



# FUNDAMENTALS OF MICRO ECONOMICS

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**FUNDAMENTALS**  
**OF**  
**MICRO ECONOMICS**

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Writing "**Fundamentals of Microeconomics**" aims to simplify key concepts like demand, supply, market equilibrium, and elasticity for students, providing a solid foundation in economics. Microeconomics is essential for understanding individual and business decision-making and their impact on markets. This book will present concepts in a clear, engaging manner, ensuring students grasp their practical relevance. Featuring visual aids, review questions, and exercises, it supports effective learning and exam preparation. By bridging theory and application, this book equips students with analytical skills and economic reasoning, empowering them to excel academically and make informed decisions in real-world scenarios.

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## **PREFACE**

It gives me immense pleasure to present **Fundamentals of Microeconomics**, my first endeavor as an author. This book is designed to provide undergraduate students with a clear and comprehensive understanding of the fundamental concepts of microeconomics.

Microeconomics is a cornerstone of economic studies, offering valuable insights into how individuals and firms make decisions, allocate resources, and interact in markets. With this in mind, I have aimed to develop a text that is both accessible and engaging for learners beginning their journey in economics.

The content of this book is organized to introduce concepts in a step-by-step manner, starting with basic principles and progressing to more intricate topics. It includes detailed explanations of theories, real-life examples, graphical illustrations, and exercises to reinforce understanding. The primary goal is to help students grasp the subject with clarity and apply their knowledge to practical situations.

As this is my first book, I extend my heartfelt gratitude to everyone who has supported and guided me throughout this journey. I especially thank my mentors, colleagues, and students whose feedback and encouragement have inspired me to undertake this project.

This book is the result of the collective expertise of two more authors, each bringing unique strengths to this project.

I hope this book will serve as a reliable resource for students and teachers alike. Constructive suggestions and feedback are always welcome to help improve future editions.

**Dr.Suvarna Raagavendaran**

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**INTRODUCTION TO ECONOMICS**

Economics studies how individuals, households, businesses, and governments allocate scarce resources to satisfy unlimited wants. It explores economic behavior, including consumption, production, and decision-making, to maximize utility or gains. Economic activities are interconnected through demand and supply, forming the foundation of market systems and economic systems. Resources such as land, labor, capital, and entrepreneurship are limited, creating the problem of scarcity, which drives the need for choice and prioritization. Human wants are unlimited, influenced by biological needs, societal trends, and technological advancements, but are also gradable in urgency and importance. Economics investigates the cause-and-effect relationships between economic events, provides tools for analysis, and predicts the outcomes of economic decisions. Despite its evolving nature, economics remains a key social science, analyzing how people and societies manage resources to achieve maximum satisfaction and welfare within the constraints of scarcity.

**Wealth Definition**

The formal definition of economics can be traced back to the days of Adam Smith (1723-90) the great Scottish economist. Adam Smith and his followers regarded economics as a science of wealth which studies the process of production, consumption and accumulation of wealth. His emphasis on wealth as a subject-matter of economics is implicit in his great book— ‘An Inquiry into the Nature and Causes of the Wealth of Nations or, more popularly known as ‘Wealth of Nations’—published in 1776.

Adam Smith in his book “An Inquiry into Nature and Causes of Wealth of Nations” (1776) defined **Economics as the science of wealth**. He explained how a nation’s wealth is created. He considered that the individual in the society wants to promote only his own gain and he is led by an “invisible hand” to promote the interests of the society.

To him, wealth may be defined as those goods and services which command value-in-exchange. Economics is concerned with the generation of the wealth of nations. Economics is not to be concerned only with the production of wealth but also the distribution of wealth. The manner in which production and distribution of wealth will take place in a market economy is the Smithian 'invisible hand' mechanism or the 'price system'. Anyway, economics is regarded by Smith as the 'science of wealth.' Other contemporary writers also define economics as that part of knowledge which relates to wealth. John Stuart Mill (1806-73) argued that economics is a science of production and distribution of wealth. Another classical economist Nassau William Senior (1790-1864) argued "The subject-matter of the Political Economics is not Happiness but Wealth." Thus, economics is the science of wealth. However, the last decade of the nineteenth century saw a scathing attack on the Smithian definition and in its place another school of thought emerged under the leadership of an English economist, Alfred Marshall (1842-1924).

### **Criticism of Wealth Definition**

Following are the main criticisms of the classical definition:

- i. This definition is too narrow as it does not consider the major problems faced by a society or an individual. Smith's definition is based primarily on the assumption of an 'economic man' who is concerned with wealth-hunting. That is why critics condemned economics as 'the bread-and-butter science'.
- ii. Literary figures and social reformers branded economics as a 'dismal science', 'the Gospel of Mammon' since Smithian definition led us to emphasise on the material aspect of human life, i.e., generation of wealth. On the other hand, it ignored the non-material aspect of human life. Above all, as a science of wealth, it taught selfishness and love for money. John Ruskin (1819-1900) called economics a 'bastard science.' Smithian definition is bereft of changing reality.
- iii. The central focus of economics should be on scarcity and choice. Since scarcity is the fundamental economic problem of any society, choice is unavoidable. Adam Smith ignored this simple but essential aspect of any economic system.

## **Welfare Definition**

Alfred Marshall (1842-1924) wrote a book entitled "Principles of Economics" in 1890. In it, he defined economics as "a study of mankind in the ordinary business of life". In the words of Marshall, "Economics is on the one side a study of wealth, and on the other and more important side, a part of the study of man".

Emphasis on human welfare is evident in Marshall's own words: "Political Economy or Economics is a study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of well-being."

Thus, "Economics is on the one side a study of wealth; and on the other and more important side, a part of the study of man." According to Marshall, wealth is not an end in itself as was thought by classical authors; it is a means to an end—the end of human welfare.

According to Marshall, economics studies both individual and social actions aimed at promoting economic welfare of people.

Marshall elevated it to the status of science by shifting the emphasis from 'Wealth' to 'Welfare'.

Marshall makes a distinction between two types of things, viz. material things and immaterial things. Material things are those that can be seen, felt and touched, (E.g.) book, rice etc. Immaterial things are those that cannot be seen, felt and touched. (E.g.) skill in the operation of a thrasher, a tractor, etc.

## **Criticism of Welfare Definition**

Though Marshall's definition of economics was hailed as a revolutionary one, it was criticised on several grounds.

i. Marshall's notion of 'material welfare' came in for sharp criticism at the hands of Lionel Robbins (later Lord) (1898- 1984) in 1932. Robbins argued that economics should encompass 'non- material welfare' also. In real life, it is

difficult to segregate material welfare from non-material welfare. If only the 'materialist' definition is accepted, the scope and subject-matter of economics would be narrower, or a great part of economic life of man would remain outside the domain of economics.

ii. Robbins argued that Marshall could not establish a link between economic activities of human beings and human welfare. There are various economic activities that are detrimental to human welfare. The production of war materials, wine, etc., are economic activities but do not promote welfare of any society. These economic activities are included in the subject-matter of economics.

iii. Marshall's definition aimed at measuring human welfare in terms of money. But 'welfare' is not amenable to measurement, since 'welfare' is an abstract, subjective concept. Truly speaking, money can never be a measure of welfare.

iv. Marshall's 'welfare definition' gives economics a normative character. A normative science must pass on value judgments. It must pronounce whether a particular economic activity is good or bad. But economics, according to Robbins, must be free from making value judgment. Ethics should make value judgments. Economics is a positive science and not a normative science.

v. Finally, Marshall's definition ignores the fundamental problem of scarcity of any economy. It was Robbins who gave a scarcity definition of economics. Robbins defined economics in terms of allocation of scarce resources to satisfy unlimited human wants.

### **Scarcity Definition**

The most accepted definition of economics was given by Lord Robbins in 1932 in his book 'An Essay on the Nature and Significance of Economic Science. According to Robbins, neither wealth nor human welfare should be considered as the subject-matter of economics.

Lionel Robbins has defined economics as “Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses”. Robbins has given the above definition in his book “An Essay on the Nature and Significance of Economic Science”.

The definition has three essential parts (features or characteristics). They are

(i) Human wants are unlimited; wants multiply—luxuries become necessities. There is no end of wants. If food were plentiful, if there were enough capital in business, if there were abundant money and time—there would not have been any scope for studying economics. Had there been no wants there would not have been any human activity. Prehistoric people had wants. Modern people also have wants. Only wants change—and they are limitless.

(ii) The means or the resources to satisfy wants are scarce in relation to their demands. Had resources been plentiful, there would not have been any economic problems. Thus, scarcity of resources is the fundamental economic problem to any society. Even an affluent society experiences resource scarcity. Scarcity of resources gives rise to many ‘choice’ problems.

(iii) Since the prehistoric days one notices constant effort of satisfying human wants through the scarcest resources which have alternative uses. Land is scarce in relation to demand. However, this land may be put to different alternative uses.

