Scientific Method:**

**The process of taking scientific decisions is as follows:**

- (i) Defining the problem, objectives and constraints are studied.
- (ii) Analysis of the problem.
- (iii) Development of alternative solution is searched.
- (iv) Deciding upon the best solution.
- (v) Converting the decision into effective action.
- (vi) Follow up the decision.

### **(i) Defining the problem, objectives and constraints are studied:**

Under this process the nature of problem is considered. Here, a careful study of the external and internal aspects of the problem should be made carefully. The objectives of resolving the problem and constraints in the way of resolving it must also be given due weight-age in order to reach the correct decision.

### **(ii) Analysing the problem:**

It involves careful appraisal of the alternatives and as such to decide which departmental executive should take the particular decision. Who others should be taken into confidence. Whether some specialists have also been consulted in this connection and who should be informed of such decisions.

It should be noted here that all policies and operating decisions should be taken by the top management while routine departmental decisions should be left to be taken by Departmental Heads. To make an important decision thorough analysis of relevant information is needed. If facts and factual information are not available, they may be estimated to the best

of information available.

**(iii) Development of Alternative Solution:**

**To develop alternate solutions following courses be adopted:**

- (a) Spending more on advertisement and publicity,
- (b) Developing the market promotion activities, or
- (c) Appointing more salesmen,
- (d) Improving the quality of the product,
- (e) Packaging should be more attractive or reducing the price etc.

Management should not depend on one solution alone, because if that fails under a peculiar situation the other one might be taken up in its place. It is therefore, essential to consider all possible course of action.

**(iv) Deciding upon the Best Solution:**

It is essential that the decisions be effective there must be co-ordinated, systematic and continuous information of all facts and situation. For example: All decisions on the marketing problem are taken on the basis of complete information available from internal and external sources. In deciding the best solution several factors have to be taken into consideration.

**They are:**

- (a) The ratio of advantages and dis-advantages of each solution.
- (b) Out of all the possible solutions which one is such that require the minimum amount of effort.
- (c) What is the financial limitation of the organisation?
- (d) Which solution is favourable to the circumstances after considering all these factors, the best possible solution should be decided upon?
- (e) Now a day's Operation Research Technique is employed in selecting the best alternative. Each alternative is quantitatively evaluated. Those which cannot be evaluated quantitatively is judged on the basis of experience, knowledge and intelligence.

**(v) Converting the Decisions into Effective Action:**

It is to be noted that a decision what so ever important it may be

if not put into practice effectively it can serve no purpose. The decision taken must reach to the hands of all sub-ordinate officers and staff' and all concerned employees and executives for whom it is meant.

The language of the decision must be simple and understandable. There must be full co-operation from the side of staff in its implementation. Staff should feel that the management decision is their own decision. While taking decision it is essential that sub-ordinates should be involved by their participation. Their participation will help in its implementation and it makes the matter quite simple, efficient and effective.

**(vi) Follow up the Decision:**

Decision making by scientific process is no guarantee that it is cent per cent correct. It is quite possible that it may be defective and might cause loss to the organisation. In order to minimise the chances of loss it is necessary that it should be followed carefully and shortcomings in the decision should be made up by taking suitable steps.

Therefore, the follow-up action has been considered a better scientific decision. Knowledge regarding business is never said to end and perfect, similarly marketing conditions are never stable. There is always uncertainty about the future. So all decisions must be taken considering all aspects of the business.

**Principles of Decision Making:**

Eminent authors of management are of this opinion that on right and appropriate decisions, the success and failure of the enterprise depend. Therefore, a manager has to take all precautions before arriving at a decision.

**Following are the important principles which may be taken into consideration while taking decision:**

**1. Marginal Theory of Decision-Making:**

This theory has been suggested by various economists. Economists believe that a business undertaking works for earning profits. To earn profit is their prime-motto. That is why they agree that the manager must take every decision with the aim in view that the profit of the organisation goes on increasing till it reaches its maximum.

The marginal analysis of the problem is based on law of

diminishing returns. With extra unit of labour and capital put in production, the production increases but it increases at a proportionately reduced rate.

From every extra unit of labour and capital the production diminishes and a time comes when the increase in production stops with 'zero' as the production of the last unit used there in. At this stage a decision is taken to the effect that no additional unit of labour and capital now is required to be introduced in the production.

Production of the last unit is marginal one where-after further in-production of extra-unit becomes un-economical or non-yielding.

**The marginal principle can be effectively and while taking decision on matters relating to:**

- (i) Production,
- (ii) Sales,
- (iii) Mechanisation,
- (iv) Marketing,
- (v) Advertising,
- (vi) Appointment and other matters, where marginal theory can be scientifically and statistically used and a good decision is rendered possible.

## **2. Mathematical Theory:**

There are few other theories like - venture analysis, game theory, probability theory, waiting theory. On the basis of which a manager analyses a given fact and takes decision accordingly. This has given rise to a scientific approach to the decision-making process.

## **3. Psychological Theory:**

Manager's aspirations, personality, habits, temperament, political leanings and social and organisational status, domestic life, technological skill and bent of mind play an important role in decision-making. They all in some form or the other leave an impact on the decision taken by the manager.

He is also bound by his responsibilities and answerability. Decision-making is a mental process and the psychology of those who are deliberating and of the person who takes the final decision has a definite say in decision-making.

#### **4. Principle of Limiting Factors:**

The decisions taken are based on limited factors nevertheless they are supposed to be good because of the simple fact that under the circumstances it was the only possibility.

From this principle it emerges that though there are numerous alternative available to a decision-maker but he takes cognizance to only those alternatives which suit the: (i) time, (ii) purpose, and (iii) circumstances and which can be properly and thoroughly analysed considering the human capacity and then finally one of the alternatives is chosen which form the basis of a decision.

#### **5. Principle of Alternatives:**

Decision is an act of choice. It is a selection process. Out of many available alternatives the manager has to choose on which he considers best in the given circumstances and purpose.

#### **6. Principle of Participation:**

This principle is based on human behaviour, human relationship and psychology. Every human being wants to be treated as an important person if it is not possible to accord him a V.I.P. treatment. This helps the organisation in getting maximum from every person at least from those who have been given the place of importance and honour.

Participation signifies that the subordinates even if they are not concerned should be consulted and due weightage should be given to their viewpoint. Japanese do this. Japanese business or institutions or government make decisions by consensus.

This makes all of them feel that they are very much part of the decision. The Japanese mostly debate a proposed decision throughout its length and breadth of the organisation until there is an agreement.

A few may disagree with Japanese method of decision-making because they may agree that it is not suited to our conditions. Such a method involves politicking, delays the decisions and sometimes may result into indecisiveness. But workers participation in decision-making can be ensured by the Japanese method.

Those favouring Japanese method and workers participation advance the argument that decisions are important. But according to modern thinking the decision should not be within the purview

of only a selected few. Those who are to carry out the decisions must be actively associated with their decision-making also.

**The principle of participation mostly aims at two things:**

- (1) It aims at the development and research of all possible alternatives. If larger number of people concerned are asked to search for alternatives on the basis of which decisions are expected to be taken then greater participation is assured which is surely an important aim of this principle.
- (2) This principle asks for debating and deliberating by more and more people, so as to know the mind of all and to assess the possible reaction of a particular decision which the manager has in mind.

**Why the Principle of Participation is becoming Popular?**

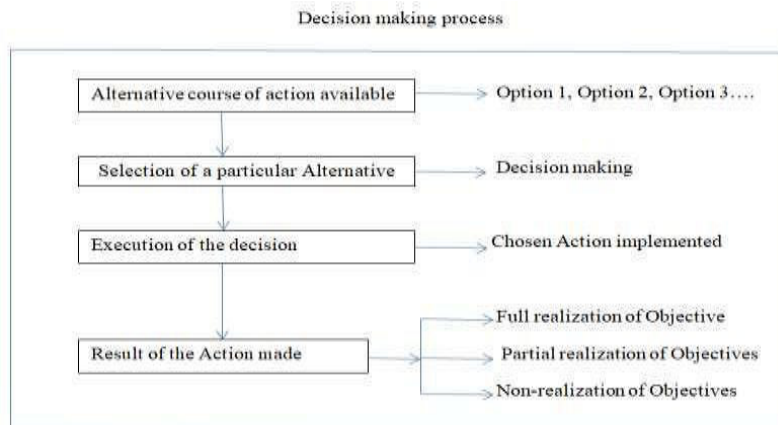
**The principle of participation is becoming popular due to the following reasons:**

1. The participants feel that the business is their own of which they are important parts;
2. Opposition to a decision is considerably reduced and those who are to carry the decision are gladly accepting even if any change is being introduced;
3. Guidance and direction functions of management are being easily performed;
4. Decisions are the results of best possible selection of the alternatives, therefore decisions may yield results to the advantage of the organisation on the expected lines;
5. Increase in the efficiency of workers;
6. Development of co-ordinated efforts;
7. Development of good human relations.
8. Development of team spirit and better understanding because of good human relations; and
9. Assurance of growth and prosperity to both the organisation as well as the whole working force-managerial supervisory and operating.

Today the managers are more interested in eliciting the participation of workers with their decisions with a view to get more co-operations and to exercise effective control. Over them in the accomplishment of



the tasks assigned by the objectives of the organisation.



The need of the hour for any manager is to take effective decision for the current business problems. Future is uncertain and we expect a set of outcome from the decision making but it may result in opposite way. Therefore, we should adopt a process for the decision making, which will be starting from sorting the alternative course of action to result of the decision.

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### Let Us Sum Up

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In this unit, you have learned about the following:

- Managerial Economics is a new of branch of Traditional Economics
- It is an integration of Economic theories with business practices
- It is an applied Economics

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### Check your progress

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1. Integration of Economic theories and business practices is \_\_\_\_\_.
2. Managerial Economics is \_\_\_\_\_ in Nature.
3. The phrase 'Decision making and forward planning' in managerial economics was used by \_\_\_\_\_.
4. The famous book on economics "An Enquiry into the Nature and Cause of Wealth of Nation" was written by \_\_\_\_\_
5. Welfare (neo classical) definition of economics is given by \_\_\_\_\_.

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### Glossary

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**Managerial Economics:** Managerial Economics is an integration of economic theory with business Practices

**Decision Making Process:** It is a process of collecting, analysing,

selecting and implementing the best option or alternative in business decisions.

**Forward Planning:** To minimise uncertainties that could occur in the future.

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### **Answers to Check Your Progress**

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1. Managerial Economics
2. Micro
3. Milton H Spencer and Louis Siegelman
4. Adam Smith
5. Alfred Marshall

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### **Suggested Readings**

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1. Milton H Spencer and Louis Siegelman, Managerial Economics, Irwin, Illinois, 1969
2. E.F. Brigham and J.L. Pappas, Managerial Economics, The Dryden press, Illinois, 1972.

## Unit-2

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### Nature and Scope - Managerial Economics

#### STRUCTURE

Overview

Objectives

2.1. Nature of Managerial Economics

2.2. Significance of Managerial Economics

2.3. Contribution of other subjects in Managerial Economics

2.4. Scope of Managerial Economics

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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#### Overview

In this unit the nature of Managerial Economics, Significance of Managerial Economics, Contribution of other subjects in Managerial Economics and the Scope of Managerial Economics has been very clearly explained.

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#### Objectives

After reading this unit, students should be able:

- To understand the nature of Managerial Economics
- To know the significance of Managerial Economics
- To recognize the scope of Managerial Economics

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#### 2.1. Nature of Managerial Economics

Managerial Economics is cross breed of economics and management science. Therefore, defining the nature of Managerial Economics is a difficult task. By answer the following questions it is easy to extract the nature of Managerial Economics.

1. Whether Managerial Economics is Art or Science?
2. Whether Managerial Economics is positive or normative?
3. Whether Managerial Economics is micro or macro in nature?

Managerial Economics is a science as well as an Art. It is an applied branch of Economics in which various economic principles and concepts are used for making effective decisions towards solving management problems, administrative problems or business problem by making effective decision making.

For example, Demand analysis, Cost Analysis, Production Analysis and Profit Analysis are used for either for making effective decisions to solve the business problems. Managerial Economics is normative in its approach even though it is extracted from the positive economic theory. Positive economics is descriptive in nature as it describes the economic activities as they are. But normative economics is subjective and perspective on the economic activities, like how it should be.

Managerial Economics is normative in nature as it involves in decision making process for business practices. Micro economics studies the internal actions of the individual consumer and firms whereas macroeconomics deals externally with behaviour of economy as a whole. Therefore the Managerial Economics accepts both micro economics and macroeconomics as it deals with solving the economic problems of individual firm level and analysing problems like inflation, business cycle the national income accounting at national level.

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## **2.2. Significance of Managerial Economics**

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According to McNair and Meriam, –Managerial Economics deals with the use of economic modes of thought to analyse business situation. The significance of Managerial Economics can be expressed as **use of economic ideas in business management**.

It augments the administrative gap between the management and decision making and serves as a link between Economic concepts and business practice. When an individual wants to start a business, he has to know about the demand for his product which he is going to produce – (demand forecasting).

Once he understands the demand for the product, the level of risk he has to take for the uncertain future period to do the business. Apart from that he should be aware of economic value of business, cost estimation, production schedule, pricing methods and strategies, and so on. For carrying out entire task, a business firm need the help of Managerial Economics.

**Table 2.2 Significance of Managerial Economics**

<b>Economics</b>	<b>Significance</b>	<b>Business</b>
Economicstheories and Concepts	Demand Forecasting	Decision making and forward planning
	Cost Estimation	
	Theory of Firm	
	Risk And Uncertainty	
	Economic View of Business Accounts	
	Production Function	
	Maximization of Profit	
	Break-Even Point	
	Minimization of Cost	
	Cost Of Capital and Cost Budget	
	Price Elasticity	
	Market Structure	
	Pricing Methods and Strategies	

### **2.3. Contribution of Other subjects in Managerial Economics**

Managerial economics is very closely linked to microeconomic theory, macroeconomic theory, statistics, decision theory, and operations research. It draws together and relates ideas from several functional fields of business administration, including accounting, production, marketing, finance, and business policy.

#### **i. Microeconomic Theory**

Microeconomic theory also known as the theory of firms and markets or price theory is the main source of managerial economics' concepts and analytical tools.

Our title makes many references to such microeconomic concepts as elasticity of demand, cost, short run and long runs profits and market structures. It also makes frequent use of well- known models in price theory such as those for monopoly price, the kinked-demand theory and price discrimination.

## **ii. Macro Economic Theory**

The techniques and models of forecasting are macroeconomic theory's main contribution to managerial economics. The prospects of an individual firm often depend largely, if not entirely, on the condition of business in general. Therefore, an individual firm's forecasts often depend heavily on general business forecasts, which make use of models derived from theory. To actually use forecasting models in everyday business situations, close attention must be paid to details, such as inventory in the automobile industry, excess capacity in chemical manufacturing, or measurements of consumer attitudes. The manager doing the forecasting has to make a detailed demand analysis.

## **iii. Statistics**

Statistics is important to managerial economics in several ways: Firstly, statistical measurements provide the basis for empirical testing of theory. Secondly, statistical techniques provide the individual firm with methods of measuring the functional relationships vital to decision making. But statistics, vital as it is, ultimately provides only part of the input needed in decision making. Information from other sources, such as accounting and engineering, and a manager's subjective estimates also are needed.

## **iv. The Theory of Decision Making:**

The theory of decision making has relevance and significance to managerial economics.

- (1) Individuals and firms strive toward a single goal maximum utility for the individual and maximum profit for the firm.
- (2) There is certainty or perfect knowledge in the individual's or firm's situation.

The decision-making theory recognizes that managers in the real world face a multiplicity of goals, and the only certainty they can count on is that each new day will bring new uncertainties.

The theoretical notion of a single optimum solution is replaced by the view that solutions must be found to balance conflicting objectives. Motivations, the relation of rewards and aspiration levels, and patterns of influence and authority all these are key factors in the theory of decision making.

The theory of decision making is concerned with how expectations are formed under conditions of uncertainty. It recognizes the costs of collecting and processing information, the problem of communication, and the need to reconcile the diverse objectives of people and organizations. It also requires that psychological and sociological influences on human behaviour be considered in the decision process.

#### **v. Operations Research:**

Operations research is closely related to managerial economics. It is concerned with model building the construction of theoretical models that aid in decision making. Economic theorists began constructing models long before the expression “model building” became fashionable. Managerial economists apply the models. Operations research is also concerned with optimization, and economics has long dealt with the consequences of maximising profits and minimizing costs. However, a business firm does not operate in a vacuum. It is a part of the economic system of a country. Its short-term and long-term decisions are affected by the overall (macro) environment of the country. There are certain forces such as consumer attitudes, or government policies or international competitiveness which are external to and beyond the control of an individual firm which is basically a micro-unit. These external forces together constitute the (macro) environment of business. An individual firm can do little to affect the environment. So firms should take decisions which are consistent with the economic environment of business.

A business manager has to take both short-term and long-term decisions. In the short run he may be interested in estimating demand and cost relationships with a view to making decisions about the price to be charged for a product and the quantity of output to be produced.

Microeconomics which deals with demand theory and with the theory of cost and production is extremely helpful for making such decisions. Likewise, macroeconomics is also useful when one attempts to forecast demand for a product on the basis of the forces influencing the total economy (like GNP, aggregate consumption expenditure, aggregate investment expenditure, the rate of inflation and so on.)

A business firm has to take not only short-term decisions like production and pricing, but certain long-term decisions like investment, diversification and growth. In the long run, a business firm has to make such decisions as whether to expand production and diversification facilities, whether to develop new products and new markets, and possibly acquire other firms (mergers).

Such decisions require an act of investment or capital expenditure

which will yield a return in future periods. These decisions are based on the economist's concept of economies and diseconomies of scale and the theory of capital.

Managerial Economics is a branch of Economics includes the concepts related to business decision making. For this purpose, it includes non-economics aspects from other disciplines in order to make effective decision making in business practice. Particularly, it includes many concepts from Operation Research, Mathematics, Statistics, Accounts, Game theory etc. The following table is helpful in understanding the contribution of other subjects to Managerial Economics.

<b>S.No</b>	<b>Other Subjects</b>	<b>Concept Contribution to Managerial Economics</b>
1	Accounts	Final Accounts, Management Accounts, Branch Accounts, Consignment, Joint Venture etc.,
2	Operation Research	Linear Programming, Optimization Technique, Queuing Theory, Assignment Problem and Transportation Problem etc.,
3	Statistics	Measures of Central Tendency, Measures of Deviations, Correlation, Regressions, Models, Test of Hypothesis, Sampling etc.,
4	Mathematics	Probability Theory, Simple Interest and Compound Interest, Profit Calculation.
5	Marketing	Theory of Firm, Market Structure, Pricing Strategy
6	Material Management	Demand Forecasting, Demand Distinction, Inventory Control, Supply Chain and Logistics
7	Production Management	Production Planning, Production Control, Process Layout and Production Layout, Input Output Analysis



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## **2.4. Scope of Managerial Economics**

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The origin of Managerial Economics is comparatively recent when compared to other subjects in order to provide a conceptual framework for expressing the scope of Managerial Economics.

The views of different authors express the scope of Managerial Economics in different ways. The need for Managerial Economics, importance of Managerial Economics, significance of Managerial Economics and nature of Managerial Economics etc., are one way or other expressing the scope of the discipline but still, the area of the study is the right source to express the scope of Managerial Economics.

It includes Demand Analysis, Cost Analysis, Production analysis, Investment analysis, Profit analysis and Market Structure and Analysis

Apart from these areas of study, Managerial Economics also includes macroeconomic variables and their foundations in the process of decision making in business such as National Income Accounting, Business cycle and Inflation etc.

The following flow chart is helpful in understanding the scope of Managerial Economics.

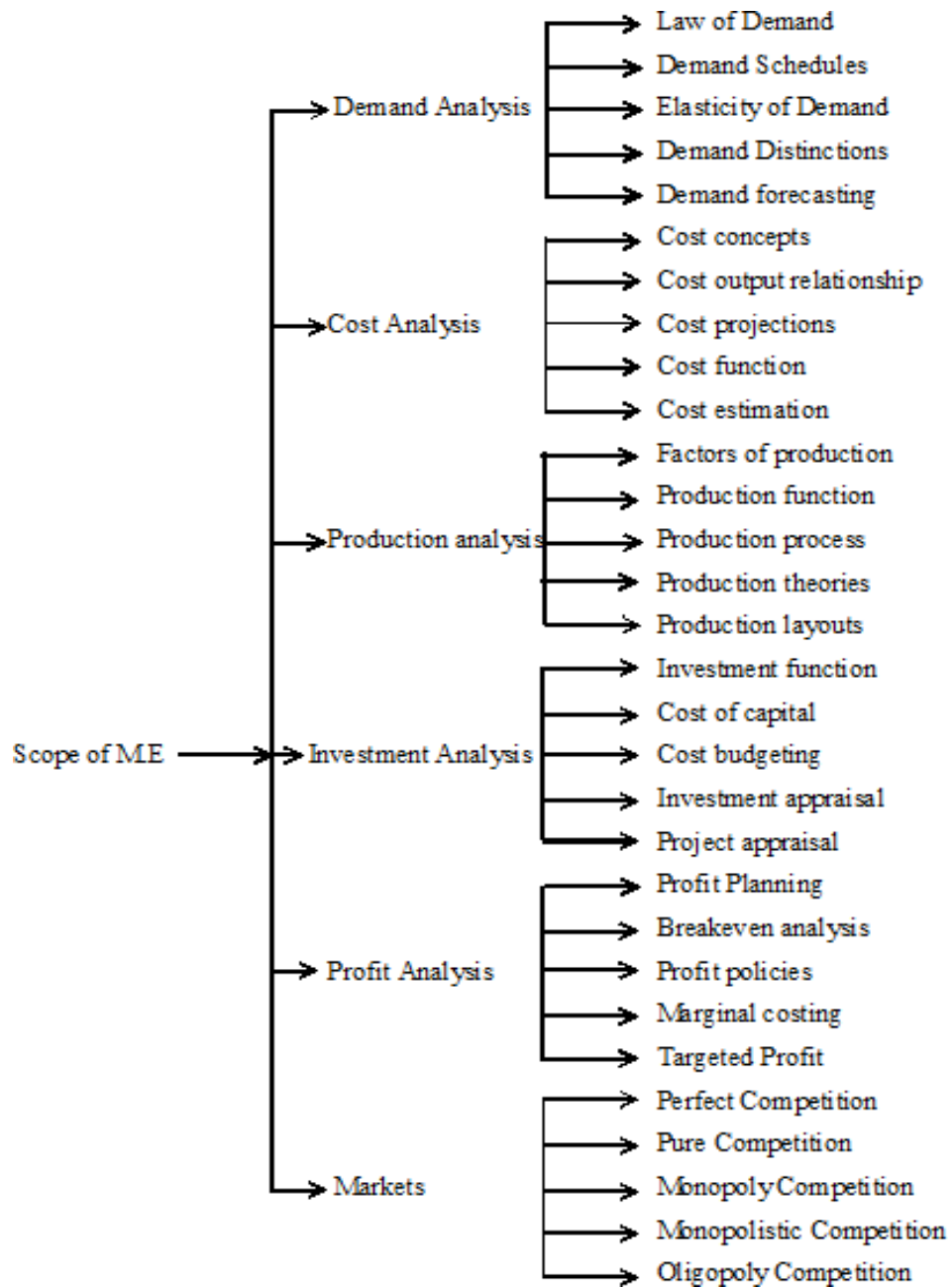
### **Relation of Managerial Economics to Other Areas of Management:**

It is possible to establish link of managerial economics to other areas of management.

In fact, there is a relation between managerial economics and the operation of every segment in a business, and management can make use of many of the fundamental principles or theories of economics to solve everyday business problems.

We normally see application of managerial economics in the following functional areas.

- i. Marketing and Sales Applications:
- ii. Production and Personnel Applications:
- iii. Financial Applications:
- iv. Law-Related Applications:
- v. Integration of Functions:



Managerial economies are a developing science which generates the countless problems to determine its scope in a clear-cut way.

**However, then the following fields may be considered under business economics:**

1. Demand Analysis and Forecasting.
2. Cost and Production Analysis.
3. Pricing Decisions, Policies and Practices.
4. Profit Management.
5. Capital Management.

The study of these segments of business economics constitutes its subject matter as well as scope. Recently, managerial economists have started making increased use of Operational Research methods.

**Let us make in-depth study of these methods:**

### **1. Demand Analysis and Forecasting:**

The foremost aspect regarding its scope is in demand analysis and forecasting. A business firm is an economic unit which transforms productive resources into saleable goods. Since all output is meant to be sold, accurate estimates of demand help a firm in minimizing its costs of production and storage.

A firm must decide its total output before preparing its production schedule and deciding on the resources to be employed. Demand forecasts serves as a guide to the management for maintaining its market share in competition with its rivals, thereby securing its profit. Thus, demand analysis facilitates the identification of the various factors affecting the demand for a firm's product. This, in turn helps the firm in manipulating the demand for its output.

In fact, demand forecasts are the starting point for a firm's planning and decision-making. This deals with the basic tools of demand analysis i.e.; Demand Determinants, Demand Distinctions and Demand Forecasting etc.

### **2. Cost and Production Analysis:**

A firm's profitability depends much on its costs of production. A wise manager would prepare cost estimates of a range of output, identify the factors causing variations in costs and choose the cost-minimising output level, taking also into consideration the degree of uncertainty in production and cost calculations. Production processes are under the charge of engineers but the business manager works to carry out the production function analysis in order to avoid wastages of materials and time. Sound pricing policies depend much on cost control.

**The main topics discussed under cost and production analysis are:** Cost concepts, cost-output relationships, Economies and Diseconomies of scale and cost control.

### **3. Pricing Decisions, Policies and Practices:**

Another task before a business manager is the pricing of a product. Since a firm's income and profit depend mainly on the price decision, the pricing policies and all such decisions are to be taken after careful analysis of the nature of the market in which the firm operates. The

important topics covered in this field of study are: Market Structure Analysis, Pricing Practices and Price Forecasting.

#### **4. Profit Management:**

Each and every business firms are tended for earning profit; it is profit which provides the chief measure of success of a firm in the long period. Economists tell us that profits are the reward for uncertainty bearing and risk taking. A successful business manager is one who can form more or less correct estimates of costs and revenues at different levels of output. The more successful a manager is in reducing uncertainty, the higher are the profits earned by him. It is therefore, profit-planning and profit measurement that constitutes the most challenging area of business economics.

#### **5. Capital Management:**

Still another most challenging problem for a modern business manager is of planning capital investment. Investments are made in the plant and machinery and buildings which are very high. Therefore, capital management requires top-level decisions. It means capital management i.e., planning and control of capital expenditure. It deals with Cost of capital, Rate of Return and Selection of projects.

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### **Let Us Sum Up**

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In this unit, you have learned about Managerial Economics is micro in nature. It includes both economics and non-economics concepts. The scope of managerial is limited when compared to traditional Economics.

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### **Check Your Progress**

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1. If the value of price elasticity is greater than one, then the elasticity of demand is \_\_\_\_\_.
2. The cross elasticity of demand deals with \_\_\_\_\_.
3. The law of supply expresses the relationship between \_\_\_\_\_.

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### **Glossary**

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**Scope of Managerial Economics:** The scope of Managerial Economics includes, demand analysis, cost analysis, production analysis, profit analysis and market structure

**Nature of Managerial Economics:** Micro in nature, Practical and concentrates only on profit.

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**Answers to Check Your Progress**

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1. Relatively elastic
2. Substitutes or complementary goods
3. Supply and price of the product

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**Suggested Readings**

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1. Dean Joel, Managerial Economics, PHI, New Delhi, 1976, First Edition.
2. Douglas Evan J, Managerial Economics, Theory, Practice & Problems; PHF, New Delhi; 1983, First Edition.

## Unit-3

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# Fundamental Principles of Managerial Economics

### STRUCTURE

Overview

Objectives

3.1. Introduction to Fundamental concepts of Managerial Economics

3.1.1. Incremental Concept

3.1.2. Concept of time Perspective

3.1.3. Discounting Principle

3.1.4. Opportunity Cost Principle

3.1.5. Equi-marginal Principle

3.2. Explanation for fundamental concepts

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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### Overview

In this unit, the fundamental concepts of Managerial Economics, i.e., Incremental Concept, Concept of time perspective, Discounting Principle, Opportunity Cost Principle and Equi-marginal Principle have been very clearly explained.

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### Objectives

After completion of this unit, you will be able:

- To understand the basic concepts of Managerial Economics
- To analyse and calculate the value of economic indicators.

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### 3.1. Introduction to Fundamental Concepts of Managerial Economics

The Managerial Economics consists of five fundamental concepts which integral parts of the decision are making process. The following flowchart is helpful to understand the basic concepts of Managerial Economics.

#### 3.1.1. Incremental Concept

The incremental concept consists of two factors called Incremental cost and Incremental revenue. The incremental cost can be defined as the

changes in the total cost due the implementation of decision on factors such as Prices, Products and promotional activities etc., On the other hand, incremental revenue is defined as the changes in total revenue due to the change in decision made.

### **3.1.2. Concept of Time perspective**

Time factor is playing a dominant role in the managerial decision making as it changes all the economic indicators considerably. In case of pricing, time factor is the major criteria for decision making. For example, the price of the daily i.e., newspaper in the morning hours is high less in the evening hours and very low in the next day. This is because of the time perspective. The price of the newspaper is doubled on the next day of either union budget or state budget. There are 4 different time perspective in the Managerial Economics viz., very short period, short period, long period and very long period.

### **3.1.3. Discounting principle**

The most influencing business factor is discounting principle. For example, the price of an apple is fixed Rs.10 and the seller is having a basket full of apples to sell on that day. Suppose a person is ready to buy all the apples, then the price of the apple will not be Rs.10, it will be less than Rs.10. It may be Rs.9, due to the discounting principle as the seller can save the man hours.

### **3.1.4. Opportunity cost principle**

The concept opportunity cost principle is the best economic tool used for managerial decision making. Under this principle, the firm can select the best alternative among the available alternatives in order to make an effective decision. The axiom of the opportunity cost is the forgone benefit that would have been derived from an option not chosen analyzing and comparing the value of the next best alternative of the decision. In other words, the opportunity cost principle provides idea about consequences when you haven't taken the decision.

### **3.1.5. Equi-marginal Principle**

The Equi-marginal principle is otherwise known as principle of maximum satisfaction. The basic idea of this principle is that an input should be employed in such a way having the value added by the last input is same in all uses. In other words, an input is utilized in optimum way so as to maximize the profitability. The Marginal Productivity of each alternative is equal under the law of Equi-marginal utility. i.e.,  $MP_A = MP_B = MP_C$  (where A, B and C are available alternatives).

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### 3.2. Explanation for Fundamental concepts

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**The Incremental Concept:** It is easy to describe incremental reasoning. But it is very difficult to apply it. As T.J. Coyne has put it, "It involves estimating the impact of decision alternatives on costs and revenues, stressing the changes in total cost and total revenue that result from changes in prices, products, procedures, investments or whatever may be at stake in the decision".

Two basic concepts lie at the heart of incremental analysis, viz., incremental cost and incremental revenue. The former refers to the change in total cost resulting from a decision. Likewise, the latter may be defined as the change in total revenue resulting from a decision.

**A decision is surely profitable if:**

1. It increases revenues more than it increases cost.
2. It reduces some cost more than it increases others.
3. It increases some revenues more than it decreases others.
4. It decreases costs more than it decreases revenue.

We may now consider some of the implications of incremental reasoning which appears to be too elementary. In general, businessmen think that in order to make an overall profit they must make a profit on every activity (or job).

Consequently they refuse orders that do not cover cost (labour, materials and overhead) and make a provision for profit. This is an unproved and probably a false belief. Incremental reasoning makes it clear that this rule may be inconsistent with short-run profit maximization.

A refusal to accept a job below cost may imply rejection of a possibility of adding more to revenue than to cost. Here the relevant cost for decision-making is not the full cost but rather the incremental cost. The following example clarifies the point. Consider a new order which is supposed to bring Rs. 9,000/- additional revenue.

**The costs are estimated as follows:**

Labour	Rs. 2,500/-
Materials	Rs. 3,500/-
Overhead (allocated at 120% of labour cost)	Rs. 3,000/-
Selling and administration expense (allocated at 20% of labour and material costs)	Rs. 1,200/-
<b>Total</b>	<b>Rs. 10, 200/-</b>



It apparently seems that the order is unprofitable. But suppose there is idle capacity in the short run. This could be used to produce the order. Suppose acceptance of the order will add only Rs. 900/- of overhead.

Suppose neither extra selling cost nor extra administration cost is involved in the order. Moreover, only part of the labour cost is incremental, since permanent workers; who are sitting idle, may be put to work without extra pay.

**Suppose the incremental cost of accepting the order is as follows:**

Labour	Rs. 1,800/-
Materials	Rs. 3,500/-
Overhead	Rs. 900/-
<b>Total</b>	<b>Rs. 6, 200/-</b>

Although at first sight it appeared that the order would result in a loss of Rs. 1200/-, it is now clear that it will bring an additional profit of Rs. 2,800/-.

However, incremental reasoning does not mean that the firm should fix the price at incremental cost or should accept all orders that just cover incremental costs. True, 'charging what the market will bear' is quite consistent with instrumentalism, for it implies raising prices as long as the resulting revenues increase.

In our example, the acceptance of the Rs. 9,000/- order is based on assumption that there is idle capacity which could be fruitfully utilized to execute the order. It is also implicitly assumed that there is no other profitable alternative. If there is a more profitable alternative, it has to be accepted.

So the essence of the incremental principle is that: a decision is to be considered as sound and rational if it increases revenue more than it increases cost, or reduces cost more than it reduces revenue.

### **Marginalism:**

Incremental reasoning is closely related to two important concepts of traditional economics, viz., cost and marginal revenue. However, there are similarities and differences.

**The following two points may be noted in this context:**

(1). Marginal cost and revenue are always defined in terms of unit changes in output, but incremental cost and revenue are not necessarily restricted to unit changes. Usually marginal cost is expressed as the ratio of two absolute changes, viz., change in total

cost and change in output, i.e.,  $MC$  (Marginal Cost) =  $dC/dQ$ . Likewise  $MR = dTR/dQ$  where  $MR$  is marginal revenue and  $TR$  is total revenue.

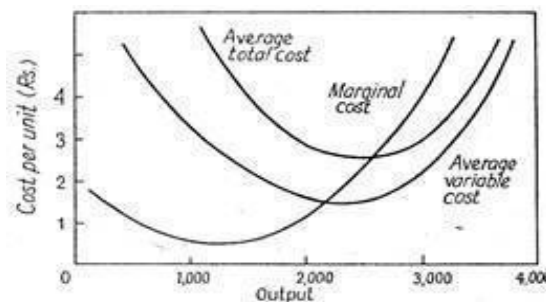
A simple example will illustrate the two concepts: the marginal concept and the incremental concept. Suppose, the extra cost of producing one extra unit of output is Rs. 10/- and the extra revenue made by selling this extra unit is Rs. 15/-.

If a 5-unit increase in output increases total cost by say Rs. 45/- (from say Rs. 350/- to Rs. 395/-), and increases revenue by Rs. 70/- (from say Rs. 400/- to Rs.470/-), we can speak of an incremental cost of Rs. 45/- and an incremental revenue of Rs. 70/-. In this case the unit (average)  $MC$  over this range of output is Rs. 9/- and unit (average)  $MR$  is Rs. 14/-.

(2). Incremental concepts are more flexible than marginal concepts. In general we restrict the two terms:  $MC$  and  $MR$  to the effects of changes in output. But managerial decision making is not to be concerned with changed output at all. For example, the production manager may be faced with the problem of substituting one process of production (or activity) for another to produce the same output.

The problem here is one of comparing the cost of the first process with -that of the alternative. Marginal analysis is not suited for this type of decision. It is, of course, possible to compare the  $MC$  of one process with that of another but not of the  $MC$  of the change.

However, the term 'incremental cost' may be used to refer to the change in cost brought about by the changes in production process or activity. The following diagram may be used to compare the marginal and incremental approaches. In Fig 1.1 the  $MC$  curve is rising over most of its range.

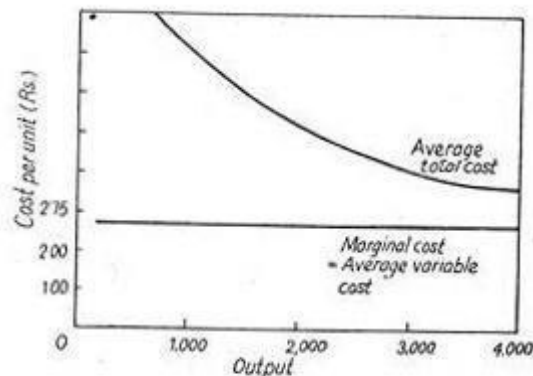


**Figure 1.1**  
Average and marginal costs as presented in traditional economics

Suppose the production manager is considering an increase in output from 2,000 to 3,000 units. In this case it is very difficult to measure the marginal cost of change. No single  $MC$  cost figure will suffice. The  $MC$

is initially low, but subsequently it rises rapidly.

However, another pattern of costs is common in industry. Several empirical studies have discovered relatively constant marginal costs over wide range of outputs, as in Fig 1.2. Here MC does not change dramatically with the changes in output. Hence a single MC cost figure can be used over the whole range.



**Figure 1.2**  
Cost curves with constant marginal costs

For the firm illustrated in Fig 1.2, we assume that total fixed cost is Rs. 4,000/- per unit of time. The average variable cost is Rs. 2.50/- per unit. The MC is also Rs. 2.50/- per unit. Suppose, the production manager has to choose between an output of 2,000 units and one of 3,000 units. In this case MC is Rs. 250/- but incremental cost is Rs. 2,500/-.

The pertinent question here is whether or not marginal costs are in fact constant and justify the substitution of incremental cost measurements over large changes in output, for measurements of cost changes for small (marginal) changes in output. If the short run cost curves were linear throughout, the decision-making problem would be greatly simplified.

## **Managerial Economics: Concept # 2.**

### **The Concept of Time Perspective:**

In economics, we often draw a distinction between the short-run and the long-run. This distinction is not based on any calendar period, say, a month, a quarter or a year. It is based in the speed with which decisions can be made and factors of production varied.

The period during which it is possible to vary some factors and not others is called the short run. But the period during which all factors can be varied is called the long-run. For example, more output can be

produced in the short-run by using more labour and raw materials. This is basically a short-term decision. But setting up a new factory or building an entirely new plant is a long-term decision.

In reality, however, the distinction between the two often gets blurred. What remains is an estimate of those costs that vary and those that do not by the decision under consideration. In managerial economics we are concerned with the short-run and long-run effects of decisions on revenues as well as on costs.

The line between the short-run and long-run revenue (or demand) is even less transparent than that for costs. What is really important for managerial decision making is maintaining the right balance among various runs, i.e., the long-run, short-run and intermediate-run perspectives.

A decision may be made on the basis of certain short-term considerations but it may have various long-term repercussions which, in turn, may make it more or less profitable than it appeared at the first sight. A simple example will make this point clear.

Suppose there is a firm with temporary idle capacity. It now gets an order for 10,000 units. The prospective customer is willing to pay Rs.3/- per unit, or Rs.30,000/- for the whole lot. The short-term incremental cost (which ignores the fixed cost is) is only Rs. 2.50/-. So the contribution to overhead and profit is 50 paise per unit (or Rs. 5,000/- in all).

**But the following two long-term repercussions must be taken into account:**

1. If the management commits itself to a series of repeat orders at the same price, the fixed costs (which are ignored temporarily) will become variable cost. For instance, sooner or later it will become necessary to replace the machinery and equipment which wear out. True enough, the gradual accumulation of orders may require an addition to capacity, with added depreciation and added top-level supervision.
2. If lower price is charged for the extra order, old customers who pay higher price for the same product may become annoyed. This practice will appear to be unethical and may destroy the company image. This will be damaging in the long-run.

Now on the basis of our above discussion we can state the above principle - the principle of time perspective - in the following words:

A decision should always take into consideration both the short-term

and long-term effects on revenues and costs, giving proper weight to the most relevant time periods. However, the real problem is how to apply this principle in specific situations to arrive at a decision.

**An example:**

A large reputed printing company in Calcutta maintains a policy of never quoting below full cost even if it has some idle capacity. Although incremental cost is far below full cost, management has found that the long-run repercussions of going below full cost more than offset any short-run gain.

Prima facie, price reduction for some customers would have an undesirable effect on customer goodwill, especially among regular customers who will not benefit from rate reductions. Secondly, if the availability of idle capacity is unpredictable, there may be pressure on capacity when demand is high.

In fact when the order becomes firm the situation might change, causing low-price orders to interfere with regular price business. Management would like to avoid this situation.

Otherwise, it would be considered as a firm that exploits the market when demand is unfavorable and allows price concessions when demand is favourable. This simple illustration reveals the need to consider both the long-term and short-term impact of price policy.

**Managerial Economics: Concept # 3.**

**The Concept of Discounting Principle:**

There is a famous proverb that a bird in the hand is worth two in the bush'. This proverb, like many others, contains an element of truth. And one of the fundamental propositions of economic theory is that a rupee to be received tomorrow is worth less than the same rupee received today.

The above proverb is, however, slightly misleading in this context, implying that the reason for discounting the future rupees is uncertainty about receiving them. Even in the absence of uncertainty, it is necessary to discount future rupees to make them equivalent to present day rupees.

A simple example will make clear the rationale of discounting. If an individual is offered to choose between a gift of Rs. 1,000/- today or Rs. 1,000/- to be received after one year, he would surely prefer the former (even if there is no uncertainty regarding the receipt of either gift).

This is because in a world where the rate of interest is not zero there is scope for investing Rs. 1,000/- at the market rate of interest and accumulate interest on the principal. If the rate of interest is 5%, today's Rs. 1,000/- will become Rs. 1,050/- after one year.

There is another way of illustrating the discounting principle. One may ask how much money today would be equivalent to Rs. 100/- a year from now.

**If the rate of interest is 5% the present value of Rs. 100/- to be received after one year is:**

$$PV = \frac{\text{Rs. } 100}{1 + i} = \frac{\text{Rs. } 100}{1.05} = \text{Rs. } 95.24$$

Where PV = present value and i = rate of interest

As a cross check one may multiply the PV of Rs. 95.24/- by 1.05 to determine how much money will have accumulated during the year at 5%. The answer is Rs. 95.24/- x 1.05 = Rs.100/-. In other words, Rs. 95.24/- plus the interest on it will accumulate to an amount exactly equal to Rs.100/-.

An individual who can earn 5% on his (or her) money should be indifferent between receiving Rs. 95.24/- today and Rs. 100/- after one year. So the present value of Rs. 100/- is Rs. 95.24/-.

The same analysis can be extended to any number of periods.

**A sum of Rs. 100 two years from now is worth:**

$$PV = \frac{\text{Rs. } 100}{(1 + i)^2} = \frac{\text{Rs. } 100}{(1.05)^2} = \frac{\text{Rs. } 100}{1.1025} = \text{Rs. } 90.70$$

So a general pattern seems to be emerging.

**In general, the present value of a sum to be received at any future date can be found out by using the following formula:**

$$PV = \frac{R_n}{(1 + i)^n}$$

in which PV = Present value

r = amount to be received in future

i = rate of interest

n = number of years lapsing between the receipt of R

If the receipts are made available over a number of years, the formula

becomes:

$$PV = \frac{R_1}{1+i} + \frac{R_2}{(1+i)^2} + \frac{R_3}{(1+i)^3} + \dots + \frac{R_n}{(1+i)^n}$$

The same formula may take the following form :

$$PV = \sum_{k=1}^n \frac{R_k}{(1+i)^k}$$

where k can take any value from 1 through n.

These formulas are usually to be made use of in any discussion of investment decision and capital budgeting.

The essence of the principle the discounting principle may now be summed up in the following words: If a decision affects both costs and revenues at future dates, it is absolutely essential to discount those cost and revenue so as to make them comparable to some present value before a valid comparison of alternatives is possible.

We often find the application of the principle in the business world. Suppose one borrows Rs. 10,000/- from a bank on a note. If the note is for Rs. 10,000/-, the borrower will not get the full value but rather the amount discounted at the appropriate rate of interest.

If the discounting rate is 6% and if the note is for one year, the borrower will receive approximately Rs. 9,420/-. In this case we can say that the present value to the bank of the borrower's promise to pay Rs. 1,000/- in a year is only Rs. 942/- at the time of the loan.

The principle operates in the bond market as well. The market price of a bond reflects not only its face value at maturity and interest payments, but also the current discount rate. As the market discount rates vary, bond price, vary inversely. Suppose you receive a bond which promises to pay you Rs. 10/- per annum, in perpetuity.

If the market rate of interest (the discount rate here) is 10% its PV will be Rs.  $10/10\% =$  Rs. 200/-. If the rate of interest goes down to 5% its market prices will rise to Rs.  $10/5\% =$  Rs. 400/-. So it is possible to make a capital gain of Rs. 200/- by selling the bond.

The same principle can be applied in case of an individual firm. Suppose a firm is considering buying a new machine. It should estimate the discounted value of the added (net) earnings from that machine before venturing out.

The same principles applies if the firm is considering the acquisition (purchase) of another firm or a merger.

Likewise, a firm that produces output maturing at varying ages cannot compare the profitability of changing the product mix without invoking the discounting principle.

#### **Managerial Economics: Concept # 4.**

##### **The Opportunity Cost Concept:**

The opportunity cost of a decision means sacrificing alternatives. Opportunity cost measures the value of the most valuable of the options that we have to forego in choosing from a set of alternative options. Suppose a shipbuilder gets a contract to be called Contract A.

After making the correct assessment of the associated incremental costs and revenues he arrives at an estimated profit of Rs. 25,000/- from the contract. Suppose, in the meantime, two other contracts, B and C, have been brought to his attention.

These two are expected to give a profit of Rs. 15,000/- and Rs. 20,000/-, respectively. However, his yard's capacity is so limited that he can accept only one of these. So, in the absence of any other consideration, he would accept contract A, the most profitable one.

His opportunity cost would then be Rs. 20,000/-, the sacrifice he must make of the profit for the next best option. Had he chosen either B or C, his opportunity cost would have been Rs. 25,000/- profit that A would have earned.

An opportunity cost has arisen here only because some essential input, the yard's capacity, is scarce, i.e., grossly insufficient to take up all the options that are open and desirable. In the absence of such a constraint no such sacrifice and hence no opportunity cost would have arisen.

We will come across various examples of opportunity cost in this title because all business activity is carried on within constraint ('scarcities') which force choices and consequent sacrifices to be made.

##### **The following examples help in understanding the meaning of the term:**

1. The Opportunity Cost (O.C.) of using a machine is the most profitable alternative sacrificed by employing the machine in its present use.
2. The O.C. of buying a colour TV is the interest or profit that could be earned by investing the purchase money.
3. The O.C. of working for oneself in one's own factory is the salary



that one could earn in others occupations.

4. The O.C. of funds tied in one's own business is the interest (or profits adjusted for difference in risk) that could be earned on those funds in other ventures.

However, if machine has been lying idle for some time, the O.C. of bringing it into production is nil. Similarly the O.C. of using idle space is obviously less than that of using space needed for other activities. So O.C.s require the measurement of sacrifices, real or monetary.

If a decision involves no sacrifices, it is cost free. The expenditure of cash (for raw- materials, say) involves a sacrifice of other possible expenditures and is therefore an O.C. Thus the only costs for decision-making are opportunity costs.

However, all O.C.s do not involve actual monetary payments. A man in a desert or in a distant island (like Robinson Crusoe) might have the choice between picking coconuts and fishing. The O.C. of coconuts is the amount of fish that might be obtained with the same amount of time and effort- irrespective of how much the man likes shinning up trees.

O.C.s are important when considering make-or- buy decisions, as also when deciding whether or not to sell. For instance, the alternative to using business premises which one owns as offices is to rent or sell them. The O.C.s is the rental forgone, or the difference between the expected market value at the beginning and end of the year, whichever is higher.

One form of opportunity cost which is likely to be used is in the analysis of capital projects. The discount rate used to find out net present values when evaluating capital projects is nothing but an opportunity cost of capital.

The alternative to carrying out the project is to invest the money in a safe alternative and the evaluation is designed to ascertain whether the project yields a higher return. This concept of O.C. is discussed in the context of capital expenditure decisions later.

Closely related to our above discussion is a distinction between explicit and implicit costs. Explicit costs are those that are reflected in the book of accounts, such as payments for raw-materials and labour.

On the contrary, implicit (or imputed) costs are those sacrifices (such as the interest on the owner's own investment) which are not reflected in accounts. Some writers equate O.C.s with implicit costs. The truth is that O.C.s cover all sacrifices, implicit or explicit.

In reality, however, some explicit expenses may not involve sacrifices of alternatives. For example, a company like Texmaco Ltd. paid wages to idle labour in periods of slack activity. These wages were in the nature of a fixed cost and were not included in the O.C. in a decision to use that labour in some other activity.

**From the above discussion we can derive another principle - the O.C. principle - as follows:**

The cost involved in any decision is the sacrifices of alternatives required by that decision. In case there is no sacrifice, there is no cost either.

Large firms often make use of the O.C. concept. They use linear programming models, replacement models and other optimization techniques. These are all based on the O.C. concept.

**Managerial Economics: Concept # 5.**

**The Concept of Equi-marginal Principle:**

The cornerstone of the economists' marginal analysis is that purchases, activities, or productive resources should be allocated so as to ensure that the marginal utilities, benefits, or value-added accruing from each, are identical in all uses. Optimality requires that it should not be possible to increase the total benefit or reduce the total cost by moving one unit from one application to another.

If this equi-marginal condition is violated, the system is operating below its optimum and it is possible to gain some improvement by reallocation of inputs or purchases. The key assumption underlying this result is the law of diminishing returns or variable proportions. For the equi-marginal principle to operate, the law of diminishing returns is held to apply.

The law implies that the marginal product will decline as more of one resource is combined with fixed amounts of another. This proposition, in fact, holds good over a wide range of economic activity. For example, successive applications of fertilizer tend to raise cereal yields per acre, but increasing quantities of fertilizer are successively required to give equal output increases.

The micro-economic theory of the demand for labour asserts that the profit-maximising entrepreneur will continue to employ labour so long as the resulting addition to his costs is covered by the addition to his receipts from the sale of his products.

One of the fundamental principles of economics is the proposition that

in input such as labour it should be so allocated among different activities or lines of production that the value added by the last unit is the same in all uses. This generalisation is known as the equi-marginal principle.

Consider a simple situation where a firm has 100 units of labour at its disposal. If this remains fixed in the short-run, the total wage bill can be determined in advance. For example, if each worker gets Rs. 300/- per month the total payroll will be Rs. 30,000/- per month.

Suppose there are five different activities in the factory: A, B, C, D and E. Each activity requires labour as an input. With limited supply of labour it is possible to expand any one of these activities by employing more labour only by reducing the level of other activities.

Suppose when one unit of labour is added to activity A, total output increases by, say, 10 units. By selling this output in the market at a price of Rs. 5/- per unit the firm makes a gain of Rs. 50/-. The value of this added output is called 'the value of the marginal product (V.M.P.) of labour' in activity A.

In the same way, we can estimate the value of the marginal product of labour in other activities, viz., B, C, D and E. If V.M.P. in activity A is greater than that in another activity, an optimum has not been reached. Now it would be profitable for the firm to shift labour from low-marginal value to high- marginal value uses.

This will surely raise the total value of all products taken together. For example, if V.M.P. in activity A is Rs. 50/- and that in activity B is Rs. 55/-, it will pay the firm to expand activity B and reduce activity A. The optimum is reached when V.M.P. is the same in all the five activities. In terms of symbol

$$VM P_{LA} = VMP_{LB} = \dots = VMP_{LE}$$

Here the subscript L denotes labour and the other subscripts refer to the activities.

**At this stage it is necessary to clarify three important points:**

(1) Firstly, the values of the marginal products in the above formula are net of incremental cost (the incremental costs, as we have noted, do not include the cost of the input being allocated). But if one extra unit of labour is employed in activity A, physical output may increase by 100 units. Each unit may sell at Rs. 25/- and the total revenue of the firm will rise by Rs. 2,500/-.

But in order to produce this output, some extra cost will have to be

incurred because the increased production will consume raw-materials, fuel and other inputs. So the variable cost in activity A (not counting the labour cost) will be higher. If this extra cost is Rs. 1,500/- the firm will be left with a net addition of Rs. 1,000/-. The value of the marginal product relevant for decision making purpose is Rs. 1,000/-.

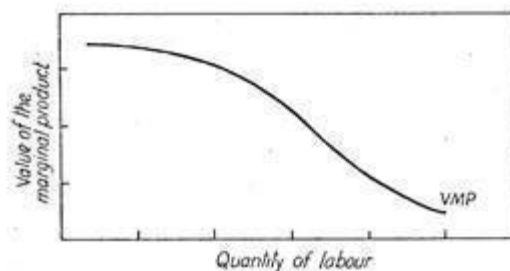
If the revenues resulting from this extra product are to be obtained in future, it is necessary to apply the discounting principle. It is necessary to discount those revenues to compare the alternative activities. Suppose activity B produces revenues immediately, but activity C takes five years to generate any revenue at all.

So the discounting of those revenues is absolutely essential for making these activities comparable. This sort of reasoning applies in capital budgeting which is concerned with allocation of capital expenditure over time.

In order to derive an optimum return from investment the firm should apply the funds where the discounted values of the marginal products are greatest, expanding the high-value activities and contracting the low value activities until a equality of marginal values is achieved.

(2) So far we have implicitly assumed that there are diminishing returns to the inputs being allocated. As more and more units of the variable factor (here labour) are added in the production (fixed factor remaining unchanged) each extra unit of labour makes less and less extra contribution to the total product.

Fig 1.3 shows that as more labour is added to activity A, the marginal product of labour will diminish. This happens because each worker is gradually having less and less capital to work with.



**Figure 1.3**  
Diminishing returns to labour

(3) It may also be noted that in order to sell the extra product the firm may have to reduce the price of the product (if it operates in an imperfectly competitive market). In this case the value of marginal product (marginal physical product times the market price of the

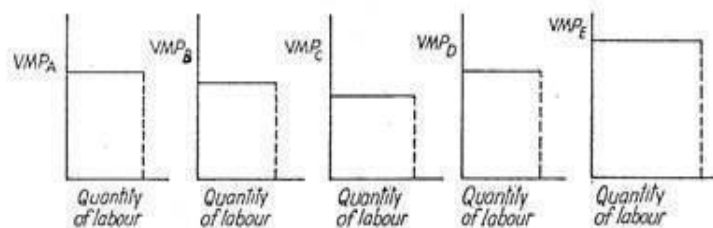
product -MPP x P) will diminish.

(4) Finally, one may refer to complementarity of demand: an increase in the availability of one product may stimulate the sales of another.

### Constant Marginal Products:

In many real life situations the law of diminishing returns may not operate in the same way as described above. It is quite possible for a firm to increase the quantity of labour in one department without encountering diminishing marginal product until some limit of capacity is reached or until all the workers are employed.

In this case we may expect the curve for the value of the marginal product to be horizontal up to full capacity, and then to drop to zero. Fig 1.4 illustrates such situation for five different activities.



**Figure 1.4**  
Constant marginal products in five activities

In this situation the values of the marginal products are not equal in all activities unless there is surplus labour. Since the value of the marginal product is the highest in activity E, the company may prefer to employ all of the labour to E. However, some constraint, such as a limit of the capacity in E, or limits on other variable inputs required, will set a limit on the amount of labour that may be used in E.

### The net result of our above discussion is this:

We may retain the equimarginal principle as long as diminishing returns operate at some stage of the production process; but when the values of the marginal products are constant (horizontal) we make use of the following alternative principle:

We have to apply inputs first to activities with higher marginal product values before moving to lower values. The equi-marginal principle can be applied in a variety of real life situations. We find its widespread use in budgeting the objective of which is to allocate resources where they are most productive. But what is relevant for decision making is marginal productivity, not average productivity. Even when it is very difficult to measure productivity, we can apply the equi-marginal principle in a rough or general way in order to avoid waste in useless activities.

We always find an application of this principle in any discussion of budgeting. We shall observe that whatever criterion is used in selecting a project, the goal is to isolate investments with high rates of return, from those with low rates of return so as to ensure optimum allocation of capital resources. We also find an application of the principle in multiple product pricing. The equi-marginal principle may also be applied in allocating research expenditures. A profit-maximizing firm is likely to expand research activities that have started paying off and to contract activities that have reached (or likely to reach) their peak of usefulness.

Unless this comparison is made expenditure is likely to be made on non-essential activities. In order to estimate the worth of alternative lines of research it is necessary to evaluate each research programme individually.

### **Managerial Economics: Concept # 6.**

#### **The Contribution Concept:**

The various concepts developed so far are interdependent. For example, in measuring opportunity cost of capital we use a discount factor by following the discounting principle. The same thing is true of the contribution concept. Consider a simple product whose price is determined either by the market forces the forces of demand and supply, or by some government agency like the Bureau of Costs and Industrial Prices (Govt, of India, New Delhi). Assume this price is Rs. 93/-.

The total cost including allocated overheads is Rs. 105/-, but the incremental cost is only Rs.74/-. The loss on the item seems to be Rs. 12/-. So at first sight the firm may think of dropping the product. However, if the contribution to overhead and profits is Rs.19/- = (Rs. 93/- – Rs.74/-), further analysis is required before arriving at a decision.

It is not always worthwhile to retain a product simply because its contribution is positive. If the company is having a package of orders on products (say, B, C or D) requiring the same scarce resources per unit - production time or machine time and labour- and if these products make larger contributions, viz., Rs. 50/- or Rs. 40/- or Rs. 30/-, there is no point in sacrificing these larger contribution in favour of product A.

However, what is important is the comparison of contributions, not the comparison of profits or losses based on full costs.

Suppose the only production constraint in a multi-product firm is machine-hours available. Now we can convert the contribution per unit of output into contributions per machine-hour. Table 1.1 illustrates such a situation in case of a company producing five products.

At first sight product B appears to be the best. Since its contribution is the highest, it deserves the top priority in allocation of capacity. But product B's demand on capacity is also maximum. By converting the contributions into contributions per hour of machine time, we get the following results. Now it is clear that the product E, which initially appeared to be the least profitable, is now the largest contributor. Therefore, the principle should be almost the opposite to those that appeared at first glance. If there are more constraints, i.e., more than one capacity bottleneck and all products pass through, say, four or five different processes, it will no longer be possible to compute contributions in terms of one of the bottlenecks. We have to make use of linear programming to reach an optimum solution (i.e., to choose an optimum product mix).

**Table 1.1: Contributions of five products in a single plant**

Product	Price Rs.	Incremental Cost Rs.	Contribution per unit Rs.	Machine requirements
A	15.00	10.00	5.00	60
B	14.00	8.00	6.00	80
C	13.00	9.00	4.00	40
D	12.00	7.50	4.50	30
E	6.00	2.50	3.50	15

**Contribution per hour of machine time**

Product	Contribution			
A	Rs. 5.00	Per machine-hour		
B	Rs. 4.00	„	„	„
C	Rs. 6.00	„	„	„
D	Rs. 9.00	„	„	„
E	Rs. 14.00	„	„	„

So long we assumed that demand for each product remained

unchanged as also its price. Now suppose the quantity demanded of product E increases at a lower price. Now we can compare product E's contribution of Rs. 2.50/- at a price of Rs. 6/- with its contribution of Rs. 3/- at a price of Rs. 5.50/-.

If sales at a higher price are 8,000 units and at the lower prices 15,000 units, the total contribution from product E increases from Rs. 28,000/- to Rs. 45,000/-. So, it is in the Tightness of things to accept the lower unit contribution to obtain the higher volume, even if other higher unit contribution products are sacrificed.

The contribution concept is often used in product- mix decisions, also in pricing decisions. It is also applicable in make or buy decisions. Finally, in a discussion on capital budgeting, it is usually discovered that the cash flows estimated by financial analysis are closely related to the contribution concept.

### **Managerial Economics: Concept # 7.**

#### **The Concept of Negotiation Principle:**

Changes in costs and revenues, all commitments made in the short or long run, interest rates, net cash flows, the contribution margin that product E could (should) make to the overall profitability of company, are all negotiable.

In fact, everything in the real commercial world is negotiable, such as housing prices and terms and conditions of payment, equipment parts, specifications, and prices. Likewise, a businessman contemplating merger, acquisition, consolidation or other form of corporate takeover is always in a position to negotiate a deal depending on his bargaining strength.

In fact, each major commitment facing a firm can be negotiated. If a negotiation is successful both the parties are happy. An example of this is collective bargaining between the employer and the employee. An intelligent businessman must understand the process by which negotiation takes place.

Negotiations refer "to the part of coming to terms in as friendly a manner as possible with a party who represents interests that differ from one's own."

For example, if company A decides to own and operate company B, the management of B must be convinced that it is to B's advantage, however defined, to allow A to win. Clearly, if the transaction is to B's interest, B has also to win. Such win-win situations are possible through



negotiations. In the absence of negotiation there may be a winner and a loser. In such an event, the winner may proceed one or two step(s) at most, but the entire process may also be started afresh.

For example, if labourers lose in a wage bargain, they are likely to oppose the wage contract sooner or later. A knowledge of the negotiation principle is important because it is conducive to one's business success. However, negotiation is a very challenging area of business activity.

### **Strategic Planning:**

All the principles developed find their application in strategic planning which **“reviews the economic impact of current micro and macro events on the overall direction of a specific firm and considers alternative actions that could have been made and probable change in outcome that might have occurred as a result of those actions. Alternatively, those that appear promising are seriously considered for future use.”**

### **Strategic planning involves three things:**

1. Establishment of long-run objectives
2. Setting up short-run goals and
3. Designing specific strategies to reach the goals.

The whole process is logical and systematic. Each step has a purpose. In the words of Coyne, “In successfully applying economic principles to the price and output behaviours of a profitable corporation, one must realize that short-run budgets and such things as deciding whether to put on the third shift as opposed to working the second shift overtime must be part of the overall strategic plan if the results of those decisions are to be meaningful to the firm.”

### **Strategic planning works like this:**

1. The corporate planning manager or his team establishes an objective (which cannot be easily defined and/or reached).
2. Goals are designed to reach the objective. These can be easily defined and reached, otherwise they are considered to be unrealistic and must be revised.
3. Strategies are established for achievement of those goals. The strategies must, of necessity, be realistic in terms of achievement.

As the strategies are implemented and goals are reached, it gradually

becomes easier to achieve the objectives. However, since objectives are not precisely defined, it is difficult to know when they are achieved until the event actually occurs.

**Product-line decisions:**

With the framework of corporate objectives and goals, business firms face a number of problems: whether to add new products, drop old products, change the relative proportions of products, sell part of the product to other firms. These problems crop up in the short run when capacity is fixed.

Even in the short-run a firm is faced with a variety of problems. Let us consider a situation in which a firm has excess capacity. Its present line of products is unable to absorb its capacity fully. The question is whether to add a new product in the product line. Before taking any decision the firm has to determine and measure the contribution of the proposed product to overheads and profits.

This requires an estimate of the added revenue and added cost of the product. The decision criterion here is simple enough: if the contribution the difference between the added revenue and the incremental cost is positive, the product should be added to the existing product size.

**However, there are certain other considerations as well:**

- (1) Firstly, if an even better new product is available, the proposed product should not be introduced.
- (2) Secondly, there is need to search out all the available opportunities before making the final decision. In other words, there is need to estimate the opportunity costs of alternative uses of the excess capacity.

It may be noted that the opportunity cost of decision means sacrificing alternatives. For example, the opportunity cost of using a machine to produce one product (say X) is the sacrifice of earnings that would be possible from other products (Y, Z, etc.).

Therefore, the opportunity cost of using a machine that is useless for any product (say X) is zero, since its use requires no sacrifice of other opportunities. In a like manner, the opportunity cost of using idle space is obviously less than that of using space needed for other activities.

So opportunity costs require the measurement of sacrifices. And any decision regarding product substitutions is made on the basis of this concept. For example, the expenditure on raw-materials involves a

sacrifice of other possible expenditures and is thus an opportunity cost. In the words of T.J. Coyne, “the only costs relevant for decision making are opportunity costs.”

Another factor is the possible impact of new product on the existing products. In some cases, the new product may be a complement for, rather than a substitute, of the old product.

In other words, “the new product may complement or round out the product line, increasing the sale of the other products. In such a case, the contribution to overhead and profits of the new product is greater than the contribution to overhead and profit of the new product itself.”

There are also instances where the product may compete with items in the existing line so that the initial contribution estimates are to be revised downward.

Such adjustments in estimates should take into account both short-term and long-term impacts of the new product: for example whether the new product can be abandoned when demand for the other products recovers or whether an expansion of facilities will be justified.

In most situations, it is preferable to accept temporary excess capacity than to create production bottlenecks when the excess capacity disappears. Moreover, management has also to consider whether it has the necessary know-how and skill to produce and distribute the new product. If the situation is one of full use of capacity, the problem becomes even more complicated.

In this situation an optimal use of its resources demands that the management not only determine the contribution of each product (and of products that might be introduced in the product mix) but also determine how much of the opportunity cost of increasing the output of one product is in terms of the reduction of the contributions of other products.

### **A Textbook Example:**

#### **In his famous title:**

Managerial Economics, Coyne considers a more complex situation, which has relevance to the real world: the allocation of scarce resource to a variety of slowly maturing products. He cites the example of garden nursery with a fixed plot of land and a wide variety of planting opportunities.

The owner of the nursery faces the problem of determining which plants to propagate and grow, what ages to assume in making such choices,

what futures to assume and how to fix prices on mature plants. Moreover, the decision maker must determine when to reduce prices on plants so that they can be sold out quickly and land tied up in them can be released for other (and more profitable) uses.

The solution to this problem requires a comparative evaluation (or estimate) of the contributions of various plants over time, which, in its turn, requires:

- (1) Separate estimates of revenues and incremental costs and
- (2) The discounting of future revenues, costs and contributions to find out the present value of such contributions at the time of making decisions on the use of the land.

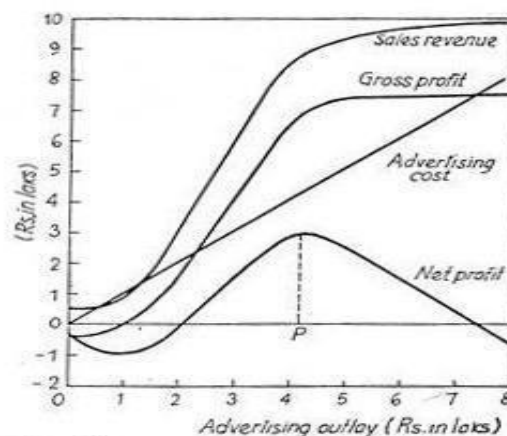
True enough, “estimates of the present value of the contribution of all plants on an acre basis would provide basis for rational decisions. These estimates would make it possible to compare the contribution from rapidly maturing plants with those of slowly maturing plants.”

**Other applications of Managerial Economics:** The following two situations maybe considered:

**(a) Decision on allocation of space in a retail store:** Limited floor space may be allocated among various products on the basis of their relative contribution to overhead and profit above incremental cost.

**(b) Decisions on advertising expenditures:** In order to determine the optimum advertising budget it becomes necessary for a firm to measure the responsiveness of sales to advertising, along with measures of the added cost of production of a larger volume.

Fig. 1.5 illustrates how sales and profits would respond to increased advertising outlays.



**Figure 1.5**  
Relationship of revenue and profits to advertising outlays

Since advertising has a lagged effect it is very difficult to measure its

effectiveness on sales revenue or turnover. However, the principles may be used to assess the true worth of advertising.

### **Case study**

The company ABC manufacturing electric bulb and selling it at a price of Rs.20/- decides to reduce the price by 20 per cent. As a result the sales increased from 10000 bulbs to 15000 bulbs. The additional cost incurred for raw materials, Rs.2000/- and Rs.800/- for Labour cost.

What is the incremental revenue of the firm?

Find the marginal revenue per unit.

How do you justify the equi-marginal principle when raw material cost is increased by Rs.3000/-?

Suggest the firm, whether to reduce the price or not?

### **Solution:**

#### **Incremental revenue of the firm**

The incremental revenue refers to the difference between the old revenue value and new revenue earned. i.e.,  $IR = R_2 - R_1$  where  $R_2$  is new revenue and  $R_1$  is old revenue.

In our case the price of the electric bulb = Rs. 20/-

New price = Rs. 20/- – 20% of Rs.20/-  
= Rs.20/- – Rs.4/- = **Rs.16/-**

#### **Incremental Revenue (IR)**

$$\begin{aligned} &= R_2 - R_1 \\ &= (\text{Rs. 16/-} \times 15,000 \text{ bulbs}) - (\text{Rs.20/-} \times 10,000 \text{ bulbs}) \\ &= \text{Rs. 2,40,000/-} - \text{Rs.2,00,000/-} \\ &= \text{Rs.40,000/-} \end{aligned}$$

### **Suggestion:**

Due to 20 per cent decrease in price, nearly 50% additional sale can be made. In monetary term, the firm earns additional profit of Rs.34,200/-. Therefore, price reduction is the right decision under the current circumstance.

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### **Let Us Sum Up**

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In this unit, you have learned about, Managerial Economics has five fundamental concepts such as Incremental concepts, concept of time

perspective, discounting concept, opportunity cost concept and equi-marginal concept.

Case study on calculating total and marginal values.

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### **Check Your Progress**

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1. Minimization of cost and Maximization of output is \_\_\_\_\_.
2. The best alternative that was forgone is known as \_\_\_\_\_ Principle.
3. \_\_\_\_\_ is the additional satisfaction gained by consuming one more unit of a commodity.
4. Analysis of long run and short run effects of decisions on revenue as well as costs is based on \_\_\_\_\_.

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### **Glossary**

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**Incremental Revenue:** It is defined as the changes in total revenue due to the change in decision made.

**Marginal Utility:** It is the additional satisfaction gained by consuming one more unit of a commodity.

**Opportunity cost Principle:** The best alternative that was forgone.

**Principle of Time Perspective:** Analysis of long run and short run effects of decisions on revenue as well as costs Efficiency.

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### **Answers to Check Your Progress**

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1. Efficiency
2. Opportunity cost Principle
3. Marginal Utility
4. Principle of time perspective

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### **Suggested Readings**

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1. Dean Joel, Managerial Economics, PHI, New Delhi, 1976, First Edition.
2. Marshirschey, "Fundamentals of Managerial Economics 'South Western Publications 2008.

# Unit-4

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## Risk and Uncertainty

### STRUCTURE

Overview

Objectives

4.1. Introduction

4.2. Uncertainty

4.3. Types of Risk

4.4. Difference between Risk and uncertainty

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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### Overview

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In this unit, meaning of risk, types of risk and the differences between risk and uncertainty have been very clearly explained.

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### Objectives

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After completion of this unit, you will be able:

- To understand the concept Risk and uncertainty
  - To know various types of Risk
  - To Identify the differences between Risk and uncertainty
- 

### 4.1. Introduction

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The purpose of studying Managerial Economics is to take right decision in the business practice in order to achieve organizational goal. But all the business decision is usually taken under the conditions of risk and uncertainty.

Risk refers to variability or outcomes which are measurable in an empirical or quantitative manner. This phenomenon can be incorporated into business outcome in the form of higher revenue or higher costs. It does not alter decision-making from those conditions of equilibrium already outlined by the businessman. On other hand, uncertainty denotes imperfect knowledge of the future or rather the knowledge of the future is less than perfect in the sense that the parameters of the probability



distribution (the yield or the price, the variance, range or dispersion, etc.) cannot be determined.

Uncertainty is a situation regarding a variable in which neither its probability distribution nor its mode of occurrence is known. For instance, an oligopolistic may be uncertain with respect to the marketing strategies of his competitors. Uncertainty as defined in this way is extremely common in economic activity. The function of the entrepreneur is to meet those risks which are non-insurable and which are called uncertainties.

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## **4.2. Uncertainty**

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Uncertainty is a situation regarding a variable in which neither its probability distribution nor its mode of occurrence is known. For instance, an oligopolist may be uncertain with respect to the marketing strategies of his competitors. Uncertainty as defined in this way is extremely common in economic activity.

The function of the entrepreneur is to meet those risks which are non-insurable and which are called uncertainties. Uncertainty arises when actual conditions differ from anticipated conditions.

Apart from our efforts some uncertainty will always be present.

**The following reasons are important:**

- i. The first is about natural laws according to which the sun rises, tide comes and seasons change.
- ii. The second is about forces working around us.

**Sources of Uncertainty:**

**There are a few sources of uncertainty:**

**(1) Uncertain Pattern:**

We are definite about certain events but uncertain about their pattern, for instance, there is sufficient quantum of rainfall in a particular year but its distribution over different months or days is uncertain. So there is the chance for crop failure by change in pattern of distribution of rains.

**(2) Existing Facts and Future Plan:**

Our belief of certainty and uncertainty about events is influenced by facts already available and future plan. As for example in constructing a dam, we face uncertainty about incoming water. But we may plan our present need with provision for future increase. The facts about past flow in volume and size reduce uncertainty to a great extent.

### **(3) Bias of Self-interest:**

Our experience of past events are modified by our personal feeling and prejudice. It is known as bias of self-interest.

### **(4) Belief about an Event Either Help or Harm:**

There is the maximum feeling of uncertainty when we believe that an event may either harm or help us, i.e., each one being equally likely.

### **Factors Determining Uncertainty:**

Uncertainty bearing has been considered as a factor of production.

### **It has a supply price depending upon:**

- i. The character of the entrepreneur,
- ii. On the amount of resources possessed by him, and
- iii. On the proportion of these resources exposed to uncertainty.

### **State Preference Theory:**

A method of examining the making of decision when there is uncertainty in the outcome. It is used primarily to analyse decisions regarding the choice of investments. The model assumes that there are several distinct possibilities as to the future economic situation.

Particular types of investment will yield various known returns, given that one of these economic states results. It is assumed that some absolutely certain form of investment exists, such as holding money in the bank at a fixed rate of interest.

This situation can be plotted given a two state world, putting the return given in state I on one axis and that given in state II on the other for any possible decision.

The results of all possible forms of investment can then be plotted with money being represented by a point on the 45° line. Joining all these points together the enclosed area represents all the possible outcomes that can be attained given the appropriate diversification of portfolio.

Next a set of indifference curves can be drawn on the graph representing those possible returns in state I or II between which the person is indifferent. Curves farther from the origin will represent a higher level of utility but shape of the curves and, in fact, whether or not they are convex will depend upon the individual's attitudes towards risk and his assessment of the likelihood of one or another of the states resulting.

### **Mean Variance Analysis:**

The making of decisions when there is uncertainty in the outcome. It is particularly used in examining how an investor will organise his portfolio. In this model, it is assumed that the determinants of an individual's choice are the expected return and the variability of the return.

The individual's choice as to how he will arrange his investments can be plotted on a graph with the expected return on the vertical axis and the variance on the horizontal.

There is usually one certain alternative for instance, holding money at a fixed interest rate. This is represented by a point on the vertical axis, that is, zero variance. The other investment possibilities are also placed on the graph.

If there is only one other possibility then the line between the certainty point and investment point will give the possibilities between which a person can choose by diversifying his portfolio. A set of indifference curves can be drawn on the diagram, their shape depending on the individual's attitude towards risk. For a normal risk averter they will be convex towards the lower right hand side of the diagram.

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### **4.3. Types of Risk**

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The concept 'risk' is a situation in which the probability distribution of a variable is known but its actual value is not. Risk is an actuarial concept. Risk may be defined as an uncertainty of financial loss on the occurrence of an unfortunate event.

A risk is an uncertainty of loss. Risk is an objectified uncertainty or a measurable misfortune. Every business involves some risk and most people do not like being involved in any risky enterprise. The greater the risk, the higher must be the expected gain in order to induce them to start the business.

#### **Types of Risk:**

**Risk may be connected with either persons or properties and it can be classified as follows:**

1. **Pure Risk or Static Risk:** Pure risk prevails where there is a probability of loss but no chance of gain. For example, if the firm is gutted out by fire, the owner sustains financial loss. If there is no such fire accident, the owner does not gain either. Pure risks are insurable.

2. **Speculative Risk or Dynamic Risk:** A speculative risk exists where there is even chance for both gain and loss. This type of risk arises from fluctuations of prices. Owners of shares and bonds will gain if the price goes up and losses if the price falls.
3. **Insurable Risks:** Transferable risks are also known as insurable risks. Such risks can be predicted, estimated and measured in terms of money and so are insurable.

### **Non-Insurable Risk**

Those risks which cannot be calculated and insured are called non-insurable risks. The non-insurable risks are further classified into:

- a) **Competitive Risk:** The existing firms may be faced with new competitions from the newly entered firms. The new firms can enter into the industry any time. As a result of this competition, the profit of the existing firms will fall.
- b) **Technical Risk:** New techniques of production may be introduced. The existing firms may not be able to follow these new techniques. As a result, they may incur loss.
- c) **Risk of Government Intervention:** In the larger interest of the country, the government may nationalize a number of industries. The firms in every industry may be affected. The government may control the price of the products.
- d) **Business Cycle Risk:** Depression may affect the industry as a whole. A depression in one industry may affect the other industries also.

### **Other types of Risk**

The risk can be classified into various types depending upon the different situation. They are economic risk, business risk, market risk, inflation risk, interest-rate risk, credit risk, liquidity risk, cultural risk and currency risk.

- **Economic risk** is the chance of loss because all possible outcomes and their probability of happening are unknown. Actions taken in such a decision environment are purely speculative, such as the buy and sell decisions made by traders and other speculators in commodity, futures, and options markets.
- **Business risk** is the chance of loss associated with a given managerial decision. Such losses are a normal by-product of the unpredictable variation in product demand and cost conditions. Business risk must be dealt with effectively; it seldom can be eliminated.

- **Market risk** is the chance that a portfolio of investments can lose money because of overall swings in the financial markets. Managers must be concerned about market risk because it influences the cost and timing of selling new debt and equity securities to investors.
- **Inflation risk** is the danger that a general increase in the price level will undermine the real economic value of corporate agreements that involve a fixed promise to pay a specified amount over an extended period. Leases, rental agreements, and corporate bonds are all examples of business contracts that can be susceptible to inflation risk.
- **Interest-rate risk** is another type of market risk that can severely affect the value of corporate investments and obligations. This stems from the fact that a fall in interest rates will increase the value of any contract that involves a fixed promise to pay over an extended time frame and vice-versa.
- **Credit risk** is the chance that another party will fail to abide by its contractual obligations. A number of companies have lost substantial sums because other parties were either unable or unwilling to provide raw commodities, rental space, or financing at agreed-upon prices.
- **Liquidity risk** is the difficulty of selling corporate assets or investments that are not easily transferable at favorable prices under typical market conditions. Another type of risk is related to the rapidly expanding financial derivatives market. A financial derivative is a security that derives value from price movements in some other security.
- **Cultural risk** is borne by companies that pursue a global investment strategy. Product market differences due to distinctive social customs make it difficult to predict which products might do well in foreign markets. For example, breakfast cereal is extremely popular and one of the most profitable industries in the United States, Canada, and the United Kingdom.
- **Currency risk** refers to probable loss due to changes in domestic currency value in terms of expected foreign currency. The main drawback of global businesses are currency risk which result that most of the MNCs wish to eventually repatriate foreign earnings back to the Indigenous status.

Many MNC firms hedge against currency price swings using financial

derivatives in the foreign currency market. This hedging is not only expensive but can be risky during volatile markets. Global investors also experience such risk.

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#### **4.4. Difference between Risk and Uncertainty**

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Government policy risk which refers to chances of loss because of domestic and foreign government policies

1. **Distinction in Nature:** Prof. Knight has said—“Uncertainty is an unknown risk, while Risk is a measurable uncertainty.”
2. **Probability of Quantitative Measurement:** Risk can be quantitatively measured by any form whereas uncertainty cannot be measured in any form.
3. **Insurance and Insurability:** There are certain risks that can be fully covered by taking insurance policies such as fire, flood, draught, theft, robbery etc. but in uncertainty, the insurance is not possible.
4. **Transferability:** One form of risk can be transferred into another form of risk. But uncertainty cannot be transferred.
5. **Elements of Cost:** According to Prof. Knight—“Cost of production includes the cost of risk bearing also. Entrepreneur does not get any profit for risk bearing. On the other-hand it is not included in the cost of production. The reality the profit is the reward of the entrepreneur for bearing uncertainty.”
6. **Subjective and Objective:** Risk is objective while uncertainty is subjective as Risk can be measured while Uncertainty can only be realised.

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#### **Let Us Sum Up**

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In this unit, you have learned about the concept of Risk is Insurable, Features of risk, The probability of risk ranges from 0 to 1, differences between risk and uncertainty, Measurement of risk, Transferability and the Elements of cost related to risk.

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#### **Check Your Progress**

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1. \_\_\_\_\_ is borne by companies that pursue a global investment strategy.
2. \_\_\_\_\_ refers to relatively objective probabilities which can be computed on the basis of past experience or some prior principle.

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## **Glossary**

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<b>Economics Risk:</b>	It is the chance of loss because all possible outcomes and their probability of happening are unknown.
<b>Market Risk:</b>	It is the chance that a portfolio of investments can lose money because of overall swings in the financial markets.
<b>Currency Risk:</b>	It refers to probable loss due to changes in domestic currency value in terms of expected foreign currency
<b>Liquidity Risk:</b>	is the difficulty of selling corporate assets or investments that are not easily transferable at favorable prices under typical market conditions
<b>Cultural Risk:</b>	It is borne by companies that pursue a global investment strategy.
<b>Credit Risk:</b>	It is the chance that another party will fail to abide by its contractual obligations.
<b>Interest Rate Risk:</b>	It is another type of market risk that can severely affect the value of corporate investments and obligations.
<b>Business Risk:</b>	is the chance of loss associated with a given managerial decision.

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## **Answers to Check Your Progress**

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1. Cultural risk
2. Risk

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## **Suggested Readings**

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1. Dean Joel, Managerial Economics, PHI, New Delhi, 1976, First Edition
2. Douglas Evan J, Managerial Economics, Theory, Practice & Problems; PHF, New Delhi;1983, First Edition

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## **Block-2: Introduction**

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Block-2: **Demand and Supply** is divided in to four Units. Unit- 5 : **Law of Demand** deals with the concept of Demand, its Meaning, Demand Determinants, Individual Demand Function, Market Demand Function, Law of Demand, Elasticity of Demand, Price Elasticity of Demand, Income Elasticity of Demand, Cross Elasticity of Demand and Advertisement Elasticity.

Unit- 6 : **Law of Supply** presents about the Law of Supply, Elasticity of Supply and Determinants of Elasticity of Supply.

Unit- 7: **Demand Forecasting** describes about the Introduction and Definition of demand forecasting, Types of Demand Forecasting, Objectives of Demand Forecasting, Steps involved in Demand Forecasting process, Methods of Demand Forecasting, Demand Forecasting for new product and Case Study.

Unit- 8: **Pricing Policy** explain about the Pricing policy and its meaning, Factors considered for formulating the pricing policy, Objectives for pricing policy and Determinants of Pricing policy.

In all the units of Block -2 **Demand and Supply**, the Check your progress, Glossary, Answers to Check your progress and Suggested Reading has been provided and the Learners are expected to attempt all the Check your progress as part of study.



# Unit-5

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## Demand Analysis

### STRUCTURE

Overview

Objectives

5.1. Demand - Meaning

5.2. Demand Determinants

5.3. Individual Demand Function

5.4. Market Demand Function

5.5. Law of Demand

5.6. Elasticity of Demand

5.7. Price Elasticity of Demand

5.8. Income Elasticity of Demand

5.9. Cross Elasticity of Demand

5.10. Advertisement Elasticity

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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### Overview

In this unit, meaning of demand, determinants of demand, Individual demand function, Market demand function, Law of demand, Elasticity of demand have been clearly explained.

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### Objectives

After completion of this unit, you will be able:

- To understand about the demand factor
- To know the relation between price and demand
- To familiarize with demand determinants
- To understand the concept Elasticity of demand

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### 5.1. Demand – Meaning

In Managerial Economics, the concept demand is considered to be lifeline of the business. The term demand refers to quantum of goods and

services are needed, desired or required by the individual or industry at particular price level for specified period of time. The axiom of demand force is the demarcated relation between the wants and means of the product. Human wants are unlimited and the means are limited. The linkage of wants and means of the product is in demand.

Different authors have defined the term demand in different ways but the following definition is the consolidated view of all the definition. –The amount of a specific economic good or service that an individual consumer or group of consumers willing to purchase or willing to experience at a particular price for the given period of time supported by ability to pay for the same.

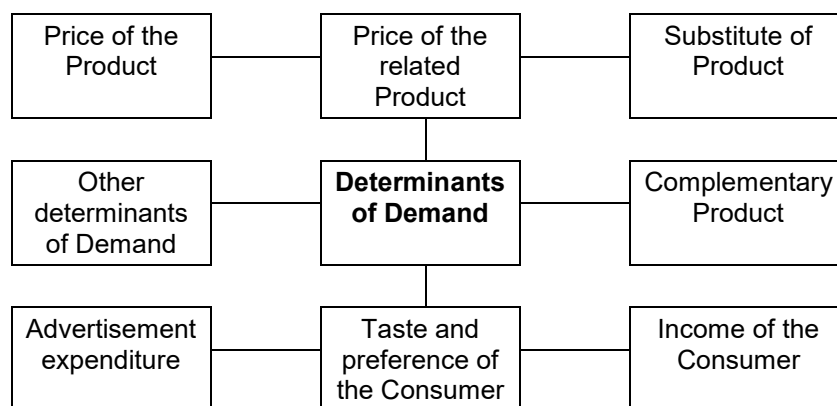
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## 5.2. Demand of Determinants

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There are many factors which influence the demand. Those factors are,

- Price of the product
- Price of the related product
- Substitutability of product
- Complementarity products
- Income of the Consumer
- Taste and preference of the consumer
- Advertisement Expenditure
- Other determinants



A mathematical expressions of the relationship between the quantity demanded of the product and the determining factors are called demand functions.

The demand functions are classified into two categories. They are individual demand function and Market demand function which are helpful to identify the determinants of demand.

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### 5.3. Individual Demand function

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The Individual demand function can be constructed as  $Q_A = f ( P_A , Y , P_1, P_2, \dots, P_{n-1} , TP , AD, E_Y, E_P, O )$

Where

- $Q_A$  - Quantity demanded for product A
- $P_A$  - The price of the product A
- $Y$  - The level of household income  $P_1 \dots$
- $P_{n-1}$  - The prices of the related products
- $TP$  - Taste and preference of the consumer
- $AD$  - Advertisement
- $E_Y$  - Consumer expected future income
- $E_P$  - Consumer expected future price of product A
- $O$  - All other determinants of demand

---

### 5.4. Market Demand function

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The market demand function consists of individual demand function, size of the market and Demographical factors like age, gender, income etc. The market demand function can be expressed as

$$Q_A = f ( P_A , Y , P_1, P_2, \dots, P_{n-1} , TP , AD, E_Y, E_P, P, D, O )$$

- $Q_A$  - Quantity demanded for product A
- $P_A$  - The price of the product A
- $Y$  - The level of household income
- $P_1 P_{n-1}$  - The prices of the related products
- $TP$  - Taste and Preference of the consumer
- $AD$  - Advertisement
- $E_Y$  - Consumer expected future income
- $E_P$  - Consumer expected future price of product A
- $P$  - Population (Size of the market)
- $D$  - Demographical factors (Income, age and gender etc)
- $O$  - All other determinants of demand

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### 5.5. Law of Demand

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The law of demand expresses the relationship between the demand for

the product and price of the product. The law of demand states that the higher the prices lower will be the quantity demanded and vice versa. This concept was initiated by the neo classical economist, Alfred Marshall who expressed the inverse relationship between the price and quantity of demand.

### **Definition of law of demand**

According to Alfred Marshall, "Other things remaining the same the amount demanded increases with fall in price and diminishes with increase in price".

### **Assumptions**

The law of demand is true with the following assumptions

1. No change in the price of the related commodities
2. Income of the consumer is constant.
3. There is no change in the taste and preference of the customer.
4. There is no change in the habit, style and fashion of the consumer.
5. There is no change in technology
6. The size of the population remains the same
7. Expectation of future change in price is absent.

### **Features of Law of demand**

From the above definition we can extract the following features for law of demand. They are

1. There is an inverse relationship between the price of the product and quantity demanded
2. Price of the product is an independent variable
3. Quantity demand for the product is the dependent variable
4. Law of demand expressed with *Ceteris paribus* i.e., other things being equal.

### **Law of demand - Graphical representation**

Price of the product is measured in vertical axis (Y) and quantity demanded measured in Horizontal axis (X). Then the shape of the demand curve is downwardsloping curve from left to right due to inverse relationship between price of the product and Quantity demanded.

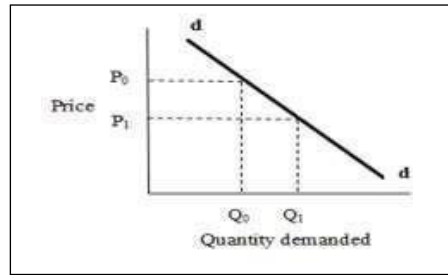


Fig: Demand schedule

### Exceptions to Law of demand

The law of demand states that there is an inverse relationship between the demand for the product and price of the product, when other things remain constant. This statement is not true always. Sometimes there will be a positive relationship between price and the quantity demanded. Those situations are called exceptions to the law of demand. Some of them are

#### 1. Necessary Goods

In case of necessary goods, like food, (rice) the law of demand will not hold good as the price of the rice increases, there is no change in the demand because minimum consumption is necessary for the survival. Irrespective of price there will be a minimum consumption in order to avoid starving.

#### 2. Inferior Goods

In case of consumption of inferior goods also, the law of demand is not applicable, as is not the deciding factor for the quantity demand. For example, salt an inferior good, there will be minimum consumption irrespective of price which is against the law of demand. This concept was propounded by Sir Robert Giffen, therefore, the concept is called **Giffen Paradox**.

#### 3. Luxuries Goods

The law of demand is not applicable to the consumption of luxury goods. Because, when the price of the precious metals or goods increases, people will demand more which is against the law of demand because these goods remains as status symbol. This concept of exception is called **Veblen effect**.

#### 4. Emergency or Urgency

In case of emergency situation or urgency in consumption, the law of demand cannot be applied. The price of the one unit of blood may be Rs.1000/-. Under emergency, if the donor demands more, there will be

consumption at an increased price, in order to save the life. Therefore the law of demand will not hold good under urgency or emergency situation.

## 5. Taste and Preference

When the consumer is particular about the consumption of the product out of his taste and preference, the law of demand cannot be applied. Irrespective of change in price, there will be same quantity of demand.

## 6. Change in Fashion

Change in fashion is another of the exceptions to the law of demand as there will be a positive relationship between the price and demand. 'Happy new year 2015' is printed in the T-Shirt, people will not demand it even at a reduced price.

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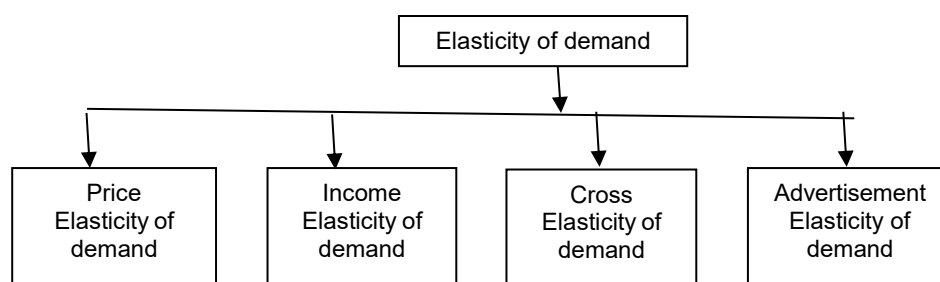
## 5.6. Elasticity of demand

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The law of demand expresses the inverse relationship between the price of the product and demand for the product. The law has been widely criticized under following grounds, viz.,

1. Price is independent variable and demand is dependent variable
2. Price is not the only factor which affects the demand for the product.
3. It shows only the direction of the change but not the quantum of change.
4. Unrealistic assumption – Other things being equal.

In order to overcome all these shortcomings, prof. Alfred Marshall have profound a new concept called Elasticity of demand. According to him, "Degree of responsiveness of demand due to change in factors like price of the product, Income of the consumer, price of the related goods etc., are called **Elasticity of Demand**". Elasticity of demand is generally classified into four categories, based on the factor considered for influencing the demand for the product. They are



**Types of Elasticity of demand**

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## 5.7. Price Elasticity of demand

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Degree of responsiveness of demand due to change in price is known as price elasticity of demand.

### 1. Income Elasticity of demand

Degree of responsiveness of demand due to change in income of the consumer is known as the income elasticity of demand

### 2. Cross Elasticity of demand

Degree of responsiveness of demand for product X due to change in price of product Y, is known as Cross Elasticity of demand. The Product X and Product Y are related goods of either substitutes or complementary goods.

### 3. Advertisement Elasticity

Degree of responsiveness of demand due to change in Advertisement expenditure is known as advertisement elasticity.

### Price Elasticity of Demand

Prof. Alfred Marshall has profound the concept Elasticity of demand for the purpose of overcoming the shortcomings of law of demand. There are various kinds of elasticity of demand, such as Price Elasticity of demand, Income elasticity of demand, Cross Elasticity of demand and Advertisement Elasticity of demand. The concept Price Elasticity of demand can be explained in the following manner.