A particular plot of land can be either used for jute cultivation or steel production. If it is used for steel production, the country will have to sacrifice the production of jute. So, resources are to be allocated in such a manner that the immediate wants are fulfilled. Thus, the problem of scarcity of resources gives rise to the problem of choice.

Society will have to decide which wants are to be satisfied immediately and which wants are to be postponed for the time being. This is the choice problem of an economy. Scarcity and choice go hand in hand in each and every economy: “It exists in one-man community of Robinson Crusoe, in the patriarchal tribe of

Central Africa, in medieval and feudalist Europe, in modern capitalist America and in Communist Russia.”

In view of this, it is said that economics is fundamentally a study of scarcity and of the problems to which scarcity gives rise. Thus, the central focus of economics is on opportunity cost and optimisation. This scarcity definition of economics has widened the scope of the subject. Putting aside the question of value judgement, Robbins made economics a positive science. By locating the basic problems of economics — the problems of scarcity and choice — Robbins brought economics nearer to science. No wonder, this definition has attracted a large number of people into Robbins’ camp.

The American Nobel Prize winner in Economics in 1970, Paul Samuelson, observes: “Economics is the study of how men and society choose, with or without the use of money, to employ scarce productive resources which could have alternative uses, to produce various commodities over time, and distribute them for consumption, now and in the near future, among various people and groups in society.”

### **Criticism of Scarcity Definition**

1. Robbins’ definition is not dynamic in nature, because it has only discussed about the problems of present generation, not anything about future generation.
2. Robbins does not make any distinction between goods helpful to human welfare and goods that are not helpful to human welfare.
3. In economics, we not only study the micro economic aspects like how resources are allocated and how price is determined, but we also study the macroeconomic aspect like how national income is generated. But, Robbins has reduced economics merely to theory of resource allocation.
4. Robbins definition does not cover the theory of economic growth and development.
5. Robbins’ definition is not applicable for a socialistic economy.
6. The economic problem for a rich and sound economy is different from the underdeveloped or poor economy which is not discussed in the definition.

## **Growth Definition**

Samuelson's definition is known as a modern definition of economics. According to Samuelson, "Economics is a social science concerned chiefly with the way society chooses to employ its resources, which have alternative uses, to produce goods and services for present and future consumption".

Samuelson definition tells us that how a society uses limited resources for producing goods and services for present and future consumption of various people or groups.

The main characteristics of Samuelson's definition are as follows:

- i. Dynamic problems of production: Economic growth is measured by the change in national output over a period. Economics is concerned with determining the method of utilising the scarce resources to produce commodities over a period. Thus, the dynamic issue of production has been brought within the purview of Economics.
- ii. Dynamic allocation of consumption: It is concerned with the method of consumption, not only now but also in the future. Thus, the problem of dividing the use of income between current and future consumption has been included in this definition.
- iii. Distribution of Consumption: It is concerned with the distribution of consumption among various individuals and groups in a society. Initially, the problem of distribution was not clear but the modern definition makes it a more understandable concept.

Improvement of resource allocation: The definition also says that Economics analyses the costs and benefits of improving the method of resource allocation.

## **Importance of Economics**

Economics has become one of the important branches of social sciences. It is of great practical value in our daily life. Economics is the important you get

to know how societies, governments, businesses, households, and individuals allocate their scarce resources. Economics is concerned with the optimal distribution of resources in society. The economics can provide valuable knowledge for making decisions in everyday life. Study of economics contribute to the development of public policies. Most of the problems of the modern State are economic in nature. So economists play an important role in the affairs of the State.

### **i. Informs decisions**

Economists provide information and forecasting to inform decisions within companies and governments. This knowledge of economics – or economic intelligence – is based on data and modelling.

### **ii. Influences everything**

Economic issues influence our daily lives. This includes issues such as tax and inflation, interest rates and wealth, inequality and emerging markets, and energy and the environment. A broad subject, economics provides answers to a range of health, social and political issues that impact households and wider communities.

### **iii. Impacts industries**

Firms of all sizes and industries have to rely on economics, whether that's for product research and development, pricing strategies or how to advertise. This wide influence means studying economics can open up a variety of career options across all sectors of the economy, from agriculture to manufacturing, to banking and consultancy.

### **iv. Inspires business success**

Understanding how consumers behave is vital for a business to succeed. Economists use theories and models to predict behaviour and inform business strategies. For example, how to analyse 'big data'.

## **v. International perspective**

Economics affects the world we live in. Understanding domestic and international perspectives – historic and current – can provide a useful insight into how different cultures and societies interact. For international corporations, understanding the world economy is key to driving success.

### **NATURE OF ECONOMICS**

The nature of economics deals with the question that whether economics falls into the category of science or arts. Various economists have given their arguments in favour of science while others have their reservations for arts.

#### **Economics is a Science**

Economics is an essential scholastic field. It can be compared to science in a sense that it fulfils the criteria of being a science in following sense:

- Science is a Systematic body of Knowledge. It is based on the methodical observation. Economics is also a science of making decisions with regard to scarce resources with alternative applications. It is a body of knowledge that determines or observes the internal and external environment for decision making.
- In science any conclusion is arrived at after continuous experimentation. In economics also policies are made after persistent testing and trailing.
- Science principles are universally applicable. Similarly, policies of economics are also universally applicable partially if not fully. The policies need to be changed from time to time depending on the situation and attitude of individuals to those particular situations. Policies are applicable universally but modifications are required periodically.

#### **Economics requires Art**

An economist is required to have an art of utilizing his capability, knowledge and understanding to achieve the organizational objective. Economist should have an art to put in practice his theoretical knowledge regarding elements of economic environment.

### **Economics has components of micro economics**

Managers study and manage the internal environment of the organization and work for the profitable and long-term functioning of the organization. This aspect refers to the micro economics study. The economics deals with the problems faced by the individual organization such as main objective of the organization, demand for its product, price and output determination of the organization, available substitute and complimentary goods, supply of inputs and raw material, target or prospective consumers of its products etc.

### **Economics has components of macro economics**

None of the organization works in isolation. They are affected by the external environment of the economy in which it operates such as government policies, general price level, income and employment levels in the economy, stage of business cycle in which economy is operating, exchange rate, balance of payment, general expenditure, saving and investment patterns of the consumers, market conditions etc. These aspects are related to macroeconomics.

### **Economics is dynamic in nature**

Economics deals with human-beings (i.e. human resource, consumers, producers etc.). The nature and attitude differs from person to person. Thus to cope up with dynamism and vitality managerial economics also changes itself over a period of time.

### **Economics for administration of organization**

Economics helps the management in decision making. These decisions are based on the economic rationale and are valid in the existing economic environment.

### **Economics is helpful in optimum resource allocation**

The resources are scarce with alternative uses. Consumers need to use these limited resources optimally. Each resource has several uses. With this knowledge

of economics that which one is the preeminent use of the resource.

### **Economics is Elective in Nature**

**E**conomics is integrative or elective in nature. It combines and synthesizes ideas and methods from various functional fields of business administration like accounting, production management, marketing and finance. This it is multi-disciplinary in dimension.

### **Two Major Branches of Economics**

Economics is broadly divided into **Microeconomics** and **Macroeconomics**. Microeconomics focuses on the behavior and decisions of individual economic units such as households, firms, and industries. It analyzes how resources are allocated, how prices are determined, and how individual consumers and producers interact in markets. Key topics include demand and supply, market structures, production, cost analysis, and consumer behavior. The objective of microeconomics is to understand the efficient allocation of limited resources on a smaller scale.

Macroeconomics, on the other hand, examines the economy as a whole. It deals with broader economic phenomena such as national income, inflation, unemployment, fiscal policy, monetary policy, and economic growth. Macroeconomics aims to analyze and stabilize the overall economic performance, addressing issues like economic fluctuations and long-term growth trends. Both branches are interconnected and essential for understanding the dynamics of economic systems.

### **Micro Economics vs Macro Economics**

Both branches are interrelated; microeconomic decisions collectively impact macroeconomic outcomes, and macroeconomic conditions can influence microeconomic behavior.

Aspect	Microeconomics	Macroeconomics
Focus	Individual economic units (households, firms, industries)	The economy as a whole
Scope	Resource allocation, pricing, consumer behavior	National income, inflation, unemployment
Key Topics	Demand and supply, market structures, production	Fiscal policy, monetary policy, economic growth
Objective	Efficient allocation of resources	Stabilization and growth of the economy
Scale	Small-scale analysis	Large-scale analysis
Example	Determining the price of a product	Measuring GDP or inflation rate

## POSITIVE AND NORMATIVE ECONOMICS

**Economics as a science:** Science is defined as a branch of knowledge that is associated with the cause-and-effect relationship and analyses economic factors. Additionally, economics contributes in combining various sections of science like statistics, mathematics, etc., to understand the relationship between price, supply, demand, and various economic determinants.