#### Definition

According to Alfred Marshall, –Degree of responsiveness of demand due to change in price of the product is known as Price Elasticity of demand. From the above definition, price elasticity is tool to understand the level of relationship between demand for the product and price of the product for the given change in price.

#### Formula

The formula to calculate Price Elasticity of demand is:

$$\text{Price Elasticity } (E_p) = \frac{\text{Proportionate change in Demand}}{\text{Proportionate change in Price}}$$

It can be expressed in percentage value as:

$$\text{Symbolically } E_p = \frac{\% \Delta d}{\% \Delta p}$$

Where  $E_p$ - is Price Elasticity of demand

$\partial d$  -is the percentage change in demand

$\partial p$  - is the percentage change in price

It is to be noted that due to inverse relationship between the demand for the product and price of the product, the value of price elasticity will have a negative sign and we have to ignore the sign. We should take only the value of price elasticity by applying the modulus. The price elasticity is classified into five categories based on the value extracted which are explained in the following manner.

### Types of Price Elasticity

#### 1. Unity Elasticity of demand

Consider the demand increased by 10% due to change in 10% change in price. Therefore the value of price elasticity is unity. The formula for price elasticity is  $E_p = \partial d / \partial p$  in which  $\partial d = 10\%$  and  $\partial p = 10\%$ . Therefore  $E_p = 10\% / 10\% = 1$ . This can be diagrammatically represented by measuring the price in the Y axis and demand in X axis.

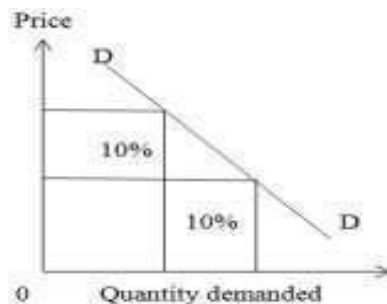


Fig :Unity price elasticity of demand

#### 2. Relatively inelastic demand

Consider the demand increased by 5% due to change in 10% change in price. Therefore, the value of price elasticity is relatively inelastic demand. The price elasticity is  $E_p = \partial d / \partial p$  in which  $\partial d = 5\%$  and  $\partial p = 10\%$ . Therefore,  $E_p = 5\% / 10\% < 1$ . In the diagram, proportionate change in demand is less than proportionate change in Price

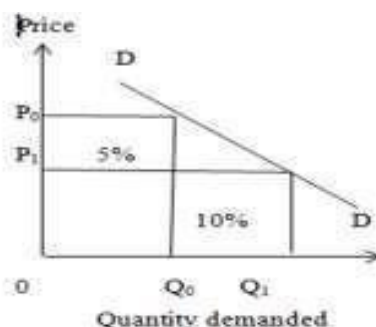
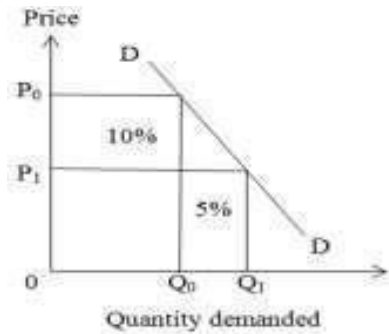


Fig :Relatively inelastic demand



### 3. Relatively elastic demand

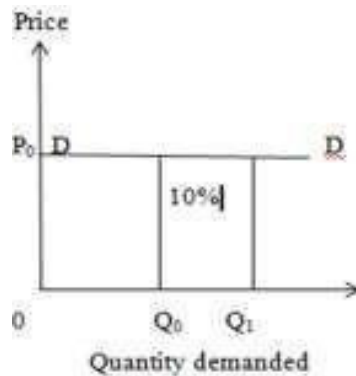
Consider the demand increased by 10% due to change in 5% change in price. Therefore, the value of price elasticity is relatively elastic demand. Price elasticity  $E_p = \frac{\partial d}{\partial p}$  in which  $\partial d = 10\%$  and  $\partial p = 5\%$ . Therefore, the value is  $E_p = 10\% / 5\% > 1$ . In the diagram, proportionate change in demand is greater than proportionate change in Price.



*Fig: Relatively elastic demand*

### 4. Perfectly elastic demand

Consider the demand increased by 10% without change in price. Here, the value of price elasticity is perfectly elastic demand. Price elasticity  $E_p = \frac{\partial d}{\partial p}$  in which  $\partial d = 10\%$  and  $\partial p = 0\%$ . Therefore, the value is  $E_p = 10\% / 0\%$  which is indeterminate. In the diagram, the demand curve is parallel to the output axis.



*Fig : Perfectly elastic demand*

### 5. Perfectly inelastic demand

Consider there is no change in demand with 10% change in price. Here, the value of price elasticity is perfectly inelastic demand. Price elasticity  $E_p = \frac{\partial d}{\partial p}$  in which  $\partial d = 0\%$  and  $\partial p = 10\%$ . Therefore, the value is  $E_p = 0\% / 10\%$  which is equal to zero as zero divided by any value is equal to zero. In the diagram, the demand curve is parallel to the price axis.



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## 5.8. Income Elasticity of Demand

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Under demand analysis, next to price of the product the income of the consumer is one of the determinant of demand which influence the demand considerably. The changes in income will affect the demand for the product for the given period of time. Income elasticity of the product is the economic tool to measure the impact of income on demand for the product.

### Definition

The degree of responsiveness of demand due to change in income is known as income elasticity of demand.

### Formula

$$\text{Income Elasticity} = \frac{\text{Percentage change in demand for product}}{\text{Percentage change in income of the consumer}} \times \text{X in period t}$$

$$\text{Symbolically, } E_Y = \frac{\Delta x}{\Delta y}$$

### Types of Income Elasticity of demand

The income elasticity of demand varies from product to product and usage of the product. There is a negative income elasticity for the inferior goods and greater than unity elasticity for the luxuries goods. The types of income elasticity are

#### 1. Zero Income Elasticity

When there is no change in the demand even there is an increase in income is called zero income Elasticity. Suppose,  $\Delta x = 0\%$  and  $\Delta y = 10\%$ , then the value of price elasticity  $E_y = \Delta x / \Delta y, \Rightarrow 0\% / 10\% = 0$ . This can be diagrammatically represented by measuring income in the y axis and quantity demanded in x axis.

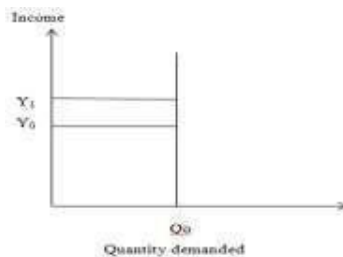


Fig : Zero Income elasticity:  $E_y = 0$

#### 2. Negative Income Elasticity

When there is a decrease in the demand due to an increase in income is called Negative Income Elasticity. Suppose,  $\Delta x = -10\%$  and  $\Delta y = 10\%$ ,

then the value of price elasticity  $E_y = \Delta x / \Delta y$ ,  $\Rightarrow -10\% / 10\% = -1$  This can be diagrammatically represented by measuring income in the y axis and quantity demanded in x axis.

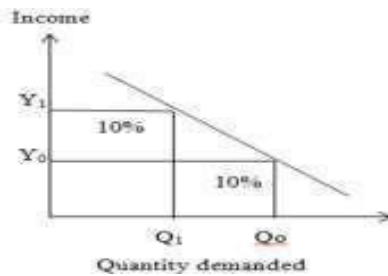


Fig : Zero Income elasticity:  $E_y = -1$

### 3. Unity Income Elasticity

When there is a decrease in the demand due to an increase in income is called Negative Income Elasticity. Suppose,  $\Delta x = -10\%$  and  $\Delta y = 10\%$ , then the value of price elasticity  $E_y = \Delta x / \Delta y$ ,  $\Rightarrow -10\% / 10\% = -1$  This can be diagrammatically represented by measuring income in the y axis and quantity demanded in x axis.

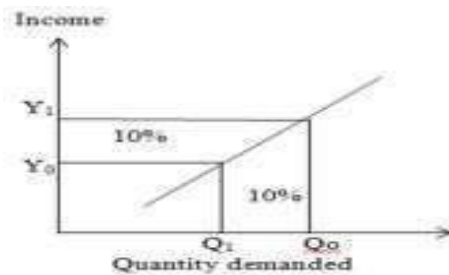


Fig : Zero Income elasticity:  $E_y = 1$

### 4. Greater than Unity Income Elasticity

When there is a 15% increase in the demand due to 10% increase in income is called Greater than unity Income Elasticity. Suppose,  $\Delta x = 15\%$  and  $\Delta y = 10\%$ , then the value of price elasticity  $E_y = \Delta x / \Delta y$ ,  $\Rightarrow 15\% / 10\% > 1$  This can be diagrammatically represented by measuring income in the y axis and quantity demanded in x axis.

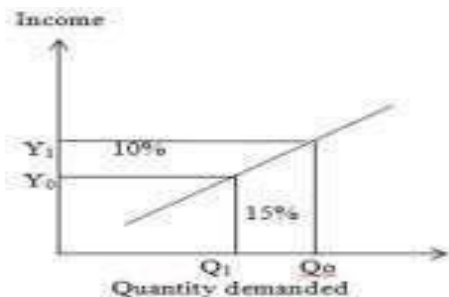


Fig : Zero Income elasticity:  $E_y > 1$

### 5. Less than Unity Income Elasticity

When there is a 10% increase in the demand due to 15% increase in income is called Greater than unity Income Elasticity. Suppose,  $\Delta x = 10\%$  and  $\Delta y = 15\%$ , then the value of price elasticity  $E_y = \Delta x / \Delta y, \Rightarrow 10\% / 15\% > 1$  This can be diagrammatically represented by measuring income in the y axis and quantity demanded in x axis.

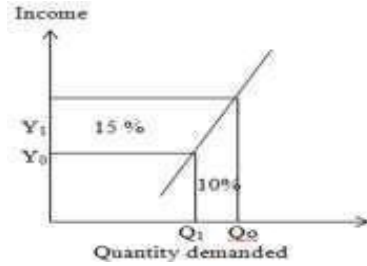


Fig :Zero Income elasticity:  $E_y > 1$

The types of Income elasticity of demand can be summarized in the following table.

S.No	Proportionate Change in Demand	Proportionate Change in income	Value of Income Elasticity	Type of Income Elasticity of demand
1	0%	10%	$E_y = 0$	Zero income Elasticity
2	-10 %	10%	$E_y < 0$	Negative income Elasticity
3	10%	10%	$E_y = 1$	Unitary income Elasticity
4	15%	10%	$E_p > 1$	Greater than unity income Elasticity
5	10%	15%	$E_p < 1$	Less than unity income Elasticity

### 5.9. Cross Elasticity of demand

The term Cross Elasticity of demand indicates the measurement of demand with the change price of two relative commodities which are either substitutes or complementary goods.

**Definition:** -The degree of responsive of demand of product X due to change in price of the product Y which may be either substitute product or complementary product.

#### Formula

$$\text{Cross Elasticity of Demand} = \frac{\text{Proportional change in demand of product X}}{\text{Proportionate change in price of product Y}}$$

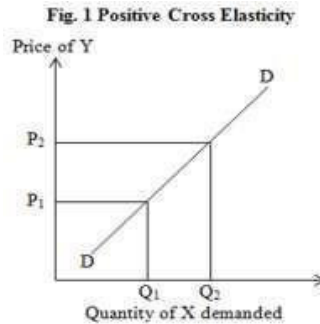
$$\text{Symbolically EC} = \frac{\Delta x}{\Delta y}$$

Where Product X and Product Y are either substitute goods or

Complementary goods.

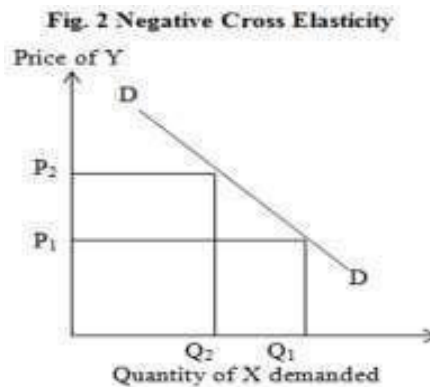
### Types of Cross Elasticity Substitute good

Consider two products X and Y are substitutes (tea and coffee), the cross elasticity of demand is said to be Positive cross elasticity. When there is an increase in price of Y, resulted in increase of quantity demanded of X, is called Positive Cross Elasticity of demand. This can be diagrammatically represented by measuring the price of Y in vertical axis and Quantity demanded of X in horizontal axis.



### 1. Complementary good

Consider two products X and Y are Complementary goods (Pen and refill), the cross elasticity of demand is said to be Negative cross elasticity. When there is an increase in price of Y, resulted in decrease of quantity demanded of X, is called Negative Cross Elasticity of demand. This can be diagrammatically represented by measuring the price of Y in vertical axis and Quantity demanded of X in horizontal axis.



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## 5.10. Advertisement Elasticity

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Advertising is a process of conveying oral, written or visual message to the customer about the availability of the product (physical and services) and uses of those products to make them to purchase the product as a sales promotion activity

## Definition

The degree of responsiveness of demand (sales) with proportionate or percentage change in the advertisement expenditure is known as Advertisement Elasticity of demand.

## Formula

$$\text{Advertisement Elasticity} = \frac{\text{Proportionate change in Sales}}{\text{Proportionate change in advertisement expenditure}}$$
$$\text{Symbolically EC} = \frac{\Delta S}{\Delta A}$$

Where  $\Delta S$  is proportionate change in Sales

i.e., Increase in sales / Initial sales,  $\Delta A$  is proportionate change in Advt.  
Exp. i.e., Increase in advertisement expenditure / Initial advertisement expenditure.

## Types of Advertisement Elasticity of sales

S.No	Proportionate Change in Sales	Proportionate Change in Advertisement	Value of Advertisement Elasticity	Type of Advertisement Elasticity of demand
1	0%	10%	$E_y = 0$	Zero Advertisement Elasticity
2	10 %	10%	$E_y = 1$	Unity Advertisement Elasticity
3	5%	10%	$0 < E_y < 1$	Less than Unity Advertisement Elasticity
4	15%	10%	$E_p > 1$	Greater than unity Income Elasticity

## Determinants of Advertisement Elasticity of sales

There are many factors which influences the advertisement elasticity but the following are main determinants Advertisement Elasticity of sales. They are

1. Development of product in the market
2. Advertisement by competitors
3. Quality of the Advertisement
4. Type of product (Existing or New Product)
5. Price of the product
6. Income of the consumer
7. Number of Substitutes etc.,

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## Let Us Sum Up

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In this unit, you have learned about the following:

- Price and output are inversely related
- Giffen paradox and Veblen effects are exceptions to law of demand
- Due to price effect, Income effect, substitution effects and law of diminishing marginal utility, the demand curve slopes downwards
- Types of Price Elasticity
- Types of Income Elasticity
- Types of Cross Elasticity
- Determinants of Advertisement Elasticity

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## Check Your Progress

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1. If the income elasticity of demand is that one, the good is a \_\_\_\_\_.
2. The income elasticity of demand is negative for a \_\_\_\_\_.

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## Glossary

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<b>Law of demand:</b>	Price and demand are inversely related
<b>Giffen Paradox:</b>	inferior goods are exception to law of demand
<b>Veblen effect:</b>	Luxuries goods are exceptions to law of demand
<b>Price Elasticity:</b>	Unitary Elasticity, perfectly Elastic, Perfectly Inelastic, Relatively Elastic and relatively inelastic
<b>Income Elasticity;</b>	Zero income Elasticity, Positive income elasticity and negative income elasticity
<b>Cross Elasticity:</b>	Substitutes and Complementary goods



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## **Answers to Check Your Progress**

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1. Luxury
2. Inferior good

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## **Suggested Readings**

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1. William F Samuelson and Stephen G Marks, "Managerial Economics" 7<sup>th</sup>Edition, John Wiley and Sons, 2012
2. Christopher Thomas and S Charles Maurice "Managerial Economics" 9<sup>th</sup>Edition, McGraw-Hill Education, 2007

## Unit-6

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### Law of Supply

#### **STRUCTURE**

Overview

Objectives

6.1. Law of Supply

6.2. Elasticity of Supply

6.3. Determinants of Elasticity of Supply

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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#### **Overview**

In this unit the law of supply, Elasticity of supply and the determinants of Elasticity of supply has been explained.

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#### **Objectives**

After completion of this unit, you will be able:

- To understand the relation between price and supply
- To familiarize with elasticity of supply

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#### **6.1. Law of Supply**

Other things remain the same, the supply of a commodity rises with a rise in price and falls with an increase in price.

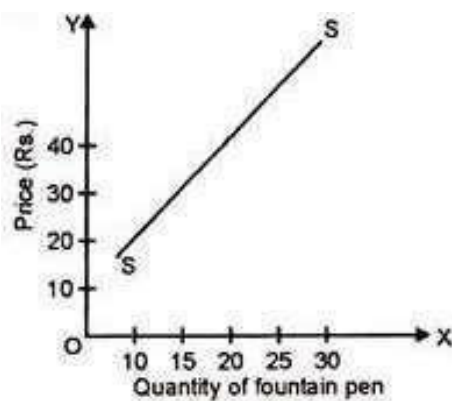
In other words, it can be said that –Higher the price, higher will be the supply and lower the price lesser will be the supply.

The law thus suggests that the supply varies directly with the change in price. So, a larger amount is supplied at a higher price and lesser amount is supplied at a lower price in the market.

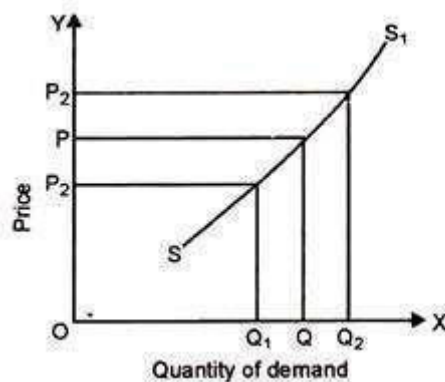
This law can be explained with the help of a supply schedule as well as by a supply curve based on an imaginary figures and data.

### Market Supply Schedule

Price of Fountain Pen Rs.	Quantity Supplied (in '000 per week)
10	10
20	13
30	20
40	25



Here, in this diagram the supply curve SS is sloping upward. It suggests a positive supply schedule, means the market supply tends to expand with the rise in price and vice-versa. Similarly, the upward sloping curve also depicts a direct co-variation between price and supply.



This law can be shown in other way also.

In the figure above OX axis shows the quantity demanded and OY axis shows the price.  $SS_1$  is the supply curve where the price of the commodity is OP then quantity supplied is OQ.

When the price rises from OP to  $OP_2$  subsequently supply will increase from OQ to  $OQ_2$ . Similarly, if the price reduces from OP to  $OP_1$ , then supply will reduce from OQ to  $OQ_1$ .

## **Assumptions Underlying the Law of Supply:**

### **Important assumptions of the law of supply are as follows:**

1. **No change in the income:** There should not be any change in the income of the purchaser or the seller.
2. **No change in technique of production:** There should not be any change in the technique of production. This is essential for the cost to remain unchanged. With the improvement in technique if the cost of production is reduced, the seller would supply more even at falling prices.
3. **There should be no change in transport cost:** It is assumed that transport facilities and transport costs are unchanged. Otherwise, a reduction in transport cost implies lowering the cost of production, so that more would be supplied even at a lower price.
4. **Cost of production be unchanged:** It is assumed that the price of the product changes, but there is no change in the cost of production. If the cost of production increases along with the rise in the price of product, the sellers will not find it worthwhile to produce more and supply more. Therefore, the law of supply will be valid only if the cost of production remains constant. It implies that the factor prices such as wages, interest, rent etc., are also unchanged.
5. **There should be fixed scale of production:** During a given period of time, it is assumed that the scale of production is held constant. If there is a changing scale of production the level of supply will change, irrespective of changes in the price of the product.
6. **There should not be any speculation:** The law also assumes that the sellers do not speculate about the future changes in the price of the product. If, however, sellers expect prices to rise further in future, they may not expand supply with the present price rise.
7. **The prices of other goods should remain constant:** Further, the law assumes that there are no changes in the prices of other products. If the price of some other product rises faster than that of the product in consideration, producers might transfer their resources to the other product—which is more profit yielding due to rising prices. Under this situation and circumstances,

more of the product in consideration may not be supplied, despite the rising prices.

8. **There should not be any change in the government policies:** Government policy is also important and vital for the law of supply. Government policies like—taxation policy, trade policy etc., should remain constant. For instance, an increase in or totally fresh levy of excise duties would imply an increase in the cost or in case there is fixation of quotas for the raw-materials or imported components of a product, then such a situation will not permit the expansion of supply with a rise in prices.

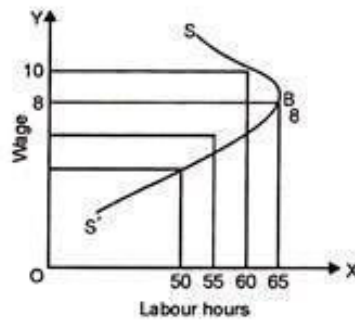
### **Exceptions to the Law of Supply or Backward-Sloping Supply Curve:**

As we have seen from the study above that supply of a commodity varies directly with its price. But in some exceptional cases where supply may tend to fall with the rise in price or tend to rise with the fall in price.

#### **Such exceptional cases may be described as follows:**

1. **Exceptions about Future Price:** In this connection if the seller expects a rise in the price in future, he may withhold his stock of the commodity. He will therefore reduce his supply in the market at the present price. Similarly, if he expects a further fall in price in future, he will try to dispose of the commodity and will supply more even at a lower price.
2. **Supply of Labour:** Supply of labour after a certain point, when the wage rate rises, its supply will tend to diminish. Why such situation because workers normally prefer leisure to work after receiving a certain amount of wage.
3. **Rate of Interest and Savings Position:** When there is rise in the interest rate, more savings are induced. But after a certain point of rise in the rate of interest households may tend to save less than before due to high income from the interest. In that case savings tend to decline even with a rise in the rate of interest.

From the points written above we can observe that the supply tends to fall with a rise in prices at a point. This paradoxical situation of supply behaviour is represented by a backward sloping or regressive supply curve over a part of its length as shown in the figure given below:



*Fig: Paradoxical situation*

In this diagram SS' shows the relationship of supply with price. Backward slopping supply curve BS ' part represents supply curve is bending at B. This curve is also known as an "Exceptional Supply Curve" as such a thing happens only in some exceptional cases like—labour supply or savings.

Further, in this diagram SBS' represents a backward slopping supply curve for labour as a commodity. Here the wage rate has been regarded as the price of labour and the labour supply is determined in terms of Labour-Hours the worker is willing to work at a given wage rate. It has been observed that as wages increase, a worker might work for a lesser number of hours than before.

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## 6.2. Elasticity of Supply

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The law of supply indicates the direction of change—if price goes up, supply will increase. But how much supply will rise in response to an increase in price cannot be known from the law of supply. To quantify such change we require the concept of elasticity of supply that measures the relative responsiveness of quantities supplied to a change in price.

Elasticity of supply measures the degree of responsiveness of quantity supplied to a change in price of the commodity. It is also defined as the percentage change in quantity supplied divided by percentage change in price.

It can be calculated by using the following formula:

$$E_s = \frac{\text{percentage change in quantity supplied}}{\text{percentage change in price}}$$

Symbolically,

$$E_s = \frac{\Delta Q_s / Q_s}{\Delta P / P} = \frac{\Delta Q_s}{\Delta P} \times \frac{P}{Q_s}$$

Since price and quantity supplied, in usual cases, move in the same direction, the coefficient of  $E_s$  is positive.

### Types of Elasticity of Supply:

For all the commodities, the value of  $E_s$  cannot be uniform. For some commodities, the value may be greater than or less than one.

**Like elasticity of demand, there are five cases of with respect to elasticity of supply**

#### (a) Elastic Supply ( $E_s > 1$ ):

Supply is said to be elastic when a given percentage change in price leads to a larger change in quantity supplied. Under this situation, the numerical value of  $E_s$  will be greater than one but less than infinity.  $SS_1$  curve of Following Fig. exhibits elastic supply. Here, quantity supplied changes by a larger magnitude than does price .

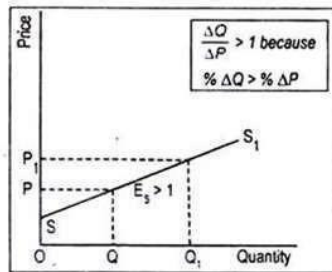


Fig: Elastic Supply

#### (b) Inelastic Supply ( $E_s < 1$ ):

Supply is said to be inelastic when a given percentage change in price causes a smaller change in quantity supplied. Here, the numerical value of elasticity of supply is greater than zero but less than one. Following Fig. depicts inelastic supply curve where quantity supplied changes by a smaller percentage than does price.

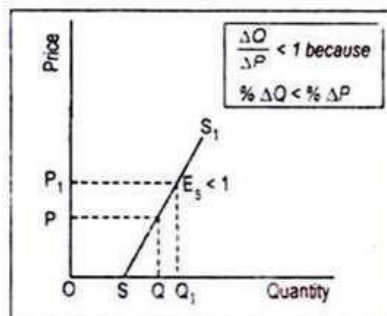


Fig: Inelastic Supply

#### (c) Unit Elasticity of Supply ( $E_s = 1$ ):

If price and quantity supplied change by the same magnitude, then we

have unit elasticity of supply. Any straight-line supply curve passing through the origin, such as the one shown in following Fig. has an elasticity of supply equal to 1. This can be verified in this way.

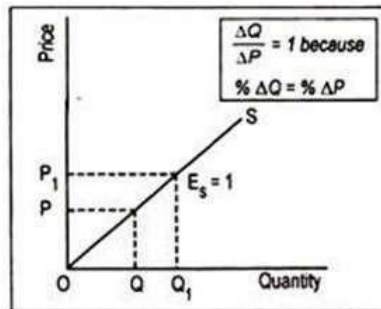


Fig: Unit Elasticity of Supply

For any straight line positively-sloped supply curve drawn through the origin, the ratio of  $P/Q$ s at any point on the supply curve is equal to the ratio  $\Delta P/\Delta Q$ s. Note that  $\Delta P/\Delta Q$ s is the slope of the supply curve while elasticity is  $(1/\Delta P/\Delta Qs = \Delta Qs/\Delta P)$ . Thus, in the formula  $(\Delta Qs/\Delta P. P/Qs)$ , the two ratios cancel out each other.

**(d) Perfectly Elastic Supply ( $E_s = \infty$ ):**

The numerical value of elasticity of supply, in exceptional cases, may reach up to infinity. The supply curve  $PS_1$  drawn in following Fig. has an elasticity of supply equal to infinity. Here, the supply curve has been drawn parallel to the horizontal axis. The economic interpretation of this supply curve is that an unlimited quantity will be offered for sale at the price  $OS$ . If price slightly drops down below  $OS$ , nothing will be supplied.

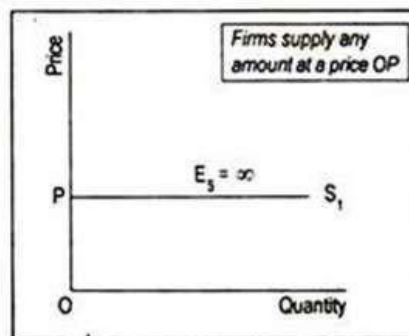


Fig: Perfectly Elastic Supply

**(e) Perfectly Inelastic Supply ( $E_s = 0$ ):**

Another extreme is the completely or perfectly inelastic supply or zero elasticity.  $SS_1$  curve drawn in following Fig. illustrates the case of zero elasticity. This curve describes that whatever the price of the commodity, it may even be zero, quantity supplied remains unchanged at  $OQ$ . This



sort of supply curve is conceived when we consider the supply curve of land from the viewpoint of a country, or the world as a whole.

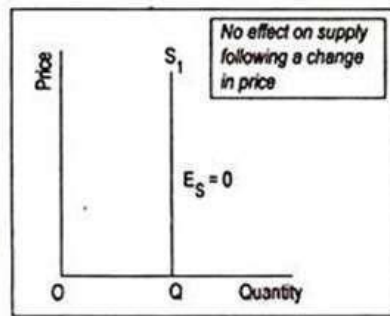


Fig: Perfectly Inelastic Supply

One important point to note here. Any straight line supply curve that intersects the vertical axis above the origin has an elasticity of supply greater than one. Elasticity of supply will be less than one if the straight line supply curve cuts the horizontal axis on any point to the right of the origin, i.e. the quantity axis.

**Measurement of Elasticity of Supply:**

Here, we will measure the elasticity of supply at a particular point on a given supply curve. This is shown in following Fig. where SS 'is the supply curve.

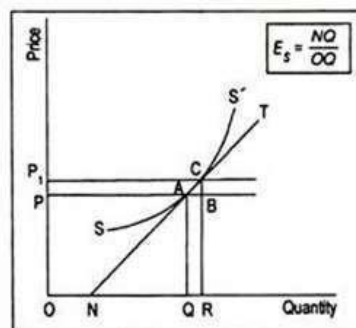


Fig: Supply curve

To measure the elasticity of supply at a particular point on the curve SS', we have drawn a straight line NT in such a way that it touches the SS' curve at points A and C.

As these two points lie very close to each other, the slope of the supply curve as well as the slope of the NT line is the same.

**Following is the formula:**

$$E_s = \Delta Q / \Delta P. P/Q = AB/BC. OA/OQ$$

Triangles ABC and NQA are similar triangles. Thus we can write NQ/QA

instead of AB/BC. Therefore,

$$E_s = NQ/QA. QA/OQ = NQ/OQ$$

As Fig. 4.22 suggests  $NQ < OQ$ , the coefficient of elasticity of supply is less than one i.e., inelastic. If the NT straight line passes through the origin, the elasticity of supply becomes unity and if it passes through the price or vertical axis, the coefficient will be greater than one, i.e., elastic.

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### **6.3. Determinants of Elasticity of Supply**

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Here, we are concerned with certain factors which affect elasticity of supply viz., the nature of the good, the definition of the good, the relevance of the time period, and so on.

#### **(a) The Nature of the Good:**

As with demand elasticity, the most important determinant of elasticity of supply is the availability of substitutes. In the context of supply, substitute goods are those to which factors of production can most easily be transferred. For example, a farmer can easily move from growing wheat to producing jute. Of course, mobility of factors is very important for such substitution.

As a general rule, the easier the factors can be transferred from the production of one good to that of another, the greater will be the elasticity of supply. Since durable goods can be stored for a long time, its elasticity of supply is very high. But for non-durable goods and perishable goods, elasticity of supply tends to be very low.

#### **(b) The Definition of the Commodity:**

As in the case of demand, elasticity of supply also depends on the definition of the commodity. The narrower a commodity is defined, the greater is its elasticity of supply. For example, it is easier for a tailor to transfer resources from producing red skirts to green skirts than from skirts to men's trousers.

#### **(c) Time:**

Time also exerts considerable influence on the elasticity of supply. Supply is more elastic in the long run than in the short run. The reason is easy to find out. The longer the time period, the easier it is to shift resources among products, following a change in their relative prices.

This is usually true in the case of most agricultural commodities, because of the natural time lag between planting and harvesting of crops. In agriculture, production plans have to be made months or even years ahead and they cannot be altered quickly.

Manufacturing industries, on the other hand, can usually adjust their output upwards or downwards fairly quickly in response to changing conditions in the market.

**(d) The Cost of Attracting Resources:**

If supply is to be increased, it is necessary to attract resources from other industries. This usually involves raising the prices of these resources. As their prices rise, cost of production also increases. So supply becomes relatively inelastic. If these resources can be obtained cheaply then supply is likely to be relatively elastic. These considerations become very important at times of full employment when the only available factors of production are those which can be attracted from other industries and uses.

**(e) The Level of Price:**

Elasticity of supply is also likely to vary at different prices. Thus, when the price of a commodity is relatively high, the producers are likely to be supplying near the limits of their capacity and would, therefore, be unable to make much response to a still higher price. When the price is relatively low, however, producers may well have surplus capacity which a higher price would induce them to use.

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**Let Us Sum Up**

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In this unit, you have learned about the following:

- Price and output are directly related
- Types of Supply Elasticity
- Determinants of Elasticity of supply

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**Check Your Progress**

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1. \_\_\_\_\_ is the degree of responsiveness of supply to changes in the price of a good.
2. \_\_\_\_\_ refers to the quantity of a good or service that producers are willing and able to sell during a certain period under a given set of conditions.
3. If supply is to be increased, it is necessary to attract \_\_\_\_\_ from other industries.

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## **Glossary**

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**Law of Supply:** Other things remain the same, the supply of a commodity rises with a rise in price and falls with an increase in price.

**Elasticity of Supply:** measures the degree of responsiveness of quantity supplied to a change in price of the commodity.

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## **Answers to Check Your Progress**

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1. Elasticity of supply
2. Supply
3. Resources

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## **Suggested Readings**

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1. Dominick Salvatore, Managerial Economics in a Global Economy', 8<sup>th</sup> edition, Oxford University Press, 2015.

# Unit-7

## Demand Forecasting

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### STRUCTURE

Overview

Objectives

7.1. Introduction

7.2. Definition

7.3. Types of Demand Forecasting

7.4. Objectives of Demand Forecasting

7.5. Steps involved in Demand Forecasting process

7.6. Methods of Demand Forecasting

7.8. Demand Forecasting for new product

7.9. Case Study

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check your Progress

Suggested Readings

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### Overview

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In this unit, the meaning of demand forecasting, objectives of demand forecasting, steps involved in demand forecasting process, methods of demand forecasting and demand forecasting for new product have been explained.

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### Objectives

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After completion of this unit, you will be able:

- To analyse various methods of demand forecasting
  - To predict the demand for a new product
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### 7.1. Introduction

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An organization faces several internal and external risks, such as high competition, failure of technology, labor unrest, inflation, recession, and change in government laws.

Therefore, most of the business decisions of an organization are made under the conditions of risk and uncertainty.

An organization can lessen the adverse effects of risks by determining the demand or sales prospects for its products and services in future. Demand forecasting is a systematic process that involves anticipating the demand for the product and services of an organization in future under a set of uncontrollable and competitive forces.

Demand forecasting enables an organization to take various business decisions, such as planning the production process, purchasing raw materials, managing funds, and deciding the price of the product.

An organization can forecast demand by making own estimates called guess estimate or taking the help of specialized consultants or market research agencies. Let us discuss the significance of demand forecasting in the next section.

### **Significance of Demand Forecasting:**

Demand plays a crucial role in the management of every business. It helps an organization to reduce risks involved in business activities and make important business decisions.

Apart from this, demand forecasting provides an insight into the organization's capital investment and expansion decisions.

### **The significance of demand forecasting is shown in the following points:**

- i. **Fulfilling objectives:** Implies that every business unit starts with certain pre-decided objectives. Demand forecasting helps in fulfilling these objectives. An organization estimates the current demand for its products and services in the market and move forward to achieve the set goals.

For example, an organization has set a target of selling 50,000 units of its products. In such a case, the organization would perform demand forecasting for its products. If the demand for the organization's products is low, the organization would take corrective actions, so that the set objective can be achieved.

- ii. **Preparing the budget:** Plays a crucial role in making budget by estimating costs and expected revenues.

For instance, an organization has forecasted that the demand for its product, which is priced at Rs. 10/-, would be 10, 00, 00 units. In such a case, the total expected revenue would be  $10 \times 100000 = \text{Rs.}10,00,000/-$ . In this way, demand forecasting enables organizations to prepare their budget.

- iii. **Stabilizing employment and production:** Helps an organization to control its production and recruitment activities. Producing according to the forecasted demand of products helps in avoiding the wastage of the resources of an organization. This further helps an organization to hire human resource according to requirement. For example, if an organization expects a rise in the demand for its products, it may opt for extra labor to fulfill the increased demand.
- iv. **Expanding organizations:** Implies that demand forecasting helps in deciding about the expansion of the business of the organization. If the expected demand for products is higher, then the organization may plan to expand further. On the other hand, if the demand for products is expected to fall, the organization may cut down the investment in the business.
- v. **Taking Management Decisions:** Helps in making critical decisions, such as deciding the plant capacity, determining the requirement of raw material, and ensuring the availability of labor and capital.
- vi. **Evaluating Performance:** Helps in making corrections. For example, if the demand for an organization's products is less, it may take corrective actions and improve the level of demand by enhancing the quality of its products or spending more on advertisements.
- vii. **Helping Government:** Enables the government to coordinate import and export activities and plan international trade.

Demand forecasting is a process of predicting the future sales of the product based on the past data and information, for the purpose of making effective decisions in management. Right from the planning stage till the delivery of finished goods, the ultimate management objective relies on value of the future sales. But the future is uncertain as well as with high risk, amidst the situation every manager has to take decisions. The demand forecasting is the right tool for estimating the future sales or demand for commodities or services.

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## 7.2. Definition

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Different authors have defined the term demand forecasting in different ways. But the following two definitions are used more in practice.

## 1. Even J. Douglas

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

## 2. Cundiff and Still

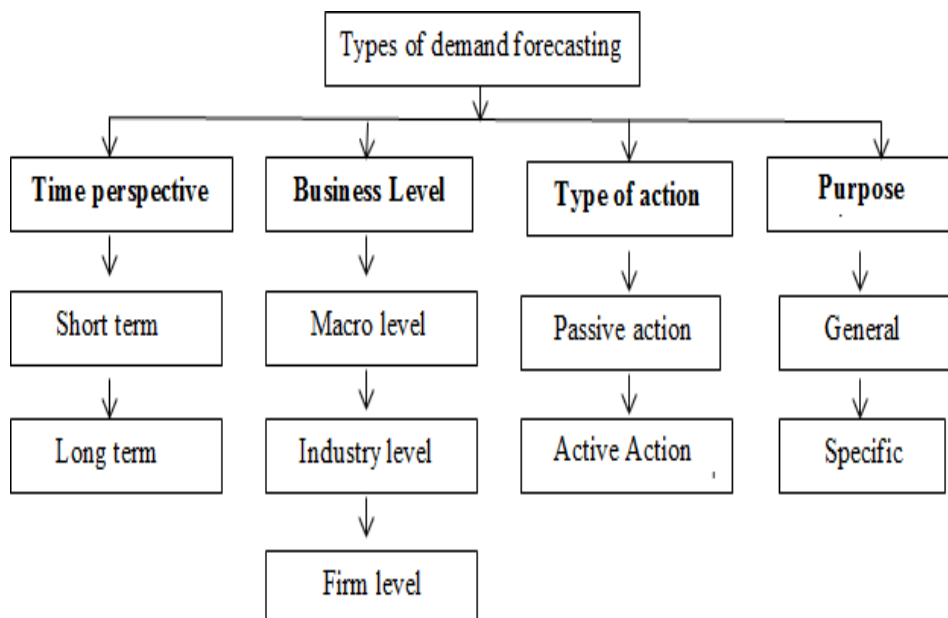
According to them, –Demand forecasting is an estimate of sales during a specified future period based on proposed marketing plan and a set of particular uncontrollable and competitive forces

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## 7.3. Types of demand forecasting

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There are various types of demand forecasting. Depending on the factors considered, such as time perspective, level of business, level of action and purpose etc., it can be classified into different types. The following flow chart is helpful to understand different types of demand forecasting.



### 1. Time perspective

The demand forecasting is divided into two categories based on the time perspective viz., short term forecasting and long term forecasting. The short term demand forecasting is limited to maximum of one year for the forecasting related to sales, purchase, pricing and finances etc.

It is useful for immediate action for the business situation. On the other hand, long term demand forecasting meant for longer time span which involves expansion of production units, administration of multi-product etc.

The policy decisions are categorized under long term demand forecasting such as man-power planning, technology transfer etc.,



## **2. Business Level**

Based on the level of business, the demand forecasting is classified into three categories viz., macro level demand forecasting, industry level demand forecasting and firm level demand forecasting. This classification was introduced by Prof. Christopher, I Savage and John R. Small in order to explain the sales forecast at different levels.

Macro level forecasting is done for national level or economy level such as national income or expenditure or national policies etc. The industry level demand forecasting is done by the trade associations or Chamber of Commerce in order to analyse the consumption pattern and statistical trends of the sales. In case of firm level demand forecasting, the forecasting is a conducted for micro level, in order to improve the quality of decision at management level.

## **3. Type of action**

Based on the level of action required, demand forecasting is classified into two categories, viz., passive demand forecasting and active demand forecasting. Passive demand forecasting envisages the future situation for the purpose of knowing changes in the business.

On the other hand, active demand forecasting predicts the future situation and giving due consideration to the future action of the firm.

## **4. Purpose**

On the basis of purpose of demand forecasting, it is classified into two kinds, viz., general demands forecasting and specific demand forecasting. General demand forecasting is conducted on routine basis but specific demand forecasting meant for specific reason or action, conducted for different products in specific area.

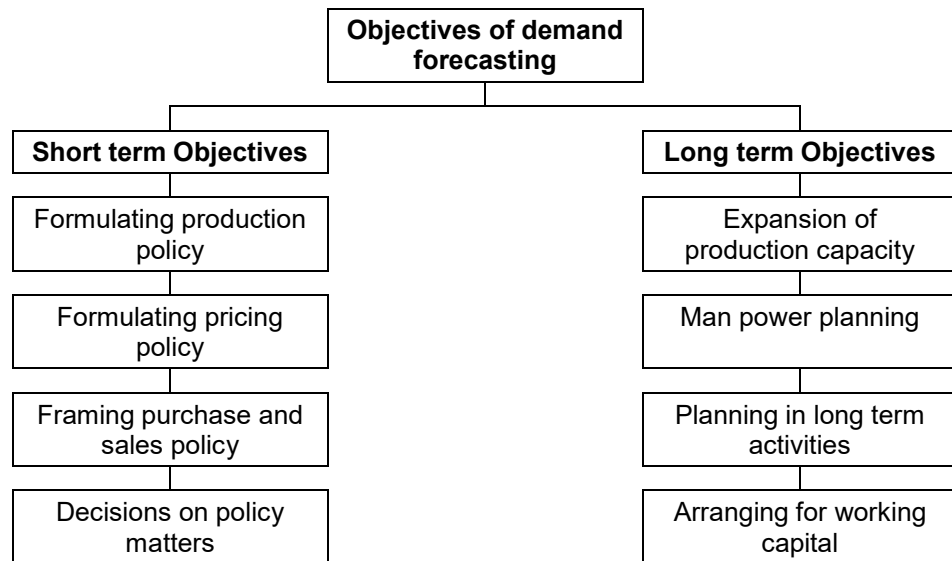
Apart from these types, there are many other forecasting are available such as type of product (existing or new product), capital product, consumer durable product and service product etc.

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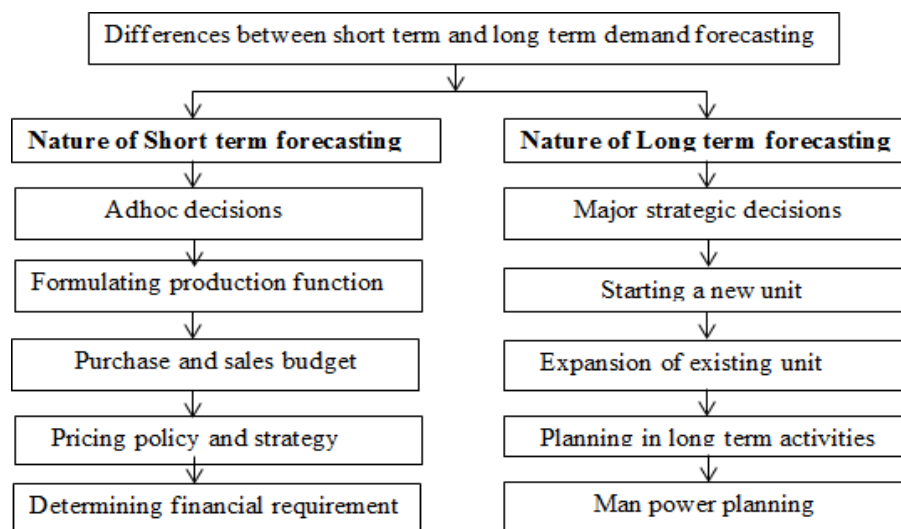
## **7.4. Objectives of Demand Forecasting**

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The purpose of demand forecasting is to achieve the management objectives which are broadly classified into two categories such as short term objectives and long term objectives. The following flow chart is helpful to understand the objectives of demand forecasting.



While comparing the objectives of short term and long term demand forecasting, it is better to see the differences between short term demand forecasting and long term demand forecasting.



Both short and long term demand forecasting are used to take effective decisions in the business.

## 7.5. Steps Involved in Demand Forecasting Process

The demand forecasting is a systematic process to estimate the demand for the future period. But it should be scientific, for which, the process of demand forecasting involves five major steps which are explained in the following manner.

**1. Identify and Specify the Objective:** The objective of the demand forecasting should be identified with the business requirement and it should clearly specify the suitable type of demand forecasting. The specifications includes whether it is short term and long term, whether

macro level, industry level or firm level or whether it is general or specific in nature etc.

**2. Determining the Time Perspective:** Based on the objective of the demand forecasting and its specification, the next step is to finalize the time perspective. If it is short term demand forecasting, some determinants are assumed to remain constant or do not change significantly. On the other hand, if it is long term demand forecasting all determinants are variable and due consideration to be given to them.

**3. Selection of Method of Demand Forecasting:** After specification of objective and its time period, it is the duty of the manager to select the method to be used for the conduct of demand forecasting. There are two broad categories of methods of demand forecasting viz., Survey Methods and Statistical Methods. Relevant method of demand forecasting will be selected on the basis of the purpose of demand forecasting, type of data required, availability of data, cost estimation and time frame.

**4. Collection of Data and Type of Data Required:** Once method of demand forecasting is finalized, the next step is to collect the data. Based on the demand forecasting criteria, type of data are to be finalized. The availability of data is the major factor which decides data requirement. It includes either primary data, secondary data or both. Data consistency, data manipulation and data adjustment are also taken into account while carrying out data collection.

**5. Estimation and Interpretation of Results:** The final step of demand forecasting process is to estimate the demand with the help of collected data and data adjustments. The estimation may be in the form of equation, statement or report and it should be scientific, easy and usable form. Thus, the objectives of demand forecasting can be achieved only if these steps are to be followed systematically.

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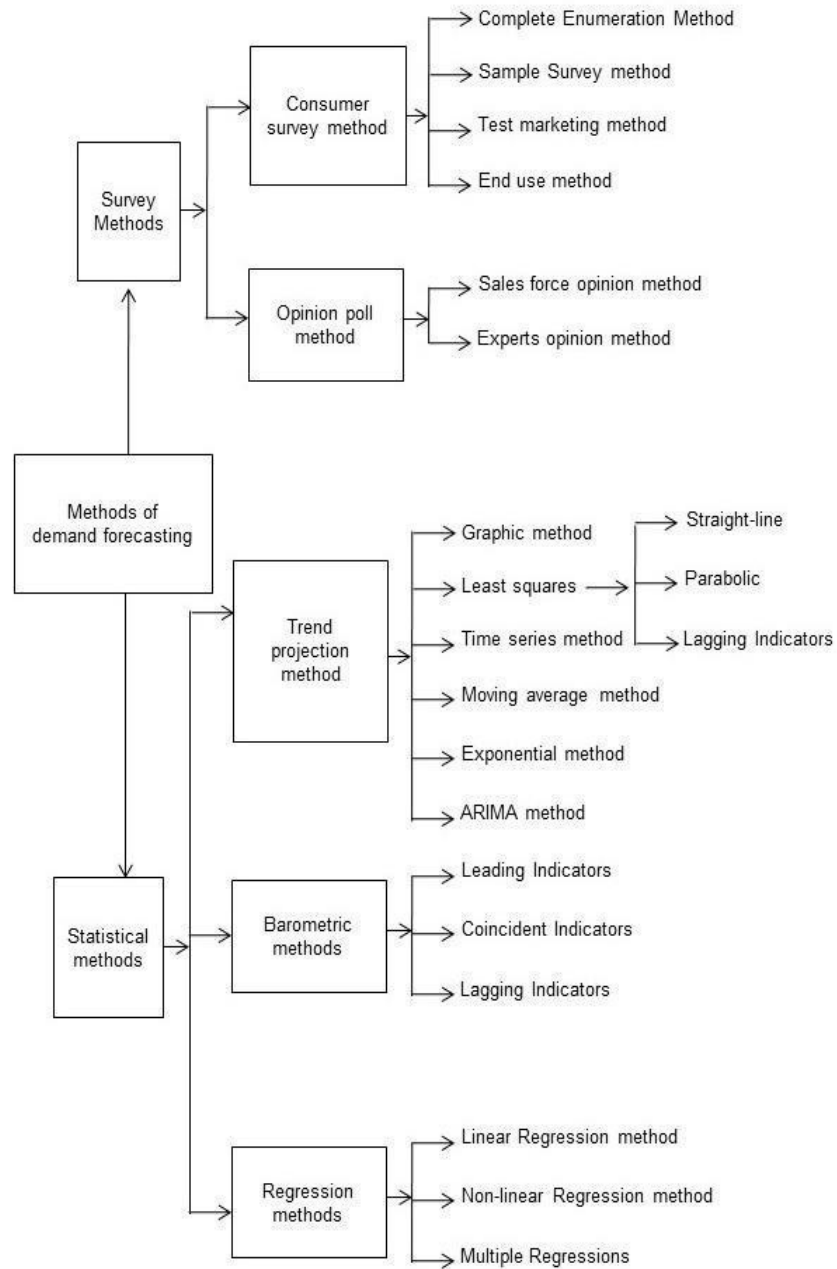
## **7.6. Methods of Demand Forecasting**

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The responsibility of a manager starts from the knowing the demand for the company product and continued with the requirement of raw materials for the production to aligning the finished product in the warehouse. The most critical problem of the manager is to choose the right method of demand forecasting which is decided by considering many factors like the objective of the forecast, time perspective of the forecast, nature of information required, nature of available information, cost estimation of the forecast and process of demand forecasting etc.

The following flow chart will be helpful to understand available methods of demand forecasting.

## Flow Chart




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### 7.7. Demand Forecasting for New Product

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Demand forecasting for the new products requires special skill and techniques as they are new products and no previous data will be available about their sales. The method or techniques should be carefully tailored for the product. Prof Joel Dean had made six possible approaches towards forecasting of new products. They are as follows:

1. **The evolutionary approach in forecasting demand:** The principle behind this approach is that the demand for a new

product is only an outgrowth and evolution of the existing product. It means that the demand conditions of the existing product should be taken into account while accessing the demand for the product.

2. **Substitute approach in forecasting demand:** By this the new product is analysed as a substitute for the old existing product or service.
3. **Growth curve approach in forecasting demand:** The estimates of rate of growth and ultimate level of demand for the new product will be established on the basis of some growth patterns of an already established product. For example, the average sales of talcum powder will give an idea about how a new cosmetic will be received in the market.
4. **Opinion poll approach in forecasting demand:** Under this, the demand for the new product will be estimated by making direct enquiries from the ultimate consumers. This is done by sample survey method. But, this is a very complicated process as there will be problems of sampling, probing the real intentions of the consumers, etc.
5. **Sales experience approach in forecasting demand:** According to sales experience approach method, samples of new products shall be offered in a sample market to forecast demand. This is done through distributive channels like departmental stores or cooperative society, etc., or by direct mailing. Total demand is predicted on the basis of the sample market. But, the difficulty in this lies in determining the allowance to make for the immaturity of the sample market and full-fledged market.
6. **Vicarious approach in forecasting demand:** Through vicarious approach method, the reaction of the customer towards new product can be found out indirectly through the specialized dealers who are able to judge the needs, tastes and preferences of customers. The dealers being the link between the producer and the ultimate consumers, with help of dealers will be able to know how the customers receive the new product.

All the above methods of forecasting demand for the new product are not mutually exclusive. According to Joel Dean, A combination of many of them is often desirable when they can supplement each other. When a new product is only an improvement of the old product, evolutionary approach becomes useful in forecasting the demand. The growth-curve

approach has only limited application. The vicarious approach appears to be very simple, but very difficult to implement in forecasting demand for new products in market.

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### 7.8. Case Study

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The following table depicts the values of sales for the last five years.

Year	2014	2015	2016	2017	2018
Sales (000')	45	52	48	55	60

1. Construct the demand forecasting report using methods of least square.
2. Find the projected value of sales for the year 2020 using trend projection estimates.

#### Solution

The demand forecasting can be made with survey method or statistical method.

Under statistical method, methods of least square is scientific and simple to use. Under normal equation

$$\sum Y = n.a + b \sum X \dots\dots\dots(1)$$

$$\sum XY = a \sum X + b \sum X^2 \dots\dots\dots(2)$$

Calculating the magnitude of the required quantities the following table used.

Year	Sales	X	X <sup>2</sup>	XY
2014	45	1	1	45
2015	52	2	4	104
2016	48	3	9	144
2017	55	4	16	220
2018	60	5	25	300
n=5	$\sum Y = 260$	$\sum X = 15$	$\sum X^2 = 55$	$\sum XY = 813$

When we substitute the values of  $\sum X$ ,  $\sum X^2$ ,  $\sum XY$ , n and  $\sum Y$  in equation (1) and (2) we get

$$260 = 5a + 15b \dots\dots\dots(3)$$

$$813 = 15a + 55b \dots\dots\dots(4)$$

Solving the equation (3) and (4); we get b = 3.3 Substituting b = 3.3

$$260 = 5a + 15(3.3)$$

$$260 = 5a + 49.5$$

$$A = 42.1$$

Therefore the equation of best fit is equal to  $Y = 42.1 + 3.3 X$

The estimated sales value from 2014 to 2020 is

$$Y_{2014} = 42.1 + 3.3 (1) = 45.4$$

$$Y_{2015} = 42.1 + 3.3 (2) = 48.7$$

$$Y_{2016} = 42.1 + 3.3 (3) = 52.0$$

$$Y_{2017} = 42.1 + 3.3 (4) = 55.3$$

$$Y_{2018} = 42.1 + 3.3 (5) = 58.6$$

The estimated sales for the year 2020 will be

Therefore

$$Y_{2020} = 42.1 + 3.3 (7) = 65.2$$

The trend projection of sales through least square method for the year 2000 is 65.2 thousands.

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### Let Us Sum Up

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In this unit, you have learned about the following:

- Demand forecasting: Prediction of future Sales
- Methods of demand forecasting: Survey and Statistical method
- Forecasting demand for new Product

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### Check Your Progress

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1. Which of the following is not a survey method of demand forecasting
  - a. Consumers interview method
  - b. Expert opinion method
  - c. Barometric method
  - d. Collective opinion method
2. Which of the following is not a method of demand forecasting
  - a. Trend projection method
  - b. Substitute approach
  - c. Sales experience approach
  - d. Evolutionary approach

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## **Glossary**

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<b>Price Elasticity:</b>	Unitary Elasticity, perfectly Elastic, Perfectly Inelastic, Relatively Elastic and relatively inelastic
<b>Income Elasticity:</b>	Zero income Elasticity, Positive income elasticity and negative income elasticity
<b>Cross Elasticity:</b>	Substitutes and Complementary goods

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## **Answers to Check Your Progress**

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1. c) Barometric method
  2. a) Trend projection method
- 

## **Suggested readings**

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1. William F Samuelson and Stephen G Marks, "Managerial Economics" 7<sup>th</sup>Edition, John Wiley and Sons, 2012
2. Christopher Thomas and S Charles Maurice, "Managerial Economics" 9<sup>th</sup>Edition, McGraw-Hill Education, 2007



# Unit-8

## Pricing Policy

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### STRUCTURE

Overview

Objectives

8.1. Pricing policy - meaning

8.2. Factors considered for formulating the pricing policy

8.3. Objectives for pricing policy

8.4. Determinants of Pricing policy

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check your Progress

Suggested Readings

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### Overview

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In this unit, the meaning of Pricing Policy, factors considered for formulating the pricing policy, objectives for pricing policy and the determinants of pricing policy have been clearly explained.

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### Objectives

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After completion of this unit, you will be able:

- To understand and analyze the Leontief model or IO model

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### 8.1. Pricing Policy - Meaning

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A pricing policy is a standing answer to recurring question. A systematic approach to pricing requires the decision that an individual pricing situation be generalized and codified into policy coverage of all the principal pricing problems. Policies can and should be tailored to various competitive situations. A policy approach which is becoming normal for sales activities is comparatively rare in pricing. Most well managed manufacturing enterprises have a clear cut advertising policy, product customer policy and distribution- channel policy. But pricing decision remains a patchwork of ad hoc decisions. In many, otherwise well managed firms, price policy has been dealt with on a crisisbasis. This kind of price management by catastrophe discourages the kind of systematic analysis needed for clear cut pricing policies.

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## 8.2. Factors Considered for Formulating the Pricing Policy

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The following considerations involve in formulating the pricing policy:

- (i) **Competitive Situation** : Pricing policy is to be set in the light of competitive situation in the market. We have to know whether the firm is facing perfect competition or imperfect competition. In perfect competition, the producers have no control over the price. Pricing policy has special significance only under imperfect competition.
- (ii) **Goal of Profit and Sales** : The businessmen use the pricing device for the purpose of maximizing profits. They should also stimulate profitable combination sales. In any case, the sales should bring more profit to the firm.
- (iii) **Long Range Welfare of the Firm** : Generally, businessmen are reluctant to charge a high price for the product because this might result in bringing more producers into the industry. In real life, firms want to prevent the entry of rivals. Pricing should take care of the long run welfare of the company.
- (iv) **Flexibility** : Pricing policies should be flexible enough to meet changes in economic conditions of various customer industries. If a firm is selling its product in a highly competitive market, it will have little scope for pricing discretion. Prices should also be flexible to take care of cyclical variations.
- (v) **Government Policy** : The government may prevent the firms in forming combinations to set a high price. Often the government prefers to control the prices of essential commodities with a view to prevent the exploitation of the consumers. The entry of the government into the pricing process tends to inject politics into price fixation.
- (vi) **Overall Goals of Business** : Pricing is not an end in itself but it is only a means to an end. The fundamental guides to pricing, therefore, are the firms overall goals. The broadest goal of business is survival, however, on a more specific level, objectives relate to rate of growth, market share, maintenance of control and finally profit. The various objectives may not always be compatible. In short, a pricing policy should never be established without considering its impact on the other policies and practices.
- (vii) **Price Sensitivity** : The various factors which may generate insensitivity to price changes are variability in consumer behaviour,

variation in the effectiveness of marketing effort, nature of the product, importance of service after sales, etc. Businessmen often tend to exaggerate the importance of price sensitivity while ignoring many recognizable factors which tend to minimize it.

- (viii) **Reutilization of Pricing** : A firm may have to take many pricing decisions. If the data on demand and cost are highly conjectural, the firm has to rely on some mechanical formula. If a firm is selling its product in a highly competitive market, it will have little scope for price discretion. This will have the way for routinized pricing.

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### **8.3. Objectives of Pricing Policy**

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The pricing policy of the firm may vary from firm to firm depending on its objective. In practice, there are many prices being attached to a product of a firm such as wholesale price, retail price, published price, quoted price, actual price and so on.

Special discounts, special offers, methods of payment, amounts bought and transportation charges, trade-in values, etc., are some of the factors that can influence the price of a product. For pricing decision, one has to define the price of the product very carefully.

Pricing decision of a firm in general will have considerable repercussions on its marketing strategies. This implies that when the firm makes a decision about the price, it has to consider its entire gamut of marketing efforts. Pricing decisions are usually considered a part of the general strategy for achieving a broadly defined goal.

**While setting the price, the firm may aim at the following objectives:**

1. **Price-Profit Satisfaction**

All firms are interested in keeping their prices stable within certain period of time irrespective of the changes in demand and costs, so that they may get the expected profit.

2. **Sales Maximization 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.

3. **Making Money**

Some firms want to use their special position in the industry by selling product at a premium price and make quick profit as much as possible.

4. **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 firms can restrict the entry of rivals.

5. **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 maximization will lead to long run profit maximization and market share growth.

6. **Survival**

In these days of severe competition and business uncertainties, firms must set 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.

7. **Market Penetration**

Some firms want to maximize 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.

8. **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.

9. **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.

10. **Satisfactory Rate of Return**

Many companies try to set the price that will maximize 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.

## **Significance of Pricing:**

### **i. Pricing to Achieve a Target Return on Investment:**

This is a long-term objective and is the most frequently mentioned of pricing goals. Under this system both costs and profits goals are based on standard volume; and the margins added to standard costs are designed to produce the target profit-rate on investment.

### **ii. Stabilization of Price and Margin:**

For some firms, cost-plus is just one step on the road to return-on-investment as a price policy- guide. However, the majority of companies refrain from exploiting products beyond the limit set by cost-plus, either in times of buoyant demand or in pricing different items in the product line.

### **iii. Target Market-Share:**

Some companies have referred to maximum (or occasionally minimum) market-share as a determinant of pricing policy. This guide is generally used for products in which the firm does not have a patent or innovative monopoly.

### **iv. Other Rationalizations:**

Pricing to meet or match competition has often been cited as a pricing objective. More often than not, this approach was directed not at meeting competition so much as preventing it.

Dominant companies, cautious of price wars, could justify meeting competition locally on the ground that the policy constituted a permanent threat to potential price-cutters. In other instances, some firms were aware of specific competitive products whose prices must be matched if sales volume was to be expanded.

R. F. Lanzilloti (1958) has pointed out that the large company has a fairly well defined pricing goal related to long-range (planned) profits. It seeks a simultaneous decision with respect to price, cost and product characteristics.

W. Longworth (1964) recommends the use of contribution analysis techniques linked with a market-oriented method of price fixing as the soundest base for developing a reliable price-policy.

He suggests that "a company will be concerned to fix prices to ensure maximum revenue to meet all fixed expenses and provide profit. Assessment of product profitability should therefore be concerned on the one hand with those expenses directly related to the products'

manufacture, and variable with volume; and on the other hand to total income resulting from sales”.

### **Pricing Techniques in Theory and Practice:**

Though pricing policies are the foundation for the achievement of specific managerial objectives, pricing techniques are to be considered as the tools used in setting or revising prices of individual products.

It is generally agreed that actual price should be set on the basis of the interaction of cost, demand, and competition. Yet, the pricing techniques used in practice often unduly stress one of these factors to the complete exclusion of others.

The practical problems faced by the business person are imperfect information, both with respect to cost and to demand, and with the various pricing decisions that have to be made. Another major complication arises due to the existence of a number of institutional rigidities that prevent the continuous adjustment of prices in accordance with changes in either demand, cost or competitive conditions.

For many products, the price is published in advertising materials or in catalogues and thus must remain unchanged for a long time. For other products sold by large companies, the actual setting of prices is delegated to many individuals in different settings. Therefore, a system of fluctuating prices would be extremely costly and time consuming.

Pricing executives, therefore, often view the pricing problems as “one of establishing reasonably satisfactory prices for a period of time, rather than selecting the optimum price at a given point in time.

Although the overall objective of establishing prices may be profit maximization, the search costs of obtaining information on a product’s cost, demand, and competitive conditions, when combined with institutional constraints, may force the decision-maker to proceed toward this objective somewhat differently than is suggested by the static theoretical models”.

Differently put, the decision-maker may know that profits will be maximized by setting prices according to the marginal rule, but the additional cost of obtaining exact estimates of MR and MC may exceed the additional revenue of following this rule, with the result that reliance is placed on simpler rule-of-thumb practices.

The actual pricing techniques are designed to assist pricing managers in the establishment of profitable prices. This explains why actual

pricing practices are set keeping the marginalize rule of pricing ( $MR = MC$ ) as the yardstick.

In particular, we will evaluate how cost, demand, and competitive factors guide pricing managers, as well as the interrelationship between pricing theory and actual pricing practices followed by business firms.

### **3. Pricing Policies and the Interest of the Firm:**

From the stand point of the firm, a price policy is intended to maximize long-run profit. This objective is pursued in an environment in which both random events and reactions emanating from other economic organisations have to be taken into account.

#### **The Pricing Process:**

According to Alfred Oxenfeldt, there is need to consult (analyse) seven main parties in the process of establishing prices:

#### **Those responsible for sales promotion and advertising;**

- Consumers of the product;
- Existing competitors;
- Potential competitors;
- Middlemen;
- Suppliers;
- Government.

One of the major drawbacks of traditional approach is that it focuses almost only on two parties, the buyer and the seller. An actual pricing decision must be based on government rules which force firms to adopt such practices as price discrimination, predatory pricing or collusive pricing.

Thus, pricing has to be viewed as a process that gives signals or information to consumers, competitors, middlemen, suppliers and government.

#### **A Multistage Approach to Pricing:**

Oxenfeldt has put forth a multistage approach to pricing that provides a conceptual framework within which to make pricing decisions.

**His approach breaks the pricing process into a series of steps, each of which involves specific pricing issues:**

- Selection of market;

- Selection of the firm or brand image;
- Determination of the marketing mix;
- Selection of a specific pricing policy;
- Selection of pricing strategy;
- Setting specific prices.

In order to select the market target, the firm has to first determine the specific market that it expects to reach and deal with such related issues as market segmentation, market share, competitive advantages, regional markets, and demographic characteristics.

For example, in the soft drink market, the pricing strategy must reflect unique segments or market categories, such as generic soft drink, low-priced or popular soft drink, costly soft drink, zero-bacteria soft drink, and imported soft drink.

Each segment has different price and income elasticity coefficients and requires a mix of varying advertising and pricing strategies from no advertising and low price mark-ups, to saturation pricing and high mark-ups. In a like manner, the pricing strategy may be linked to desired or possible market share in each segment and in each region.

Likewise, a company's long-run pricing philosophy will be related to the initial decisions made concerning the desired reputation of the product or the firm. Some firms strive to achieve reputations for high-quality products that sell at higher than average prices, while other firms emphasize discounted prices. According to Oxenfeldt, price is a variable that must be used to respond to shifting market forces.

### **Pricing Policies and Market Conditions:**

#### **Price policy has to be examined in the following contexts:**

##### **i. Perfect Competition:**

A firm can only sell its product at the market price and nothing above it. In the long run, for an efficient firm, the sales price is just equal to the average cost. Normal profit is made. There is no excess profit.

##### **ii. Monopoly:**

Monopolies are almost always nationalized enterprises for which the criterion of maximization of profit is not justifiable. In reality, a firm enjoys monopoly position only because it has succeeded in eliminating or absorbing its competitors. It is therefore probable that, initially, it was better organized and more efficient.

The technical advantages which benefit large firms in certain branches



of industry can also neutralize, at least partly, the harmful effects of a monopoly.

Finally, “any de facto monopoly must be prepared to defend itself, on the one hand, against the emergence of substitute competitors and, on the other, against the competition of substitute products, which imposes a limitation on its profit realization”.

In general, to prevent the entry of new firms, a monopolist must set entry-preventing prices, i.e., it should hold prices at a level which will tend to discourage new firms from entering that particular branch of industry. This presupposes an implicit estimation of production costs of possible competitors, and of the profits which will be required to attract them.

On the contrary, in order to fight the competition of substitute products, a monopoly must establish its price policy on the basis of a demand curve which will actually take those products into account.

When the uses of goods produced by a monopoly are many, the degree of monopoly can vary enormously from one use to another. In case of coal, for instance, sales range from the industrial market in which the fuel oil competition is extremely active to blast furnace coke market in which coal enjoys a technical monopoly.

So profit maximization demands that management collect more detailed econometric data in the environment of monopoly, than in that of perfect competition.

### **iii. Temporary Monopoly:**

This situation occurs more frequently. A firm invents a new product and places it on the market. For quite some time the demand will remain low, as consumers are not yet aware of the product. The firm will enjoy a de facto monopoly under the protection of its patents.

Then, as the product enters into common usage, demand develops rapidly. Additional firms try to enter the market. They develop new production methods. Gradually, prices and production techniques tend to stabilize. So, at the end, the market evolves towards an ordinary competitive one.

A firm which invents a new product must determine a strategy relating to prices and production which leads to a maximum effective income. Following J. Dean, we may consider two extreme cases: that of skimming of demand and that of creating a broad market.

#### **iv. Skimming of Demand:**

This policy is characterized by very high initial prices and by major promotional efforts. The prices are reduced as the market develops and competitors tend to appear.

#### **The conditions which make such a policy satisfactory are the following:**

Firstly, demand is only slightly elastic. This is usually the case when the product is brand new. Consumers are not yet aware of the product or service and many are drawn by the novelty of the product, all of which contribute to reduce the influence of price.

Secondly, advertising plays an important role in promoting sales. Advertising informs the buyers about a product and excites curiosity.

Thirdly, the elasticity of demand will gradually increase with the passage of time and the firm will progressively reduce its prices. In case of a durable good, the policy is one of maximising price to the initial market, consisting of a relatively small number of eager buyers. As the market potential is broadened, the price is reduced to convert potential sales into actual revenues.

Fourthly, if a firm is aware of the fact that it cannot prevent the emergence of new competitors, this policy avoids sacrificing current receipts for less probable future receipts.

Finally, this policy obviates the necessity of making large investments because large-scale development in the demand for the product is not anticipated.

#### **v. The Creation of a Broad Market:**

This policy, on the contrary, **“is characterized by relatively low initial prices, and consists essentially in exchanging present heavy costs against the expectation of future returns”**. Certain favourable conditions must exist for this policy to be successful.

#### **Strong Demand:**

Firstly, a strong initial elasticity of demand is needed. This, in effect, permits lowering prices without severely reducing sales revenue.

#### **Large Market Potential:**

Secondly, there is need for a large market potential. This implies that the product should be potentially attractive to consumers of diverse environments.

**Increasing Returns:**

Thirdly, the production process should exhibit increasing returns. In practice, by creating a broad' market, a firm can avoid working below optimal production capacity and can effect substantial savings in cost.

**Entry Prevention:**

Finally, there should be some way of minimizing the emergence of new competitors in the market.

However, these are extreme cases and the price policy must be re-examined periodically.

**Imperfect competition:**

We have noted that imperfect competition refers to markets in between perfect competition and monopoly. There are different varieties of imperfection: duopoly, oligopoly, monopolistic competition and so on.

**vi. Duopoly:**

This is the case where there are only two firms in an industry. Each duopolist can choose his production in such a way as to maximize his income for a given value of output. Each duopolist has no interest in modifying his behaviour as long as the other does not modify his behaviour.

If both duopolists attempt to take one another's reactions into account, the problem is no longer predetermined. Duopoly is often characterised by instability.

Duopolists eliminate their competitors through price wars or through agreements. We have already demonstrated that duopolists can assure themselves, by cooperating, a total income greater than the sum of the revenues that each can insure for himself by non-cooperative behaviour.

**vii. Oligopoly:**

In oligopolistic situations, entrepreneurs attempt to avoid price wars which are ruinous for the industry. Being aware of the fact that their rivals can do the same, they refrain from seeking to increase their share of the market through price cuts.

**As a result, oligopoly can attain a certain stability characterized by:**

- (a) The 'price leadership' of a firm,
- (b) The reduction of hidden prices, and

(c) Competition in fields other than that of price (like promotion, packaging, etc.).

Now, about the lowering of hidden prices. It can assume various forms. It is contingent upon the customer, upon the size of the order, upon the geographical area and the existence of inferior brands. This policy has the advantage that it precedes adjustments of official prices and in this way contributes to the stability of oligopolists.

Finally, non-price competition is a substitute for price competition. It is much less dangerous because its effects are felt in the long run. So the possibilities of reactions from competitors are more limited.

#### **viii. Monopolistic Competition:**

In this type of market, price policies are extremely varied because of product differentiation. Each firm is faced with a separate demand curve and a market price.

#### **5. Establishing Prices of Related Products:**

**There are three standard rules in this context:**

The first rule states that the prices of different products must be proportionate to average costs. However, in case of related products, the concept of average cost has no operational significance and can result only from arbitrary agreements. By applying this rule, a firm will be faced with a rigid price policy in the face of changing market conditions.

A second rule suggests, on the other hand, that prices should be proportional to short-term marginal costs. This rule is more practical since marginal cost can be accurately measured. This rule, as one shall see, is used in case of public utility pricing.

A final rule suggests prices such that profit margins on each product would be proportionate to the value added. However, all the three rules take only cost into account and ignore market conditions.

#### **i. Price Differentiation:**

Price differentiation may assume different forms, but the most important are partitioning the market, differentiating prices within a geographical area, and granting discounts to distributors.

#### **ii. Partitioning of the Market:**

Dividing a market consist of separating it into distinct sections of differing elasticity. This is the essence of differential pricing or price discrimination.

### **iii. Price Differentiation within a Geographical Area:**

The theory of the economic optimum demands that, at each point, the price of a product will be equal to the sum of the factory price plus a transportation cost. However, in order to maximize profit, a firm often breaks away from this rule.

In practice, the monopolist charges relatively much higher transportation costs to neighbouring consumers than to more distant ones. These policies are found in a somewhat disguised form in the systems used in actual practices which are discussed below.

#### **a. F.O.B. Prices:**

This method of rate setting consists in having the consumer pay the sum of the factory delivered price plus actual transportation costs.

#### **b. Uniform Prices:**

Under this policy, the same price is charged irrespective of the geographical proximity of the seller to the buyers.

#### **c. Zone Prices:**

Under this policy, the customer is actually billed the sum of the factory delivered price plus a transportation cost but the factory price varies according to the zone. It is generally lower for distant zones. Zone prices, therefore, constitute price discrimination.

#### **d. Parity Prices:**

This system “selects a point of parity, the same for all firms. The price scale of a company gives delivery prices at the parity point. Customers are not charged actual transportation costs but fictitious ones from the point of parity to the point of consumption.”

#### **Discounts to distributors:**

Trade discounts influence profits obtained by distributors and, if large enough, attract their interest. An expanding industry may grant large trade discounts in order to attract a large number of distributors very quickly. These discounts are valuable in partitioning of markets.

Company price policy is based on economic studies relating to markets, costs, policies of operation, stockage, and investment. True, “price is thus the connecting link between the firm and the outer world: it summarizes the demand situation for the firm, and it summarizes for the outside world a firm’s conditions of operation. This intermediary role makes it possible to decentralize the decision function.”

We may now discuss different pricing techniques used and practices

followed by modern business firms in both the private and the public sector. We may start with Public Utility Pricing.

### **6. Public Utility Pricing:**

Pricing in public utilities such as electricity, gas, water, telephones and public transportation presents a special type of problem. These are 'natural monopolies' inasmuch as, in one locality, a single firm tends to drive out competing firms.

In these industries, the nature of technology is such that production and distribution results in substantial economies of scale.

The implication is that one large firm can produce more economically than can several firms. Naturally, the object of government policy is to protect such utility companies from competition and then subject them to rate control by regulatory commissions.

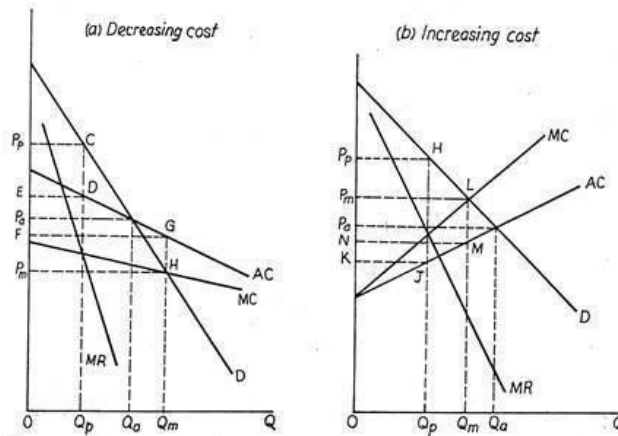
### **The Theoretical Basis of Nationalized Industry Pricing:**

Many nationalized enterprises are guided by commercial consideration. They seek to maximise profits by setting prices and outputs at levels which make marginal cost and marginal revenue equal.

The possible price-output-profit positions for three alternative types of policy of such firms are illustrated in Figure 19.1 for both decreasing and increasing cost enterprises.

Where costs are decreasing, as in (a), the profit-maximising state firm would produce an output of  $OQ_p$  and charge a price of  $OP_p$ , earning profits of  $P_pCDE$ ; the state firm attempting to break even, and adopting average cost pricing, would charge  $OP_a$ , produce  $OQ_a$ , and earn no economic profits; while the firm charging prices equal to marginal cost would charge  $OP_m$ , produce output  $OQ_m$ , and make a loss of  $FGHP_m$ .

In increasing cost industry, as in (b), profit maximising leads to a price  $OP_p$ , output of  $OQ_p$ , and profit of  $P_pHJK$ ; breaking even would lead to a price of  $OP_a$ , and output of  $OQ_a$ , while the marginal cost pricing firm would charge  $OP_m$ , produce output  $OQ_m$ , and earn profits of  $P_mLMN$ .

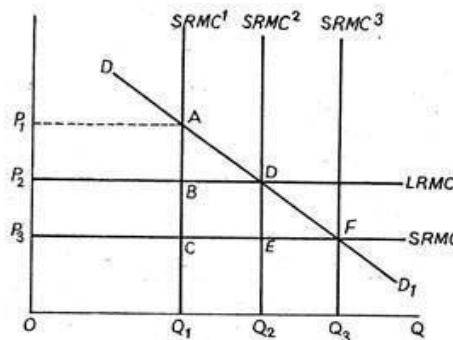


**Figure 19.1**  
Price in Decreasing and Increasing Cost Industries

### Price in Decreasing and Increasing

Therefore, in a decreasing cost industry, profit maximising results in the highest price and smallest output, average cost pricing produces a lower price and greater output compared to profit maximising, while marginal cost pricing leads to the lowest price and largest output. Marginal cost pricing, therefore, leads to the best use of existing capital but results in a financial loss.

In Figure 19.2, the firm facing demand curve  $DD_1$  has a choice of three plant sizes represented by three cost curves  $SRMC^1$ ,  $SRMC^2$  and  $SRMC^3$ . For each plant size, short-run marginal cost  $OP_3$  is constant up to capacity output. Long-run marginal cost  $OP_2$  is constant throughout and equal to short-run marginal cost plus long-run capacity cost, i.e.  $BC$ .



**Figure 19.2**  
Short-Run and Long-Run Marginal Cost Pricing

If plant 1 already exists, the short-run marginal cost price that equates demand and supply is  $OP_1$ , which exceeds long-run marginal cost. If plant 3 exists, then the price charged is  $OP_3$  which is just equal to short-run marginal cost, but is less than long-run marginal cost. With plant 2, price is  $OP_2$  which is equal to both short-run and long-run marginal cost.

Thus, with the right size plant, short-run and long-run marginal cost are equal; if short-run marginal cost exceed long-run marginal cost, expansion of capacity is called for, and if LRMC is greater than SRMC, contraction is warranted. The pricing rule thus also includes an investment rule.

The main argument for marginal cost pricing is that “it relates the cost of producing the marginal unit to the price the consumer pays. This avoids problems of cross-subsidisation and of encouraging consumers to buy excessively goods that are priced below marginal cost, when average costs of production are rising. Where unit costs are falling, marginal cost pricing allows the more intensive use of fixed costs, but brings with it the problem of financial losses”.

Where there are variations in the level of demand, either within the day or by the time of year, then marginal cost pricing may be an appropriate method. For example, in the telephone industry, where demand varies by both time of day and time of year, and short-run marginal costs vary directly with the level of output, it is often argued that the consumer should cover the costs of meeting his demand.

Under such circumstances, pricing the goods or service according to short-run marginal cost is quite inconsistent with long-run marginal cost pricing.

This point is illustrated in Figure 19.3 where the demand and cost curves refer to equal time periods, say of twelve hours, and the equilibrium condition is that the sum of the short-run marginal cost prices should equal the sum of the two-period long-run marginal costs. Thus, night-time demand for telephone calls ( $D_n$ ) is charged  $P_n$  which is equal to short-run marginal cost or  $CQ_d$ .

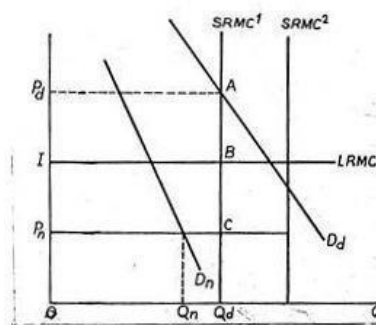


Figure 19.3  
Peak Load and Off-Peak Pricing

Daytime demand  $D_d$ , given the size of the system must cover the system's entire capital or capacity cost plus its own short-run marginal cost  $SRMC$ . Thus, the price of daytime telephone call is equal to



$CQ_d$  plus AC, which is equal to twice the single period long-run marginal capacity cost (BC). Hence, price can vary between periods and be consistent with the long-run marginal cost pricing rule.

**However, this method has certain drawbacks:**

Firstly, the price does not cover total cost in a decreasing cost firm. So, the government has to pay a subsidy to the utility so that it can cover all costs. A case is also made in favour of public ownership on the ground that the government is not required to cover all costs out of revenues.

Secondly, if the utility is subject to increasing costs, as is true of telephone companies, marginal cost pricing results in prices which exceed total costs. This result is shown in Figure 19.1. The firm makes excess profit but the size of the profit is less than would be possible without regulation. A special tax can be imposed to siphon off a large part of the excess profit.

Thirdly, marginal cost pricing is objectionable on the ground that subsidies will have to be provided to utility companies in case of loss. In other words, their profits may depend more upon their success in demonstrating the need for subsidies than in controlling costs. So they may be distracted from their main business if they have to contend with political agencies for subsidies.

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#### **8.4. Determinants of Pricing Policy**

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**The pricing of products involves consideration of the following factors:**

- |                            |                         |
|----------------------------|-------------------------|
| (i) Cost Data.             | (ii) Demand Factor.     |
| (iii) Consumer Psychology. | (iv) Competition.       |
| (v) Profit.                | (vi) Government Policy. |

#### **Cost Data in Pricing**

Cost data occupy an important role in price setting process. There are different types of costs incurred in the production and marketing of a product. There are production costs, promotional expenses like advertising or personal selling as well as taxation, etc. They may necessitate an upward fixing of price. For example, the prices of petrol and gas are rising due to rise in the cost of raw materials, such as crude transportation, refining, etc. If costs go up, price rise can be quite justified. However, their relevance to the pricing decision must neither be underestimated nor exaggerated. For setting prices apart from costs, a number of other factors such as demand and competition are to be taken into consideration.

## Two Types of Costs

Fixed costs and variable costs are the two broad types of costs. In the short period, there exist the cost of at least one factor constant, that is, the period in which a firm wants to establish itself, the firm may not cover the fixed costs but it must cover only the variable cost. But in the long run, costs of all factors vary and all costs must be covered. If the entire costs are not covered, the producer stops production.

Subsequently, the supply is reduced which, in turn, may lead to higher prices. If costs are not covered, the producer stops production. Subsequently, the supply is reduced which, in turn, may lead to higher prices. If costs were to determine prices why do so many companies report losses?

There are marked differences in costs as between one producer and another. Yet the fact remains that the prices are very close for a somewhat similar product. This is the very best evidence of the fact that costs are not the determining factors in pricing.

In fact, pricing is like a tripod. It has three legs. In addition to costs, there are two other legs of market demand and competition. It is no more possible to say that one or another of these factors determines price than it is to assert that one leg rather than either of the other two supports a tripod.

Price decisions cannot be based merely on cost accounting data which only contribute to history while prices have to work in the future. Again it is very difficult to measure costs accurately. Costs are affected by volume, and volume is affected by price.

The management has to assume some desired price-volume relationship for determining costs. That is why, costs play even a less important role in connection with new products than with the older ones. Until the market is decided and some idea is obtained about volume, it is not possible to determine costs.

Regarding the role of costs in pricing, Nickerson observes that the cost may be regarded only as an indicator of demand and price. He further says that the cost at any given time represents a resistance point to the lowering of price. Again, costs determine profit margins at various levels of output. Cost calculation may also help in determining whether the product whose price is determined by its demand, to be included in the product line or not. What costs determine the price or not, but whether the production can be profitably carried out or not is very important.

## **Relevant Costs**

The question naturally arises: –What then are the relevant costs for pricing decision? Though in the long run, all costs have to be covered, for managerial decisions, in the short run, direct costs are relevant. In a single product firm, the management would try to cover all the costs.

In a multi-product firm, problems are more complex. For pricing decision, relevant costs are those costs that are directly traceable to an individual product. Ordinarily, the selling price must cover all direct costs that are attributable to a product. In addition, it must contribute to the common cost and to the realization of profit. If the price, in the short run, is lower than the cost, the question arises, whether this price covers the variable cost or not. If it covers the variable cost, the low price can be accepted.

But in the long run, the firm cannot sell at a price lower than the cost. Product pricing decision should not be lower than the cost. Product pricing decision should, therefore, be made with a view to maximize company's profits in the long run.

### **(i) Demand Factor in Pricing**

In pricing of a product, demand occupies a very important place. In fact, demand is more important for effective sales. The elasticity of demand is to be recognized in determining the price of the product. If the demand for the product is inelastic, the firm can fix a high price. On the other hand, if the demand is elastic, it has to fix a lower price.

In the very short term, the chief influence on price is normally demand. Manufacturers of durable goods always set a high price, even though sales are affected. If the price is too high, it may also affect the demand for the product. They wait for arrival of a rival product with competitive price. Therefore, demand for durable product is very sensitive to price changes.

### **(ii) Consumer Psychology in Pricing:**

Demand for the product depends upon the psychology of the consumers. Sensitivity to price change will vary from consumer to consumer. In a particular situation, the behaviour of one individual may not be the same as that of the other. In fact, the pricing decision ought to rest on a more incisive rationale than simple elasticity. There are consumers who buy a product provided its quality is high.

Generally, product quality, product image, customer service and promotion activity influence many consumers more than the price. These factors are qualitative and ambiguous. From the point of view of

consumers, prices are quantitative and unambiguous. Price constitutes a barrier to demand when it is too low, just as much as where it is too high. Above a particular price, the product is regarded as too expensive and below another price, as constituting a risk of not giving adequate value. If the price is too low, consumers will tend to think that a product of inferior quality is being offered.

With an improvement in incomes, the average consumer becomes quality conscious. This may lead to an increase in the demand for durable goods. People of high incomes buy products even though their prices are high. In the affluent societies, price is the indicator of quality.

Advertisement and sales promotion also contribute very much in increasing the demand for advertised products. Because consumers think that the advertised products are of good quality. The income of the consumer, the standard of living and the price factor influence the demand for various products in the society.

### **(iii) Competition Factor in Pricing**

Market situation plays an effective role in pricing. Pricing policy has some managerial discretion where there is a considerable degree of imperfection in competition. In perfect competition, the individual producers have no discretion in pricing. They have to accept the price fixed by demand and supply of market. In monopoly, the producer fixes a high price for his product. In other market situations like oligopoly and monopolistic competition, the individual producer takes the prices of the rival products in determining their price. If the primary determinant of price changes in the competitive condition is the market place, the pricing policy can least be categorized as competition based pricing.

### **(iv) Profit Factor in Pricing**

For pricing products, producers consider profit as an important aspect. Each producer fixes price of his product in order to maximize profit. If the objective is profit maximization, the critical rule is to fix the price at which  $MR = MC$ . Generally, the pricing policy is based on the goal of obtaining a reasonable profit.

Most of the businessmen want to hold the price at constant level. They do not wish frequent price variation. The profit maximization approach to pricing is logical because it focuses the attention of the producers on the changes in production, cost and revenue with any contemplated change in price to get maximum profit. The price rigidity is the practice of many producers. Rigidity does not mean inflexibility. It means that prices are stable over a given period.

### **(v) Government Policy in Pricing**

In a market economy, government generally does not interfere in the economic decisions of firms. But in planned economies, government interferes in almost every decision. According to conventional economic theory, the buyers and sellers determine price. In reality, besides the buyers and sellers, other factors such as competition and the government also involve in the pricing process.

The government's practical regulatory price techniques are ceiling on prices, minimum prices and dual pricing. In a mixed economy like India, the government resorts to price control. The business establishments have to adopt the government's price policies to control relative prices to achieve certain targets, to prevent inflationary price rise and to prevent abnormal increase in prices.

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### **Let Us Sum Up**

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In this unit, you have learned about the following:

- Meaning of pricing policy
- Factors considered for pricing policy
- Determinants of pricing policy

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### **Check Your Progress**

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1. The degree of homogeneity is always one in \_\_\_\_\_ Production function.
2. In a \_\_\_\_\_ firm, the management would try to cover all the costs.
3. In pricing of a product, \_\_\_\_\_ occupies a very important place.

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### **Glossary**

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**Pricing policy:** It is a standing answer to recurring question.

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### **Answers to Check Your Progress**

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1. Linear homogeneous
2. Single product
3. Demand

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### **Suggested Readings**

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1. E. Case Karl and C Fair Ray and E Oster Sharon, 'Principles of Economics' Pearson, 2017
2. Keat Paul, K Young Philip and C Dickinson 'Managerial Economics' Pearson, 2017

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### **Block-3: Introduction**

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Block-3: **Production and Cost Analysis** consists of four Units and **Unit- 9: Production Analysis** presents about Introduction of Production and Cost Analysis and its Definition, Production and its meaning, Factors of Production, Classification of production function, Cobb-Douglas production function, Leontief production function, CES production function, Economies and Diseconomies of Scale.

Unit- 10 : **Theory of Production** deals with Introduction, Law of variable proportion, Definition, Assumptions, Production schedule, Stages of law of variable proportion, Decision making in production function, Limitations, Law of returns to scale, Definition, Assumptions, Production schedule and Stages of law of returns to scale.

Unit- 11 : **Cost of Production** explains about the Cost and its Meaning, and Different Cost Concepts.

Unit- 12 : **Cost-output relationship** describes about Cost functions, Role of cost function in decision making, Short run cost-output relationship and Long run cost-output relationship.

In all the units of Block -3 **Production and Cost Analysis**, the Check your progress, Glossary, Answers to Check your progress and Suggested Reading has been provided and the Learners are expected to attempt all the Check your progress as part of study.

# Unit-9

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## Production Analysis

### STRUCTURE

Overview

Objectives

9.1. Introduction

9.2. Definition

9.3. Production - meaning

9.4. Factors of Production

9.5. Classification of production function

9.5.1. Cobb-Douglas production function

9.5.2. Leontief production function

9.5.3. CES production function

9.6. Economies and Diseconomies of Scale

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check your Progress

Suggested Readings

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### Overview

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In this unit, meaning of production, factors of production and the classification of production function, Cobb-Douglas production function, Leontief production function and CES production function have been explained.

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### Objectives

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After completion of this unit, you will be able:

- To understand the process of production
- To analyze different production functions

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### 9.1. Introduction

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Different authors have defined the term production in different ways but the following definition is common in practice.

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### 9.2. Definition of Production

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Production is a process or method used to transform the tangible inputs



(raw materials, semi-finished goods, subassemblies) and intangible inputs (ideas, information and knowledge) into required output (goods or services). In other words, production is a process of converting inputs into the required output, i.e., converting the various inputs into finished products.

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### **9.3. Production - Meaning**

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Normally production means creation of goods. For example, a blacksmith produces iron chain and carpenter produces wooden box. In economic sense this view seems different. A blacksmith changes the form of the iron or add value where iron is a free gift of nature and similarly carpenter changes the shape of the wood or add value where wood is also a free gift of nature. In both cases the production is not a creation of goods but make the available things more useful than before. Man uses things extracted from nature and offers new form in order to make them more useful than before. In easy words, creating more utility value for the production factors. Therefore, production in economics means creation of new utility.

Creation of new utility includes three categories, viz., form utility, place utility and time utility. By changing the shape of the things gifted by nature is called form utility – iron ore into steel and wood into furniture are the production of form utility. By changing the place of things i.e., moving the things from the place of abundance to the place of scarcity is called production of place utility and increasing the value of things by means of transferring from time of abundance to time of scarcity is called production of time utility.