- **Positive economics:** Positive science examines the connection between two variables, but it does not furnish any value judgement, which means that it only states ‘what is’ and deals with just the facts related to the economy.

Normative economics focuses on value-based judgments aimed at improving economic development, investment projects, and the distribution of wealth. Its goal is to summarize the desirability (or lack thereof) of various economic developments, situations, and programs by asking what should happen or what ought to be.

Normative economics is subjective and value-based, originating from personal perspectives or opinions involved in the decision-making process. The statements of this type of economics are rigid and prescriptive in nature. They often sound political, which is why this economic branch is also called "what should be" or "what ought to be" economics.

## **SCOPE OF ECONOMICS**

Economists use different economic theories to solve various economic problems in society. Its applicability is very vast. From a small organization to a multinational firm, economic laws come into play. The scope of economics can be understood under two subheads: Microeconomics and Macroeconomics. Let's discuss these in detail:

### **Microeconomics**

Microeconomics examines individual economic activity, industries, and their interaction. It has the following characteristics:

- It determines the ratio of change in the proportion of one variable to another variable. For example- the income elasticity of demand, the price elasticity of demand, the price elasticity of supply, etc.
- It involves an efficient conversion of input into output. For example- packaging, shipping, storing, and manufacturing.
- With the help of economic theories, the object price is evaluated by the price of resources.
- Economic theories help to identify the dominance of a single entity is studied in a particular field.
- It corresponds to the dominance of small entities in a market.

### **Macroeconomics**

It is the study of an economy as a whole. It explains broad aggregates and their interactions "top down." Macroeconomics has the following characteristics:

- It studies the factors which explain economic growth such as the increase in output per capita of a country over a long period of time.
- It advocates the involvement of the central bank and the government to

formulate monetary and fiscal policies to monitor the output over the business cycle.

- Economic theories help in measuring the unemployment rate. It is caused by various factors like rising wages, a shortfall in vacancies, and more.
- Inflation corresponds to an increase in the price of a commodity, while deflation corresponds to a decrease in the price of a commodity. These indicators are valuable to evaluate the status of the economy of a country.

### Key Glossories

- **Economics:** The study of how individuals, firms, and societies make choices under conditions of scarcity, aiming to allocate resources efficiently to satisfy needs and wants.
- **Definitions by Eminent Economists:**
  - **Adam Smith:** Known as the "Father of Economics," Smith defined economics as the study of wealth creation and distribution.
  - **Alfred Marshall:** Defined economics as the study of people in the ordinary business of life, focusing on the well-being and material welfare of society.
  - **Lionel Robbins:** Defined economics as the science of scarcity and choice, emphasizing that it studies human behavior as a relationship between ends and scarce means with alternative uses.
  - **Paul Samuelson:** Defined economics as the study of how societies use limited resources to produce valuable goods and services and distribute them among different people.
- **Nature of Economics:** The characteristics of economics that include its focus on scarcity, choice, and allocation of resources. Economics is viewed as both a social science and a discipline influenced by human behavior, institutions, and societal needs.
- **Positive Economics:** The branch of economics that deals with objective analysis and facts, describing how the economy actually works. It focuses on "what is" without making judgments, and statements can be

tested and validated (e.g., "An increase in taxes will reduce disposable income").

- **Normative Economics:** The branch of economics that involves value judgments and opinions on how the economy should work. It focuses on "what ought to be" and often includes ethical considerations and recommendations (e.g., "The government should reduce income inequality").
- **Scarcity:** A fundamental concept in economics that describes the limited nature of resources relative to unlimited human wants. Scarcity requires individuals and societies to make choices about how to allocate resources.
- **Choice:** The act of selecting among alternative uses of scarce resources. Choice is central to economics, as individuals and societies must decide how to use limited resources to satisfy needs and wants.
- **Opportunity Cost:** The cost of forgoing the next best alternative when making a choice. It represents the benefits that could have been gained from an option not chosen and is a key concept in decision-making.

### Short Questions

1. Define Economics according to Adam Smith.
2. What is the difference between Positive and Normative Economics?
3. Mention any two characteristics of the nature of economics.
4. Explain the term 'Scarcity' in the context of Economics.
5. List the key aspects that define the scope of Economics.

### Brief Questions

1. Compare the definitions of Economics provided by Adam Smith and Alfred Marshall.
2. Analyze the scope of Economics in addressing contemporary economic issues.

3. Discuss how the nature of economics as a social science influences its study.
4. Evaluate the role of Positive Economics in economic policy-making.
5. Apply the concept of scarcity to explain the basic economic problem.

### **Detailed Questions**

1. Critically evaluate the statement: "Economics is a science of choice." Discuss with reference to the definitions provided by different economists.
2. Examine the relevance of Positive and Normative Economics in shaping economic policies, providing examples from current economic scenarios.
3. Create an argument supporting the notion that the scope of Economics has expanded beyond the traditional boundaries, incorporating global issues like climate change and inequality.
4. Evaluate the strengths and limitations of Marshall's definition of Economics in understanding the modern economic system.
5. Design a framework that illustrates the interconnectedness of the nature and scope of Economics in addressing economic problems at the micro and macro levels.

**Utility** refers to want satisfying power of a commodity. It is the satisfaction, actual or expected, derived from the consumption of a commodity. **Utility** differs from person- to-person, place-to-place and time-to-time. In the words of Prof. Hobson, “**Utility** is the ability of a good to satisfy a want”. . When an individual has a desire for a good or service and when he gets it and consumes it, his desire is fulfilled. Thus utility was also defined as “fulfillment of desire”. Besides, an English philosopher Jeremy Bentham (1748–1832), defined utility as the property of a good that provides pleasure or happiness to the people and in this way promotes their welfare. The goal of the society, according to him, is the achievement of the greatest happiness of the greatest number. Though, the economists called as utilitarians believed that utility was a psychic feeling, they thought it can be measured directly in cardinal terms with some kind of psychological or imaginary units called “utils”. However, Alfred Marshall provided a measure of utility in cardinal terms in a different and relatively better way. According to him, the utility of a quantity of a good is the amount of money that a consumer is willing to pay for it instead of defining in terms of subjective units of ‘utils’. However, prior to Marshall, William Stanley Jevons (1835–82) extended Bentham’s utility concept to explain consumer’s behaviour. He conceived utility as value that a consumer places on a good. The major contribution of Jevons has been his contribution to development of marginal utility analysis. He demonstrated that rational consumers in their decision making regarding choice of goods for consumption would take into account the marginal utility of each good. It is Jevon’s pioneering work together with Carl Menger, Leon Walras and Alfred Marshall that led to the neoclassical revolution that established the marginal analysis as the core of economics.

### **1. Form Utility**

If the physical form of a commodity is changed, its utility may increase. For instance, the utility of cotton increases, if it is converted into clothes. The other

examples are processing of paddy into rice, wheat into flour and butter into ghee.

## **2.Place Utility**

If a commodity is transported from one place to another, its utility may increase. For instance, if rice is transported from Tamil Nadu to Kerala, its utility will be more.

**3.Time Utility** If the commodity is stored for future usage, its utility may increase. During rainy season, water is stored in reservoirs and it is used at a later time. This increases the utility of that stored water. Agricultural commodities like paddy, wheat, oilseeds, pulses are stored for the regular uses of consumers throughout the year.

## **Cardinal Utility Approach**

The **Cardinal Utility** approach is propounded by neo-classical economists, who believe that utility is measurable, and the customer can express his satisfaction in cardinal or quantitative numbers, such as 1,2,3, and so on. The neo-classical economist developed the theory of consumption based on the assumption that utility is measurable and can be expressed cardinally. And to do so, they have introduced a hypothetical unit called as **“Utils”** meaning the units of utility. Here, one **Util is equivalent to one rupee** and the **utility of money remains constant**.

The cardinal utility approach used in analyzing the consumer behavior depends on the following assumptions

1. **Rationality:** It is assumed that the consumers are rational, and they satisfy their wants in the order of their preference. This means they will purchase those commodities first which yields the highest utility and then the second highest and so on.
2. **Limited Resources (Money):** The consumer has limited money to spend on the purchase of goods and services and thus this makes the consumer buy those commodities first which is a necessity.
3. **Maximize Satisfaction:** Every consumer aims at maximizing his/her satisfaction for the amount of money he/she spends on the goods and

services.

4. **Utility is cardinally Measurable:** It is assumed that the utility is measurable, and the utility derived from one unit of the commodity is equal to the amount of money, which a consumer is ready to pay for it, i.e. **1 Util = 1 unit of money.**
5. **Diminishing Marginal Utility:** This means, with the increased consumption of a commodity, the utility derived from each successive unit goes on diminishing. This law holds true for the theory of consumer behavior.
6. **Marginal Utility of Money is Constant:** It is assumed that the marginal utility of money remains constant irrespective of the level of a consumer's income.
7. **Utility is Additive:** The cardinalists believe that not only the utility is measurable but also the utility derived from the consumption of different commodities are added up to realize the total utility.