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### **9.4. Factors of Production**

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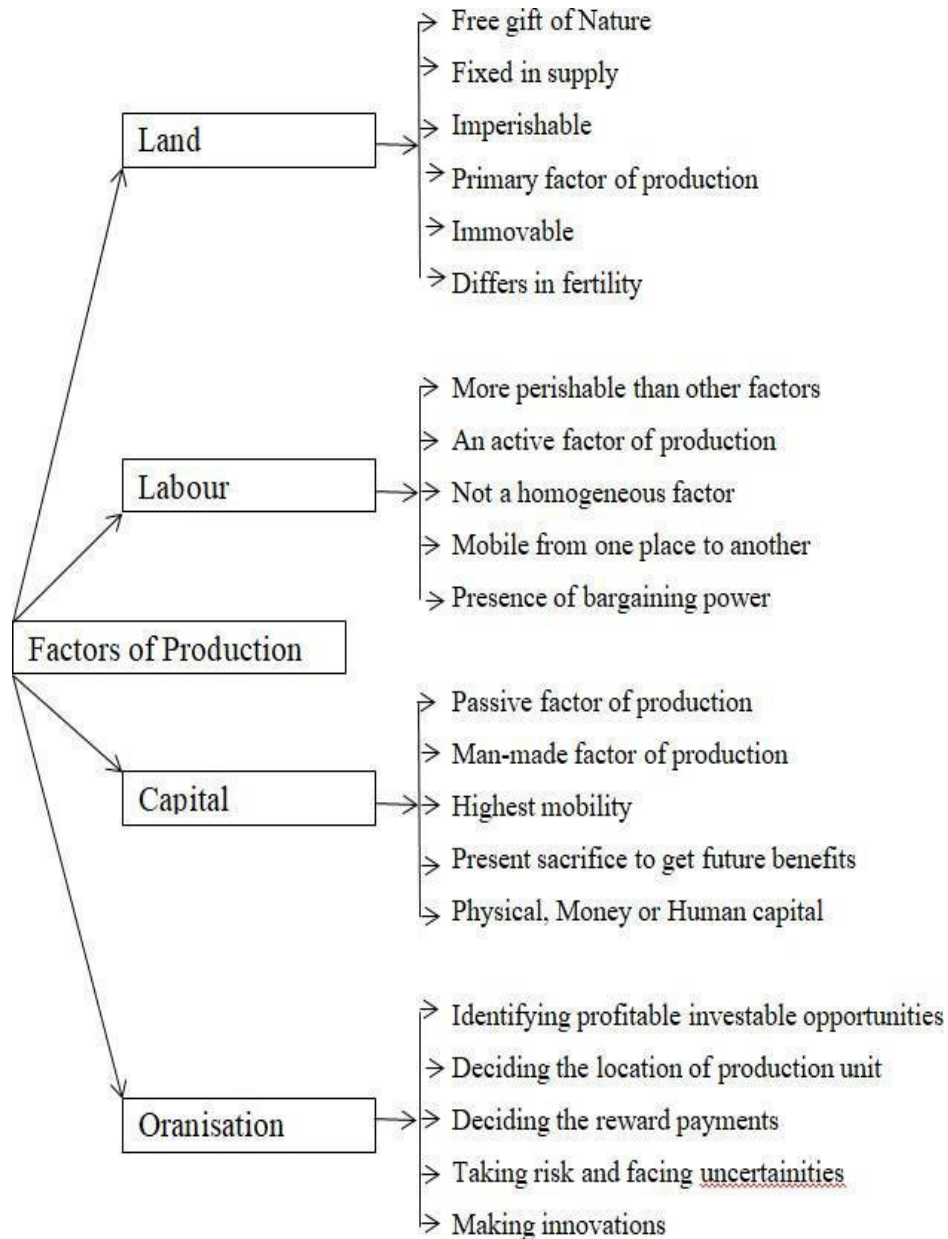
Factors of production are otherwise called as agents of production. Every product being produced using four factors of production nevertheless the level of usage of factors may differ among the products produced. The traditional factors of production are Land, Labour, Capital and Organization. For each factor, the remuneration is the criteria for managerial decision making. We have to consider rent for land, wage for labour, interest for capital and profit for organization. Now a days, technology is considered as fifth factor of production. The factors of production in the short run are classified as fixed factors and variable factors. In short run, some factors may be fixed while in the long run all factors of production are variable.

The human activities are divided into two components production and consumption. Production is a process of converting the factors of

production into an output. The following flowchart shows the characteristics of all four factors of production

### Figure Factors of Production

The input are classified and referred to land, labour and capital. When



these factors of production are combined in order to produce something, a fourth factor is required. The goods and services do not produce themselves but need some conscious thought process in order to plan and implement manufacture. This thought process is often called entrepreneurship or organization.

A production function articulates the functional relationship between a set or combination of inputs and outputs. Production is a process or method

in which the physical inputs are transformed or converted into physical output. Production function provides the list of production possibilities with the given state of technology and managerial ability from different combination of the productive input factors during the given period of time. The production function can be expressed algebraically with an equation by treating level of output as dependent variable and combination of inputs as independent variables, as  $Q = f(A, B, C, \dots, N)$

Where Q is output level and A, B, C, ... N are input factors.

With the help of the given equation, the production function can be stated as the rate of output Q is the function of different input factors and services, A, B, C, ... N for the given period of or units of time. Different authors have defined the term production function in different ways. The following definition by G. J. Stigler is simple and more appropriate. According to him, "The Production function is the name given to the relationship between the rates of input of productive services and the rate of output of product. It is the economist's Summary of technological knowledge"<sup>1</sup>

The term production function can be defined as "Production function is a statement or equation which shows different combination or set of input factors and services with rate of output of respective combination of inputs for the given period of time and technology"

**1. G.J. Stigler: 'The theory of Prices' 1953 p106**

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## **9.5. Classification of Production function**

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Production function is a specified valued charting to show the functional relationship between various combinations of inputs for producing a given output. Accordingly, the production function can be classified into three, as 1. Based on the proportion of input. 2. Based on functional relationships and 3. Based on the degree of input substitution. Based on the proportion of input, the production function can be classified into two categories, fixed proportion production function and variable proportion production function.

The former is having a fixed combination of input for each level of output due to technical reasons. Based on the functional relationships, the production function has three classes. Viz.,

1. Linear or homogenous production function
2. Non-linear or heterogeneous production function

Based on the degree of input substitution, production function can be classified into three categories

- 1 Cobb-Douglas Production function.
- 2 Leontief Production function
- 3 CES Production function

### 9.5.1. Cobb-Douglas Production Function:

The Cobb-Douglas Production function was developed by Charles W. Cobb and Paul H. Douglas with the empirical study made in American manufacturing industries, during the period 1899 to 1922. It is a specific standard equation applied to describe how much output can be made with capital and labour inputs. It is still used in the analysis of economies of modern, developed and stable nations.

Cobb-Douglas production function refers to the production function in which one input can be substituted by other but to a limited extent. For example, capital and labour can be used as a substitute of each other, but to a limited extent only. Cobb-Douglas production function can be expressed as follows:

**$Q = AK^aL^b$**  Where, Q = Output; A = positive constant; K = Capital; L = Labour and a and b = positive fractions showing elasticity coefficients of output for the input labour and capital respectively.

$(a + b) = 1$  constant returns to scale

$(a + b) < 1$  Decreasing returns to scale  
 $(a + b) > 1$  Increasing returns to scale

Under constant returns to scale  $b = 1 - a$ .

Therefore, Cobb- Douglas production function can also be expressed as follows:  **$Q = ak^aL^{1-a}$**

The characteristics of Cobb- Douglas production function are as follows:

- a. Makes it possible to change the algebraic form in log linear form, represented as follows:  **$\log Q = \log A + a \log K + b \log L$** ; This production function has been estimated with the help of linear regression analysis.
- b. Makes it possible to change the algebraic form in log linear form, represented as follows:  **$\log Q = \log A + a \log K + b \log L$** ; This production function has been estimated with the help of linear regression analysis.
- c. Acts as a homogeneous production function, whose degree can be calculated by the value obtained after adding values of a and b. If the resultant value of a + b is 1, it implies that the degree of homogeneity is 1 and indicates the constant returns to scale.

- d. Makes use of parameters a and b, which signifies the elasticity 'coefficients of output for inputs, labour and capital, respectively. Output elasticity coefficient refers to the change produced in output due to change in capital while keeping labour at constant.
- e. It represents that there would be no production at zero cost.

### 9.5.2. Leontief Production Function

Leontief production function was developed by Wassily Leontief in 1941 as fixed proportion production function under marginal productivity theory. The additional labour without adding capital will be unproductive if the marginal productivity of input factor labour becomes zero.

Leontief production function uses fixed proportion of inputs having no substitutability between them. It is regarded as the limiting case for Constant Elasticity of Substitution.

The production function can be expressed as follows:  $q = \min (z_1/a, Z_2/b)$

Where, q = quantity of output produced  $Z_1$  = utilized quantity of input 1

$Z_2$  = utilized quantity of input 2 a and b = constants

For example, tyres and steering wheels are used for producing cars. In such case, the production function can be as follows:

$$Q = \min (z_1/a, Z_2/b)$$

$$Q = \min (\text{number of tyres used}, \text{number of steering used}).$$

### 9.5.3. CES Production Function:

The CES Production function is a neoclassical production function that displays constant elasticity of substitution. In other words, the production technology has a constant percentage change in input factor (e.g., Labour and capital) proportions due to a percentage change in Marginal Rate of Technical Substitution.

CES stands for constant elasticity substitution. Arrow, Chenery, Minhas and Solow in the research paper in 1961 developed a new production function called Constant Elasticity of Substitution Function. This function consists of three variables Q, K and L and three parameters A, a and  $\beta$  as efficiency parameter, distribution parameter and substitution parameter respectively.

The main features of CES production function are CES function is homogeneous to the degree of one and the slope of iso-quant i.e., the Marginal Rate of Technical Substitution (MRTS) of capital for labour are convex to the origin.

CES production function shows a constant change in output due to a same change in input.

It can be represented as follows:  $Q = A [aK^\beta + (1-a) L^{-\beta}]^{-1/\beta}$

Or,

$$Q = A [aL^{-\beta} + (1-a) K^{-\beta}]^{-1/\beta}$$

Where Q = Total output; K= Capital; L= Labour: A = Efficiency parameter indicating the state of technology and organizational aspects of production; a = is the distribution parameter or capital intensity factor coefficient concerned with the relative factor shares in the total output and  $\beta$  = Substitution parameter which determines the elasticity of substitution.

CES has the homogeneity degree of 1 that implies that output would be increased with the increase in inputs. For example, labour and capital has increased by constant factor m.

In such a case, production function can be represented as follows:

$$Q' = A [a (mK)^{-\beta} + (1-a) (mL)^{-\beta}]^{-1/\beta}$$

$$Q' = A [m^{-\beta} \{aK^{-\beta} + (1-a) L^{-\beta}\}]^{-1/\beta}$$

$$Q' = (m^{-\beta})^{-1/\beta} .A [aK^{-\beta} + (1-a) L^{-\beta}]^{-1/\beta}$$

Because,  $Q = A [aK^{-\beta} + (1-a) L^{-\beta}]^{-1/\beta}$

Therefore,  $Q' = mQ$

This implies that CES production function is homogeneous with degree one.

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## 9.6. Economies and Diseconomies of Scale

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The scale of production has certain advantages when it moves in large size. In economic terms we used to call it as economies of scale. Economies of scale refers to the economic situation, where the cost per unit of production (Average cost) decreases with the increase in output. On contrary, diseconomies of scale refers to an economic situation in which the cost per unit of production (Average cost) increases with the increase of output. Growth brings both advantages and disadvantages to a business.

Prof. Stigler defines economies of scale as synonyms with returns to scale. As the scale of production is increased, up to a certain point, one gets economies of scale.

Beyond that, there are its diseconomies to scale Marshall has classified economies to scale into two parts as under:

## **I. Internal Economies:**

As a firm increases its scale of production, the firm enjoys several economies named as internal economies. Basically, internal economies are those which are special to each firm. For example, one firm will enjoy the advantage of good management; the other may have the advantage of specialisation in the techniques of production and so on.

“Internal economies are those which are open to a single factory, or a single firm independently of the action of other firms. These result from an increase in the scale of output of a firm and cannot be achieved unless output increases.” Cairncross

**Prof. Koutsoyannis has divided the internal economies into two parts:**

- A. Real Economies
- B. Pecuniary Economies

### **A. Real Economies:**

Real economies are those which are associated with the reduction of physical quantity of inputs, raw materials, various types of labour and capital etc.

**These economies are of the following types:**

#### **1. Technical Economies:**

Technical economies have their influence on the size of the firm. Generally, these economies accrue to large firms which enjoy higher efficiency from capital goods or machinery. Bigger firms having more resources at their disposal are able to install the most suitable machinery. Therefore, a firm producing on large scale can enjoy economies by the use of superior techniques.

Technical economies are of 3 kinds

- (i) **Economies of Dimension:** A firm by increasing the scale of production can enjoy the technical economies. When a firm increases its scale of production, average cost of production falls but its average return will be more.
- (ii) **Economies of Linked Process:** A big firm can also enjoy the economies of linked process. A big firm carries all productive activities. These activities get economies. These linked activities save time and transport costs to the firm.

(iii) **Economies of the Use of By-Products:** All the large sized firms are in a position to use its by-products and waste-material to produce another material and thus, supplement to their income. For instance, sugar industries make power, alcohol out of the molasses.

## **2. Marketing Economies:**

When the scale of production of a firm is increased, it enjoys numerous selling or marketing economies. In the marketing economies, we include advertisement economies, opening up of show rooms, appointment of sole distributors etc. Moreover, a large firm can conduct its own research to effect improvement in the quality of the product and to reduce the cost of production. The other economies of scale are advertising economies, economies from special arrangements with exclusive dealers. In this way, all these acts lead to economies of large scale production.

## **3. Labour Economies:**

As the scale of production is expanded they accrue many labour economies, like new inventions, specialization, time saving production etc. A large firm employs large number of workers. Each worker is given the kind of job he is fit for. The personnel officer evaluates the working efficiency of the labour if possible. Workers are skilled in their operations which save production, time and simultaneously encourage new ideas.

## **4. Managerial Economies:**

Managerial economies refer to production in managerial costs and proper management of large scale firm. Under this, work is divided and subdivided into different departments. Each department is headed by an expert who keeps a vigil on the minute details of his department. A small firm cannot afford this specialisation. Experts are able to reduce the costs of production under their supervision. These also arise due to specialization of management and mechanisation of managerial functions.

## **5. Economies of Transport and Storage:**

A firm producing on large scale enjoys the economies of transport and storage. A big firm can have its own means of transportation to carry finished as well as raw material from one place to another. Moreover, big firms also enjoy the economies of storage facilities. The big firm also has its own storage and godown facilities. Therefore, these firms



can store their products when prices are unfavorable in the market.

### **B. Pecuniary Economies:**

Pecuniary economies are those which can be had after paying less prices for the factors used in the process of production and distribution. Big firms can get raw material at the low price because they buy the same in the large bulk. In the same way, they enjoy a lot of concessions in bank borrowing and advertisements.

#### **These economies occur to a large firm in the following:**

(i) The firms producing output on a large scale purchase raw material in bulk quantity. As a result of this, the firms get a special discount from suppliers. This is a monetary gain to the firms.

#### **These economies occur to a large firm in the following:**

- i. The firms producing output on a large scale purchase raw material in bulk quantity. As a result of this, the firms get a special discount from suppliers. This is a monetary gain to the firms.
- ii. The large-scale firms are offered loans by the banks at a low interest rate and other favourable terms.
- iii. The large-scale firms are offered concessional transportation facilities by the transport companies because of the large-scale transportation handling.
- iv. The large-scale firms advertise their products on large scales and they are offered advertising facilities at lower prices by advertising firms and newspapers.

### **II. External Economies:**

External economies refer to all those benefits which accrue to all the firms operating in a given industry. Generally, these economies accrue due to the expansion of industry and other facilities expanded by the Government. According to Cairncross, "External economies are those benefits which are shared in by a number of firms or industries when the scale of production in any industry increases." Moreover, the simplest case of an external economy arises when the scale of production function of a firm contains as an implicit variable the output of the industry. A good example is that of coal mines in a locality. Prof. Cairncross has divided the external economies as:

#### **1. Economies of Concentration:**

As the number of firms in an area increases each firm enjoys some

benefits like, transport and communication, availability of raw materials, research and invention etc. Further, financial assistance from banks and non-bank institutions easily accrue to firm.

We can, therefore, conclude that concentration of industries lead to economies of concentration.

## **2. Economies of Information:**

When the number of firms in an industry expands they become mutually dependent on each other. In other words, they do not feel the need of independent research on individual basis. Many scientific and trade journals are published. These journals provide information to all the firms which relates to new markets, sources of raw materials, latest techniques of production etc.

## **3. Economies of Disintegration:**

As an industry develops, all the firms engaged in it decide to divide and sub-divide the process of production among themselves. Each firm specializes in its own process. For instance, in case of moped industry, some firms specialize in rims, hubs and still others in chains, pedals, tires etc. It is of two types-horizontal disintegration and vertical disintegration. In case of horizontal disintegration each firm in the industry tries to specialize in one particular item whereas, under vertical disintegration every firm endeavors to specialize in different types of items. Material of one firm may be available and useable as raw materials in the other firms. Thus, wastes are converted into by-products. The selling firms reduce their costs of production by realizing something for their wastes. The buying firms gain by getting other firms' wastes as raw materials at cheaper rates. As a result of this, the average cost of production declines.

## **Significance of Economies of Scale:**

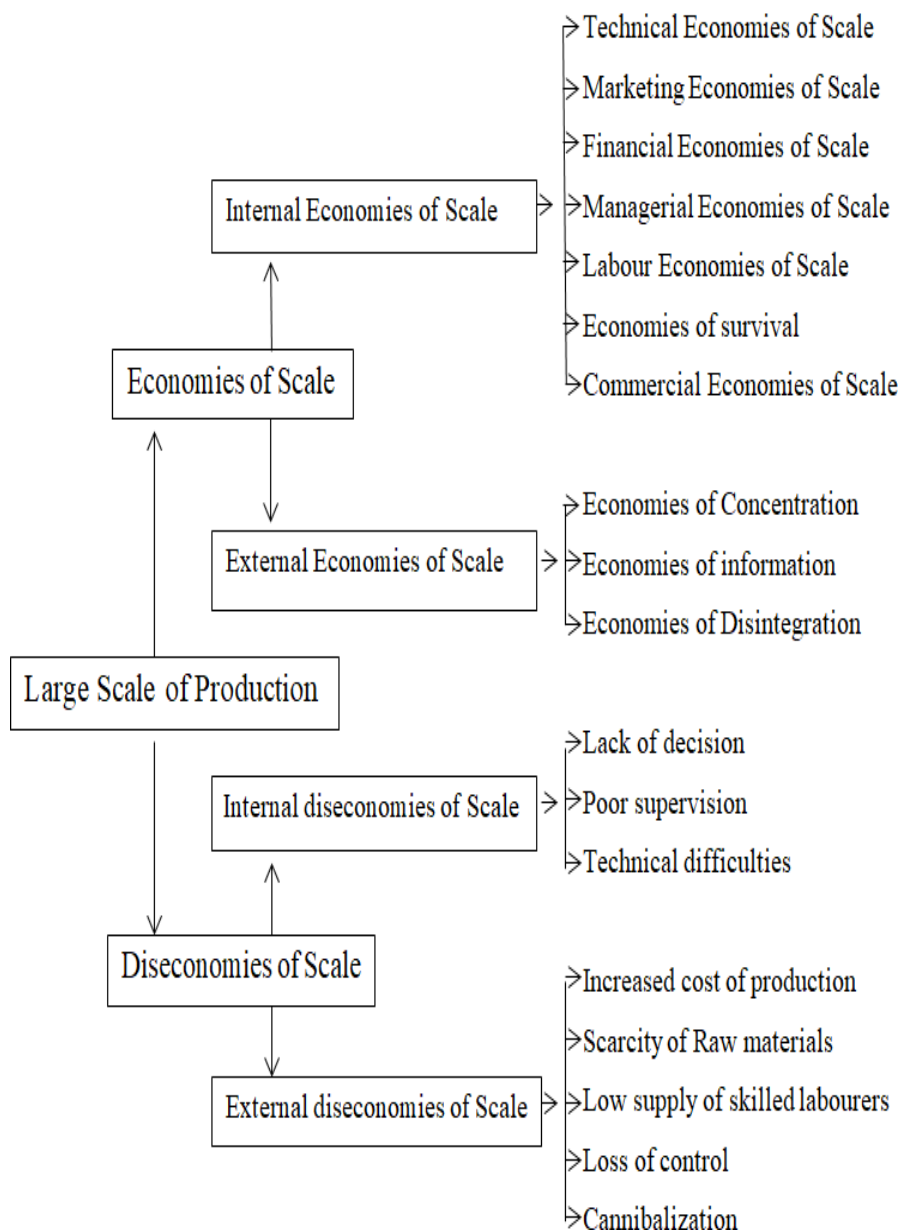
**The significance of economies of scale is discussed as under:**

- (a). Nature of the Industry:** The foremost significance of economies of scale is that it plays an important role in determining the nature of the industry i.e. increasing cost industry, constant cost industry or decreasing cost industry.
- (b). Analysis of Cost of Production:** When an industry expands in response to an increase in demand for its products, it experiences some external economies as well as some external diseconomies. The external economies tend to reduce the costs of production and thereby causing an

upward shift in the long period average cost curve, whereas the external diseconomies tend to raise the costs and thereby causing an upward shift in the long period average cost curve. If external diseconomies outweigh the external economies, that is, when there are net external diseconomies, the industry would be an Increasing cost industry.

The Impact of Economies and Diseconomies of Scale is presented in the following chart

**Impact of Economies and Diseconomies of Scale**



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## Let Us Sum Up

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In this unit, you have learned about the following:

- **Production process:** Conversion of input into output
- **Production function :** Procedure or process of converting raw materials into finished output in scientific way

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## Check Your Progress

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1. \_\_\_\_\_ is a short run production function.
2. Prof. Stigler defines economies of scale as \_\_\_\_\_ with returns to scale.
3. Managerial economies refer to \_\_\_\_\_ in managerial costs and proper management of large scale firm.
4. External economies refer to all those benefits which accrue to all the firms operating in a given \_\_\_\_\_.

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## Glossary

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<b>Production:</b>	It is a process or method used to transform the inputs into required output
<b>Production function:</b>	It explains the functional relationship between input and output.
<b>Factors of production:</b>	The inputs needed for creating a good or service.

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**Answers to Check Your Progress**

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1. Law of returns to scale
2. Synonyms
3. Production
4. Industry

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**Suggested Readings**

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1. Deepakshi Gupta, "Managerial Economics" Wiley, 2019
2. Ivan Png, "Managerial Economics" Routledge, London, 2015

# Unit-10

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## Theory of Production

### STRUCTURE

Overview

Objectives

10.1. Introduction

10.2. Law of variable proportion

10.2.1. Definition

10.2.2. Assumptions

10.2.3. Production schedule

10.2.4. Stages of law of variable proportion

10.2.5. Decision making in production function

10.2.6. Limitations

10.3. Law of returns to scale

10.3.1. Definition

10.3.2. Assumptions

10.3.3. Production schedule

10.3.4. Stages of law of returns to scale

Let Us Sum Up

Check Your Progress

Glossary

Model Questions

Answers to Check Your Progress

Suggested Readings

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### Overview

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In this unit, the law of variable proportions and the law of returns to scale have been clearly explained.

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### Objectives

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After completion of this unit, you will be able :

- To analyze and evaluate the production function
- To know the theories of production

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### 10.1. Introduction

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The theory of production can be explained in two manifolds based on the variability of input factors. When some inputs are in variable and

others are fixed in production process, expressing the input output relationship is known as the law of variable proportion and if all the inputs are variable, the production process is known as the law of returns to scale.

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## **10.2. Law of Variable Proportion**

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Production process is a transformation of inputs into output. We use four factors of production, viz., land, labour, capital and organization to get output.

In the production process, we construct production function in which the levels of output are expressed with different combination of input factors. The law of variable proportion examines when any one variable factor is increased for getting output while keeping all other inputs constant.

### **10.2.1. Definition**

Many authors have expressed their views about the law of variable proportion. According to Alfred Marshall, "An increase in the amount of a variable factor added to a fixed factor causes, in the end, a less than proportionate increase in the amount of product, given technical conditions"

According to G.J. Stigler –An equal increase of one input is added, the inputs of other productive services being held constant, beyond a certain point, the resulting increments of product will decrease, that is, the marginal product will diminish from these two definitions, we understand that the law of variable proportion describes the change in output when one input factor is increased while keeping all other inputs fixed. The changes in output include not only the total output but also the marginal and average product which are declining eventually.

### **10.2.2. Assumptions**

The law of variable proportion can be explained with certain prerequisite conditions, termed assumptions of the law.

1. The state of technology remains constant.
2. Only one factor input is made variable and rest of the factors are fixed.
3. All units of variable input factor are homogeneous.

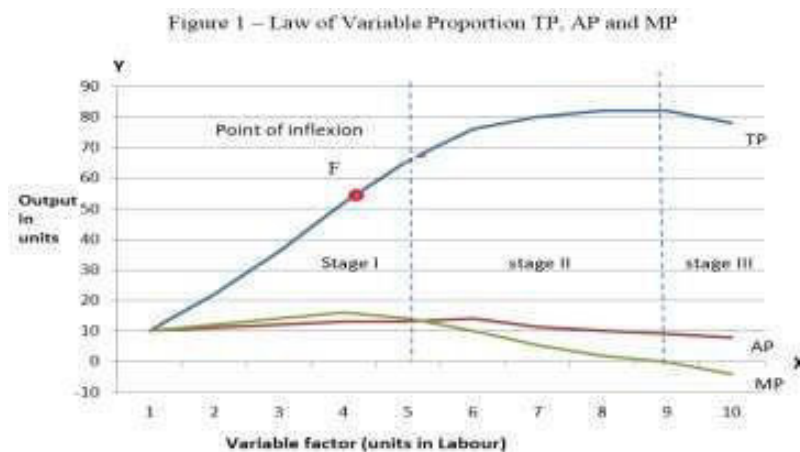
### 10.2.3. Production Schedule

Consider a production of food grains in a piece of land in which the variable factor of input is labour and the fixed factor is Machine. The following table depicts the input factor with the total output along with the calculation of average output and marginal output in units.

Table 1 Change in variable factor with the change in total, average and marginal output.

Fixed Factor (Machine)	Variable factor (Labour)	Total production(in units)	Average Production( in units)	Marginal Production(in units)
1 +	1	10	10.0	10
1 +	2	22	11.0	12
1 +	3	36	12.0	14
1 +	4	52	13.0	16
1 +	5	66	13.2	14
1 +	6	76	12.6	10
1 +	7	80	11.4	4
1 +	8	82	10.2	2
1 +	9	82	9.2	0
1 +	10	78	7.8	-4

Column 1 represents the fixed factor (a tractor) and column 2 represents increase of labour input one by one. Column 3 represents the total output in units while column 4 is average product calculated by dividing the 3<sup>rd</sup> column with 2<sup>nd</sup> Column and last column is marginal product calculated by taking difference in total product with its previous value. These three curves diagrammatically represented as:





#### **10.2.4. Stages of Law of Variable Proportion**

**Stage I:** In stage one, the total product increases at increasing rate till the point of F i.e., up to fourth labourer is employed. After this point, the total product (TP) is increasing, not in increasing rate, but in decreasing rate. At this point, the marginal product is maximum and after this point it starts diminishing but positive. The point F in the total product is called point of inflexion as the total product changes its output rate from increasing rate of increase to decreasing rate of increase. As TP and AP are in increasing trend, the marginal product is also increasing. Therefore this stage is called **Increasing return stage**.

**Stage II:** In the second stage, the total product is increasing at a slower rate to the increase of the variable factor and reaches its maximum level when the marginal product reaches the value zero. Both average product and marginal product are declining but are positive. As the marginal product is in diminishing and reaches zero, this stage is called **Diminishing return stage**.

**Stage III:** In the last stage, the total product starts declining which result in downward slope in TP curve. The average product also declines and coming closer to axis but it never touches the axis. The marginal product curve intersect the X axis and moves further and becomes negative. Therefore, this stage is called **Negative return stage**.

#### **10.2.5. Decision making in Production Process**

Considering the stages of the law of variable proportion, a rational producer will not stop in employing the labour up to stage II and in stage III the producer has to decide not to deploy additional labourers. A successful manager will expand the business during the first two stages and once the marginal product reaches zero, further expansion leads to negative returns.

The law of variable proportion gains its importance as it can operate under the scarcity of various factors of production and clarity in the input output ratio of the production in terms of labourers. Professor Joan Robinson has rightly pointed that the law of variable proportion indicates the limit to the extent of input factor to reach maximum level of output. Stage I can be considered the expansion of production and Stage II is the range of rational production and no further expansion should be made.

#### **10.2.6. Limitations**

This law suffers with certain drawbacks. The technological factor is an influencing factor for the production process but the law treats as constant

and the variable input factor labour cannot be homogenous in nature. The law of variable proportion is short term phenomenon.

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### 10.3. Law of Returns to Scale

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The objective of any firm is long run survival in the business. The concept law of variable proportion is a short term phenomenon as more input factors are constant. In long term, all the input factors are variable. Therefore, the law of variable proportion must be replaced with law of returns to scale in which all the input factors are variable and production planning will be framed with all input variables transformed into output.

#### 10.3.1. Definition

Different authors have defined the term laws of return to scale in different ways. According to Koutsoyiannis, –The terms return to scale refers to the changes in output as all factors change by the same proportion

According to Leibhafskey, returns to scale related to the behaviour of total output as all inputs are varied and is a long run concept.

#### 10.3.2. Assumptions

1. All input factors are employed in same proportion.
2. Output measured with different scale of input factors land and labour.
3. The input factor labour is homogeneous in nature.
4. The input factor land has the same fertility.

#### 10.3.3. Production Schedule

Consider the behaviour of output for the cultivation of corn, as number of labourers and acres of land are deployed in same proportion. The following table depicts the returns to scale in terms of Total Product and Marginal Product Table Stages of the law of returns to scale

S.No	Scale of Input	Total product of corn in units	Marginal product of corn in units	Stages
1	1 Labour + 2 acres of Land	4	4	Increasing return to scale
2	2 Labour + 4 acres of Land	10	6	
3	3 Labour + 6 acres of Land	18	8	
4	4 Labour + 8 acres of Land	28	10	

5	5 Labour + 10 acres of Land	38	10	Constant return to scale
6	6 Labour + 12 acres of Land	48	10	
7	7 Labour + 14 acres of Land	56	8	Decreasing return to scale
8	8 Labour + 16 acres of Land	62	6	

#### 10.3.4. Stages of law of return to scale

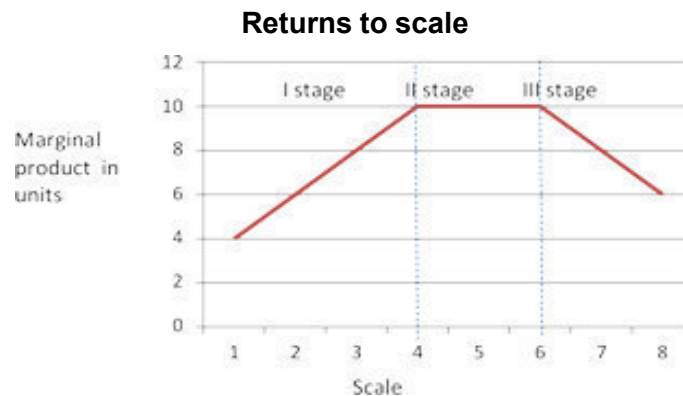
There are three stages in the law of returns to scale namely:

1. Increasing return to scale;
2. Constant returns to scale; and
3. Decreasing returns to scale.

If the increase in all factors provides more than proportionate increase in output, it is called increasing returns to scale. If the increase in all factors provides an equal proportionate, increase in output is known as constant returns to scale. If the increase in all factors provides less than proportionate increase in output, return to scale is said to be decreasing returns to scale.

From the table, when 1 labourer and 2 acres of land are employed, the total product is 4 units of corn. Suppose if we double the input i.e., 2 labourers and 4 acres of land, the output increased more than doubled which result in increase in the marginal product from 4 to 6 units. Similarly, when input are trebled i.e., 3 labourers and 6 acres of land, the output increased more than triple and the marginal product increased to 8 units of corn and it has been increased further to 10 units of corn when 4 labourer with 8 acres of land.

Up to this stage, we have increasing return to scale. When 5<sup>th</sup> and 6<sup>th</sup> labourers are employed with additional 2 acres of land each, the output increased in equal proportions, which result in constancy in the marginal product, 10 units of corn. This stage is called constant returns to scale. It is to be noted that when the 7<sup>th</sup> labourer is employed with 2 acres of land, the total product increased with less proportion, the marginal product reduced to 8 units of corn. Finally, it has reduced to 6 units of corn when the 8<sup>th</sup> labourer is employed with another 2 acres of land. This stage is called decreasing return to scale. The following fig. shows the same



The law of returns to scale explains the proportional change in output with respect to proportional change in inputs.

In other words, the law of returns to scale states when there are a proportionate change in the amounts of inputs, the behavior of output also changes.

The degree of change in output varies with change in the amount of inputs. For example, an output may change by a large proportion, same proportion, or small proportion with respect to change in input.

**On the basis of these possibilities, law of returns can be classified into three categories:**

- i. Increasing returns to scale
- ii. Constant returns to scale
- iii. Diminishing returns to scale

**1. Increasing Returns to Scale:**

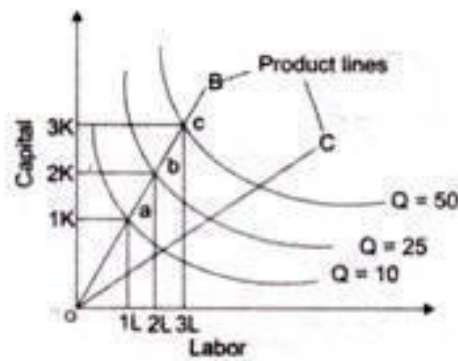
If the proportional change in the output of an organization is greater than the proportional change in inputs, the production is said to reflect increasing returns to scale.

For example, to produce a particular product, if the quantity of inputs is doubled and the increase in output is more than double, it is said to be an increasing returns to scale.

When there is an increase in the scale of production, the average cost per unit produced is lower.

This is because at this stage an organization enjoys high economies of scale.

**Figure-13 shows the increasing returns to scale:**



**Figure-13: Increasing Returns to Scale**

In Figure-13, a movement from a to b indicates that the amount of input is doubled. Now, the combination of inputs has reached to  $2K+2L$  from  $1K+1L$ . However, the output has increased from 10 to 25 (150% increase), which is more than double. Similarly, when input changes from  $2K+2L$  to  $3K+3L$ , then output changes from 25 to 50 (100% increase), which is greater than change in input. This shows increasing returns to scale.

There are a number of factors responsible for increasing returns to scale.

**Some of the factors are as follows:**

- i. **Technical and managerial indivisibility:** Implies that there are certain inputs, such as machines and human resource, used for the production process are available in a fixed amount. These inputs cannot be divided to suit different level of production. For example, an organization cannot use the half of the turbine for small scale of production.

Similarly, the organization cannot use half of a manager to achieve small scale of production. Due to this technical and managerial indivisibility, an organization needs to employ the minimum quantity of machines and managers even in case the level of production is much less than their capacity of producing output. Therefore, when there is increase in inputs, there is exponential increase in the level of output.

- ii. **Specialization:** Implies that high degree of specialization of man and machinery helps in increasing the scale of production. The use of specialized labor and machinery helps in increasing the productivity of labor and capital per unit. This results in increasing returns to scale.

- iii. **Concept of Dimensions:** Refers to the relation of increasing

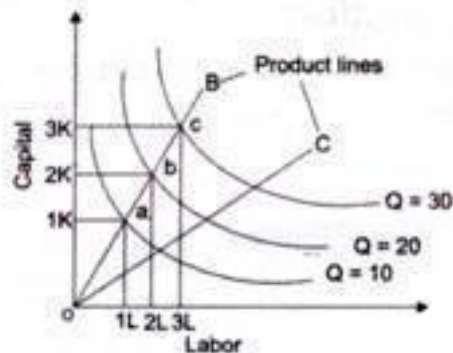
returns to scale to the concept of dimensions. According to the concept of dimensions, if the length and breadth of a room increases, then its area gets more than doubled.

For example, length of a room increases from 15 to 30 and breadth increases from 10 to 20. This implies that length and breadth of room get doubled. In such a case, the area of room increases from 150 (15\*10) to 600 (30\*20), which is more than doubled.

## 2. Constant Returns to Scale:

The production is said to generate constant returns to scale when the proportionate change in input is equal to the proportionate change in output. For example, when inputs are doubled, so output should also be doubled, then it is a case of constant returns to scale.

**Figure-14 shows the constant returns to scale:**



**Figure-14: Constant Returns to Scale**

In Figure-14, when there is a movement from a to b, it indicates that input is doubled. Now, when the combination of inputs has reached to  $2K+2L$  from  $1K+1L$ , then the output has increased from 10 to 20.

### Advertisements:

Similarly, when input changes from  $2K+2L$  to  $3K + 3L$ , then output changes from 20 to 30, which is equal to the change in input. This shows constant returns to scale. In constant returns to scale, inputs are divisible and production function is homogeneous.

## 3. Diminishing Returns to Scale:

Diminishing returns to scale refers to a situation when the proportionate change in output is less than the proportionate change in input. For example, when capital and labor is doubled but the output generated is less than doubled, the returns to scale would be termed as diminishing returns to scale.

Figure-15 shows the diminishing returns to scale:

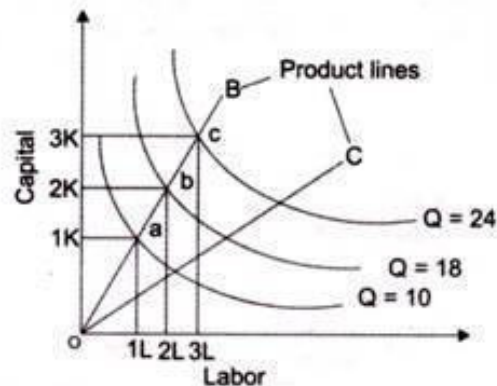


Figure-15: Constant Returns to Scale

In Figure-15, when the combination of labor and capital moves from point a to point b, it indicates that input is doubled. At point a, the combination of input is  $1k+1L$  and at point b, the combination becomes  $2K+2L$ .

However, the output has increased from 10 to 18, which is less than change in the amount of input. Similarly, when input changes from  $2K+2L$  to  $3K + 3L$ , then output changes from 18 to 24, which is less than change in input. This shows the diminishing returns to scale.

Diminishing returns to scale is due to diseconomies of scale, which arises because of the managerial inefficiency. Generally, managerial inefficiency takes place in large-scale organizations. Another cause of diminishing returns to scale is limited natural resources. For example, a coal mining organization can increase the number of mining plants, but cannot increase output due to limited coal reserves.

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### Let Us Sum Up

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In this unit, you have learned about the following:

- **Production process:** Conversion of input into output
- **Production function :** Procedure or process of converting raw materials into finished output in scientific way

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### Check Your Progress

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1. \_\_\_\_\_ is the functional relationship between input and output.
2. Cobb Daughlass Production function satisfies \_\_\_\_\_ theorem.
3. The \_\_\_\_\_ to scale explains the proportional change in output with respect to proportional change in inputs.

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## **Glossary**

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**Production:** It is a process or method used to transform the inputs into required output

**Production function:** It explains the functional relationship between input and output.

**Factors of production:** The inputs needed for creating a good or service.

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## **Answers to Check Your Progress**

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1. Production function
  2. Euler's Theorem
  3. Law of returns
- 

## **Suggested Readings**

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1. Luke M. Froeb, Brian T McCann, Mikhael Shor and Michael Robert Ward, Managerial Economics, Cengage Learning Asia Pvt. Limited, 2019.
2. Suma Damodaran "Managerial Economics 'Oxford University Press, 2010.



# Unit-11

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## Cost Analysis

### STRUCTURE

Overview

Objectives

11.1. Cost - Meaning

11.2. Different Cost Concepts

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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### Overview

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In this unit, the meaning of cost and different types of cost have been clearly explained

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### Objective

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After completion of this unit, you will be able:

- To understand and analyze various cost concepts in economics.

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### 11.1. Cost – Meaning

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In Managerial Economics, the cost analysis demands the knowledge of realities in the business world, as it influences all the economic indicators right from purchase of raw materials up to rendering the after sale services. In accounting or commercial sense the cost are classified into two categories, namely direct costs and indirect costs. But in Economic sense, the classification of cost ranges from opportunity cost to adaption cost. The term cost can be defined as the amount that has to be paid or given up in order to get something. In business sense, cost is usually a monetary valuation of efforts, materials, resources utilized, time utilized, consumed and risk incurred and opportunity omitted during production process or service rendered. It is to be noted that all expenses are considered as cost but all costs are not expenses. The primary objective of any business is to earn more profit, which is possible in two ways, viz., cost minimization and revenue maximization. In order to minimize the cost one should be clear with the idea about the different types of cost concepts.

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## **11.2. Different Cost Concepts**

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There are varieties of cost concepts which are differing from the purpose of the business, type of product, quality of the decision, maintenance of the business, prediction of future demand etc. Prof. Joel dean has given cost distinction for the classification of the term 'cost'. In accounting sense cost incurred and revenue earned are the determinants of profit. But in economic sense, knowledge about alternatives and average of the cost factor play a dominant role in business decision making. The following list of cost distinctions are helpful to analyze the cost function and type of cost involved in business decision making process under Managerial Economics.

1. Opportunity Cost Vs. Actual cost
2. Past Cost Vs. Future Cost
3. Traceable Cost Vs. Common Cost
4. Out of Pocket Cost Vs. Book Cost
5. Incremental Cost Vs. Sunk Cost
6. Avoidable Cost Vs. Unavoidable cost
7. Private cost Vs. Social Cost
8. Shut down Cost Vs. Abandonment Cost
9. Implicit Cost Vs. Explicit cost
10. Controllable Vs. Non-Controllable cost
11. Replacement Cost Vs. Historical Cost
12. Short run cost Vs. Long run cost
13. Fixed cost Vs. Variable cost
14. Semi variable cost
15. Total cost, Average cost and Marginal cost

### **Opportunity Cost Vs. Actual Cost**

The opportunity cost may be defined as the expected returns from the second best alternative of the decision or use of resources. The other name for the opportunity cost is called alternative cost. For e.g., suppose an individual has sum of Rs.50, 000 for which he has only two alternative uses. Either he can buy a Xerox machine or computer system with printer. From the Xerox machine, he expects an annual income of Rs.12000 and from the computer system with printer, Rs.10000. Considering as a profit maximizing investor; he would invest his money in Xerox machine and

forgo the expected income from the computer system. The opportunity cost of his income from the Xerox machine is the expected income from the computer system with printer, Rs.10000.

On the other hand, the actual cost refers to the cost incurred by the business man in payment of factors of production – land, labour, capital and organization in terms of materials, plant, equipment, transport advertisement etc. The total money spent on business or tasks which are recorded in the book are called actual cost and this concept is an accounting concept.

### **Past Cost Vs. Future Cost**

The other names for the past cost are Actual cost and Historical Cost. Past cost refers to the actual cost incurred in the previous time interval. On the other hand, future cost refers to the cost to be incurred in the next time interval which are calculated through forecasting. This cost gains its importance as it plays a dominant role in managerial decision making including expense control, projection of future income statement, appraisal of capital expenditure, ground work for new project, expansion programme and pricing. While comparing the past cost and future cost, the business firm gives more priority to future cost as the usage of the cost is more and past cost is relevant only under the assumption that, the cost condition of the previous period would be duplicated in the future too.

### **Traceable Cost Vs. Common Cost**

Traceable cost is otherwise called direct cost. It refers to the cost which are identified easily and indisputably with the unit of operation. On the other hand, common or indirect cost is the cost which is not traceable to any particular plant, department, and operation or to any individual final product. For e.g.,

Salary of Branch manager is direct or traceable cost by salary of General Manager is indirect or common cost. The usage of direct cost is more compared to indirect cost and secondly it is difficult to calculate common cost.

### **Out-of-pocket Cost Vs. Book Cost**

Out-of-pocket cost refers to the costs which involved in payment of cash to the business parties, specifically to outsiders. On the other hand there are some cost which does not required any cash payments but value are to be considered, are termed as actual cost. For e.g., the value of depreciation does not require current cash payment but values are entered in books. The relation between book cost and out-of-pocket cost are

subject to manipulation of transactions. The book cost can be converted into out-of-pocket costs by selling the assets and having them on hire, as the rent would replace the value of depreciation and interest.

### **Incremental Cost Vs. Sunk Cost**

Incremental cost and marginal cost look alike but there is a difference between these two. The marginal cost refers to the cost incurred for the one unit of additional output. The incremental cost refers to the cost incurred to the batch of additional units of output. It also includes to the change in productlines, introduction of new product, replace of equipment, machinery or plant, expansion of production capacity etc., On the other hand, the sunk cost refers to the cost which cannot be altered, increased or decreased by varying the level of output. In easy words, the money spent on investment purpose cannot be revised or reversed or recovered with the change in market conditions or change in business fluctuations are called sunk cost.

### **Avoidable Cost Vs. Unavoidable Cost.**

Avoidable cost are otherwise called escapable cost which refers to cost which can be reduced or evaded due to contraction of extra activities of the business enterprises. For e.g. closing apparently unprofitable branch to escape from the house storage cost, combining the official of same route with common vehicle to escape from transportation cost. On the other hand, there are certain expenditures which cannot be avoided is called unavoidable cost.

### **Private cost Vs. Social Cost**

Private cost refers to the cost of production to an individual, private or firm. On the other hand, social cost refers to the total cost of production of an industry or cost of producing a product to society in the form of factors of production (resources) which are used to produce it. In other words, the value of resources of the economy which would be utilized for the production is called social cost. The private cost otherwise called individual cost as it discusses about one firm or one industry or production of one type of commodity.

### **Shut down Cost and Abandonment Cost**

Shut down costs are expressed in three different economic situations. They are the cost which are incurred in the occasion of suspension of the plant operation, the cost which has been saved if the plant operation is continued and additional amount paid to restart the plant operation. On the other hand, abandonment costs are those cost which are incurred while

complete cessation of plant operation or business activities. In business point of view, both costs are more important to decide either continuing the existing plant or suspending its operations or abandoning the plant once for all.

### **Implicit Cost vs. Explicit Cost**

Explicit cost refers to the expenditure incurred by the business firms which are belonging to the factor units owned by others. In easy words, the amount paid to the owners of the factor units which are not belong to employer itself. The explicit cost consist of all contractual payment, such as wages and salaries paid; payment for raw materials; interest on borrowed capital funds, rent amount to land owner and tax paid to government etc. On contrary, implicit cost refers to non-expenditure value for the used factor units owned by the employer himself. In real sense the cost saved by the owner as the he owned the factors.

### **Controllable Cost Vs. Non-Controllable Cost**

Controllable cost refers to the cost which are influenced by the usage of factor and administrated by specified level of executive, for example, electricity cost, transportation charge etc. On the other hand, there are certain cost which are out of control as the cost involved with more than one level of executives. In easy words, those cost are not controllable at one level of executive and may be controllable at higher level of executives.

### **Replacement Cost Vs. Historical Cost**

Replacement cost refers to the cost to be incurred or paid currently to acquiring the same plant but historical cost is the cost mentioned in the financial accounts book, at time of purchase (price originally paid). Due to random changes in the price level, historical cost are considered as outdated value and may not be correct value to project the future cost. On the other hand, replacement cost is the right indicator for the expansion or additional unit or replacing the existing plant or production unit.

### **Short Run Cost Vs. Long run Cost**

Short run costs refer to those costs which are proportional to the output or sale when plant and other fixed capital equipment remains constant. On the other hand long run cost refers to the cost vary with the level of output or sales including plant and machinery. The short run cost helpful to decide whether to make or buy. The long run costs helpful to decide whether to set up a new plant.

### **Fixed Cost Vs. Variable Cost**

Fixed cost refers to the costs which are constant in total amount irrespective of output level and there is an inverse relationship between the total volume and fixed cost per unit. On the other hand variable cost refers to the costs which are directly proportional to the volume of production. In easy words, an increase in output results in proportional increase in Total Variable Cost and a decrease in output results in a proportional decline in the Total Variable Costs. There is a linear relationship between volume and variable cost as they are constant per unit cost.