Thus, the cardinal utility approach is used as a basis for explaining the consumer behavior where every individual aims at maximizing his/her utility or satisfaction for the amount of money he spends on the consumption of goods and services.

### **Ordinal Utility Approach**

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

The ordinal utility approach used in analyzing the consumer behavior depends on the following assumptions

1. **Rationality:** It is assumed that the consumer is rational who aims at maximizing his level of satisfaction for given income and prices of goods and services, which he wish to consume. He is expected to take decisions consistent with this objective.
2. **Ordinal Utility:** The indifference curve assumes that the utility can only be expressed ordinally. This means the consumer can only tell his order of preference for the given goods and services.
3. **Transitivity and Consistency of Choice:** The consumer's choice is expected to be either transitive or consistent. The transitivity of choice means, if the consumer prefers commodity X to Y and Y to Z, then he must prefer commodity X to Z. In other words, if  $X = Y$ ,  $Y = Z$ , then he must treat  $X = Z$ . The consistency of choice means that if a consumer prefers commodity X to Y at one point of time, he will not prefer commodity Y to X in another period or even will not consider them as equal.
4. **Diminishing Marginal Rate of Substitution (MRS):** The marginal rate of substitution refers to the rate at which the consumer is ready to substitute one commodity (A) for another commodity (B) in such a way that his total satisfaction remains unchanged. The MRS is denoted as  $DB/DA$ . The ordinal approach assumes that  $DB/DA$  goes on diminishing if the consumer continues to substitute A for B.

### **Total Utility**

Total Utility According to the cardinal utility approach, it is possible to measure and express TU and MU in quantitative terms. TU from a single commodity, may be defined as the sum of the utility derived from each unit consumed of the commodity. For example, if a consumer consumes four units of a commodity and derives  $U_1$ ,  $U_2$ ,  $U_3$  and  $U_4$  utils from the successive units consumed, then

$$TU = U_1 + U_2 + U_3 = U_4$$

If the consumer consumes n units of a commodity, then his TU derived from n units of the commodity may be expressed as

$$TU = U_1 + U_2 + U_3 + \dots + U_n$$

In case number of commodities consumed is greater than one, say, x, y, z, ..., n, then

$$TU = TU_x + TU_y + TU_z + \dots + TU_n$$

where subscripts x, y, z and n denotes commodities.

### 9.5 Marginal Utility

The MU can be defined as the utility derived from the marginal or the last unit consumed. MU is also defined as the addition to the TU derived from the consumption or acquisition of one additional unit. More precisely, MU is the change in the TU resulting from the consumption of one additional unit. That is,

$$MU = \Delta TU / \Delta C$$

where  $\Delta TU$  = change in TU, and  $\Delta C$  = change in consumption by one unit. MU may also be expressed as

$$MU = TU_n - TU_{n-1}$$

where  $TU_n$  = TU derived from the consumption of n units and  $TU_{n-1}$  = TU derived from the consumption of n-1 units.

#### Relationship between TU and MU

The relationship between TU and MU can be properly understood through the table beneath. Here, we are assuming that the consumer is rational and expects utility from the consumption of coffee. Each unit is a cup of coffee.

No.Of.Units	Total Utility	Marginal Utility
1	30	30
2	55	25
3	75	20
4	85	10

5	92	7
6	95	3
7	95	0
8	90	-5

We can see that both TU and MU began from the same point. However, as consumption increased, total utility continued increasing, whereas, the marginal utility kept declining in line.

On the 7<sup>th</sup> unit, when total utility is at its peak (95 utils), the marginal utility was zero, therefore, implying that any additional cup of coffee from that point would result in negative MU or dissatisfaction. A rational consumer would stop his/her consumption at the 7<sup>th</sup> unit.

Thus, from the above discussion, we can encapsulate the relationship between TU and MU as noted below –

- Marginal utility falls when total utility rises
- MU = 0 when total utility is maximum

From a consumer’s perspective, the marginal utility can be aligned with the cost of consuming a commodity. For instance, if the marginal utility cost of a commodity is Rs.20 and MU derived from it is more than 20 utils (assuming Re.1 = 1 utils), then such individuals will continue his/their consumption until the marginal utility of that commodity equals its price. It is also known as the consumer’s equilibrium.

### **The Revealed Preference Theory**

Revealed preference theory of consumer behavior is the only theory which has derived the demand curve of the consumer for a commodity from the revealed preference axioms i.e. baskets of different goods which a consumer buys at different prices, without using IC and its restrictive assumptions. Moreover this theory is also capable of establishing the existence of IC and its convexity. Because of its success, it is also known as the “third root of the logical theory

of demand”.

### **Assumptions**

**Rationality:** A consumer is always rational i.e. he/she always prefers more of goods and services to derive maximum utility. Thus he always buys the commodity which gives him maximum utility first and then he buys the least utility giving commodity at the end.

**Transitivity and consistence of choice:** Consumers preferences are always transitive i.e., if a consumer prefers good X over good Y and the same consumer prefers good Y over good Z then according to this assumption of transitivity, he must prefer good X over good Z also. If,  $X > Y$  If,  $Y > Z$  Therefore,  $X > Z$ . Whereas as per consistence of choice, if a consumer prefers good X to good Y in one period then he must not prefer good Y to good X in another period or must not treat both the goods as equal. Symbolically, If,  $X > Y$  in one period Then,  $Y > X$  or  $Y \neq X$  in other period.

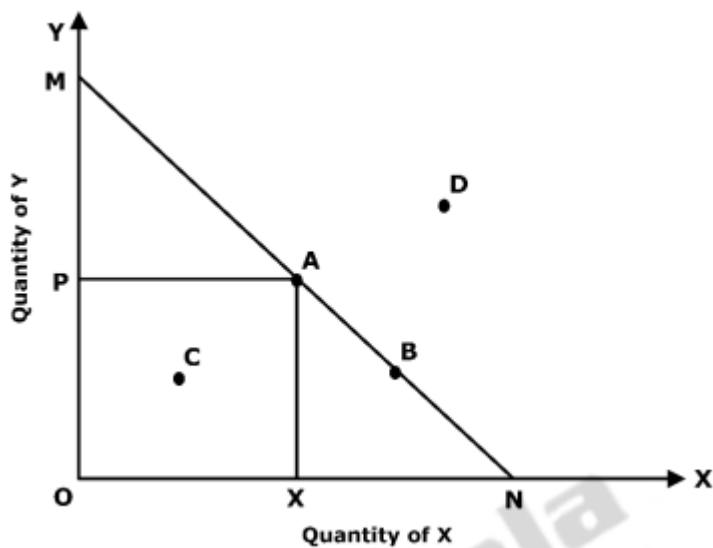
**Price inducements:** Given the consumer's choice for a basket of goods, a consumer can induce to buy a different basket of goods which provide him sufficient price incentives.

### **Axioms of Revealed Preference Theory**

1. **Weak Axiom of Revealed Preference (WARP):** If a consumer chooses bundle A over bundle B when both are within their budget, then B should not be chosen over A in any situation where both are affordable. This ensures consistency in consumer behavior.
2. **Strong Axiom of Revealed Preference (SARP):** Extends WARP by including transitivity. If A is revealed preferred to B and B is revealed preferred to C, then A must be revealed preferred to C.
3. **General Axiom of Revealed Preference (GARP):** A more comprehensive form, allowing for some degree of irrational behavior but still ensuring that consumer choices do not contradict the notion of rational preference.

The basic axiom of the revealed preference theory is that “if a consumer chooses

one basket of goods, given his budgetary constraints and the alternative baskets of goods of same price, then he reveals his preference. For instance, if there are two baskets A and B, comprising of two goods X and Y and both are equally expensive to the consumer, then if a consumer chooses basket A over B then the consumer is said to reveal his preference for basket A. He may do so because either he would have a liking for that basket of goods or it is relatively less expensive than the other. But if the consumer chooses one basket over the other because it is cheaper than the other then the consumer is not said to have revealed his preference; he is only said to have revealed his preference for a basket over the other when the price of both the baskets are same and he chooses one basket over the other because he likes that basket over the other. Then only the consumer reveals his preference for one basket over the other. This can be shown in the following diagram 1:



Here in the diagram, the budget line of the consumer is MN where he can choose various baskets of goods (X and Y) given his income and the prices of X and Y. Now if the consumer chooses any basket of good for instance if he chooses basket A which comprises of OX of X and OP of Y then he is said to have revealed his preference for basket A over any other basket which lies on the same budget line. So here the consumer has revealed his preference for A over B. Any basket

which lies below the budget line like basket C comprises of cheaper X and Y and the consumer will not revealed his preference for it. Any basket lying above the budget line would be too expensive for the consumer to buy therefore he will also not revealed his preference for that basket (like basket D).

### ***Implications of the Revealed Preference Theory***

- **Non-Utility Based:** Unlike utility theory, RPT does not rely on utility functions, making it more practical in analyzing real-world consumer behavior.
- **Consistency in Choices:** The theory assumes that consumers make consistent choices, which can be used to derive a consistent set of preferences.
- **Test of Rationality:** RPT serves as a test of rationality in consumer behavior. If a consumer violates WARP or SARP, it indicates inconsistency, questioning the rationality of their choices.

### **Criticisms and Limitations**

- **Non-Inferential:** The theory assumes that all consumer behavior is rational and consistent, which may not always be true in the real world.
- **Lack of Utility Measurement:** RPT does not provide a direct measurement of utility, limiting its use in cases where utility comparison is essential.
- **Complexity in Application:** Applying WARP and SARP in empirical research can be complex, especially when dealing with large datasets.

## **Law of Diminishing Marginal Utility**

An important tenet of cardinal utility analysis relates to the behaviour of marginal utility. This familiar behaviour of marginal utility has been stated in the Law of Diminishing Marginal Utility according to which marginal utility of a good diminishes as an individual consumes more units of a good. In other words, as a consumer takes more units of a good, the extra utility or satisfaction that he derives from an extra unit of the good goes on falling. It should be carefully

noted that it is the marginal utility and not the total utility that declines with the increase in the consumption of a good. The law of diminishing marginal utility means that the total utility increases at a decreasing rate.

This law is based upon two important facts. First, while the total wants of a man are virtually unlimited, each single want is satiable. Therefore, as an individual consumes more and more units of a good, intensity of his want for the good goes on falling and a point is reached where the individual no longer wants any more units of the good. That is, when saturation point is reached, marginal utility of a good becomes zero. Zero marginal utility of a good implies that the individual has all that he wants of the good in question. The second fact on which the law of diminishing marginal utility is based is that the different goods are not perfect substitutes for each other in the satisfaction of various wants. When an individual consumes more and more units of a good, the intensity of his particular want for the good diminishes but if the units of that good could be devoted to the satisfaction of other wants and yielded as much satisfaction as they did initially in the satisfaction of the first want, marginal utility of the good would not have diminished.

The law of diminishing marginal utility explains an ordinary experience of a consumer. If a consumer takes more and more units of a commodity, the additional utility he derives from an extra unit of the commodity goes on falling. Thus, according to this law, the marginal utility decreases with the increase in the consumption of a commodity. When marginal utility decreases, the total utility increases at a diminishing rate.

### **Definition**

According to Marshall, “The additional benefit which a person derives from a given increase of his stock of a thing diminishes with every increase in the stock that he already has”.

### **Assumptions of Law of Diminishing Marginal Utility**

1. The units of consumption must be in standard units e.g., a cup of tea, a bottle of cool drink etc.

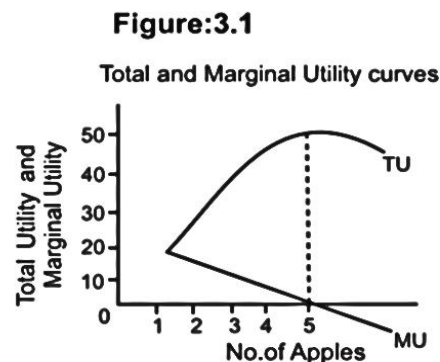
2. All the units of the commodity must be identical in all aspects like taste, quality, colour and size.
3. The law holds good only when the process of consumption continues without any time gap.
4. The consumer's taste, habit or preference must remain the same during the process of consumption.

### **Diagrammatic Explanation of Law of Diminishing Marginal Utility**

Suppose Mr X is hungry and eats apple one by one. The first apple gives him great pleasure (higher utility) as he is hungry; when he takes the second apple, the extent of his hunger will reduce. Therefore, he will derive less utility from the second apple. If he continues to take additional apples, the utility derived from the third apple will be less than that of the second one. In this way, the additional utility (marginal utility) from the extra units will go on decreasing. If the consumer continues to take more apples, marginal utility falls to zero and then becomes negative.

**Total and Marginal utility schedule**

Units of apple	Total utility	Marginal utility
1	20	20
2	35	15
3	45	10
4	50	5
5	50	0
6	45	-5
7	35	-10



The above table gives the utility derived by a person from successive units of consumption of apples. From Table 3.1 and figure 3.1 it is very clear that the marginal utility (addition made to the total utility) goes on declining. The consumer derives 20 units of utility from the first apple he consumes. When he

consumes the apples continuously, the marginal utility falls to 5 units for the fourth apple and becomes zero for the fifth apple. The marginal utilities are negative for the 6th and 7th apples. Thus, when the consumer consumes a commodity continuously, the marginal utility declines, reaches zero and then becomes negative.

The total utility (sum of utilities of all the units consumed) goes on increasing and after a certain stage begins to decline. When the marginal utility declines and it is greater than zero, the total utility increases. For the first four units of apple, the total utility increases from 20 units to 50 units. When the marginal utility is zero (5th apple), the total utility is constant (50 units) and reaches the maximum. When the marginal utility becomes negative (6th and 7th units), the total utility declines from 50 units to 45 and then to 35 units.

### **Importance of Law of Diminishing Marginal Utility**

**This law is of great importance in economics:**

#### **i. Basis of Economic Laws**

The Law of Diminishing Marginal Utility is the basic law of consumption. The Law of Demand, the Law of Equi-marginal Utility, and the Concept of Consumer's Surplus are based on it.

#### **ii. Diversification in Consumption and Production**

The changes in design, pattern and packing of commodities very often brought about by producers are in keeping with this law. We know that the use of the same good makes us feel bored; its utility diminishes in our estimation. We want variety in soaps, toothpastes, pens, etc. Thus, this law helps in bringing variety in consumption and production.

#### **iii. Value Theory**

The law helps to explain the phenomenon in value theory that the price of a commodity falls when its supply increases. It is because with the increase in the stock of a commodity, its marginal utility diminishes.

#### **iv. Diamond-Water Paradox**

The famous “diamond-water paradox” of Smith can be explained with the help of this law. Because of their relative scarcity, diamonds possess high marginal utility and so a high price. Since water is relatively abundant, it possesses low marginal utility and hence low price even though its total utility is high. That is why water has low price as compared to a diamond though it is more useful than the latter.

#### **v. Progressive Taxation**

The principle of progression in taxation is also based on this law. As a person’s income increases, the rate of tax rises because the marginal utility of money to him falls with the rise in his income.

#### **vi. Basis of Socialism**

The marginal utility of money to the rich is low. It is, therefore, advisable that their surplus wealth be acquired by the state and distributed to the poor who possess high marginal utility for money.

### **Indifference Curve Theory**

The indifference curve analysis is a popular theory of consumer’s demand which forms the subject-matter of the present unit. The technique of indifference curves was first of all invented by a classical economist Edgeworth but he used it only to show the possibilities of exchange between two persons and not to explain consumer’s demand. Two English economists, J.R. Hicks and R.G.D.Allen in their now well-known paper ‘A Reconsideration of the Theory of Value’ severely criticized Marshall’s cardinal utility analysis based upon cardinal measurement of utility and put forward the indifference curve approach based on the notion of ordinal utility to explain consumer’s behaviour. In 1939 Hicks reproduced the indifference curve theory of consumer’s demand in his book ‘Value and Capital’ modifying somewhat the version of the original paper.

Indifference curve method has been evolved to supersede the cardinal utility analysis of demand which was discussed in the last chapter. The indifference curve method seeks to derive all rules and laws about consumer’s demand that are derivable from the cardinal utility analysis. At the same time

the inventors and supporters of new method contend that their analysis is based on fewer and more reasonable assumptions. The indifference curve analysis has, however, retained some of the assumptions of Marshall's cardinal utility analysis. Thus, the indifference curve approach, like the old cardinal utility approach, assumes that the consumer possesses 'complete information' about all the relevant aspects of economic environment in which he finds himself. For example, the prices of goods, the markets in which they are available, the satisfaction to be obtained from them etc. are all known to the consumer. Further, it is assumed that the consumer acts rationally in the sense that, given the prices of goods and the money income, he will choose the combination from among the various possible combinations that gives him maximum satisfaction. Moreover, the assumption of 'continuity' has also been retained by Hicks-Allen indifference curve method. Continuity assumption means that the consumers are capable of ordering or ranking all conceivable combinations of goods according to the satisfaction they yield.

Marshall's demand analysis is based on the cardinal measurement of utility. The approach is criticised for two reasons. (i) Utility is a psychological phenomenon and (ii) It cannot be measured. Hence, the indifference curve approach based on ordinal ranking preference was evolved.