### **Total Cost, Average Cost and Marginal cost**

The Total cost is sum of the Total Fixed Cost (TFC) and Total Variable Cost (TVC), i.e,  $TC = TFC + TVC$ ; Average Cost refers to Total cost divided by the Total Quantity produced  $Average\ Cost - AC = \frac{TC}{Q}$ ; Marginal Cost refers to the cost incurred for one additional unit produced or cost differences between the current cost of production and previous period cost of production. i.e.,  $MC = TC_n - TC_{n-1}$

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### **Let Us Sum Up**

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In this unit, you have learned about the following:

1. Opportunity Cost Vs. Actual Cost
2. Past Cost Vs. Future Cost
3. Traceable Cost Vs. Common Cost
4. Out of Pocket Cost Vs. Book Cost
5. Incremental Cost Vs. Sunk Cost
6. Avoidable Cost Vs. Unavoidable cost
7. Private cost Vs. Social Cost
8. Shut down Cost Vs. Abandonment Cost
9. Implicit Cost Vs. Explicit Cost
10. Controllable Vs. Non-Controllable Cost
11. Replacement Cost Vs. Historical Cost
12. Short run Cost Vs. Long run Cost
13. Fixed Cost Vs. Variable Cost
14. Semi Variable Cost
15. Total Cost, Average Cost and Marginal Cost

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### Check Your Progress

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1. The cost recorded in the books of accounts are considered as\_\_\_\_\_.
2. The shape of the short run Average Cost curve is \_\_\_\_\_ .
3. \_\_\_\_\_ refers to the costs which are constant in total amount irrespective of output level and there is an inverse relationship between the total volume and fixed cost per unit.
4. Explicit cost refers to the \_\_\_\_\_ incurred by the business firms which are belonging to the factors units owned by others.

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### Glossary

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- Fixed Cost:** It refers to the costs which are constant in total amount irrespective of output level and there is an inverse relationship between the total volume and fixed cost per unit.
- Total cost:** It is sum of the Total Fixed Cost (TFC) and Total VariableCost

---

### **Answers to Check Your Progress**

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1. Explicit Cost
2. 'U' Shape
3. Fixed cost
4. Expenditure

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### **Suggested Reading**

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1. Luke M. Froeb, Brian T McCann, Mikhael Shor and Michael Robert Ward, Managerial Economics, Cengage Learning Asia Pvt. Limited, 2019.
2. Suma Damodaran , Managerial Economics' Oxford University Press, 2010.



## Unit-12

# Cost Output Relationship

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### STRUCTURE

Overview

Objectives

12.1. Cost functions

12.2. Role of cost function in decision making

12.3. Short run cost-output relationship

12.4. Long run cost-output relationship

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

---

### Overview

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In this unit, cost functions, role of cost function in decision making, short run and long run cost output relationship have been clearly explained.

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### Objectives

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After completion of this unit, you will be able:

- To know the relationship between the cost factors and production factors

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### 12.1. Cost Functions

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Cost functions express the relationship between cost and output. It depends on the prices of inputs and the production function. Based on the time perspective, cost function differs in the short run and long run.

The equation of the cost function implies that the cost of production is the function of prices of inputs and quantities of inputs used by firm. The cost function can be expressed with the expression:

$$C_T = f(Q_i, P_i)$$

Where  $C_T$  is the total cost of production:

$Q_i$  is the quantities employed by the firm  $P_i$  is the prices of respective inputs.

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## **12.2. Role of Cost Function in Decision Making**

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The cost function gains its importance as it plays a vital role in the business decision making. The key factor of any business is the construction of cost function. Basically, the cost function is called derived from the function because it has been derived from the production function. The knowledge about the cost analysis and its theory is essential, for evaluation of a project, or capital investment decision, make or buy decisions, selection and conversion of input for the production process etc. Most of the economists expressed the application of cost function in terms of time horizon, usually short run and long run. For any kind of market structure, short run costs are essential in the determination of price and output. In easy words, the construction of Average Cost Curve (AC Curve) is the called Cost Output relationship nothing but the cost function.

The roles of the managers are to make decisions that should govern how a company reaches its goals. Most of these goals have financial aspects, such as revenue and profit targets. The level of costs included in such decisions have a major impact on the finances of a company. Reliable reporting of actual costs, accurate estimation of projected costs and the appropriate integration of such costs in managerial decisions are key components of business operations that meet their targets and further the goals of the company.

An ideal decision making process selects one of two or more alternatives. When cost of the alternatives is same, then the manager has to consider the other factors. In most of the cases, there is difference in cost, and the need of the decision arises and the cost function will influence the selection of the best alternative i.e., decision making. Further, the types of cost impacts the manager's decision making in terms of production cost, raw material cost, investment cost and final product cost (Price).

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## **12.3. Short Run Cost-Output Relationship**

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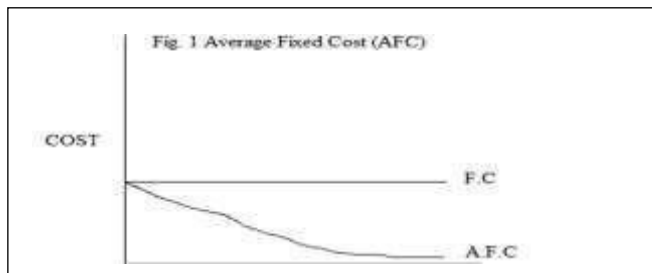
The cost output relationship in short run involves extraction of Short run Average Cost Curve (SAC).

In case of short run, Fixed cost remains the same and only variable cost will change proportionate to the output level.

### **Average Fixed Cost**

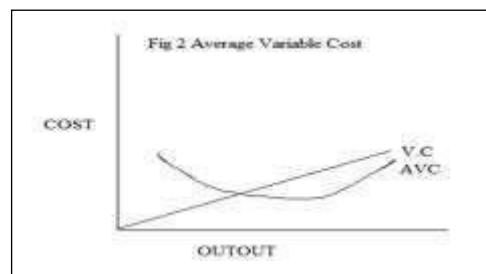
There are certain costs which are unchanged, irrespective of output are called Fixed cost. The fixed cost curve is parallel to the output axis. While calculating the Average Fixed Cost (AFC), it slopes downwards from left

to right, moving closer to output axis but never reach the axis. (Fig.1)



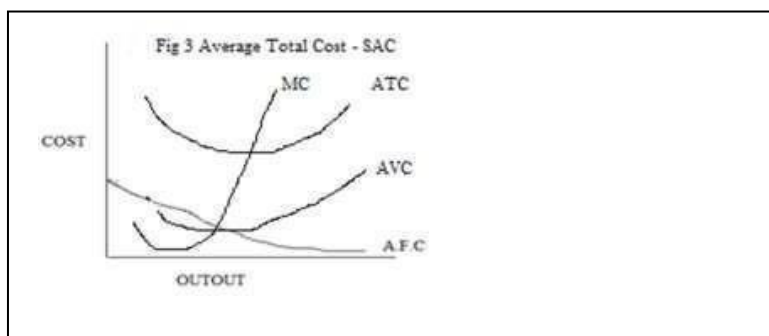
### Average Variable Cost

Some of the cost which will increase along with the output level, are called variable cost curve. The variable cost curve slopes upwards from left to right. But the shape of the Average Variable Cost (AVC), initially it slopes, and then it starts rising steeply. (Fig.2)



### Average Total Cost

The sum of the Average Fixed cost and Average Variable Cost is equal to Average Total Cost. The shape of SAC is U shaped and the point at which the Marginal Cost Curve intersects is called the least cost level of output. The optimum point of both AVC and ATC and the average cost (SAC) decreases initially and reach the minimum and then rises. The shape of AFC is rectangular hyperbola. It means the AFC reduces continuously as the output increases but it will never become zero. (Fig. 3).



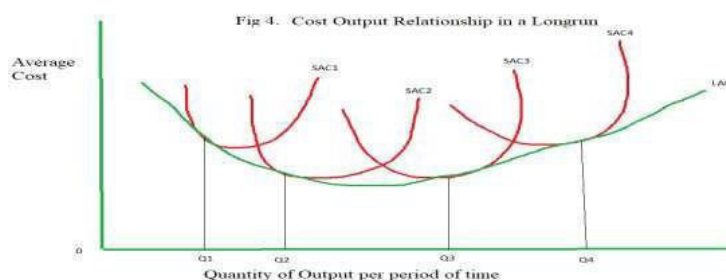
### Cost-Output Relationship in Short run:

1. AFC falls as output rises from lower levels to higher levels of output
2. AVC first falls and then rises and also the ATC curve

3. The AVC curve starts rising earlier than ATC Curve
4. The least cost level of output corresponds to the point LC' on ATC Curve
5. The Marginal Cost curve (MC) intersect both AVC curve and the ATC

### 12.4. Long Run Cost-Output Relationship

When we aggregate various Short-run Average Cost (SAC) curves, resulted in Long-run Average Cost (LAC) Curve or LAC is the summation of SAC curves. It is to be noted that the LAC involves, all the cost are variable and no fixed cost as such. The scale of production has been changing depending on different plant size. In easy words, LAC is useful for the law of returns to scale and on contrary the SAC useful for law of variable proportion. Consider the above mentioned SAC<sub>1</sub> curve is for the period of cost-output relation in the year 2015. The SAC<sub>2</sub>, SAC<sub>3</sub>, and SAC<sub>4</sub> are for the years 2016, 2017 and 2018 respectively. The level of output measured in x axis and Average Cost measured in y axis for the period 2015 to 2018.



#### Cost-Output Relationship in Long run:

1. The LAC curve is tangential to the various SACs ;
2. The LAC curve is U shaped or like a dish ;
3. The LAC Curve will never intersect the SAC as it makes tangency to SAC;
4. LAC curve will touch the optimum scale curve at the latter's least cost point.
5. LAC curve will touch SAC curves lying to the left of the optimum scale curve at the left of their least cost points and
6. LAC curve will touch SAC curves lying at the right of the optimum scale curve at the right their least cost points

In short run the firm will be busy with one plant size whereas in the long run more than one plant size will be operating as the scale of operation expands. Long run Average Cost initially falls with the increase in output and it will become the lowest at a particular level of output after that it starts rising which results in a boat shape LAC. There are many other

names for LAC such as Planning Curve, as it helps in planning the business or Envelope Curve, as it envelopes the optimum points of sequential Short run Average Cost Curves and Development Curve, as it plays a significant role on Business Development.

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### **Let Us Sum Up**

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In this unit, you have learned about the following:

- Role of cost function in business decision making
  - Short Run Average cost – Cost-output relation in short run
  - Long Run Average cost – Cost –output relation in long run
- 

### **Check Your Progress:**

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1. The shape of AFC is \_\_\_\_\_.
  2. The \_\_\_\_\_ intersect both AVC curve and the ATC.
  3. The shape of SAC is \_\_\_\_\_ and the point at which the Marginal Cost Curve intersects is called the least cost level of output.
  4. \_\_\_\_\_ will touch the optimum scale curve at the latter's least costpoint.
- 

### **Glossary**

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**SAC** : Calculation of average cost in a short run

**LAC** : Calculation of Average cost in long run

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**Answers to Check Your Progress:**

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1. Rectangular hyperbola.
2. Marginal Cost curve
3. U shaped
4. LAC curve

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**Suggested Readings**

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1. Amit Ahuja, Managerial Economics, S.Chand Limited 2017.
2. Marshirschey, Fundamentals of Managerial Economics, South Western Publications 2008.

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## **Block-4: Introduction**

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Block-4: **Market Structure** has been divided into four Units. Unit- 13 : **Perfect Competition** deals with Features of Perfect competition, Shut down point, Price and output determination under perfect competition.

Unit- 14 : **Monopoly Competition** explain about the Price and output determination under Monopoly, Definition, Features, Equilibrium conditions, Price and output of simple monopoly, Case study, Price discrimination, Price and output of Discriminating Monopoly, Nature of demand and Revenue under Monopoly, Monopoly equilibrium and cost of costs and Labour Exploitation under Monopoly.

Unit-15 : **Monopolistic Competition** describes about the Introduction and Features of monopolistic competition, Price and output determination, Short run price and output determination, Long run price and output determination.

Unit-16: **Oligopoly Competition** presents about the Introduction of Oligopoly Competition and its Definition and various Types, Features of oligopoly and Kinked demand curve (Sweezy's model).

In all the units of Block -4 **Market Structure**, the Check your progress, Glossary, Answers to Check your progress and Suggested Reading has been provided and the Learners are expected to attempt all the Check your progress as part of study.

# Unit-13

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## Perfect Competition

### STRUCTURE

Overview

Objectives

13.1. Features of Perfect competition

13.2. Shut down point

13.3. Price and output determination under perfect competition

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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### Overview

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In this unit, the feature of perfect competition, shut down point and price, and output determination under perfect competition have been clearly explained.

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### Objectives

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After completion of this unit, you will be able:

- To understand the basic characteristics of perfectly competitive market.
  - Price and output determination in perfectly competitive market.
- 

### 13.1. Features of Perfect Competition

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1. **Large number of buyers and sellers:** A large number of buyers imply that each individual buyer buys a very small portion of the market and each individual seller occupies a very small share of the market. This means that neither the buyer nor the seller can influence the market. It means that each individual firm is only a price taker and not a price maker. This means that individual firms have no power to fix the price of the product but they simply accept the price determined by the market. Like the buyer, the seller is only a price taker and not a price maker. The term -large number of sellers -implies that the share of each individual seller is very small. In other words, individual buyer or seller has no power to fix the price of the product.



2. **Homogeneous product and uniform price:** The product sold and bought is homogeneous in nature, in the sense that the units of the product are perfectly substitutable. All the units of the product are identical [i.e.] of the same size, shape, colour, quality etc. Therefore, a uniform price prevails in the market or all firms in the market charge the same price for their product.
3. **Free entry and exit:** In the short run, it is possible for the very efficient producer, producing the product at a very low cost, to earn super normal profits. Attracted by such a profit, new firms enter into the industry. When large number of firms enter, the supply (in comparison to demand) would increase resulting in lower price. An inefficient producer, who is unable to bring down the cost incurs loss, disturbed by the loss, the loss-incurring firms quit the market. If it happens, supply will then decrease, price will go up. Thus, existing firms could earn more profit.
4. **Absence of transport cost:** The prevalence of the uniform price is also due to the absence of the transport cost.
5. **Perfect mobility of factors of production:** The prevalence of the uniform price is also due to the perfect mobility of the factors of production. As they enjoy perfect freedom to move from one place to another and from one occupation to another, the price get adjusted
6. **Perfect knowledge about the Market:** All the buyers and sellers have a thorough knowledge of the quality of the product, prevailing price etc.,
7. **No Government intervention:** There is no government regulation on supply of raw materials or in the determination of price.

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### 13.2. Shut -down Point

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Under perfect competition, the profit position of the firm can be expressed under four categories viz.,

1. Normal Profit
2. Abnormal profit or excess profit
3. Minimum loss
4. Shut down point

Under this market, the prices are uniform as products are homogeneous. Position of Average Revenue (AR) curve and the Average Cost (AC) curve decide the profit position of the firm. Due to price uniformity, the AR curve is a straight line parallel to output axis and

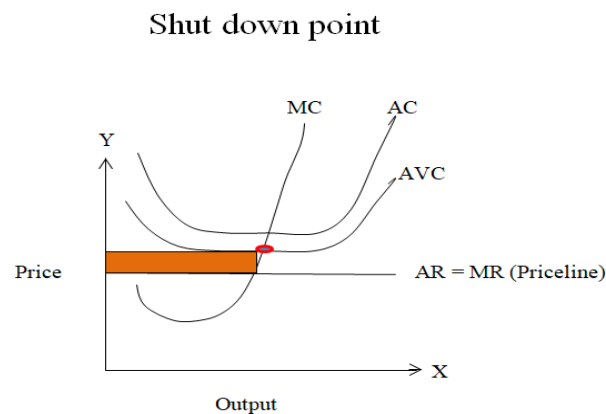
equal to Marginal Revenue (MR)

1.  $AC = AR$  - Normal profit position
2.  $AC < AR$  - Abnormal profit position
3.  $AC > AR$  - Minimum Loss position
4.  $AVC > AR$  - Shut down point.

Where  $AVC =$  Average Variable cost.

The following diagram shows the shutdown area and point at which  $MC$  intersect  $AVC$  is shutdown point

Figure



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### 13.3. Price and Output Determination under Perfect Competition

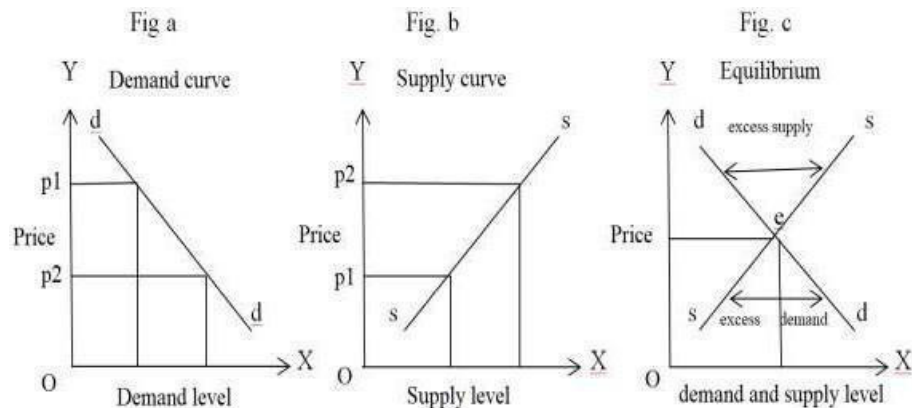
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The price and output determination under perfect competition can be illustrated in the following manner.

1. Short run equilibrium price
2. Long term equilibrium price

Under short run equilibrium determination, the quantity of demand and quantity of supply decides the equilibrium price. The demand curve follows the law of demand, i.e., an inverse proportion to the price and the supply curve follows the law of supply i.e., directly proportional to the price. The demand curve slopes downwards from left to right and supply curve slopes upwards from left to right which are shown in fig. a and fig. b respectively. In fig. c the point e at which the demand is equal to supply. At that level, the output is the equilibrium output and price is called equilibrium price. Beyond this point, there is an excess supply and below

this point there is an excess demand.



In the short run equilibrium, the price and output determination are on the basis of demand and supply which results in either abnormal profit or minimum loss. But on the contrary, there will be a normal profit in the long run. This can be calculated with two equilibrium conditions.

1. Marginal Revenue (MR) is equal to Marginal Cost (MC)
2. Marginal Cost (MC) curve will intersect Marginal Revenue from below.

The point at which  $MC = MR$ , the firm can enjoy the profit with the optimum output. The features uniformity in price and products are identical, the profit position of the firm decides the whether to continue or exit.

There are four profit positions for the firm who is in the perfectly competitive market in the short run. The profit positions are

1. Abnormal Profit position
2. Minimum loss position
3. Normal profit position
4. Shutdown point position

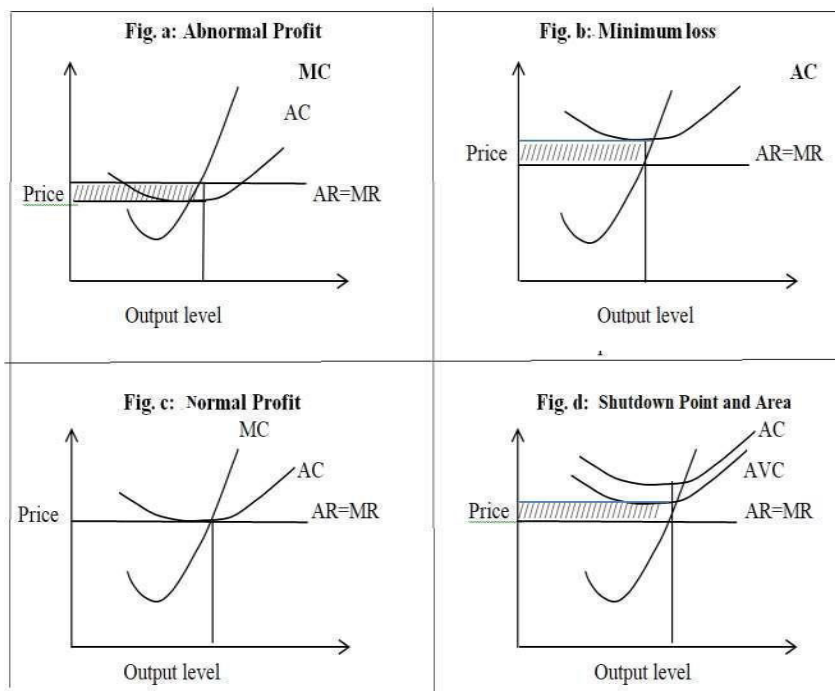
Consider the price is measured in vertical axis and output is measured in horizontal axis. Due to price uniformity the Average Revenue (AR) is equal to Marginal Revenue (MR) and at that level the price level are fixed. If the Marginal Cost (MC) curve intersects the Marginal Revenue (MR) curve from below, at that intersection point  $MC=MR$  and the output is optimum. The position of the Average cost curve decides the profit position of the firm.

The following four figures, Fig. a, Fig. b, Fig. c and Fig. d show the profit position of the firm

In fig. a, the average cost curve lying below the average revenue curve at the equilibrium level of output. Therefore, the firm enjoys abnormal profit.

The shaded area indicates the profit position of the firm.

In fig. b, the average cost curve lying above the average revenue curve at the equilibrium level of output. Therefore, the firm incurs minimum loss. The shaded area indicates the loss position of the firm.



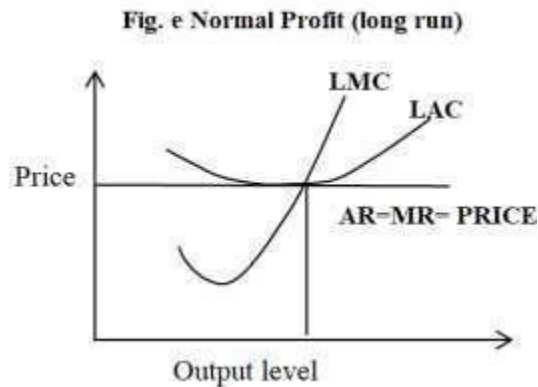
In fig. c, the average cost is equal to the average revenue at the equilibrium level of output. Therefore the firm enjoys normal profit. The profit position is applicable in case of long run price and output determination.

In fig. d, not the average cost curve lying above the average revenue curve but also the average variable cost curve, at the equilibrium level of output. Therefore, the firm forced to shut down the business. The shaded area indicates the shutdown area and the point intersect the average variable cost by marginal cost curve is called shutdown point.

### Long run profit position

In case of long run, the perfectly competitive firm enjoys normal profit as the equilibrium price level, the long run marginal cost (LMC) and long run average cost (LAC) are equal to Average revenue. (shown in fig. e)

$$LMC = LAC = AR = MR = \text{Price}$$



To summarise the price and output determination under perfect competition in terms of profit position of the firm as a price taker with the equilibrium conditions  $MR = MC$  and  $MC$  cuts  $MR$  from below, as;

S.No	Level of AR and AC	Profit or loss Position of the firm
1	$AR > AC$	Abnormal Profit
2	$AR = AC$	Normal profit
3	$AR < AC$	Minimum loss
4	$AR < AVC$	Shutdown point
5	$AR = MR = LMC = LAC$	Normal Profit (Long run)

### Let Us Sum Up

In this unit, you have learned about the following:

- Seven features of perfect competition
- Calculation of shut down point
- Price and output determination under perfect market

### Check Your Progress

1. In \_\_\_\_\_ competition, competitive firms are called price taker.
2. When  $AVC > AR$ , it is \_\_\_\_\_
3. There are four profit positions for the firm who is in the perfectly \_\_\_\_\_ in the short run.
4. Under \_\_\_\_\_ determination, the quantity of demand and quantity of supply decides the equilibrium price.

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**Glossary**

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**Price taker:** Perfectly competitive firms are called price taker

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**Answers to Check Your Progress:**

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- a) Perfect Competition
  - b) Shutdown point
  - c) Competitive market
  - d) Short run equilibrium
- 

**Suggested Readings**

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1. Ivan Png, Managerial Economics' Routledge, London, 2015
2. Luke M. Froeb, Brian T McCann, Mikhael Shor and Michael Robert Ward, Managerial Economics, Cengage Learning Asia Pvt. Limited, 2019.

# Unit-14

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## Monopoly Competition

### STRUCTURE

Overview

Objectives

14.1. Price and output determination under Monopoly

14.1.1. Definition

14.1.2. Features

14.1.3. Equilibrium conditions

14.1.4. Price and output of simple monopoly

14.1.5. Case study

14.2. Price discrimination

14.3. Price and output of Discriminating Monopoly

14.4. Nature of demand and Revenue under Monopoly

14.5. Monopoly equilibrium and cost of costs

14.6. Labour Exploitation under Monopoly

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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### Overview

In this unit features of Monopoly, equilibrium conditions, price and output determination and price discrimination have been clearly explained.

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### Objectives

After completion of this unit, you will be able:

- To study the characteristics of monopoly market
- To understand the discriminating monopoly
- Price and output determination under monopoly.

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### 14.1. Price and Output determination under Monopoly

The price and output determination under monopoly can be expressed in two ways.

1. Simple or pure monopoly
2. Discriminating monopoly

#### **14.1.1. Definition**

Different authors have defined the term monopoly in different ways. The following definitions are useful to understand the concept Monopoly.

According to McConnel, Pure or absolute monopoly exists when a single firm is the sole producer for a product for which there is no close substitutes.

According to Koutsoyiannis, "Monopoly is a market situation in which there is a single seller. There is no close substitute of the commodity it produces, there are barriers to entry".

#### **Features of Monopoly**

From the above definitions we can extract the following features.

1. There is a single seller with large number of buyers for the product
2. The product of the monopolist is unique and has no close substitutes
3. There are strict barriers to entry of any firm into the industry.
4. The monopolist is a price maker.
5. The monopolist enjoys abnormal profit i.e., maximum profit
6. There is a provision for price discrimination.

#### **14.1.2. Equilibrium Conditions**

There are two equilibrium conditions in order to maximize the profit.

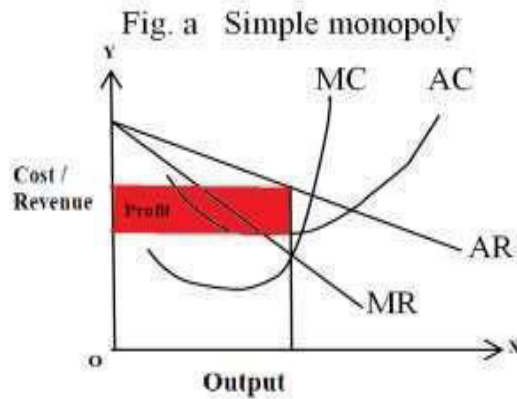
They are

1. Marginal Revenue (MR) is equal to Marginal Cost (MC),  $MC = MR$ ;
2. Marginal cost curve will intersect the marginal revenue curve from below

#### **14.1.3. Price and output of Simple Monopoly**

Under simple monopoly market, the demand curve is sloping downwards from left to right indicate AR curve. When AR falls, the MR curve also falls lies below the AR. MC cuts the MR from below at the point 'E' (MR=MC). At that level of output, the firm enjoys monopoly profit (shaded area) in fig.a.





It is to be noted that the monopolist will continue to sell his product as long as the  $MR > MC$ . Because he attains equilibrium at the level of output when  $MC = MR$ . beyond this point, the monopolist may incur more cost than the revenue. The following case study is helpful to understand the revenue function and cost function under monopoly.

#### 14.1.5. Case study

The revenue function and cost function of a monopoly are as follows:  $TR = 100Q - 4Q^2$  and  $TC = Q^3 - 18Q^2 + 91Q + 12$

1. Find the Average and Marginal revenue function.
2. Find the Average and Marginal Cost function
3. Suggest the value of profit per unit when  $Q=3$
4. Also calculate the total profit and express it diagrammatically.

#### Solution

Average Revenue (AR) = Total Revenue (TR) divided by Quantity (Q)

$$\begin{aligned}
 &= TR / Q \\
 &= 100Q - 4Q^2 / Q \\
 &= \mathbf{100 - 4Q}
 \end{aligned}$$

Marginal Revenue (MR) = first order differentiation of

$$\begin{aligned}
 &\text{Total Revenue (TR)} \\
 &= d(100Q - 4Q^2) \\
 &= \mathbf{100 - 8Q}
 \end{aligned}$$

$$\begin{aligned}
\text{Average Cost (AC)} &= \text{Total Cost (TC) divided by Quantity(Q)} \\
&= \text{TC} / \text{Q} \\
&= (\text{Q}^3 - 18\text{Q}^2 + 91\text{Q} + 12) / \text{Q} \\
&= \text{Q}^2 - 18\text{Q} + 91 + 12/\text{Q}
\end{aligned}$$

$$\begin{aligned}
\text{Marginal Revenue (MR)} &= \text{first order differentiation of Cost (TC)} \\
&= d (\text{Q}^3 - 18\text{Q}^2 + 91\text{Q} + 12) \\
&= 3\text{Q}^2 - 36\text{Q} + 91
\end{aligned}$$

Profit can be calculated as

$$\text{Profit per unit} = \text{Average Revenue} - \text{Average Cost} \Rightarrow \pi = \text{AR} - \text{AC}$$

When  $Q = 3$

$$\text{Average Revenue} = 100 - 4Q \Rightarrow 100 - 4(3) \Rightarrow \mathbf{88}$$

$$\text{Average Cost} = \text{Q}^2 - 18\text{Q} + 91 + 12/\text{Q}$$

$$= 3^2 - 18(3) + 91 + 12/3$$

$$= 9 - 54 + 91 + 4 \Rightarrow \mathbf{50}$$

Profit per unit when  $Q = 3$

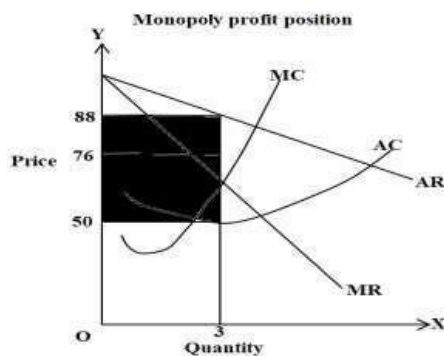
$$\pi = \text{AR} - \text{AC} \Rightarrow 88 - 50 = \mathbf{38}$$

$$4. \text{MR} = 100 - 8Q \Rightarrow 100 - 8(3) \Rightarrow 100 - 24 = \mathbf{76}$$

$$\text{MC} = 3\text{Q}^2 - 36\text{Q} + 91 \Rightarrow 3(3)^2 - 36(3) + 91$$

$$= 27 - 108 + 91 = \mathbf{10}$$

From the fig.b, till he sells 3 units output, MR is greater than MC, and when he exceeds this output level, MR is less than MC. The monopoly firm will be in equilibrium at the level of output when MR is equal to MC. The Price is 88. At the level of equilibrium output is 3; the average revenue is 88 and average cost is 50. Therefore, the profit per unit is  $\text{AR} - \text{AC}$ , i.e.,  $(88 - 50 = 38)$ ; Total profit =  $(\text{AR} - \text{AC}) \times \text{Total output}$  which is equal to  $(88 - 50) \times 3 = \mathbf{114}$



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## 14.2. Price Discrimination

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Price Discrimination is an imperfect market, the monopoly firm charges different price from different customers for the same type of product is known as price discrimination. In technical words, the price discrimination refers to the action of selling the same product at different prices to different buyers, in order to maximize sales and profits. Price discrimination is a pricing policy where companies charge each customer different prices for the same goods or services based on how much the customer is willing and able to pay. Typically, the customer does not know this is happening.

Different authors have defined the term price discrimination in different ways. According to Koutsoyiannis, Price discrimination exists when the same product is sold at different prices to different buyers.

According to Stigler, -Price discrimination refers to the sale of technically similar products at prices which are not proportional to their marginal cost. Conditions for Price discrimination

The following conditions must be met for price discrimination to be successful:

1. Firms must be able to control supply;
2. Firms must prevent resale of products from one buyer to another; and
3. There must be a difference in price elasticity in the different markets for the product.
4. The firm can be able to divide his market into segments which is possible when some degree of market is imperfect.
5. Same service in connection with differentiated products. For eg., railways charge different rates for transport of coal and iron.

### Types of Price discrimination

Discrimination of price can be divided into three types

1. Personal price discrimination
2. Place price discrimination
3. Trade price discrimination

The personal price discrimination refers to the charging of different price from different customer for the same product. For example, a lawyer charges different fees for the same type of cases from rich and poor clients.

Place price discrimination is otherwise called geographical price discrimination which refers to that the monopoly charges different prices in different markets for the same product. Dual pricing in marketing is geographical price discrimination as one price within the nation and at the other price in abroad.

Trade price discrimination is otherwise called price discrimination according to use. For example, electricity board charges lowest tariff for the domestic use and highest for the commercial use.

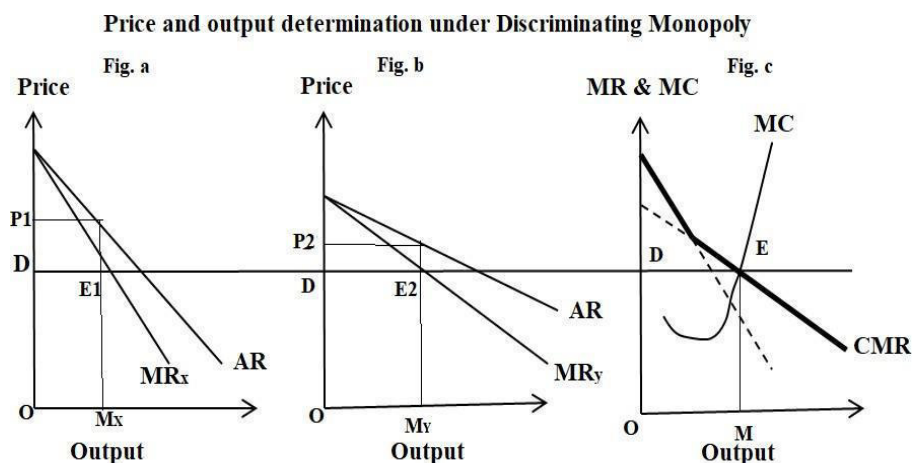
Degree of Price discrimination

Professor A. C. Pigou, has classified the price discrimination into three categories based on the degree of price discrimination.

1. Price discrimination of first degree – Simple monopoly
2. Price discrimination of second degree – Discriminating monopoly
3. Price discrimination of third degree - Bilateral monopoly and other imperfect markets

### 14.3. Price and output of Discriminating Monopoly

Under discriminating monopoly, the market divided into submarkets based on the elasticity of demand. In order to explain the discrimination clearly, consider the market divided into two submarkets X and Y. The Average Revenue curves are different for the submarkets. In fig. a and fig. b the AR curves slopes downwards from left to right with different elasticity  $AR_X$  and  $AR_Y$  respectively. The respective Marginal Revenue curves  $MR_X$  and  $MR_Y$  lies below the AR curves



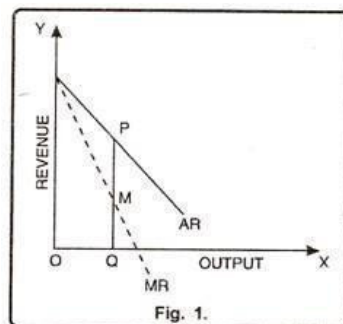
In fig a,  $OM_x$  level of output with  $OP$  level of price provides monopoly profit for the submarket X. In case of Submarket Y, the output is  $OM_y$  with  $OP_1$  level of price to reach the monopoly profit. The respective marginal revenue are  $MR_x$  and  $MR_y$  of submarket X and are combined to get the

actual revenue of the monopoly represented in fig.c. The Combined Marginal Revenue curve (CMR) is extracted from  $MR_x + MR_y$ .

Since the output is under single control, the Marginal Cost curve (MC) is shown in fig.c for the entire output. The level of production is determined with the equilibrium condition  $MC=MR$ . At the point E, MC intersect MR from below and they are equal at E. At that level, output is optimum to maximise the profit. The line DD indicating the MC cost of output cuts  $MR_x$  and  $MR_y$  at the points E1 and E2. The principle of equilibrium under discriminating monopoly is that  $MR_1 = MR_2 = MC$  with  $OP_1$  and  $OP_2$  level of price for submarkets X and Y.

#### **14.4. Nature of Demand and Revenue under Monopoly**

Under monopoly, it becomes essential to understand the nature of demand curve facing a monopolist. In a monopoly situation, there is no difference between firm and industry. Therefore, under monopoly, firm's demand curve constitutes the industry's demand curve. Since the demand curve of the consumer slopes downward from left to right, the monopolist faces a downward sloping demand curve. It means, if the monopolist reduces the price of the product, demand of that product will increase and vice-versa. (Fig. 1).



In Fig. 1 average revenue curve of the monopolist slopes downward from left to right. Marginal revenue (MR) also falls and slopes downward from left to right. MR curve is below AR curve showing that at OQ output, average revenue (= Price) is PQ where as marginal revenue is MQ. That way  $AR > MR$  or  $PQ > MQ$ .

#### **Costs under Monopoly:**

Under monopoly, shape of cost curves is similar to the one under perfect competition. Fixed costs curve is parallel to OX-axis whereas average fixed cost is rectangular hyperbola. Moreover, average variable cost, marginal cost and average cost curves are of U-shape. Under monopoly, marginal cost curve is not the supply curve. Price is higher than marginal cost. Here, it is of immense use to quote that a

monopolist is not obliged to sell a given amount of a commodity at a given price.

## 14.5. Monopoly equilibrium and Laws of costs

### Monopoly Equilibrium and Laws of Costs:

The decision regarding the determination of equilibrium price in the long run depends on the elasticity of demand and effect of law of costs on monopoly price determination.

#### 1. Nature of Elasticity of Demand:

If the demand is inelastic, the monopolist will fix high price of his product. Inelastic demand refers to the situation in which consumers must have to buy the commodity what-so-ever may be the price. On the other hand, if demand is elastic, the monopolist will fix low price per unit.

#### 2. Effects of Laws of Costs:

The monopolist also takes into consideration laws of costs while determining the prices. In the long run, output may be produced under law of diminishing costs, increasing costs and constant costs.

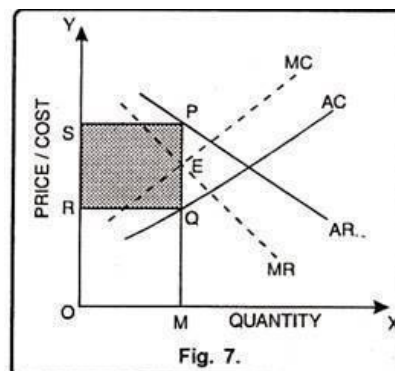
**A brief description of these laws has been given as under:**

#### Increasing Costs:

If the monopolist produces the commodity under the law of Diminishing Returns or Increasing costs, he will get the maximum profit at point E where marginal revenue is equal to marginal cost.

This is indicated in Fig. 7. Here he produces OM units of the commodity and gets PM as the price. His monopoly profit is represented by the shaded area PQRS.

No other alternative will give him this much of profit and hence this is the best position for him provided he produces goods under the Law of Increasing Costs.



### Diminishing Costs:

The same approach will be applicable under the Law of Increasing Returns or Diminishing Cost as explained in Fig. 8. Here AC and MC are falling. The MC and MR are equal at point E. accordingly; the monopolist will produce OM units of commodity and sell the same at PM Price. His net monopoly revenue will be PQRS indicated by shaded area.

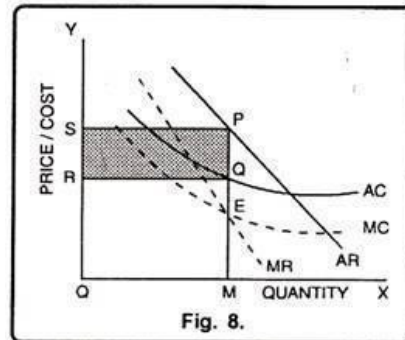


Fig. 8.

### Constant Costs:

The determination of monopoly price under constant costs can be shown with the help of Fig. 9. In the diagram, the AC curve will be a horizontal line running parallel to OX and for all the levels of output AC will be equal to MC. AR and MR represent the average revenue curve and marginal revenue curve respectively. The equilibrium between MC and MR is brought at point E when the output is OM. Thus, the monopolist will produce OM and will sell it at PM Price. The monopoly profit will, therefore, be equal to PERS which is represented by the shaded area.

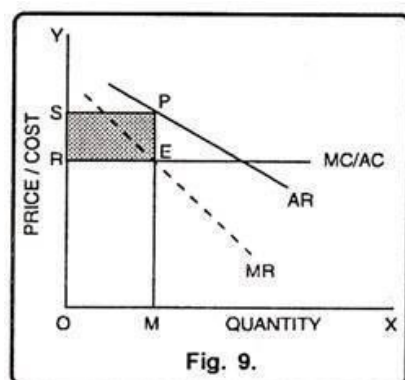


Fig. 9.

### Misconceptions Concerning Monopoly Pricing:

#### 1. Monopolist is Interested in Maximum Profits and not in Maximum Price:

Because monopolist can manipulate output and price so it is often

alleged that a monopolist “will charge the highest price he can get”. It is generally believed that prices under free competition are lower than under monopoly. This is clearly a misguided assertion. Under certain conditions, things may be altogether different. As explained in the previous table and diagram, there are many prices above the one he charges but the monopolist shuns them for the simple reason that they entail a smaller than maximum profits.

### **2. Maximum Total Profits and not Maximum Profit per Unit:**

The monopolist seeks maximum total profits, not maximum per unit profits. The profits per units may be higher at higher price but the total profits will be higher at lower price. It is; therefore, better to sell more at a lower price than to sell less at a higher price.

### **3. Economies of Scale:**

The monopolist may enjoy certain economies like a better and cheaper utilization of by-products, cheaper raw material, better and cheaper methods of production, lower cost of advertisement and so on than under free competition. Evidently, the monopolist may be able to charge prices lower than under free competition.

### **4. Law of Increasing Returns:**

If the commodity is produced under the Law of Increasing Returns, the monopolist may be producing more at lower costs and selling at lower prices. This policy may help him to earn higher total revenue. The consumer may also buy larger output at lower prices.

### **Multiplied Plant Monopoly:**

Under monopoly, multiple plants are a situation where a monopolist produces in two or more plants. Each plant has different cost structure. In this situation, multi plant monopoly takes two decisions.

#### **They are:**

- (i) To decide the amount of output to be produced and the price at which it will be sold to maximize profits.
- (ii) To decide the allocation of production between different plants.

#### **Assumptions:**

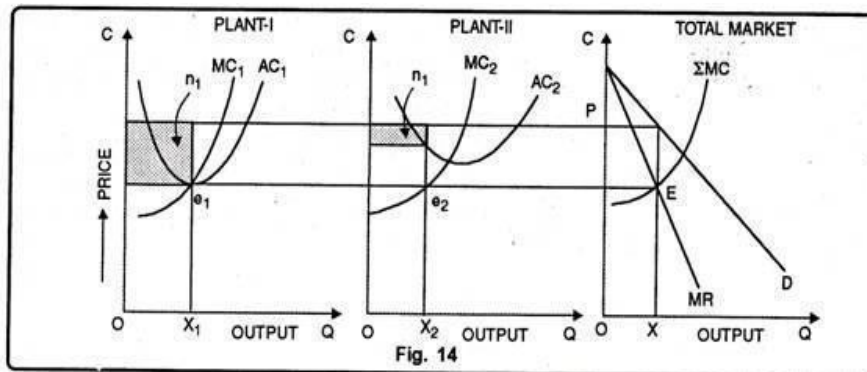
#### **The multi-plant monopoly is based on following assumptions:**

- (i) There are two plants X and Y.
- (ii) Plant X is more efficient than Y plant



(iii) Cost structure of both plants is different.

(iv) The monopolist knows the market demand curve and corresponding MR curve. The multiple plant monopoly can be illustrated with the help of Fig. 14.



In Fig. 14, we get:

$SMC =$  horizontal summation of  $MC_1$  and  $MC_2$  i.e.  $SMC = MC_1 + MC_2$  at point  $E = MR = SMC$ .

Here, monopolist will sell  $OX$  output at price  $OP$  to get maximum profit. At point  $e_1$  and  $e_2$  = By extending point  $E$  leftwards to cut  $MC_1$  at  $e_1$  and  $MC_2$  at  $e_2$  > producer decides the allocation of production of  $OX$  units between plant 1 and plant 2.

In short, from point  $e_1$ , we draw perpendicular to the X-axis. It gives  $O_1$  as the level of output produced by plant 1. Again  $O_2$  is the level of output produced by plant 2 and  $OX = O_1 + O_2$

∴ Total profit = Total profit is the sum of the two shaded rectangles shown by  $n_1$  and  $n_2$ .

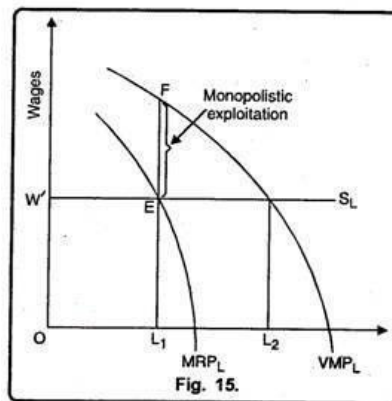
## 14.6. Labour Exploitation under Monopoly

**Monopolistic exploitation of labour can be discussed under:**

### (1) Exploitation of Labour by a Monopoly Firm:

The fact that market demand curve for labour by a monopoly firm in product market is based on  $MRP_C$  rather than on its  $VMP_L$  leads to monopolistic exploitation of labour.

There is exploitation because labour is paid wages equal to its  $MRP$  which is lower than its  $VMP$ .



According to Joan Robinson, a productive factor is exploited if it is paid a price less than the Value of its Marginal Product (VMP). Robinson's analysis of monopolistic exploitation of labour (a variable factor) by an individual monopoly firm is illustrated in Fig. 15.

It is shown in Fig. 15, the  $MRP_1$  and  $S_1$  curves, a profit maximizing monopolist will employ  $OL_1$  units of labour determined by point E and pay wage  $OW (= EL_1)$ .

But, under perfect competition in the product market,  $VMP_1$  is the relevant labour demand curve. Therefore,  $OL_1$  units of Labour would be demanded at wages  $FL_1$  or else, the employment will be  $OL_2$ .