### **Definition**

An indifference curve is the locus of different combinations of two commodities giving the same level of satisfaction.

### **Assumptions of Indifference Curve**

The assumptions about the behaviour of the consumer which are generally made in indifference curve analysis are as follows

#### **i. More of a commodity is better than less.**

It is assumed that the consumer will always prefer a larger amount of a good to a smaller amount of that good, provided that the other goods at his disposal remains unchanged. This is a very reasonable and realistic assumption. This assumption implies that the consumer is not over-supplied with any good. When a consumer is over-supplied or over-satiated with one good, he will prefer a

smaller quantity of that good to its larger quantity. It is thus assumed that the consumer has not yet reached the point of satiety in the consumption of any good. This assumption is therefore known as non-satiety assumption.

**ii. Preferences or indifferences of a consumer are transitive.**

Suppose there are three combinations of two goods A, B and C. If the consumer is indifferent between A and B and also between B and C, it is then assumed that he will be indifferent between A and C too. This condition implies that consumer's tastes are quite consistent. This assumption is known as assumption of transitivity.

**iii. Diminishing marginal rate of substitution.**

In indifference curve analysis the principle of diminishing marginal rate of substitution is assumed. In other words, it is assumed that as more and more units of X are substituted for Y, the consumer will be willing to give up fewer and fewer units of Y for each additional unit of X, or when more and more of Y is substituted for X, he will be willing to give up successively fewer and fewer units of X for each additional unit of Y. This rule about consumer's behaviour is described as the principle of diminishing, marginal rate of substitution. This principle follows as a matter of logical necessity from the assumption that particular wants are satiable and that various goods are not perfect substitutes for one another.

**Indifference schedule**

An indifference schedule is a statement of various combinations of two commodities that will equally be accepted by the consumer. The various combinations give equal satisfaction to the consumer. Therefore, he is indifferent between various combinations.

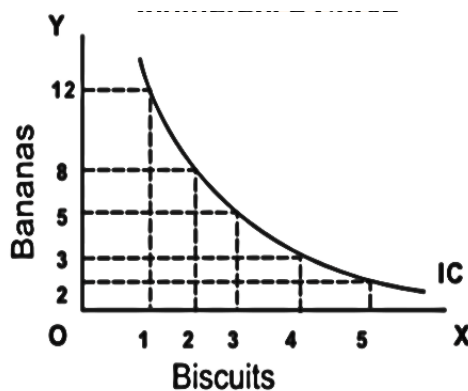
### Indifference Schedule

Combination	Biscuits (Good X)	Bananas (Good Y)
A	1	12
B	2	8
C	3	5
D	4	3
E	5	2

From the above schedule it can be understood that while the number of biscuits is increasing, the number of bananas is decreasing so that the level of satisfaction is the same for all the combinations. Therefore, the consumer is indifferent between the combinations A, B, C, D and E.

### Indifference curve

The data in the indifference schedule can be represented in the graph with one commodity on the X-axis and another commodity in the Y-axis. The various combinations of the two commodities are plotted and joined to form a curve called indifference curve. In the figure IC is an indifference curve showing combinations of the two commodities given in the schedule.



As in an indifference schedule, combinations lying on an indifference curve will also be equally desirable to the consumer, that is, will give him the same satisfaction. The smoothness and continuity of an indifference curve mean that

goods in question are assumed to be perfectly divisible. If the indifference schedule II is also converted into indifference curve, this will lie above the indifference curve IC.

Any combination on a higher indifference curve will be preferred to any combination on a lower indifference curve. It is thus clear that the indifference curve lying above and to the right of an indifference curve will indicate a higher level of satisfaction. It may be noted that while an indifference curve shows all those combinations of two goods which provide equal satisfaction to the consumer, it does not indicate exactly how much satisfaction is derived by the consumer from those combinations. This is because the concept of ordinal utility does not involve the quantitative measurability of utility. Therefore, no attempt is made to label an indifference curve by the amount of satisfaction it represents.

### **Properties of an indifference curve**

#### ***1. They Slope Negatively or Slope Downwards from the Left to the Right:***

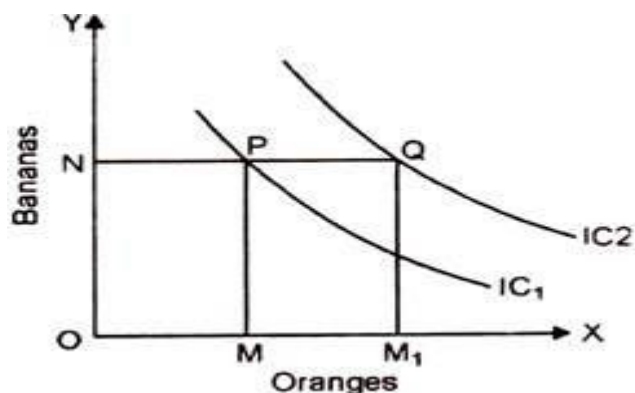
This is an important feature of Indifference Curve. If the total satisfaction is to remain the same, the consumer must part with a diminishing number of bananas as he gets an increasing stock of oranges. The loss of satisfaction to the consumer on account of the downward movement must be made up by the gain through the rightward movement. As such the Indifference Curve must slope downwards to the right.

#### ***2. They are Convex to the Origin of Axes:***

The second property of the Indifference Curve is that they are generally convex to the origin of the axes—the left hand portion is normally steep while the right hand portion is relatively flat. This property of the Indifference Curve is derived from the Law of Diminishing Marginal Rate of Substitution. The marginal rate of substitution neither increases nor does it remain constant.

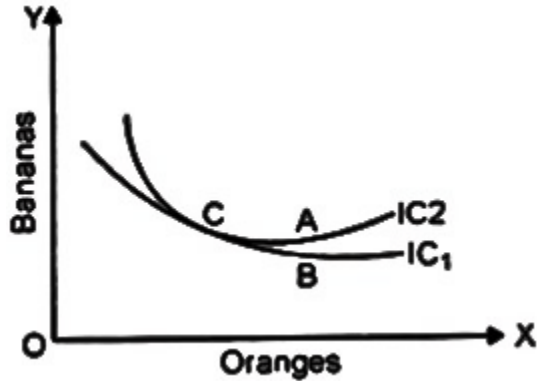
**3. Every Indifference Curve to the right represents Higher Level of Satisfaction than that of the Proceeding One:**

Let us take two Indifference Curves  $IC_1$  and  $IC_2$  lying to the right of  $IC_1$ . At the point P the consumer gets OM of oranges and ON of bananas. At the point Q though the number of bananas remains the same i.e., ON, yet the number of oranges increases from OM to  $OM_1$ . The total satisfaction of the consumer is therefore bound to be greater at Q than at P. Hence Q represents a more valued and preferred combination of oranges and bananas than P. As all the points on one Indifference Curve represents equal satisfaction, therefore every point on  $IC_2$  represents a combination, preferred to that represented by any point on  $IC_1$ . An Indifference Curve to the right represents a preferred position and therefore a consumer will always try to move on the indifference map as much to the right as possible.



**1. Indifference Curves can neither touch nor Intersect each other, so that one Indifference Curve Passes through only one Point on an Indifference Map:**

The fourth property of Indifference Curve is that no two Indifference V' Curves can ever cut each other.

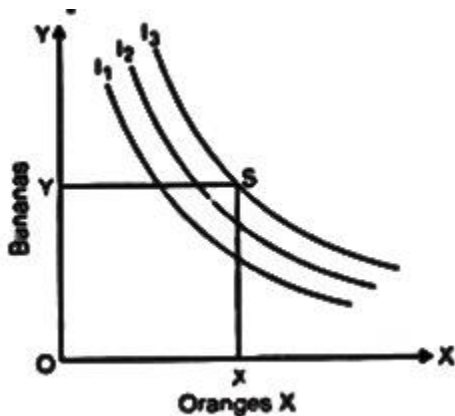


Since point A is an Indifference Curve  $IC_2$ , it represents a higher level of satisfaction to the consumer  $c$  than point B which is located on the lower Indifference Curve  $IC_1$ . Point C, however lies on both the curves. This means that two levels of satisfaction, A and B which are by definition unequal manage to become equal at the point C. This is clearly impossible.

**Indifference Curve can never intersect each other:**

**5. In reality, Indifference Curves are like Bangles:**

But as a matter of principle their effective region is in the form of segments. This is so because Indifference Curves are assumed to be negatively sloping and convex to the origin. An individual can move to the higher indifference. Curves  $I_2$  and  $I_3$ , until he reaches the saturation upon S where his total utility is the maximum. If the consumer increases his consumption beyond X and Y his total utility will fall.



**Water Diamond Paradox**

The **diamond-water paradox**, also known as paradox of value, and it was first presented by the economist Adam Smith in the 1700s.

In his works, Smith points out that practical things that we use every day often have little or no value in exchange. Things like cups, utensils, socks, and water are a few examples. On the other hand, things that often have the greatest value in the market have little or no practical use. An example may be an old piece of art or 1920s baseball card. Other than looking at it, there isn't much else we can do with the art or baseball card. So, why are things valued this way?

Understanding why the paradox exists can be helped by understanding the economic terms known as marginal utility and scarcity. **Scarcity** can be simply defined as how readily available a good, skill, or service is. Is there a lot of it compared to what people are demanding? **Marginal utility** is the additional satisfaction or gain someone gets from using or purchasing an additional unit of a particular good or service. People are willing to pay a higher price for goods with greater marginal utility.

So, let's go back to water and diamonds. There is plenty of water in most parts of the world (not scarce), which means that, as consumers, we usually have a low marginal utility for water. In a typical situation, we aren't willing to pay a lot of money for one more drink of water. Diamonds, however, are scarce. Because they are harder to find and attain, our marginal utility (additional satisfaction), for adding a diamond to our collection is much higher than someone offering us one more drink of water. If one is dying of thirst, then this paradox might not make sense, and the marginal utility from another drink of water would be much higher than the additional satisfaction of owning a diamond.

### **Indifference Curve: Consumer Equilibrium**

As a consumer has a limited income, he spends it in such a manner so as to obtain maximum level of satisfaction. He will attain equilibrium when he gets maximum satisfaction from his expenditure on different goods. Under the utility analysis explained earlier, a consumer gets maximum satisfaction when

marginal utilities from his different purchases are equal.

### **Income Effect**

Normal goods are, in general, goods whose consumption increases with increase in consumer's income. When consumers' income increases, prices remaining constant, their budget line shifts upwards, remaining parallel to the original budget line. In addition, when their income decreases, the budget line shifts downwards. It implies that when consumers' income increases, they consume more of normal goods; and vice versa. An inferior good is one whose consumption decreases with an increase in consumer's income. In other words, when the income effect on the consumption of a commodity is negative, the commodity is said to be inferior. It must be borne in mind that no commodity is in itself superior or inferior—there may be some exceptions. In fact, the level of income and the consumers' perceptions, tastes and preferences make a commodity superior or inferior. The general consumer behaviour, however, shows that some commodities are inferior to some others and people consume less of such goods when their income increases. For example, when income increases, the consumption of inferior food grains, such as bajra, millet, maize and so on, decreases beyond a level of income. Similarly, with an increase in income, the demand for two-wheelers decreases and that for four-wheelers increases.

In a brief gist, When there is a decrease in the price of a good or service, the consumer will be able to buy the more quantity with the same amount or same quantity with less amount of money. In this way, the overall purchasing power of the consumer increases, which induces him to buy more of that commodity whose price has decreased, increases. The inverse is also true, i.e. any increase in the price of a good or service will result in the fall in consumption, due to income effect. Suppose Mr. X spends half of his income on purchasing grocery and a decline of 10% in the price of grocery will increase his free money available

to him which he can spend on buying additional grocery or something else of his choice.

### **Substitution Effect**

When the price of a commodity falls, it becomes comparatively cheaper than another commodity, which instigates customers to replace commodity whose price has been decreased for other commodities that are relatively expensive now. As a result of this, the aggregate demand of the commodity whose price has been reduced, increases and vice versa. This is known as substitution effect, which arises due to the inherent tendency of consumer's to substitute cheaper goods for relatively expensive ones, after eliminating real income effect of price change.

### **Key Differences Between Income Effect and Substitution Effect**

The following points are noteworthy so far as the difference between income effect and substitution effect is concerned:

1. The change in the demand for a commodity caused by the change in consumer's real income is called income effect. An effect due to the change in the price of a good or service, leading the consumer to replace higher priced items with lower priced ones, is called substitution effect.
2. The income effect is represented by the movement along income-consumption curve, which have a positive slope. Unlike, substitution effect which is depicted by movement along price-consumption curve, which have a negative slope
3. The income effect is a result of income being freed up whereas substitution effect arises due to relative changes in prices.
4. Income effect shows the impact of rise or fall in purchasing power on consumption. On the contrary, substitution effect reflects the change in the consumption pattern of an item due to change in prices.

5. Income effect of a rise in the price of a good is the decrease in discretionary income leading to decrease in the quantity demanded. As against this, the substitution effect of the increased price of a good is that consumers customers will buy less costly alternatives.
6. Income effect of a fall in prices of a good is that the purchasing power of customer will increase, allowing customers to buy more with the same budget. Conversely, substitution effect of a fall in prices of a good is that the good will become cheaper than its substitutes, which will attract more customers, leading to higher demand.

### Consumer's Equilibrium with Indifference Curve

Suppose that the consumer has Rs.20 to spend on tea and biscuits, which cost 50 paise and 40 paise respectively. The consumer has three alternative possibilities before him.

- (a) He may decide to buy tea only, in which case he can buy 40 cups of tea.
- (b) He may decide to buy biscuits only, in which case he can buy 50 biscuits.
- (c) He may decide to buy some quantity of both the goods, say 20 cups of tea (Rs.10) and 25 biscuits (Rs.10) or 12 cups of tea (Rs.6) and 35 biscuits (Rs.14), and so on. (Total amount = Rs.20).

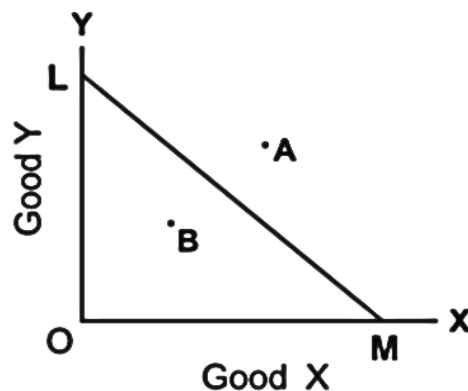
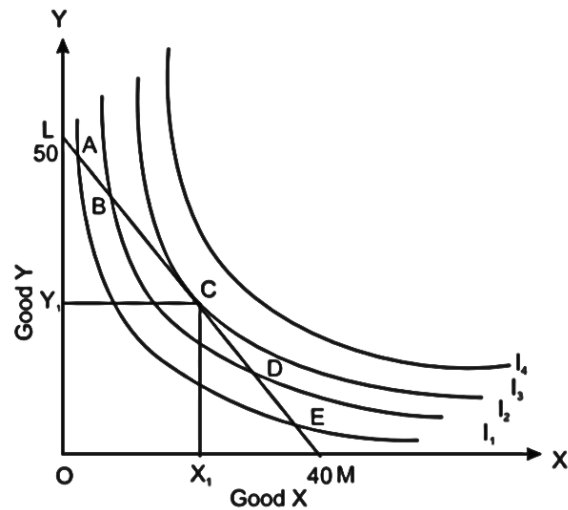


Figure shows the above three possibilities. The line LM represents maximum amount of biscuits (50) and to tea (40 cups), which the consumer can

buy with his income of Rs.20. The line LM shows that the consumer cannot choose any combination beyond this line because his income does not permit him. Nor would he like to choose a combination below this line; say, B, as it will not represent the maximum satisfaction. Line LM is known as the budget line since it represents the various amounts the consumer can buy with his income; it is also known as the price-ratio line or simply the price line since its slope represents the ratio of prices of the two goods (i.e., OM of Good X = OL of good Y).



The consumer gets the maximum possible satisfaction from his given income at point C on the indifference curve  $I_3$ . At this point, he buys a combination of  $OX_1$  amount of Good X and  $OY_1$  amount of Good Y. Any other possible combination of the two goods will either yield lesser satisfaction or will not be unobtainable at present prices, with the given amount of income of the consumer.

At the point of equilibrium (point C) the price-line LM is tangential to the indifference curve  $I_3$ . At point C, the indifference curve and the price-line have the same slope. Now the slope of the indifference curve represents the marginal rate of substitution; and the budget line shows the ratio of prices between the two goods. At point C the marginal rate of substitution between the two goods as indicated by the slope of the indifference curve  $I_3$  and the ratio of prices between the two goods as indicated by the price-line LM are equal. This

point, therefore, indicates the ideal combination between the two commodities, giving the consumer the highest satisfaction possible with his limited income. At this point, therefore the consumer is in equilibrium.

An indifference map of a consumer represents, as said earlier, his tastes and preferences for the two goods and his preferences between different combinations of them. In other words, an indifference map portrays consumer's scale of preferences. Scale of preferences of indifference curve analysis replaces Marshall's utility schedule. So long as consumer's tastes and preferences remain unchanged, the whole indifference map will remain the same. If the consumer's tastes and preferences undergo a change, then a new indifference map corresponding to new tastes and preferences will have to be drawn

### **Key Glossary**

**Utility** refers to the satisfaction or pleasure a consumer derives from consuming goods and services. **Cardinal Utility** assumes that utility can be measured in numerical units, allowing for precise comparisons of satisfaction across different goods. In contrast, **Ordinal Utility** only ranks preferences without assigning specific numerical values, indicating which goods are preferred over others.