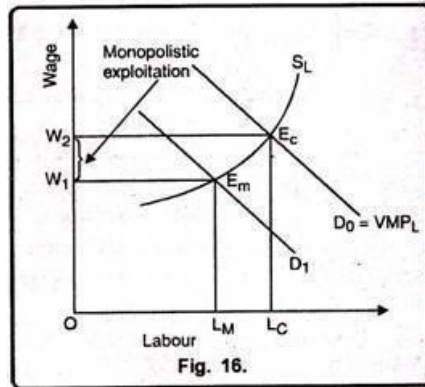
Thus, the difference between monopoly wage rate ( $FL_1$ ) and competitive wage rate ( $EL_1$ ), i.e.,  $FL_1 - EL_1 = EF$  is the extent of monopolistic exploitation of labour.

The monopolist restricts employment of labour to  $OL_1$  units where as the perfectly competitive firm would have employed  $OL_2$  units of labour. The lower level of employment by a monopolist also result in the loss of output.

#### (ii) Exploitation of Labour under Monopolistic Competition:

Figure 16 describes the exploitation of labour under monopolistic competition at the market level. In this figure, curve  $D_1$  represents the market demand curve for labour by the monopolistic firms; curve  $D_0$  represents the market demand curve for labour by the perfectly competitive firms, and curve  $S_1$ , represents the market supply curve of labour.

Under monopoly, labour market will be in equilibrium at point  $E_m$  wage rate will be  $OW_1$ .



Under monopolistic competitions, equilibrium wage rate will be at  $OW_2$  and employment  $OL_1$  units of labour. Obviously, imperfect competition in the product market causes wage rate to be lower than the value of marginal product ( $VMP_L$ ) as is the case in a perfectly competitive product market.

Thus, according to Joan Robinson,  $OW_2 - OW_1 = W_2 - W_1$  is the extent of exploitation under monopolistic competition.

**Criticism:**

This monopolistic exploitation of labor can be criticized on the ground that lower wage payment is inevitable because of divergence between  $MRP_L$  and  $VMP_L$ . The  $MRP_L$  is lower than  $VMP_L$ , (at all levels of employment) not because of monopoly powers of the monopolistic sellers but because of product differentiation.

Product differentiation creates brand loyalty which makes the demand curve slope downward to the right. In case of a downward sloping demand curve, there is bound to be a diversion between price (AR) and the marginal revenue (MR), marginal revenue being lower than the price.

Since all the firms, whether in perfect or in imperfect market, attempt at profit maximization, monopolistic firm will have to pay labour a wage rates that equal  $MRP_L$ .

Therefore, the difference between  $OW_2$  and  $OW_1$  cannot be considered as exploitation. The difference arises due to the market conditions.

However, if product differentiation is excessive and commodities are imposed on the consumers by the monopolistic sellers, then the argument of monopolistic exploitation may be acceptable.

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## Let Us Sum Up

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In this unit, you have learned about the following:

- Price discrimination – definition, types and degrees
- Simple monopoly
- Discriminating monopoly

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## Check Your Progress

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1. Charging different prices for the same product is known as \_\_\_\_\_.
2. In \_\_\_\_\_ competition, firm is a price maker.
3. Under monopoly, \_\_\_\_\_ are a situation where a monopolist produces in two or more plants.
4. According to \_\_\_\_\_, a productive factor is exploited if it is paid a price less than the Value of its Marginal Product (VMP).
5. \_\_\_\_\_ creates brand loyalty which makes the demand curve slope downward to the right.

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## Glossary

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**Price discrimination:** Charging different price from different customer for the same quality and quantity of the product

**Price Maker:** Monopoly firm - Fixing monopoly price

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### **Answers to Check Your Progress**

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1. Price discrimination
2. Monopoly
3. Multiple plants
4. Joan Robinson
5. Product differentiation

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### **Suggested Readings**

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1. Keat Paul, K Young Philip and C Dickinson, *Managerial Economics*, Pearson, 2017.
2. Deepakshi Gupta, *Managerial Economics* Wiley, 2019

# Unit-15

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## Monopolistic Competition

### STRUCTURE

Overview

Objectives

15.1. Introduction

15.2. Features of monopolistic competition

15.3. Price and output determination

15.3.1. Short run price and output determination

15.3.2. Long run price and output determination

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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### Overview

In this unit the features of Monopolistic Competition and the Price and output determination have been explained.

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### Objectives

After completion of this unit, you will be able:

- To analyze and understand the Monopolistic Competitive market.
- Price and output determination under Monopolistic Competition.

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### 15.1. Introduction

Monopolistic competition is a market structure in which there are many sellers with large number of buyers, dealing with differentiated products, allows the firm to enter and exit freely and facing non-price competition.

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### 15.2. Features of Monopolistic Competition

1. There are large number of buyers and sellers.
2. Firms under monopolistic competition are price makers. They set their own prices for their products.
3. Firms produce differentiated products but are substitutes which is the key element of monopolistic competition.

4. There is a free entry and exit of firms.
5. Firms compete with each other by incurring selling cost and advertisement cost for sales promotion.
6. Non-price competition is an essential part of monopolistic competition.

The concept of monopolistic competition was put-forth by an American economist Prof. E.H. Chamberlin in his popular book, "The Theory of Monopolistic Competition" published in 1933.

In simple words, monopolistic competition refers to a market situation where there are many sellers of a commodity, but the product of each seller differs from each other.

No seller can have any perceptible influence on the price output policies of the other seller nor can he be influenced by their action. Thus, product differentiation is the hall mark of the monopolistic competition.

The product differentiation manifests itself in several ways like difference in product brand, difference in trade mark, difference in quality and colour etc. However, many examples can be put forward to explain the concept of monopolistic competition.

All the firms producing soaps, toothpastes etc. are the examples of monopolistic competition. Under monopolistic competition, a firm enjoys some features of monopoly and perfect competition. For instance, Hindustan Levers Ltd. enjoys monopoly right on the trademark "Lux". No other firm can use this trade mark. The other firms enjoy their own trade mark like Moti.

Sandal, Breeze etc. so that they may produce the substitute of Lux. In this way, under monopolistic competition features of monopoly and perfect competition are found. Thus, we can say that monopolistic competition is a market situation which lies between monopoly and perfect competition.

**Definitions:**

"Monopolistic competition is a market situation in which there are many sellers of a particular product, but the product of each seller is in some way differentiated in the minds of consumers from the product of every other seller." Leftwich "Monopolistic competition is a market situation where there are many producers but each offers a slightly differentiated product." Lim Chong Yah

“Monopolistic competition is found in the industry where there are a large number of small sellers selling differentiated but close substitute products.” Joe S. Bain

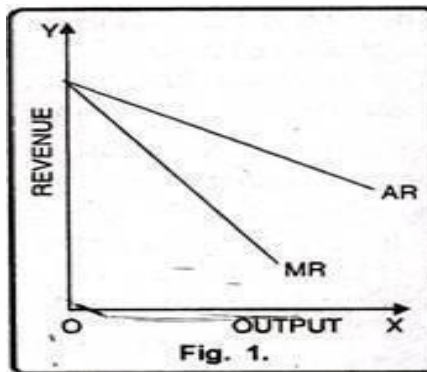
“Monopolistic competition has today come to mean a state of affairs in which there is a large number of sellers selling non-homogeneous or slightly differentiated products and in which freedom of entry exists.” H.H. Liebhafsky

### **Nature of Demand and Cost:**

#### **(i) Demand Curve:**

Like perfect competition and monopoly, price under monopolistic competition is also determined by the intersection of demand and supply. Therefore, before studying the price determination under monopolistic competition we must have knowledge of demand and supply curves of a firm. Generally under monopolistic competition due to product differentiation, a firm faces a downward sloping demand curve. It is highly elastic but not perfectly elastic within a relevant range of prices at which he can sell any amount of the product.

The reason is that if a producer raises the price of the product, some of his customers will stop buying his product and will shift to his rival firm who has not changed his price. On the other hand, if he lowers his price, he will attract some new customers. The shape of the demand curve is shown in Fig. 1.



#### **(ii) Cost Curve:**

Under monopolistic competition Average Cost (AC), Average Variable Cost (AVC), Marginal Cost (MC) is also of U-shape. We know, selling cost is the special feature of imperfect competition. Basically, selling costs are incurred on advertising of product. According to Chamberlin, selling cost curve is also y-shaped. The supply curve under monopolistic competition of the industry cannot be drawn due to product differentiation.



## **Equilibrium Price and Output under Monopolistic Competition:**

### **Short Run Equilibrium:**

According to Prof. Chamberlin, the firm under monopolistic competition has to make a wider range of decisions than under perfect competition. The firm may vary its price and with it, its sales and output; it may vary the quality of its product and it may engage in sales-promotion activities such as advertisement, publicity and propaganda, etc.

**Thus, there are three variables under monopolistic competition, viz.;**

- i. Price,
- ii. Product; and
- iii. Selling outlay.

It would be very difficult to discuss their effects simultaneously. Therefore, the equilibrium of individual firm is discussed here with reference to prices and output adjustments, assuming that the selling costs are absent. In other words, now we shall examine the individual equilibrium and then examine group equilibrium.

### **Individual Equilibrium:**

It should be recalled here that for maximum profits two conditions are to be satisfied under perfect competition and monopoly; (1)  $MC = MR$  and (2)  $MC$  must cut  $MR$  from below. Under monopolistic competition also, a firm will make the maximum profits when these two conditions are satisfied.

However, in short period, it is not necessary that all the firms should have iso-classic demand curves. The elasticity of demand curve under monopolistic competition depends upon the attachment of the buyers. So, this it will depend upon the age of the firm (and of the product).

If a firm is an old one, it shall be selling its product for a long time and consequently the buyers will have a less elastic or inelastic demand for its products. On the contrary, a comparatively, new firm will have a more elastic demand curve for its product.

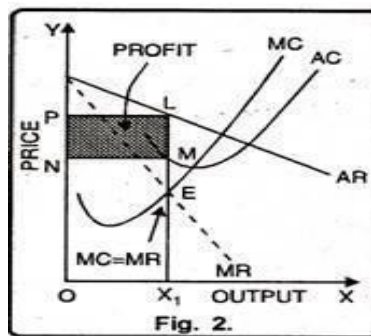
Thus, older firms will have greater price advantage while newer firms will have lesser price advantage. Since it is assumed that product differentiation or the effects of selling costs are absent, cost curves of different firms will be identical.

It follows therefore that older firms will make abnormal profits while newer firms may have normal profits or even losses. To be very clear

and simple, it is stated that there may be three equilibrium conditions of a firm in the short period under monopolistic competition, viz.

1. It may earn abnormal profits;
2. It may undergo losses;
3. It may earn only normal profits.
4. Super Normal Profit

Under monopolistic competition, a firm earns maximum profits or is in equilibrium when  $MC=MR$  and  $MC$  cuts  $MR$  from below. In the fig. 2. the firm is in equilibrium at  $OX_1$  level of output and at the point E, at which  $MR$  and  $MC$  are equal and  $MC$  cuts  $MR$  from below.



The firm is earning super-normal profits or abnormal profits since average revenue is greater than average cost, i.e.,  $AR > AC$ . The main reason for these abnormal profits is that, the other rival firms are not able to produce closely competitive substitutes. Hence, they are not able to attract consumers towards their product.

## 2. Normal Profit:

If under monopolistic competition, the price of product is equal to  $AC$ , the firm will be earning normal profit. In Fig. 3  $MC$  is equal to  $MR$  at point E. This is the equilibrium point. At equilibrium point, the equilibrium output is  $OX_1$  and price is  $OP_1$ . At this point,  $AC$  is  $NX_1$  and  $AR$  is also  $NX_1$  i.e.,  $AC=AR$ . Thus the firm will be earning only normal profits.

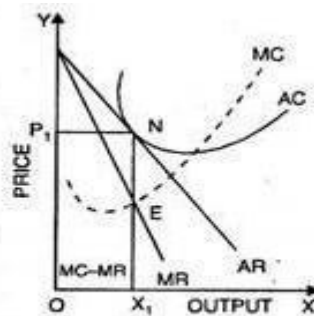
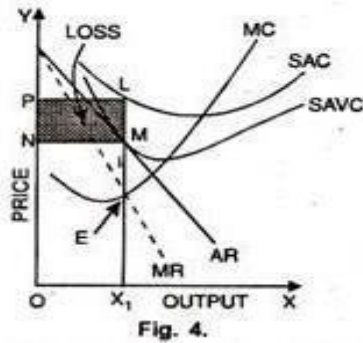


Fig. 3.

### 3. Sustaining Losses:

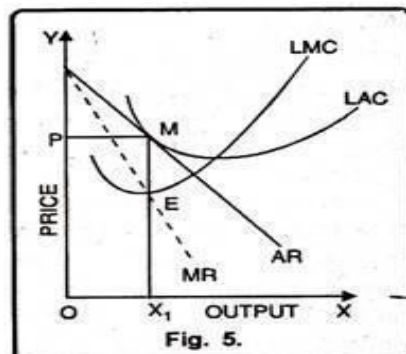
However, it is also possible that the demand may not be favourable to firm under monopolistic competition, i.e., it may not be able to attract the consumers towards its product, if it fixes price equal to its SAC. But it is compelled to sell its product at the price which is less than even its short period average cost.



Hence, it may incur losses such firm, in the long-run may leave the industry, if it is not possible for it to change its demand relative to its cost conditions through product differentiation and advertisement. In figure 4 the firm is in equilibrium at point E, where  $MC=MR$ . At this equilibrium level the output is  $OX_1$  at price  $OP$ . Corresponding to this, the average cost  $LX_1$  is greater than average revenue  $MX_1$ . Since, revenue is less than cost, the firm will sustain losses equal to the shaded area  $PLMN$ .

### Long Run Individual Equilibrium:

Long period refers to that time period in which each firm can change its production capacity by changing the fixed as well as variable factors. New firms can enter the industry and old firms can exit it. Basically, the firms in the long run will get the normal profits.



If, the existing firms are making super normal profits, it will attract some of the new firms in the industry. The entry of new firms will result into over production which will have a depressing effect on price. Hence all

the firms in the long run will get normal profits. In fig. 5 output is measured on X-axis whereas price on Y-axis. LAC is the long run average cost and LMC is the long run marginal cost curve. The firm is in equilibrium because at point E,  $MC = MR$ . The equilibrium output is  $OX_1$  and price is  $OP$ . Since, at this equilibrium average revenue curve is tangent to long run average cost curve at point M; hence the firms are earning normal profits.

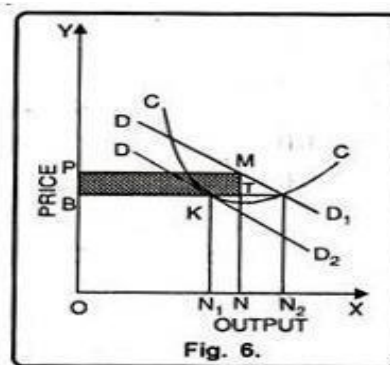
### Group Equilibrium in Monopolistic Competition:

Under monopolistic competition, the word 'group' is used for industry. There is a difference between an industry and a group. An industry generally consists of firms which produce homogeneous product, whereas a group is composed of firms which produce a differentiated product. Thus group consists of a number of firms producing close substitutes. For example, shoe making firms like 'Bata', 'Carona', and 'Liberty' are a group.

To study group equilibrium, we assume that:

- (i) Demand and cost curves of all the firms are identical,
- (ii) No firm can influence the price and output decisions of its rivals.

The Group Equilibrium is shown below with the help of Fig. 5.



In Fig. 6,  $DD_1$  is the group demand curve and  $CC$  is the cost curve. Every firm would like to fix up  $OP$  price because at this price the difference between price and cost is the maximum and producer gets supernormal profit equal to  $PMTB$ . The other firms will be attracted to enter the market and now the market demand will be shared by a larger number of firms. In this situation demand curve will shift downwards and the new demand curve will be  $DD_2$ .

The number of firms in the market will continue increasing till the new demand curve  $DD_2$  is tangent to the cost curve. In the Fig. 6 at point 'K' demand curve is tangent to the cost curve. At this point firm will be

earning only normal profit and this will be the equilibrium position of the firm. Thus under monopolistic competition, OB is the equilibrium price and ON is the equilibrium output.

### 15.3. Price and Output Determination

The price and output determination under monopolistic competition can be expressed with the equilibrium conditions in two ways; short run equilibrium and long run equilibrium.

#### Equilibrium Conditions

The profit will be maximised with optimum price and output, where

1. Marginal Cost is equal to Marginal Revenue
2. Marginal cost curve will intersect marginal revenue curve from below.

#### 15.3.1. Short run price and output determination

In Short run, the firm either earn supernormal profit or suffers with loss. But in long run, firms can achieve only normal profit.

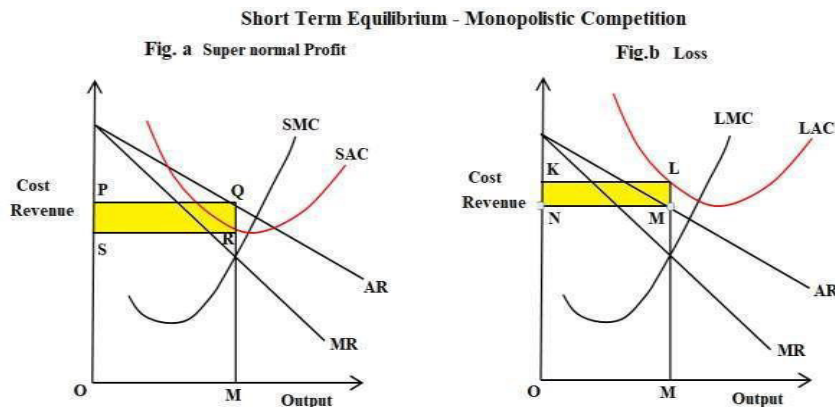


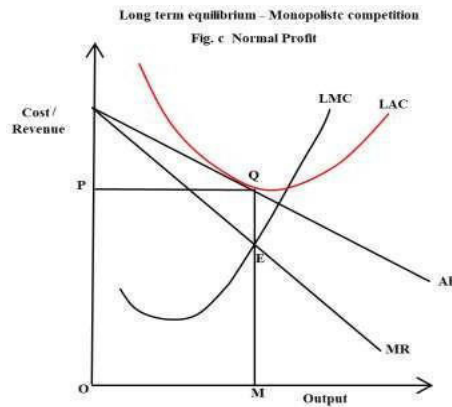
Fig.a represents short run price and output determination with supernormal profit and fig. b represents short run price and output determination with loss. In fig a. the SAC curve lies below the AR curve and the profit is expressed in shaded area PQRS at OP level of Price and OM level of output where SMC is equal to MR and intersect from below.

Suppose the SAC lies above the AR curve, the firm incur loss, shown in shaded area KLMN with OP level of price and OM level of output where SMC is equal to MR and intersect from below.

#### 15.3.2. Long run Price and Output determination.

The monopolistic firm earns normal profit in the long run equilibrium position due to the entry of new firms and exit of loss making firms. In long run the demand curve i.e., the AR curve is more elastic or flatter due to

the availability more close substitute products. In fig.c the equilibrium is achieved at the point E, where  $MC=MR$ . The equilibrium output is  $OM$  and the equilibrium price is  $OP$ . The  $AR$  curve has the tangency at the point  $Q$  with Long run Average Cost curve ( $LAC$ ) at the equilibrium level of price and output. At the equilibrium,  $AR=LAC$  and  $MR = MC$ .



To summarise, the price and output determination under monopolistic,

- |              |   |                    |   |           |
|--------------|---|--------------------|---|-----------|
| 1. $AR > AC$ | - | Supernormal profit | - | Short run |
| 2. $AR < AC$ | - | Loss position      | - | Short run |
| 3. $AR = AC$ | - | Normal profit      | - | Long run  |

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### Let Us Sum Up

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In this unit, you have learned about the following:

- Features of Monopolistic Competition.
- Short run price and output determination.
- Long run price and output determination.

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### Check Your Progress

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1. Product differentiation is an important feature of \_\_\_\_\_.
2. Selling cost is the feature of the market form in \_\_\_\_\_ competition.
3. The product under monopolistic competition are \_\_\_\_\_.
4. The entry of new firms will result into over \_\_\_\_\_ which will have a depressing effect on price.

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### Glossary

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**Product differentiation:** It is the process of distinguishing a product or service from others to make it more attractive.

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## **Answers to Check Your Progress**

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1. Monopolistic Competition
2. Monopolistic
3. Differentiated with close substitute
4. Production

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## **Suggested Readings**

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1. Luke M. Froeb, Brian T McCann, Mikhael Shor and Michael Robert Ward, Managerial Economics, Cengage Learning Asia Pvt. Limited, 2019.
2. SumaDamodaran "Managerial Economics" Oxford University Press, 2010

# Unit-16

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## Oligopoly Competition

### STRUCTURE

Overview

Objectives

16.1.Introduction

16.2.Definition and Types

16.3.Features of oligopoly

16.4.Kinked demand curve (Sweezy's model)

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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### Overview

In this unit the features of Oligopoly Competition and the Price and output determination have been explained.

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### Objectives

After completion of this unit, you will be able:

- To analyse and understand the Oligopoly market

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### 16.1. Introduction

Oligopoly is market structure in which there are few firms, selling homogeneous or heterogeneous products, interdependence with firms. It is difficult to give the exact number but there are a few firms in the market. Duopoly market may be termed as simple oligopoly if they collusive each other and non-collusive if the firms compete with each other.

---

### 16.2. Definition and Types

The term 'Oligopoly' is coined from two Greek words 'Oligoi meaning 'a few' and 'pollein means 'to sell'.

It occurs when an industry is made up of a few firms producing either an identical product or differentiated product.

In simple words, "Oligopoly is a situation in which there are so few sellers that each of them is conscious of the results upon the price of



the supply which he individually places upon the market”-The number of sellers is greater than one, yet not big enough to render negligible the influence of any one upon the market price.

**Definition:**

**The concept of oligopoly can be defined as under:**

“Oligopoly is that situation in which a firm bases its markets policy in part on the expected behaviour of a few close rivals.” – J. Stigier

“An oligopoly is a market of only a few sellers, offering either homogeneous or differentiated products. There are so few sellers that they recognize their mutual dependence.” – PC. Dooley

“Oligopoly is a market structure characterized by a small number of firms and a great deal of interdependence.” -Mansfield

“An oligopoly is a market situation in which each of a small number of interdependent, competing producer’s influences but does not control the market.” – Grinols

“Oligopoly is a market situation in which number of firms in an industry is so small that each must consider the reaction of rivals in formulating its price policy.” – McConnel

**Classification of Oligopoly:**

**Oligopoly situation can be classified on different bases:**

**1. Basis of Product Differentiation:**

On the basis of product differentiation, oligopoly may be classified as Pure or Perfect Oligopoly and Imperfect or Differentiated Oligopoly. In the case of pure oligopoly, the product of different firms in the industry is identical or homogeneous while in the case of differentiated oligopoly, the products of different firms are not identical but rather differentiated products. Thus, differentiated oligopoly will exist where the competing firms produce products which are close substitutes but not perfect substitutes.

The distinction between pure oligopoly and differentiated oligopoly does not play a significant role in the analysis. In real situation, firms in most oligopolistic industries produce differentiated products. But theoretically we may determine price and output in both kinds of oligopoly.

**2. Basis of Entry of Firms:**

On the basis of the possibility of entry of new firms into the industry,

oligopoly may be classified as Open Oligopoly and Closed Oligopoly. An open oligopoly provides full freedom to new firms to enter into the industry. In the situation of open oligopoly there is no restriction of any kind for the desiring firms to enter into the market.

A closed oligopoly, on the other hand, refers to that market situation where only the few firms control the entire market and new firms are not allowed to enter the industry.

### **3. Basis of Price Leadership:**

On the basis of presence or absence of price leadership, oligopoly may be classified as Partial Oligopoly and Full Oligopoly.

Partial oligopoly refers to that market situation where the industry is dominated by one large firm (known as the leader) and the other firms (known as the followers) of the industry follow the price policy determined by their leader.

Full oligopoly, on the other hand, refers to that market situation where there is no leader and no followers.

### **4. Basis of Agreement:**

On the basis of agreement, oligopoly is classified as Collusive Oligopoly and Non-collusive Oligopoly. A collusive oligopoly refers to that market situation where the firms of the industry follow a common policy of pricing. In other words, they combine together to avoid competition among themselves regarding the price and output of the industry. A non-collusive oligopoly refers to that market situation where there is no agreement among the firms regarding the price and output of the entire market. In other words, the firms under non-collusive oligopoly act independently.

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## **16.3. Features of Oligopoly**

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1. **Few large firms:** very few big firms own the major control of the whole market by producing major portion of the market demand.
2. **Interdependence among firms:** The price and quality decisions of a particular firm are dependent on the price and output decisions of the rival firms.
3. **Group behaviour:** The firms under oligopoly realise the importance of mutual co-operation.
4. **Advertisement cost:** The oligopoly firm could raise sales either by advertising or improving the quality of the product.

5. **Nature of product:** Perfect oligopoly mean homogenous products and imperfect oligopoly deal with heterogeneous products.
6. **Price rigidity:** It implies that prices are difficult to be changed. The oligopoly firms do not change their prices due to the fear of rival's reaction

#### 16.4. Kinked Demand Curve (Sweezy's Model)

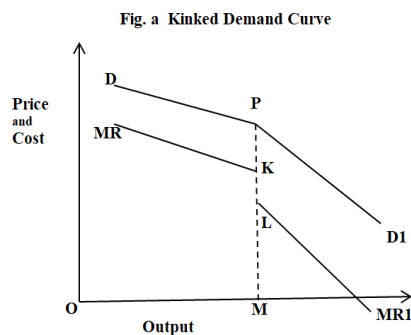
The price and output determination influenced with price rigidity as once price established in oligopoly market, remains constant for a span of time. i.e., the quoted wholesale price remains unchanged for a long period. It is to be noted that constancy of price differs from the price rigidity.

The theory of kinked demand curve was explained by Prof. Paul Sweezy, famously known as Sweezy model. Under oligopoly the output and price does not change due to the kink in the demand curve. The kinked demand curve theory describes the price rigidity but it does not describe how the price under oligopoly is determined.

The kinked demand curve model expresses the condition of the oligopoly firm how the price neither increase nor decrease when the rival increases the price and the firms only reduces the price only when the rival firm reduce the price.

The justification is that if the rival firm increases its price the firm will be losing its customers and it is beneficial to other firms because they can increase the demand for their products. On the other hand, if a rival firm reduces its price other firms will follow suit.

In the cases of changes in market demand dissimilar to the demand of the firms, the firm will face the situation of indeterminate market demand about the changes in price. This is how a kink in the demand curve does happen.



In fig.a the demand curve with a kink at the point 'P' has been shown. P is

the price at which the firm is selling the product by producing ON units. Above the price 'P' the demand curve as anticipated more elastic, the firm maintains the old price as other competitors are sticking into the same price. Therefore the total revenue and profit of the firm would be reduced. The corresponding portion marginal revenue of DP, shown as MR. Due to demand and cost conditions, the demand become less elastic and corresponding marginal revenue is MR1.

When the demand curve is in DP portion the marginal revenue is positive but the demand curve is in PB portion the marginal revenue becomes negative. This has happened because of the price rigidity at OM level of output represented by KL.

Kinked demand curve represents the price rigidity under oligopoly market in which the firm has no option either increase the price or to decrease the price, but keep the price rigid at a particular level of output OM. This is due to rival response on price strategy where price will be reduced once the firm reduce the price but price will not be increased when the firm increase the price.

The discontinuity in the marginal revenue, from MR to MR1 shows the level of price rigidity and this gap create a kink in the demand curve.

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### Let Us Sum Up

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In this unit, you have learned about the following:

- Features of Oligopoly, Kinked demand curve
- Price Rigidity and Price leadership

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### Check Your Progress

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1. Kinked \_\_\_\_\_ demand curve is a peculiar character in Oligopoly competition.
2. Price rigidity is possible in \_\_\_\_\_ competition.
3. The theory of kinked demand curve was explained by Prof. Paul Sweezy, famously known as \_\_\_\_\_.
4. A collusive oligopoly refers to that \_\_\_\_\_ where the firms of the industry follow a common policy of pricing.

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### Glossary

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**Kinked demand curve:** There is a kink in the demand curve

**Price Rigidity:** Price constancy of oligopoly market

**Price leadership:** Few sellers led by leader.

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### **Answers to Check Your Progress**

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1. Demand
2. Oligopoly
3. Sweezy model
4. Market situation

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### **Suggested Readings**

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1. Christopher Thomas and S Charles Maurice, Managerial Economics' 9<sup>th</sup>Edition, McGraw-Hill Education, 2007
2. E. Case Karl and C Fair Ray and E Oster Sharon, Principles of Economics' Pearson, 2017

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## **Block-V: Introduction**

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Block-V: **Factor Pricing** consists of four Units. Unit- 17: **Marginal Productivity Theory of distribution** describes about Introduction of Marginal productivity theory of distribution and the Theory in details and its Criticisms

Unit- 18: **Ricardian Theory of rent** explains about the Introduction and Assumption of Ricardian Theory of Rent, Reasons for the existence of Rent and Criticisms of the Ricardian Theory of Rent.

Unit- 19: **Liquidity Preference Theory** deals with the Introduction of Liquidity Preference theory and the Theory in details and Criticisms of the Liquidity Preference Theory

Unit- 20 : **Profit Concepts and Analysis** presents about Introduction, Meaning and definition, Elements of profit, Nature of Profit, Justification of Profit, Break even analysis, Break-even point, Break-even chart, Safety margin, Targeted Profit, Formula for break-even quantity and Cost-Volume- Profit Analysis.

In all the units of Block -5 **Factor Pricing**, the Check your progress, Glossary, Answers to Check your progress and Suggested Reading has been provided and the Learners are expected to attempt all the Check your progress as part of study.

## Unit-17

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### Marginal Productivity Theory of distribution

#### STRUCTURE

Overview

Objectives

17.1. Introduction

17.2. Marginal productivity theory of distribution

17.3. Criticisms

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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#### Overview

In this unit the concept of Marginal Productivity theory of distribution has been clearly explained.

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#### Objectives

After completion of this unit, you will be able:

- To analyse and understand the Monopolistic Competitive market.

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#### 17.1. Introduction

The oldest and most significant theory of factor pricing is the marginal productivity theory. It is also known as Micro Theory of Factor Pricing. It was propounded by the German economist J.H. Von Thunen. But later on, many economists like Karl Menger, Walras, Wicksteed, Edgeworth and Clark and many others contributed to the development of this theory. According to this theory, remuneration to each factor of production tends to be equal to its marginal productivity.

Marginal productivity is equal to change in the total quantity of production by employing one extra unit of the factor to the production process. So long as the marginal cost of a factor is less than the marginal productivity, entrepreneurs will go on employing more factors. They will stop giving further employment when its marginal productivity turns out to be equal to its marginal cost.

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## 17.2. Marginal Productivity Theory of Distribution:

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### Definitions:

- The distribution of income of society is controlled by a natural law, if it worked without friction, would give to every agent of production the amount of wealth which that agent creates -J.B. Clark
- The marginal productivity theory contends that in equilibrium each productive agent will be rewarded in accordance with its marginal productivity.-Mark Blaug
- The marginal productivity theory of income distribution states that in the long run under perfect competition, factors of production would tend to receive a real rate of return which was exactly equal to their marginal productivity.- Liebhafasky

### Assumptions of the Theory:

#### The main assumptions of the theory are as under:

1. **Perfect Competition:** The marginal productivity theory has the fundamental assumption of perfect competition. This is because it cannot take into account unequal bargaining power between the buyers and the sellers.
2. **Homogeneous Factors:** This theory assumes that units of a factor of production are homogeneous. This implies that different units of factor of production have the same efficiency. Thus, the productivity of all workers offering the particular type of labour is the same.
3. **Rational Behaviour:** The theory assumes that every producer desires to reap maximum profits. This is because the organizer is a rational person and he so combines the different factors of production in such a way that marginal productivity from a unit of money is the same in the case of every factor of production.
4. **Perfect Substitutability:** The theory is also based upon the assumption of perfect substitution not only between the different units of the same factor but also between the different units of various factors of production.
5. **Perfect Mobility:** The theory assumes that both labour and capital are perfectly mobile between industries and localities. In the absence of this assumption the factor rewards could never tend to be equal as between different regions or employments.
6. **Interchangeability:** It implies that all units of a factor are equally



efficient and interchangeable. This is because different units of a factor of production are homogeneous, since they are of the same efficiency, they can be employed inter-changeable, and e.g., whether we employ the fourth man or the fifth man, his productivity shall be the same.

7. **Perfect Adaptability:** The theory takes for granted that various factors of production are perfectly adaptable as between different occupations.
8. **Knowledge about Marginal Productivity:** Both producers and owners of factors of production have means of knowing the value of factor's marginal product.
9. **Full Employment:** It is assumed that various factors of production are fully employed with the exception of those who seek a wage above the value of their marginal product.
10. **Law of Variable Proportions:** The law of variable proportions is applicable in the economy.
11. **The Number of Factors of Production should be Capable of being Varied:** It is assumed that the quantity of factors of production can be varied i.e. their units can either be increased or decreased. Then the remuneration of a factor becomes equal to its marginal productivity.
12. **The Law of Diminishing Marginal Returns:** *It means that when more and more units of a factor of production are employed, the marginal productivity of that factor goes on diminishing.*
13. **Long-Run Analysis:** Marginal productivity theory of distribution seeks to explain determination of a factor's remuneration only in the long period.

The marginal productivity theory of distribution, as developed by J. B. Clark, at the end of the 19th century, provides a general explanation of how the price (of the earnings) of a factor of production is determined.

In other words, it suggests some broad principles regarding the distribution of the national income among the four factors of production.

According to this theory, the price (or the earnings) of a factor tends to equal the value of its marginal product. Thus, rent is equal to the value of the marginal product (VMP) of land; wages are equal to the VMP of labour and so on. The neo-classical economists have applied the same principle of profit maximisation ( $MC = MR$ ) to determine the factor price. Just as an entrepreneur maximises his total profits by equating MC and

MR, he also maximises profits by equating the marginal product of each factor with its marginal cost.

### **Some Key Concepts:**

The theory is also based on key certain concepts.

### **These are the following:**

1. **MPP:** The first is marginal physical product of a factor. The marginal physical product (MPP) of a factor, say, of labour, is the increase in the total product of the firm as additional workers are employed by it.
2. **VMP:** The second concept is value of marginal product. If we multiply the MPP of a factor by the price of the product, we would get the value of the marginal product (VMP) of that factor.

### **Advertisements:**

3. **MRP:** The third concept is marginal revenue product (MRP). Under perfect competition, the VMP of the factor is equal to its marginal revenue product (MRP), which is the addition to the total revenue when more and more units of a factor are added to the fixed amount of other factors, or  $MRP = MPP \times MR$  under perfect competition. It is simply MPP multiplied by constant price, as  $P = MR$ . [VMP of a factor = MPP of the factor  $\times$  price of the product per unit, and MRP of a factor = MPP of the factor  $\times$  MR under perfect competition. So under perfect competition VMP of a factor = MRP of that factor.]

### **The Essence of the Theory:**

The theory states that the firm employs each factor up to that number where its price is equal to its VMP. Thus, wages tend to be equal to the VMP of labour; interest is equal to VMP of capital and so on.

By equating VMP of each factor with its cost a profit- seeking firm maximises its total profits. Let us illustrate the theory with reference to the determination of the price of labour, i.e., wages.

Let us suppose that the price of the product is Rs. 5 (constant) and the wages per unit of labour are Rs. 200 (constant). As the number of factors other than labour remain unchanged, wages represent the marginal cost (MC).

**Table 12.1: Calculation of MPP, VMP and MRP of a Variable Factor (Labour)**

Land	Capital	Labour	Total Product	MPP of Labour	VMP or MRP of Labour	The Wage Rate AW-MW
1 Unit	1 Unit	1 Unit	10 Units	X	X	Rs. 20
``	``	2 Units	16 Units	6 Units	Rs. 30	``
``	``	3 Units	21 Units	5 Units	Rs. 25	``
``	``	4 Units	25 Units	4 Units	Rs. 20	``
``	``	5 Units	28 Units	3 Units	Rs. 15	``
``	``	6 Units	30 Units	2 Units	Rs. 10	``

Table 12.1 shows that at 2 or 3 labourers, the VMP or MRP of labour is greater than wages; so the firm can earn more profits by employing an additional labour.

But at 5 or 6 labourers, the VMP or MRP of labour is less than wages, so it would reduce the number of labourers. But when it employs 4 labourers, the wage rate (Rs. 20) becomes equal to the VMP or MRP of labour (also Rs. 20).

Here the firm gets the maximum profits because its marginal cost of labour (or marginal wage Rs. 20) is equal to its marginal revenue (VMP or MRP, Rs. 20).

Thus, under the assumption of perfect competition a firm employs a factor up to that number at which the price of the factor is just equal to the value of the marginal product (=MRP of the factor).

In the same way it can be shown that rent is equal to the VMP of land, interest is equal to the VMP of capital, and so forth.

The theory may now be illustrated diagrammatically. See Fig. 12.2. Here WW is the wage line indicating the constant rate of wages at each level of employment (AW = MW. Here AW is average wage and MW is marginal wage).

The VMP line shows the value of marginal product curve of labour, and it goes downwards from left to right indicating diminishing MPP of labour.

Fig. 12.2 shows that the firm employs OL number of labourers, because by doing so it equates the MRP of labour with the wage ratio, and makes optimum purchase of labour.

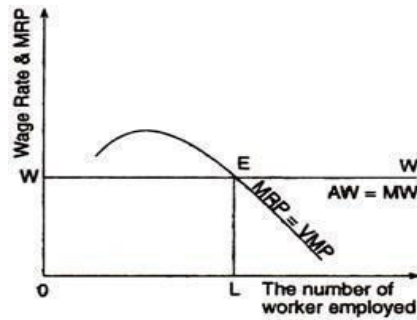


Fig. 12.2. Wage Determination

### Explanation of the Theory:

The marginal productivity theory states that under perfect competition, price of each factor of production will be equal to its marginal productivity. The price of the factor is determined by the industry. The firm will employ that number of a given factor at which price is equal to its marginal productivity. Thus, for industry, it is a theory of factor pricing while for a firm it is a factor demand theory.

### Analysis of Marginal Productivity Theory

Under the conditions of perfect competition, price of each factor of production is determined by the equality of demand and supply. As the theory assumes that there exists full employment in the economy, therefore, supply of the factor is assumed to be constant. So, factor price is determined by its demand which itself is determined by the marginal productivity. Thus, under such conditions, it becomes essential to throw light on the demand curve or marginal productivity curve of an industry.

As the industry consists of a group of many firms, accordingly, its demand curve can be drawn with the demand curves of all the firms in the industry. Moreover, marginal revenue productivity of a factor constitutes its demand curve. It is only due to this reason that a firm's demand or labour depends on its marginal revenue productivity. A firm will employ that number of labourers at which their marginal revenue productivity is equal to the prevailing wage rate.

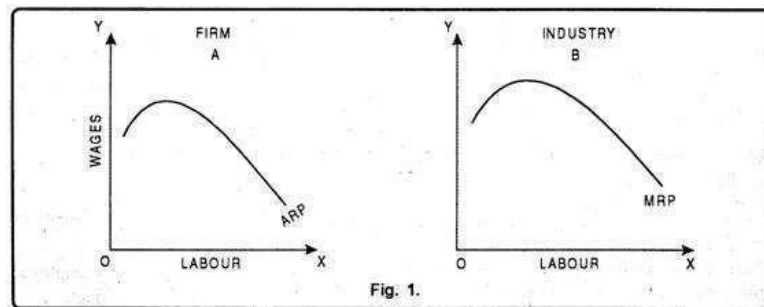


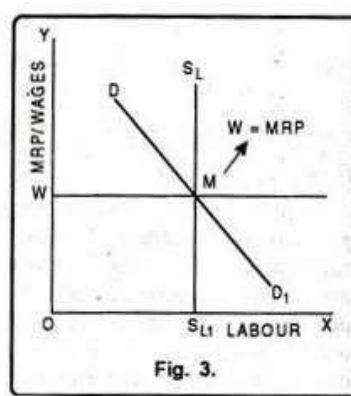
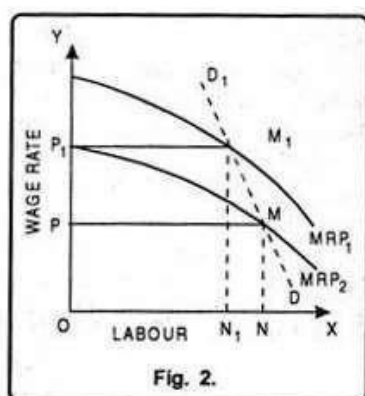
Fig. 1.

Fig. 2 shows that at wage rate  $OP_1$ , the demand for labour is  $ON_1$  and marginal revenue productivity curve is  $MRP_1$ . If wage rate falls to  $OP$ , firms

will increase production by demanding more labour. In such a situation the price of the commodity will fall and marginal revenue productivity curve will also shift to  $MRP_2$ .

At  $OP$  wages, the demand for labour will increase to  $ON$ .  $DD_1$  is the firm's demand curve for labour. The summation of demand of all the firms shows demand curve of an industry. Since the number of firms is not constant under perfectly competitive market, it is not possible to estimate the summation of demand curves of all firms. However, one thing is certain that is the demand curve of industry also slopes downward from left to right. The point where demand for and supply of a factor are equal will determine the factor price for the industry.

This theory assumes the supply of a factor to be fixed



Thus factor price is determined by the demand for factor i.e. factor price will be equal to the marginal revenue productivity. It has been shown by Fig. 3. In the Fig. 3, number of labour has been taken on  $OX$  axis whereas wages and MRP have been taken on  $OY$  axis.  $DD_1$  is the industry's demand curve for labour. This is also the Marginal Revenue Productivity curve.

Factor Price ( $OW$ ) = Marginal Revenue Productivity MRP.

Thus under perfect competition, factor price is determined by the industry and firm demands units of a factor at this price.

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## 17.2. Criticisms of the theory:

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**The marginal productivity theory of distribution has been subjected to a number of criticisms:**

1. **In determination of marginal product:** Firstly, main product is a joint product- produced by all the factors jointly. Hence the marginal product of any particular factor (say, land or labour) cannot be separately determined. As William Petty pointed out

as early in 1662: Labour is the father and active principle of wealth, as lands are the mother.

2. **Unrealistic:** It is also shown that the employment of one additional unit of a factor may cause an improvement in the whole of organisation in which case the MPP of the variable factors may increase. In such circumstances, if the factor is paid in accordance with the VMP, the total product will get exhausted before the distribution is completed. This is absurd. We cannot think of such a situation in reality.
3. **Market imperfection:** The theory assumes the existence of perfect competition, which is rarely found in the real world. But E. Chamberlin has shown that the theory can also be applied in the case of monopoly and imperfect competition, where the marginal price of a factor would be equal to its MRP (not to its VMP).
4. **Full employment:** Again, the assumption of full employment is also unrealistic. Full employment is also a myth, not a reflection of reality.
5. **Difficulties of factor substitution:** W. W. Leontief, the Nobel economist, denies the possibility of free substitution of the factors always owing to the technical conditions of production. In some products process, one factor cannot be substituted by another. Moreover organisation or entrepreneurship is a specific factor which cannot be substituted by any other factor.
6. **Emphasis on the demand side only:** The theory is one-sided as it ignores the supply side of a factor; it has emphasised only the demand side i.e., the employer's side, hi the opinion of Samuelson, the marginal productivity theory is simply a theory of one aspect of the demand for productive services by the firm.
7. **Inhuman theory:** Finally, the theory is often described as 'inhuman' as it treats human and non-human factors in the same way for the determination of factor prices.

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### Let Us Sum Up

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In this unit, you have learned about the following:

- Definitions of MPT
- Assumptions of MPT
- Explanation for Marginal productivity theory of distribution

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### **Check Your Progress**

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1. The marginal productivity theory relates to the \_\_\_\_\_.
2. The marginal productivity theory of distribution was firstly formulated in its complete form by \_\_\_\_\_.
3. Under Marginal productivity Theory, reward for labour is determined by \_\_\_\_\_.

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### **Glossary**

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**Marginal Productivity:** It is equal to change in the total quantity of production by employing one extra unit of the factor to the production process.

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### **Answers to Check Your Progress**

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1. Remuneration of resources
2. J. B. Clark
3. Marginal Product

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### **Suggested Readings**

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1. Dominick Salvatore, Managerial Economics in a Global Economy', 8<sup>th</sup> edition, Oxford University Press, 2015
2. William F Samuelson and Stephen G Marks, Managerial Economics' 7<sup>th</sup>Edition, John Wiley and Sons, 2012



## Unit-18

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### Ricardo's Theory of Rent

#### STRUCTURE

Overview

Objectives

18.1. Introduction.

18.2. Assumption of Ricardian Theory of Rent.

18.3. Reasons for the existence of Rent

18.4. Criticisms of the Ricardian Theory of Rent

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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#### Overview

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In this unit, the Ricardian theory of rent has been clearly explained.

---

#### Objectives

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After completion of this unit, you will be able :

- To understand the implications of rent theory
- 

#### 18.1. Introduction

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David Ricardo, an English classical economist, first developed a theory in 1817 to explain the origin and nature of economic rent. Ricardo used the economic rent to analyse a particular question.

In the Napoleonic wars (1805- 1815) there were large rise in corn and land prices. Did the rise in land prices force up the price of corn, or did the high price of corn increase the demand for land and so push up land prices. Ricardo defined rent as, **“that portion of the produce of the earth which is paid to the landlord for the use of the original and indestructible powers of the soil.”**

In his theory, rent is nothing but the producer's surplus or differential gain, and it is found in land only.

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## **18.2. Assumptions of the Theory**

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**The Ricardian theory of rent is based on the following assumptions:**

1. Rent of land arises due to the differences in the fertility or situation of the different plots of land. It arises owing to the original and indestructible powers of the soil.
2. Ricardo assumes the operation of the law of diminishing marginal returns in the case of cultivation of land. As the different plots of land differ in fertility, the produce from the inferior plots of land diminishes though the total cost of production in each plot of land is the same.
3. Ricardo looks at the supply of land from the standpoint of the society as a whole.
4. In the Ricardian theory, it is assumed that land, being a gift of nature, has no supply price and no cost of production. So rent is not a part of cost, and being so it does not and cannot enter into cost and price. This means that from society's point of view the entire return from land is a surplus earning.

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## **18.3. Reasons for Existence of Rent:**

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**According to Ricardo rent arises for two main reasons:**

1. Scarcity of land as a factor and
2. Differences in the fertility of the soil.

### **Scarcity Rent:**

Ricardo assumed that land had only one use—to grow corn. This meant that its supply was fixed, as shown in Figure 13.1. Hence the price of land was totally determined by the demand for land. In other words, all the price of a factor of production in perfectly inelastic supply is economic rent—it has no transfer earnings.

Thus, it was the high price of corn which caused an increase in the demand for land and a rise in its price, rather than the price of land pushing up the price of corn. However, this analysis depends on the assumption that land has only one use. In the real world, a particular piece of land can be put to many different uses. This means its supply for any one use is elastic, so that it has transfer earnings.

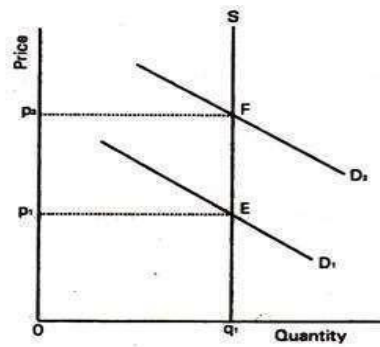


Fig. 13.1. Earnings of a Factor in Fixed Supply

**Differential Rent:**

According to Ricardo, rent of land arises because the different plots of land have different degree of productive power; some lands are more fertile than others. So there are different grades of land. The difference between the produce of the superior lands and that of the inferior lands is rent—what is called differential rent. Let us illustrate the Ricardian concept of differential rent.

**Differential Rent on account of differences in the fertility of soil:**

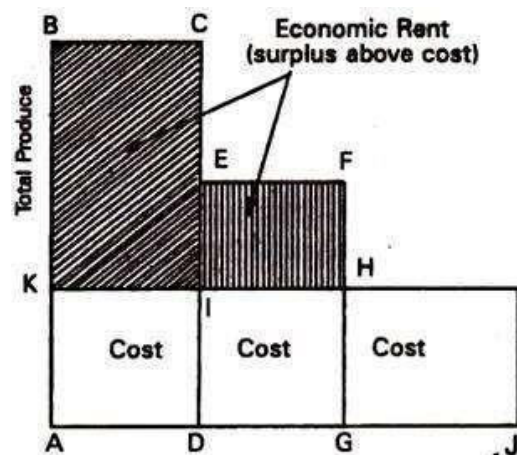
Ricardo assumes that the different grades of lands are cultivated gradually in descending order—the first grade land being cultivated at first, then the second grade, after that the third grade and so on.

With the increase in population and with the consequent increase in the demand for agricultural produce, inferior grades of lands are cultivated, creating a surplus or rent for the superior grades.

The first grade land, being the most fertile, produces 40 kg, the second grade 70 kg and the third grade land, being less fertile, only 20 kg. So, the first grade land earns a surplus or rent of Rs. 100, the second grade a rent of Rs. 50 and the third one earns no surplus.

The first two plots are called the intra-marginal and the third one is the marginal (or no-rent) land. This simple example shows how the differences in the fertility of the different plots of land create rent for the superior plots of lands.

The concept of differential rent arising due to differences in the fertility of different plots of land is illustrated in Fig. 13.2.



**Fig. 13.2. Differential Rent**

Here, AD, DG and GJ are three separate plots of land of the same size, but of difference in fertility. The total produce of AD is ABCD, that of DG is DEFG and that of GJ is GHIJ. The first and second plots of land generate a surplus shows by the shaded area, which represents the rent of the first two plots of land. Since the third plot GJ has no surplus it is marginal land or no-rent land. Grade 4 (below-marginal) land will not be cultivated, because rent is negative (Rs. 25 in this example).

#### **Rent and Price:**

From the Ricardian theory we can show the relation between rent (of land) and price (of wheat). Since the market price of wheat is determined by costs of the marginal producer and since, for this marginal producer, rents are zero, Ricardo concluded that economic rent is not a determinant of market price. Rather, price of wheat is determined solely by the market demand for wheat and the availability of fertile land.

#### **Deductions from the Theory:**

**If rent depends on price and on the superiority of rent-producing land over marginal land, we can deduce the following:**

1. **Improved methods of farming:** Improved methods of cultivation may lead to a fall in rent (demand remaining unchanged). It is because increased output on the superior grades of land will make the cultivation of inferior grades of land unnecessary.
2. **Population growth:** Population growth is likely to lead to a rise in rent, since the increased demand for land will bring poor quality land into cultivation, thus lowering the output of marginal land. Thus, if the price of food increases, the rent of existing land will increase.

3. **Improved transport facilities:** Improved transport facilities are likely to lead to a fall in rent. It is because the output of less fertile land of foreign countries may be able to compete more closely with the home produce. So there will be no need to cultivate inferior home areas. As a result the output of the marginal land rises and rent falls.

Thus, it is difficult to say whether or not rent increases with economic progress. However, rent is likely to fall with economic progress if population growth is unable to fully neutralise the effects of technological progress and improvement in transport facilities.

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#### **18.4. Criticisms of the Theory**

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**Ricardian theory has been criticised on the following grounds:**

1. Ricardo considers land as fixed in supply. Of course, land is fixed in an absolute sense. But land has alternative uses. So the supply of land to a particular use is not fixed (inelastic). For example, the supply of wheat land is not absolutely fixed at any given time.
2. Ricardo's order of cultivation of lands is also not realistic. If the price of wheat falls the marginal land need not necessarily go out of cultivation first. Superior grades of land might cease to be cultivated if a fall in the price of its output causes such land being demanded for other purposes (e.g., for constructing houses).
3. The productivity of land does not depend entirely on fertility. It also depends on such factors as position, investment and effective use of capital.
4. Critics have pointed out that land does not possess any original and indestructible powers, as the fertility of land gradually diminishes, unless fertilisers are applied regularly.
5. Ricardo's assumption of no-rent land is unrealistic as, in reality; every plot of land earns some rent, although the amount may be small.
6. Ricardo restricted rent to land only, but modern economists have shown that rent arises in return to any factor of production, the supply of which is inelastic.
7. According to Ricardo, rent does not enter into price (cost) but from the point of view of an individual farm rent forms a part of cost and price.

In spite of the various shortcomings of the Ricardian theory, it cannot be

discarded as Stonier and Hague remarked. The concept of transfer earnings helps to bring the simple Ricardian theory of rent into closer relation with reality.

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### **Let Us Sum Up**

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In this unit, you have learned about the following:

- Definitions of Ricardo's theory of rent
- Assumptions of Ricardo's theory of rent
- Quasi Rent

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### **Check Your Progress**

---

1. Ricardo's theory of rent was formulated on the basis of \_\_\_\_\_.
2. The productivity of land does not depend entirely on \_\_\_\_\_.
3. The difference between the produce of the superior lands and that of the inferior lands is rent, what is called \_\_\_\_\_.

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### **Glossary**

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**Theory of rent:** the rent of a land site is equal to the economic advantage obtained by using the site in its most productive use, relative to the advantage obtained by using marginal (i.e., the best rent-free) land for the same purpose, given the same inputs of labor and capital.

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### **Answers to Check Your Progress**

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1. The law of diminishing returns
2. Fertility
3. Differential rent

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### **Suggested Readings**

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1. Leontief, Wassily. [1966] Input-Output Economics. New York, NY: Oxford University Press, 1986.
2. R.L.Varshney, K.L. Maheshwari, Managerial Economics, Sultan & Chand, 2018.

# Unit-19

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## Theory of Interest

### STRUCTURE

Overview

Objectives

19.1. Introduction.

19.2. Liquidity Preference theory

19.3. Criticisms of the Liquidity Preference Theory

Let Us Sum Up

Check Your Progress

Glossary

Answers to Check Your Progress

Suggested Readings

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### Overview

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In this unit, the Liquidity Preference theory of rent has been clearly explained.

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### Objectives

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After completion of this unit, you will be able:

- To understand the implications of rent theory
- 

### 19.1. Introduction

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According to J.M. Keynes, interest is not the reward for saving has been postulated by the classical economists but the reward for parting with liquidity for a specific period. It is purely a monetary phenomenon and is determined by the demand for and the supply of money.

The supply of money refers to the quantity of money in circulation at a fixed point of time. Since it is controlled by the central bank of a country, it remains constant per period. So, in order to see how the rate of interest is determined it is necessary to consider the demand for money.

The demand for money does not refer to saving or money required for spending on goods and services but the demand for the actual stock of money to hold as liquid balances. The classical economists believe that money was only held for purposes of making transactions and bridging the time period between income receipts. Keynes added the possibility of the demand for money as an asset, i.e., speculative balances.



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## 19.2. Liquidity Preference Theory

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There are three motives' for demanding money balances and these are identified as follows:

### 1. Transactions Demand:

Transactions balances are needed to bridge the time gap between income receipts and expenditure.

The amount of money demanded for transactions purposes depends on:

- i. Length of time between income receipts and expenditures, and
- ii. the size of income receipts and expenditure.

Transactions balance would vary directly with income and price level and not rates of interest. If national income rises, people will require more money for spending purposes. Similarly, if the price level rises, people will require more money to buy that same amount of goods and services.

### 2. Precautionary Demand:

Money is also held for the purpose of meeting unforeseen emergencies. This motive was not included in classical theory where perfect certainty was assumed. Keynes grouped transactions and precautionary balances together into a single sum which varied directly with the level of income and the general price level.

### 3. Speculative Demand:

The speculative motive was first identified by Keynes. This is also known as the asset motive. In order to understand this concept, it is necessary to ask transformation and speculative balances why should people hold money balances over and above when money as an asset which yields no return at all. The answer to this question is that if other financial assets, in particular bonds, are likely to fall in price, then losses on bonds can be avoided by holding money instead.

The basic motive for holding speculative money balances was therefore to avoid losses in a declining securities market. In order to understand this point more clearly, it is necessary to consider the relationship between bond prices and the rate of interest.

In this context, Keynes was referred to 'undated government securities' (called 'gilts'). These bonds pay a fixed annual sum and are bought and sold on the securities market. Their prices, therefore vary with demand and supply. For example, if an undated security has a nominal value of Rs .200/- and pays Rs.10/- per annum, the nominal interest (or coupon) is 5%.

**This is found out by using the following formula:**

The price of a bond = Fixed annual return / The prevailing market rate of interest = Rs.10/- / 5% = Rs.10/- / (1/20) = Rs. 200/-

However, the actual yield or earnings yield, expressed as a rate of interest, will vary inversely with the market price of the security as the following example shows. It can be seen that as the market price of a bond rises to Rs.400/- the fixed annual payment of Rs.10/- represents the equivalent of an earnings yield of 2½% rate of interest and when the price of the bond falls to Rs.100/- the rate of interest rises to 10%. Thus, the rate of interest is the reciprocal of the bond price. The market price and the rate of interest, i.e., earnings yield, or fixed interest bonds is therefore inversely related.

Nominal Price (Rs.)	Rs. 10 Annual Payment Expressed as % of Nominal Price	Market Price (Rs)	Earnings Yield = Rate of Interest
200	5%	400	2½%
200	5%	200	5%
200	5%	100	10%

Keynes was the first economist to point out that it costs money to hold money and the rate of interest is the opportunity cost of money holding, i.e., by holding money people lose the opportunity to earn interest. So, at low rates of interest people hold as much money as possible and at high rates as less money as possible.

Speculative money balances vary therefore, with the anticipated gains or losses on the securities market, and the extent to which individuals prefer holding of money to other financial assets is referred to as liquidity preference. Keeping in mind the (above) relationship between security prices and interest rates we can make the following assumptions.

1. When security prices are high (and interest rates are low) speculators will expect bond prices to fall and therefore a capital loss to be made. They will, therefore, attempt to avoid such losses by holding speculative money balances. Low interest rates therefore imply a high liquidity preference. In this case; the opportunity cost of holding money is also low.
2. When bond prices are low (and interest rates therefore are high) speculators will anticipate a rise in bond prices and therefore a capital gain. They will attempt to take advantage of the capital gain on bonds by holding bonds rather than money balances. High

interest rates therefore imply a low liquidity preference. In this case, the opportunity cost of holding money is If each individual's liquidity preference is added together a liquidity preference curve can be drawn, which represents the demand for money. The liquidity preference curve relates the total demand for money to the rate of interest. Although each individual may have different expectations of future events, by adding them all together we obtain the smooth liquidity preference curve as shown in Fig. 4.

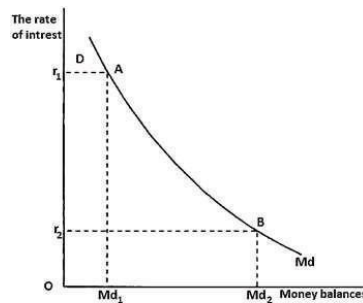


Fig. 4 : Liquidity Preference Curve

The total demand curve for money is downward sloping due to speculating component much varies inversely with the rate of interest.

When the interest rate is high ( $r_1$ ) bond prices will be low and a rise in bond prices, and therefore capital gains, will be anticipated and speculative balances will be very small (almost equal to zero). So, only transactions and precautionary balances are hold, i.e.,  $Md_1$ . When the rate of interest is low at  $r_2$  and bond prices are high capital losses are anticipated and larger speculative money balances are held, i.e.,  $Md_2$  in order to avoid capital losses on bonds.

### The Supply of Money:

The supply of money at any point of time is fixed by monetary authorities (the central bank) and is therefore independent of the rate of interest. In Fig. 5 the money supply curve is therefore the vertical line  $M_s$ .

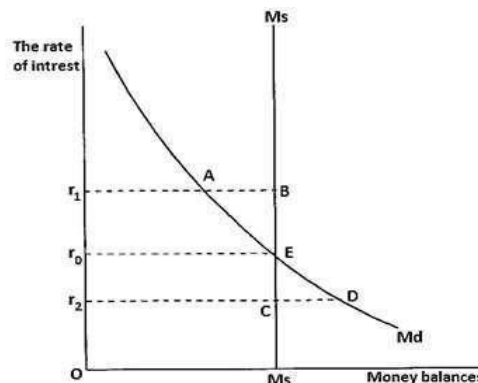


Fig. 5 : Equilibrium Rate of Interest

### Money Market Equilibrium and Interest Rate Determination:

The money market reaches Money balances equilibrium when the downward sloping demand curve for money intersects the vertical supply curve and the rate of interest is determined at  $r_0$ . What is the logic of this equilibrium? If the rate of interest goes above the equilibrium level (to say,  $r_1$ ), there will be excess supply of money (AB), which implies excess demand for bonds (because in Keynes' model money-holding is the only alternative to bond-holding).

If the demand for bond increases, its price will rise. This is equivalent to a fall in the rate of interest (in this case from  $r_1$  to  $r_0$ ). On the other hand, if the rate of interest falls to  $r_2$  there will be excess demand for money (measured by the distance CD).

This implies excess supply of bonds. People will meet the demand for money by selling bonds. As a result, the price of bonds will fall. This is equivalent to a rise in the rate of interest. So,  $r_0$  is indeed the equilibrium rate of interest. Any deviation from it will not last for long. Sooner or later, the rate of interest will have to return to the original level.

### Changes in Equilibrium Rate of Interest:

#### Changes in the interest rate could occur as a result of:

A shift of the liquidity preference curve from  $Md_0$  to  $Md_1$  as shown in Fig. 6 as a result of anticipated changes in bond prices.

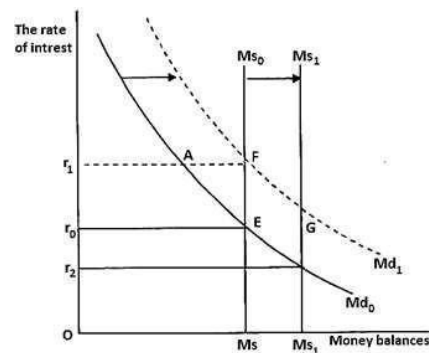


Fig. 6 : Changes in the Equilibrium Rate of Interest

A shift of the money- supply curve from  $Ms_0$  to  $Ms_1$  by the central bank. If the central bank increases the quantity of money in circulation the supply curve of money will shift to the right and the rate of interest will fall. The converse is also true. According to modern economists, the changes in either the quantity of money or in liquidity preference can no doubt bring about changes in interest rates but the outcome of such changes is not always certain.

New developments may only cause wide differences of opinion leading to

increased activity in the bond market without necessarily causing any shift in the aggregate speculative demand for money schedule. If the balance of market expectations is changed, there will be a shift in the schedule. Central bank policy designed to increase the money supply may, therefore, be met by an upward shift of speculative demand function leaving the rate of interest virtually unaffected.

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### **19.3. Criticisms of the Liquidity Preference Theory**

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**The main criticisms of the Keynes' liquidity of preference theory are the following:**

**a) Ambiguity:**

Keynes does not explain clearly what he means by –money. Owing to its vagueness it has been said that the Keynesian theory is indeterminate. Keynes ignored real factors like productivity of capital and thriftiness as determining the interest rate.

**As A.H. Hansen has put it:**

–In the Keynesian case the supply and demand for money schedules cannot give the rate of interest unless we already know the income level; in the classical case the demand and supply schedules for savings offer no solution until the income is known. Precisely the same is true of loanable funds theory. Keynes' criticism of the classical and loanable funds theories applies equally to his own theory.

**b) Complete neglect of productivity of capital:**

Keynes dismisses as irrelevant the marginal productivity of capital. According to him, new investments are determined by the psychology of entrepreneurs and the current rate of interest. But since entrepreneurial activity is based on the productivity of capital it seems hardly proper to ignore it altogether.

**c) No role assigned to saving and waiting:**

Keynes ignores the inducements for saving and waiting. Jacob Viner said, **“Without savings there cannot be any liquidity to surrender”**. According to Keynes, interest is a reward for parting with liquidity and in no way an inducement for saving, but it is ridiculous to think of surrounding liquidity if one has not already saved money.

**d) Biased view:**

Keynes places undue emphasis on monetary phenomena. Somers points out that an individual having funds has four choices before him – to invest in securities, to hold cash, to invest in production and to consume.

Commercial firms have the first three choices and not the fourth one. The decisions of individuals and firms regarding their choices in each of these areas must influence the rate of interest. The choice regarding investment in securities is determined by the demand and supply of securities. The choice regarding the holding of cash is determined by liquidity preference. The choice regarding investment in production is determined by the marginal productivity of capital.

The choice regarding consumption is determined by time preference. Hence, we must say that the demand and supply of securities, liquidity preference, marginal productivity and time preference all play their part in determining the rate of interest. Keynes however, takes into account only liquidity preference and the supply of money and ignores all the other factors.

**e) Partial equilibrium approach:**

Somers also points out that strictly speaking the rate of interest is affected by all other prices and economic quantities in the community (–all the elements expressed in the equations of the Walras-Hicks system of general equilibrium). Hence, both the loanable funds theory and the liquidity preference theory represent a partial equilibrium analysis of the determinants of the rate of interest. While determining the rate of interest, Keynes treated national income as constant.

This implies constancy of transactions and precautionary demand for money. However, in reality national income does not remain constant when the rate of interest varies. In fact, a fall in the rate of interest leads to an increase in investment and an increase in investment, in its turn, leads to an increase in national income through the investment multiplier.

Moreover, the people who take decision regarding the purchase of commodities are the same people who take decision regarding the purchase of bonds. Thus, peoples' behaviour in the commodity market will determine their behaviour in the money market, too.

If an individual spends more money to buy goods and services, he will be left with less money to purchase income-earning assets like bonds. This is why Hicks and Hansen have pointed out in their famous IS-LM model that the rate of interest and the level of income are to be determined simultaneously in a general equilibrium framework.

**f) Ignorance of real factors:**

On accounts of above shortcomings it has been said that Keynes ignores the real factors of determination of interest.

In the construction of the total demand curve for money only the speculative demand is assumed to vary and the other two sources of demand for money are assumed to remain constant. But they will so only when national income is in equilibrium, i.e.,  $Y = C + I$  or  $S = I$ . According to Keynes, interest is not the reward for saving or thriftiness or waiting but for parting with liquidity for a specific period.

Keynes pointed out that it is not the rate of interest which equates saving with investment but this equality is brought about through income changes. Hence, liquidity preference theory requires as a pre-condition of saving-investment equality, already postulated by classical economists. Hence, the rate of interest is neither a purely monetary phenomenon nor a purely real phenomenon.

So far as the main content of the Keynesian interest theory is concerned it is the determination of the rate of interest through equality between demand for, and supply of, money. But one of the components of total money demand known as speculative demand is assumed to depend on rate of interest. Hence, the logical circularity in the model can be mentioned as one of principal sources of its weakness.

#### **Possibility of Zero Rate of Interest:**

A zero (or even a negative) rate of interest can be imagined under certain circumstances but in real life neither event is likely to occur.

A negative rate of interest is possible in a society where there is absence of law and order. In such a society, savings (if any) have to be kept in the custody of men having the power to protect the savings. The payment made for such safe custody may be regarded as -negative interest.

#### **A zero rate of interest is conceivable in the following cases:**

1. When the whole income of a community is spent on consumption, there being no savings and no investment; and,
2. When the amount of capital in a community is so large that the marginal productivity of capital is zero.

The first case is that of a primitive economy where the question of paying interest does not arise because there is no saving in such an economy and there is no investment either. But no such economy exists today.

The second case is theoretically possible in a mature economy in the long run. The classical economists thought that in the long run the rate of interest would fall. Keynes agreed with this view on the ground that in course of time capital accumulation would grow large and the yield from new investments would tend to diminish.

The progressive diminution of yield would lead to a progressive fall in the rate of interest and ultimately it might be zero. Such a course of events can be described as secular stagnation or long-run sluggishness caused by lack of capital investment due to low, about zero return.

It is very unlikely that the marginal productivity of capital will fall to zero in any community. There are certain dynamic economic forces which operate in almost every community and ensure that the demand price of capital as determined by its MPP is always positive.

**These are as follows:**

- a) New inventions and discoveries;
- b) Growth of population; and
- c) Destruction of capital assets by war and natural calamities like earthquakes.

Moreover, Keynes pointed out that the actual rate of interest cannot fall to zero because the expected rate cannot fall to zero. This is due to complete elasticity of the liquidity preference curve at a very low rate of interest. This is known as absolute liquidity preference or liquidity trap, a term coined by Denis Robertson. In a liquidity trap situation, the rate of interest cannot fall below a certain low figure. There is no way of reducing the rate of interest further even though it may be desirable for ensuring recovery. In fact, an important implication of perfect elasticity of the liquidity preference schedule at a very low rate of interest is that the rate of interest cannot fall to zero.

We can conclude that the rate of interest may tend to fall but will never be zero.

**In the words of Paul Samuelson:**

As long as any increase in time-consuming process could be counted on to produce any extra product and dollars of revenue, the yield of capital could not be zero. Also, as long as any land or other asset exists with a sure perpetual net income and as long as people are willing to give only a finite amount of money today in exchange for a perpetual flow of income spread over the whole future, we can hardly conceive of the rate of interest as falling to zero.

According to Keynes, therefore, the rate of interest depends on the liquidity preference and the supply of money. The expected profitability of new investment (or the marginal efficiency of capital, as Keynes calls it) does not determine interest but is determined by it. Which investments will be profitable depends on the rate of interest. Income does not determine



interest but influences it indirectly because the amount of money required to be held for the transactions motive depends on income.

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### **Let Us Sum Up**

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In this unit, you have learned about the following:

- Definitions of Liquidity preference theory
  - Three motives of demand for money
  - Equilibrium rate of interest
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### **Check Your Progress**

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1. According to Keynes interest is a payment for \_\_\_\_\_.
  2. Money is also held for the purpose of meeting unforeseen emergencies \_\_\_\_\_.
  3. When the amount of capital in a community is so large that the marginal productivity of capital is \_\_\_\_\_.
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### **Glossary**

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**Precautionary motive:** Money is also held for the purpose of meeting unforeseen emergencies

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**Answers to check Your Progress**

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1. Liquidity preference
2. Precautionary Motive
3. Zero

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**Suggested Readings**

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1. Dean Joel, Managerial Economics, PHI, New Delhi, 1976, First Edition
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# Unit-20

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## Profit Concepts and Analysis

### STRUCTURE

Overview

Objectives

20.1.Introduction

20.1.1.Meaning and definition

20.1.2.Elements of profit

20.1.3.Nature of Profit

20.1.4.Justification of Profit

20.2.Break even analysis

20.2.1.Break-even point

20.2.2.Break-even chart

20.2.3.Safety margin

20.3.4.Targeted Profit

20.3.Formula for break-even quantity

20.4. Cost-Volume- Profit Analysis

Let Us Sum Up

Glossary

Answers to Check Your Progress

Suggested Readings

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### Overview

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In this unit, the concept of break-even analysis such as meaning, elements, nature and justification related profit along with cost volume profit analysis has been clearly explained.

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### Objectives

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After completion of this unit, you will be able to

- To analyse and understand concepts and theories of profit.

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### 20.1. Introduction

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In Managerial Economics, profit analysis is a form of cost accounting used for elementary instruction and short run decisions. A profit analysis widens the use of info provided by breakeven analysis. An important part of profit analysis is the point where total revenues and total costs are equal.

### **20.1.1. Meaning and Definition of Profit:**

“The share of the national income that goes to the entrepreneur is known as Profit”.

The term “**Profit**” is usually understood to mean the difference between the total sale-proceeds obtained by a businessman and his total expenses of production. It is the surplus that remains in the hands of the businessman after paying rent, wages, interest on borrowed capital etc.

In other words, we can say that Profit is the surplus of income over expenses of production according to a businessman. It is the amount left with him after he has made payments for all factor services used by him in the process of production. But he may not have been careful in calculating all such expenses of production in the economic sense. Therefore, economists regard businessman’s Profit as “Gross Profit”.

#### **Definitions:**

**Important definitions of Profit as given by different authors are as follows:**

1. According to Prof. Marshall – “Profit is the earning of management”.
2. According to Walker – “**Profit is the rent of ability**”.
3. According to Croome – “Profit is the reward for uninsured risks”.
4. According to Ely-“Profit is a surplus over and above the expenses of production”.
5. As Taussig has said – “**Profit is a mixed and vexed income.**”
6. According to Prof. J. K. Mehta – “The element of uncertainty introduces a fourth category of sacrifice in the productive activities of man in a dynamic world. This category is risk-taking or uncertainty bearing. It is remunerated by Profit.”

Since economists are of this opinion that

Profit = Gross Profit – (Rent + Wages + Interest)

### **20.1.2. Elements of Profits:**

**Essential elements of Profits are as follows:**

- 1. Profits Include Some Reward for Risk-Taking and Uncertainty-Bearing:**

One of the important functions of an entrepreneur is to assume the risks of production. And for this risk-taking he gets some income.

**2. Profits Include some Income which Businessmen Manage to Secure:**

This is an important question as to how a businessman should secure Profits? In order to secure profits the businessmen either tries on account of their monopolistic control over supply or because of the existence of imperfect competition. In real life, every businessman is often able to secure some monopolistic or semi-monopolistic control over the markets. Therefore, he is normally in a position to charge a slightly higher price than would be possible under perfect competition. He therefore, earns some extra income.

**3. The Existence of Market Imperfections may Swell Profits in another Way:**

Competition in the market for labour or for any other factor of production may be, and is often, imperfect, as a result of which an employer is in a position to exploit the situation and pay those factors an amount of remuneration which may be less than the values of their respective marginal net products. The difference will be his profits.

**4. Profits often Contain Large Amounts of Fortuitous Gains:**

These gains arise from mere good luck in certain enterprises. A sudden shift in demand may drive up prices, and so may bring large gains to the entrepreneurs.

**20.1.3. Characteristics of Profit:**

Profit as we have seen is the reward for enterprise which goes to the entrepreneur- owner (individual or collective) of the firm. The reward for an entrepreneur cannot be determined in advance. The reward for entrepreneur depends on his calculations regarding future business expectations. If these calculations prove correct, he may earn profit but if they prove wrong he has to bear losses also.

**The important characteristics or peculiarities of Profit are as follows:**

**1. Profit is a Residual Reward:**

It means profit is received by the entrepreneur as a residual surplus, which is left over after meeting all the business expenses from the sales receipts.

**2. It is not Contractual or Pre-Determined Payment:**

Remember Profit is not like rent, wages, interest and Profit a pre-determined contractual payment. Therefore, it can be said that it is not an explicit cost.

**3. It is the End Result of Business:**

In profit other factors rewards such as rent, wages and interest are received by their agents during the process of production. Profit is realised by the entrepreneur only after the completion of the business, i.e., after completing the sales and meeting all the expenses.

**4. Profit is a Dynamic Concept:**

Profit depends on many factors such as entrepreneur's organisational ability, changes in market demand and supply conditions, element of monopoly power, innovation such as production of new items, discovery of new-markets, new modes of advertising and sales propaganda etc. and many other dynamics changes in the economy.

**5. It is not Determined through Formal Factors of Market:**

In all other factor prices are determined in a formal market.

**For example:**

Rent is determined in the land market, wages in the labour market and interest in the capital market. There is no such formal entrepreneurial market for determination of profit.

**6. Profit is not Fixed Income, it is Uncertain and Fluctuating:**

Profit being a residual income cannot be fixed in a pre-determined manner. It varies from time to time. It will be high during a period of prosperity. It declines during recession. There may be even losses during a depression. Here, other factor incomes are generally stable over a period of time, Profit is widely fluctuating.

**20.1.4. Nature of Profit:**

The nature of Profit has even been the most perplexed and troubled problem in the opinion of the economists. In early days, the classical economists regarded Profit as accruing to the capitalist who supplied capital and owned the business, Profits are determined after making all necessary payments from the total income of the business. It is the demand and supply of entrepreneur. Regarding Nature of Profit Prof. Taussig has said that it is a "mixed and vexed income.' Walker looked

upon “Profit as the reward of the entrepreneur with a superior ability than others”.

According to Clark, Knight and Schumpeter – “It is an income which arises out of change, uncertainty and friction inherent in a dynamic world, and which the belated operation of competitive forces tends to eliminate.”

In this connection the Marxian economists Veblen and Hobson are of this opinion that “Profit is an unearned income and attribute it to the existence of institutional monopolies established by a few capitalists. Monopoly profits arise because a monopolist is able to restrict output and keep the price of his product much above the average cost of production.”

#### **20.1.5. Justification of Profit:**

Our next discussion regarding Profit is “**whether the payment of Profit to entrepreneur is justified or not**”. There are different views taken by different economists over this point. According to Karl Marx— “The Profit is earned by labour therefore it should go to labour. Whatever amount other people’s taking they are taking away from the shares of labour. Therefore, he is of this opinion that “Profit is a legalized robbery”.

There is no doubt that there are many elements in actual profits, which cannot be defended. The employer may swell his Profits by paying to the labourers less than their marginal worth, or by ‘sweating’ the helpless workmen. Privileges yielding valuable financial benefits may be obtained dishonestly.

The industrialists may bribe the legislators into passing tariff legislation. On the stock exchange gambling and unscrupulous manipulation of the market may enable persons to become rich. Monopoly points may be secured which are many ways unjustifiable.

There are innumerable other ways in which large sums can be collected by foul means. Nothing can be said in defence of these types of profits. The result often forms the low commercial mortality of the people. The proper remedy for such practices is full freedom of competition and the improvement in the moral spirit of the public. But the condemnation of these types of Profits does not also mean the condemnation of normal Profits earned by honest work. They are the inevitable outcome of the institution of private property. Just as you must pay people for waiting, so you must pay them for risk-taking and uncertainty-bearing.

An entrepreneur, by assuming risks and by directing the productive organisation, renders useful services to the society for which he must be paid. The services of businessmen are no less valuable than those of workers. By his superior organizing, by his boldness and sagacity in shouldering risks, an entrepreneur increases the productivity of the economic organisation in a greater ratio than would have been possible otherwise.

Further, it has been observed that Profits have been the spur to progress under the present organisation and to stop profits would mean the abolition of progress. Of course if we will abolish private property, the payment of profits will not be necessary. But the abolition of private property raises various questions, which we will have to analyse from very close. But the general view is that the payment of Profit for the work to entrepreneur is justified.

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## **20.2. Break-Even Analysis**

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In the process of profit planning, it is mandatory to forecast the profit for the required future period in order to manage the hurdles of investment analysis, labour unions and government authorities in a smooth way. The management techniques which connect cost factor, revenue factor, output factor, price factor and sales factor is Break-even analysis. There are few basic concepts involved in Break-even analysis such as Break-Even Point (BEP), Break even chart, safety margin and targeted profit.

### **20.2.1. Break-Even Point**

The Break - Even Analysis (BEA) has considerable significance for economic research, business decision making company management, investment analysis and public policy. Break even analysis is an important technique to trace the relationship between cost, revenue and profits at the varying levels of output or sales. In BEA, the break-even point is located at that level of output or sales at which the net income or profit is zero. At this point, total cost is equal to total revenue. Hence, break-even point is otherwise called no profit no loss point, or zero income point or equal cost and revenue point. Break-even point refers to the point at which the total revenue of the firm is equal to the total cost incurred by him.

In easy words, at BEP point  $TR=TC$  i.e., Total revenue = Total cost.

### **20.2.2. Break-even chart**

Break-even chart refers to the graphical representation of break-even point includes cost function (fixed cost and variable cost) and revenue



function (Price x Output). It represents both profit zone and loss zone along with the BEP in terms of level of output and the cost to be incurred.

### 20.2.3. Safety Margin

The Break-even chart represents the profit position of firm under different level of output. Safety margin is a management tool which helps the firm to avoid the loss position in terms of proportional volume (or percentage) of additional output. In easy words, safety margin is the extent to which the firm can afford a decline in sales before it starts incurring loss

#### Formula

$$\text{Safety margin} = \frac{(\text{Sales} - \text{BEP})}{\text{Sales}} \times 100$$

### 20.2.4. Targeted Profit

Most of the firm uses the targeted profit technique in order to achieve the expected level of profit using the P/V ratio. The formula to calculate the targeted sales volume is

$$\text{Target sales volume} = \frac{\text{Fixed cost} + \text{Target profit}}{\text{Contribution margin per unit}}$$

## 20.3. Formula for Break-Even Quantity

$$\text{Break-even Quantity} = \frac{F.C}{P - V.C} = \frac{\text{Fixed cost}}{\text{Selling price} - \text{Variable cost per unit}}$$

At BEP,

$$\text{Total revenue} = \text{Total Cost} \quad TR = TC$$

$$P \times Q = F.C + V.C \dots \dots \dots (1)$$

Where P is price, Q = Break-even sales,

F.C is Fixed Cost and V.C is Variable Cost

÷ equation (1) by Q, then

$$P = \frac{F.C}{Q} + V.C \dots \dots \dots (2)$$

Where V.C is variable cost per unit i.e., V.C/Q

$$P - V.C = \frac{F.C}{Q} \dots \dots \dots (3)$$

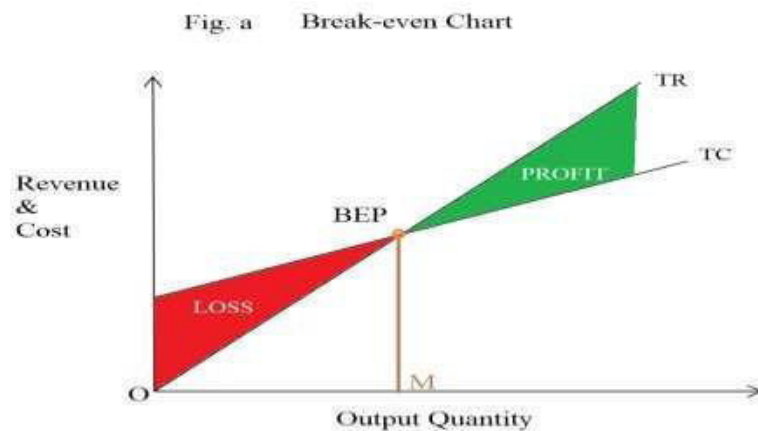
$$Q (P - V.C) = F.C$$

$$Q = \frac{F.C}{P - V.C}$$

## 20.4. Cost-Volume-Profit Analysis

The object of the BEA is not just to determine the break - even point (BEP), but to understand the financial relationship among cost, revenue and the rate of output .It is also called cost -volume - profit analysis.

In the fig. total revenue and total costs are plotted on vertical axis, where sales or output per period is plotted on the horizontal axis. The slope of the TR curve refers to the constant price of Rs.10 per unit at which the firm can sell-its output. The TC curve indicates total fixed costs (TFC) of Rs.200 (the vertical intercept) and constant average variable cost (AVC) of Rs.5 (the slope of TC curve).



In the figure it is clear that the firm break even (with  $TR = TC = \text{Rs.}400$ ) at  $Q = 40$  per time period. (Point B in the figure). The firms incurred loss at smaller output and earn profit at higher output levels. The cost volume profit or break - even chart is a flexible tool to quickly analyse and plan accordingly the effect of changing conditions on the firm. For example, an increase in the price of commodity can be shown by increasing the slope of the TR curve on shown an increase in the total fixed costs of the firm can be shown an increase in the vertical intercept of the TC curve and a decrease in the average of a variable cost by decrease in the TC curve. Break even Analysis (BEA) can also be performed algebraically, as follow.

Total revenue is equal to the selling price (P) per unit times the quantity of output or sales

$$(Q). \text{ That is: } TR = (P) (Q) \dots\dots\dots(1)$$

Total costs (TC) equal total fixed cost (TFC) plus total variable cost (TVC)  
 Since TVC is equal to the average (per unit) variable cost. (AVC) times the quantity of output or sales we have

$$TC = TFC + AVC (Q) \dots\dots\dots(2)$$

Setting total revenue equal to total costs and substituting  $Q_b$  (the

break -even output) for Q,

we get

$$TR = TC \dots\dots\dots(3)$$

$$(P)(QB) = TFC + AVC(QB) \text{-----}(4)$$

Solving the equation (4) for QB, we have

$$\begin{aligned} (P)(QB) - AVC(QB) &= TFC \\ (P - AVC)QB &= TFC \\ QB &= TFC / (P - AVC) \text{-----}(5) \end{aligned}$$

For example, with TFC = Rs.200/-,

P = Rs. 10/- and AVC = Rs.5/-

$$QB = 200 / (10 - 5) = 40$$

This is the same break -even output shown on the cost - volume profit fig  
.....(6).

The denominator in equation (5) (P - AVC) is called contribution margin per unit because it represents the portion of the selling price that can be applied to cover the fixed costs of the firm and to provide for profits.

### Profit Planning

More generally, suppose, the firm wishes to earn a specific profit and want to estimate the quantity that they must sell to earn that profit. Cost volume profit or break even analysis can be used in determining the target output (QT) at which a target profit (pT) can be achieved. To do so, we simply add p T to the numerator of eq . 5 and we have

$$QT = (TFC + pT) / (P - AVC)$$

For example, if the firm wanted to earn a target profit of Rs.200/- in our previous example, the target output would be

$$\begin{aligned} QT &= (200 + 200) / (10 - 5) \\ &= 400 / 5 = 80 \end{aligned}$$

To see that the output of Q=80 does indeed lead to the target profit (pT) of Rs.200, Note that

$$\begin{aligned} TR &= (P)(Q) = (10)(80) = 800 \\ TC &= TFC + AVC(Q) \\ &= 200 + 5(80) \\ &= 200 + 400 = 600 \\ \Rightarrow TR - TC &= 800 - 600 \\ &= 200 \end{aligned}$$

While linear cost volume profit analysis can be very useful and are frequently used by business executives, government agencies and other organizations, care must be taken to apply them only in uses where the assumption of constant price and average variable costs hold. If prices and average variable costs are not constant, a non-linear Break-even-analysis can be applied, that is an advance technique to be covered under the under graduate course level.

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### **Check Your Progress**

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1. At breakeven point there is \_\_\_\_\_.
2. Total Revenue is equal to Total expenses in \_\_\_\_\_.
3. The break even point is obtained at intersection of \_\_\_\_\_

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### **Let Us Sum Up**

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In this unit, you have learned about

- Break even analysis
- Cost-Volume-Profit analysis
- Basic concepts in break-even analysis

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### **Glossary**

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**BEP:** Break-even point – no profit no loss point

**BEA:** Break-even Chart – profit and loss area diagram

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**Answer to Check Your Progress**

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1. No profit or loss
2. Break-even point
3. Total revenue and Total cost line

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**Suggested Readings**

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- [https://books.google.co.in/books/about/Managerial\\_Economics.html?id=CxK7AAAAIAAJ&redir\\_esc=y](https://books.google.co.in/books/about/Managerial_Economics.html?id=CxK7AAAAIAAJ&redir_esc=y)
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## End Semester Examination Model Question Paper

Bachelor of Business Administration (BBA)/  
Bachelor of Commerce (B.Com)

Course Code: DCBEC-13 / Course Title: Managerial Economics

**Max. Marks:** 70

**Time:** 3 hours

### **PART – A (2 Marks) 5X2=10 Marks**

Answer any FIVE questions out of EIGHT questions  
[All questions carry equal marks]

1. What is managerial economics?
2. What is risk?
3. Define law of demand.
4. What is income elasticity of demand?
5. What is SAC?
6. What is production function?
7. What is Oligopoly Competition?
8. What is Ricardian Theory of Rent?

### **PART - B (5-Marks) 4X5=20 Marks**

Answer any FOUR questions out of SEVEN questions  
[All questions carry equal marks]

9. Explain the features of Managerial Economics.
10. Explain income elasticity of demand.
11. Explain Cobb-Douglas production function.
12. Explain internal and external economies of scale.
13. Explain the different types of Cost.
14. Describe Monopolistic Competition.
15. Explain Liquidity Preference Theory.

### **PART - C (10 Marks) 4X10= 40 Marks**

Answer any FOUR questions out of SEVEN questions  
[All questions carry equal marks]

16. Explain the Nature and scope of Managerial Economics.
17. Explain the details about Law of demand.
18. Explain the cost output relationship in a short run.
19. Explain the Law of Variable Proportions with diagram.
20. Explain about Perfect Competition.
21. Explain price and output determination under Oligopoly Competition.
22. Explain about Marginal Productivity Theory of Distribution.














## Document Information

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## Sources included in the report

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<b>W</b>	URL: <a href="https://vdocuments.mx/managerial-economics-an-introduction-58f9dee1a28ac.html">https://vdocuments.mx/managerial-economics-an-introduction-58f9dee1a28ac.html</a> Fetched: 2023-02-06 19:49:56	 <b>2</b>
<b>W</b>	URL: <a href="https://josephcollege.ac.in/lms/Uploads/pdf/material/ME.pdf">https://josephcollege.ac.in/lms/Uploads/pdf/material/ME.pdf</a> Fetched: 2021-11-08 22:25:15	 <b>12</b>
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<b>W</b>	URL: <a href="http://anucde.info/bba2a.pdf">http://anucde.info/bba2a.pdf</a> Fetched: 2021-07-15 10:26:08	 <b>10</b>
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<b>W</b>	URL: <a href="https://wikieducator.org/Income_Elasticity_Of_Demand">https://wikieducator.org/Income_Elasticity_Of_Demand</a> Fetched: 2019-10-15 15:55:08	 <b>1</b>
<b>W</b>	URL: <a href="https://www.scribd.com/document/360438566/ELASTICITY-OF-DEMAND-docx">https://www.scribd.com/document/360438566/ELASTICITY-OF-DEMAND-docx</a> Fetched: 2019-11-03 02:36:44	 <b>2</b>
<b>W</b>	URL: <a href="https://www.doccity.com/en/managerial-economics-48/2175097/">https://www.doccity.com/en/managerial-economics-48/2175097/</a> Fetched: 2021-04-26 10:15:24	 <b>3</b>

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The SWAYAM PRABHA is a group of 40 DTH channels devoted to telecasting of high-quality educational programmes on 24X7 basis using the GSAT-15 satellite. Every day, there will be new content for at least (4) hours which would be repeated 5 more times in a day, allowing the students to choose the time of their convenience. The channels are uplinked from BISAG-N, Gandhinagar. The contents are provided by IITs, UGC, CEC, IGNOU. The INFLIBNET Centre maintains the web portal.

**Open and Distance Learning (ODL) students of Vels Institute of Science, Technology and Advanced Studies(VISTAS)** are advised to use the SWAYAM PRABHA (A good initiative of Ministry of Education, Government of India) as part of supplementary learning materials in addition to the Self Learning Materials(SLM) supplied to the students.

Open and Distance Learning (ODL) students of VISTAS can also visit <https://swayamprabha.gov.in/> and under Higher Education can view the videos uploaded in the website.



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An initiative by Ministry of Education

SWAYAM PRABHA is a group of 40 channels devoted to telecasting of high-quality educational programmes on 24X7 basis using the GSAT-15 satellite

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- IIT PAL: To assist the students for classes 11 and 12, who are aspiring to join IITs

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Indian Institute of Technology Madras  
E-mail: [swayamproiitm@dth.ac.in](mailto:swayamproiitm@dth.ac.in)

## SWAYAM Prabha Channels Information



Channel Number	Channel Description
Channels 01 – 10 & 40 are managed by <b>CEC, New Delhi.</b>	
1	Language and Literature
2	History, Culture & Philosophy
3	Social & Behavioral Sciences
4	Education and Home Science
5	Information, Communication and Management Studies
6	Law and Legal Studies
7	Economics and Commerce
8	Physical and Earth Sciences
9	Life Sciences
10	Applied Sciences
40	Arts/Literature, Social Science, Management and other Professional Courses, Natural and Applied Science
Channels 11 to 16 are Managed by <b>IGNOU, New Delhi</b>	
11	Social Sciences & Humanities
12	Basic and Applied Sciences
13	Professional Education
14	State Open Universities and Gyandarshan
15	Capacity Building and Teacher Education
16	Skill and Vocational Education
Channels 17 to 20 are managed by <b>IIT Bombay</b>	
17	Biotechnology and Biochemical Engineering
18	Electronics and Communication Engineering
19	Electrical Engineering
20	Physics

<b>Channels 21 to 22 are managed by IIT Delhi</b>	
21	Textile Engineering
22	IIT PAL (JEE competition assistance)
<b>Channels 23 is managed by IIT Gandhinagar</b>	
23	Civil Engineering
<b>Channels 24 to 28 are managed by IIT Kanpur</b>	
24	Aeronautical Engineering
25	Humanities and Social Sciences
26	Management, Law, Economics; Business Analytics, Communication, Cooperative Management
27	Mechanical Engineering, Engineering Design, Manufacturing E & T and allied subjects
28	Visual communications, Graphic design, Media technology
<b>Channels 29 to 30 are managed by IIT Kharagpur</b>	
29	Architecture & Interior Design.
30	Computer Sciences Engineering / IT & Related Branches
<b>Channels 31 to 35 are managed by IIT Madras</b>	
31	Instrumentation, Control and Biomedical and Engineering
32	Bridge Courses, Impact Series
33	Chemical Engineering, Nanotechnology, Environmental and Atmospheric Sciences
34	Health Sciences
35	Metallurgical and Material Science Engineering, Mining and Ocean Engineering
36	Skills and Logistics (IT - Enabled Sector, Banking, Financial and Insurance sector Skills Logistics, Supply Chain Management and Transportation, Life skills)
<b>Channels 37 to 38 are managed by IIT Tirupati</b>	
37	Chemistry, Biochemistry and Food Processing Engineering
38	Mathematics
<b>Channels 39 is managed by University of Hyderabad and National Sanskrit University</b>	
39	Performing Arts (Indian Classical Music and Dances), Theatre Arts, Film making and Painting





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(Railway)  
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▶ LIVE ▶ PROGRAM SCHEDULE



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