**Types of Utility** include form utility (changing the form of a product), place utility (making a product available at a convenient location), time utility (availability of a product when needed), and possession utility (ownership of a product).

The **Revealed Preference Theory** suggests that a consumer's preferences can be inferred from their purchasing behavior, assuming they act rationally and consistently.

The **Law of Diminishing Marginal Utility** states that as a consumer consumes more of a good, the additional satisfaction (marginal utility) gained from each additional unit decreases.

**Indifference Curve Theory** analyzes consumer preferences by representing combinations of two goods that provide equal satisfaction on a graph. The point where a consumer reaches equilibrium on the highest possible indifference curve, given their budget constraint, reflects their optimal consumption choice.

### Short Questions

1. Define Cardinal Utility and Ordinal Utility.
2. What is the Law of Diminishing Marginal Utility?
3. List the different types of utility and provide a brief explanation of each.
4. What does the Revealed Preference Theory assume about consumer behavior?
5. Explain what an Indifference Curve represents.

### Brief Questions

1. Compare Cardinal Utility and Ordinal Utility theories in terms of their approach to measuring consumer satisfaction.
2. Illustrate with an example how the Law of Diminishing Marginal Utility operates in real-life consumption.
3. Discuss how the Revealed Preference Theory can be used to understand consumer choices in the absence of utility measurement.
4. Analyze the conditions necessary for consumer equilibrium using the Indifference Curve Theory.
5. Explain how different types of utility (form, place, time, possession) add value to a product.

### Detailed Questions

1. Critically evaluate the strengths and limitations of the Law of Diminishing Marginal Utility in explaining consumer behavior.

- 2.** Discuss the relevance of the Indifference Curve Theory in modern economics. Illustrate how a consumer reaches equilibrium with the help of a diagram.
- 3.** Evaluate the practicality of Cardinal and Ordinal Utility theories in real-world economic analysis.
- 4.** Design a model showing the relationship between Revealed Preference Theory and Indifference Curve Theory, explaining how they complement each other in understanding consumer choices.
- 5.** Assess the impact of different types of utility on consumer decision-making and market strategies, providing relevant examples.

## UNIT – III

### DEMAND ANALYSIS

Demand for a commodity refers to the desire backed by the necessary purchasing power. “By demand, we mean the various quantities of a given commodity or services which consumers would buy in one market in a given period of time, at various prices, or at various incomes or at various prices of related goods.”

Demand is an economic term that refers to the amount of products or services that consumers wish to purchase at any given price level. The mere desire of a consumer for a product is not demand. Demand includes the purchasing power of the consumer to acquire a given product at a given period. In other words, it's the amount of products or services that consumers are willing and able to purchase.

The relationship can be written as an equation thus:

$$Q=f(p)$$

Q= Quantity demanded of the product

P = Price of the product

#### **Types of Demand**

Demand is generally classified on the basis of various factors, such as nature of a product, usage of a product, number of consumers of a product, and suppliers of a product.

The demand for a particular product would be different in different situations. Therefore, organizations should be clear about the type of demand for their products.

**The different types of demand (as shown in below Figure) are discussed as follows:**

##### ***i. Individual and Market Demand:***

Refers to the classification of demand of a product based on the number of consumers in the market. Individual demand can be defined as a quantity demanded by an individual for a product at a particular price and within the

specific period of time. For example, Mr. X demands 200 units of a product at Rs. 50 per unit in a week.

The individual demand of a product is influenced by the price of a product, income of customers, and their tastes and preferences. On the other hand, the total quantity demanded for a product by all individuals at a given price and time is regarded as market demand.

In simple terms, market demand is the aggregate of individual demands of all the consumers of a product over a period of time at a specific price, while other factors are constant. For example, there are four consumers of oil (having a certain price). These four consumers consume 30 liters, 40 liters, 50 liters, and 60 liters of oil respectively in a month. Thus, the market demand for oil is 180 liters in a month.

***ii. Organization and Industry Demand:***

Refers to the classification of demand on the basis of market. The demand for the products of an organization at given price over a point of time is known as organization demand. For example, the demand for Toyota cars is organization demand. The sum total of demand for products of all organizations in a particular industry is known as industry demand.

For example, the demand for cars of various brands, such as Toyota, Maruti Suzuki, Tata, and Hyundai, in India constitutes the industry' demand. The distinction between organization demand and industry demand is not so useful in a highly competitive market.

This is due to the fact that in a highly competitive market, organizations have insignificant market share. Therefore, the demand for an organization's product is of no importance. However, an organization can forecast the demand for its products only by analyzing the industry demand.

***iii. Autonomous and Derived Demand:***

Autonomous and Derived Demand refers to the classification of demand on the basis of dependency on other products. The demand for a product that is not associated with the demand of other products is known as autonomous or direct

demand. The autonomous demand arises due to the natural desire of an individual to consume the product.

For example, the demand for food, shelter, clothes, and vehicles is autonomous as it arises due to biological, physical, and other personal needs of consumers. On the other hand, derived demand refers to the demand for a product that arises due to the demand for other products.

For example, the demand for petrol, diesel, and other lubricants depends on the demand of vehicles. Apart from this, the demand for raw materials is also derived demand as it is dependent on the production of other products. Moreover, the demand for substitutes and complementary goods is also derived demand.

***iv. Demand for Perishable and Durable Goods:***

Demand for perishable and Durable goods refers to the classification of demand on the basis of usage of goods. The goods are divided into two categories, perishable goods and durable goods. Perishable or non-durable goods refer to the goods that have a single use. For example, cement, coal, fuel, and eatables. On the other hand, durable goods refer to goods that can be used repeatedly.

For example, clothes, shoes, machines, and buildings. Perishable goods satisfy the present demand of individuals. However, durable goods satisfy both present as well as future demand of individuals. Therefore, consumers purchase durable items by considering its durability.

In addition, durable goods need replacement because of their continuous use. The demand for perishable goods depends on the current price of goods and customers' income, tastes, and preferences and changes frequently, while the demand for durable goods changes over a longer period of time.

***v. Short-term and Long-term Demand:***

Short-term and long term Demand refers to the classification of demand on the basis of time period. Short-term demand refers to the demand for products that are used for a shorter duration of time or for current period. This demand depends on the current tastes and preferences of consumers.

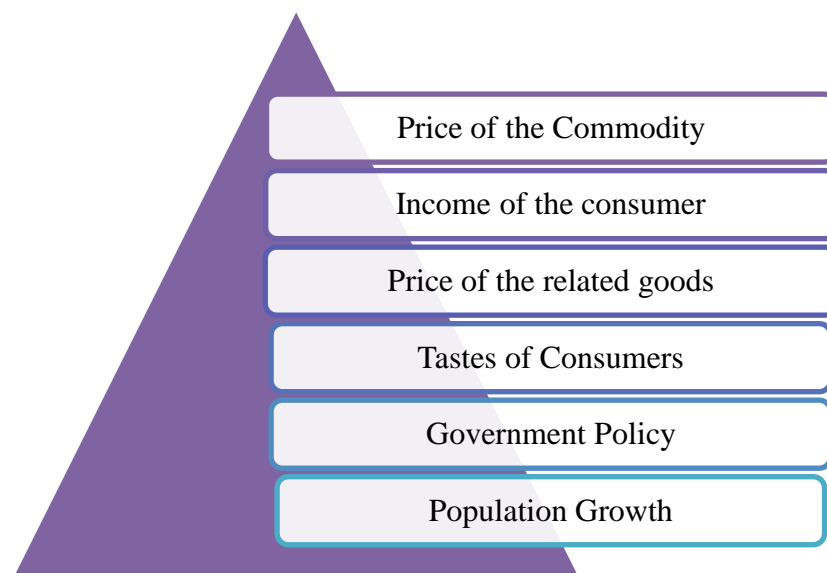
For example, demand for umbrellas, raincoats, sweaters, long boots is short term

and seasonal in nature. On the other hand, long-term demand refers to the demand for products over a longer period of time.

Generally, durable goods have long-term demand. The long-term demand of a product depends on a number of factors, such as change in technology, type of competition, promotional activities, and availability of substitutes. The short-term and long-term concepts of demand are essential for an organization to design a new product.

### **Factors Influencing Demand**

The factors which determine the level of demand for any commodity are the following:



#### **1. Price of a commodity**

The higher the price of a commodity, the lower the quantity demanded. The lower the price, the higher the quantity demanded.

#### **2. Prices of other Commodities**

There are three types of commodities in this context.

*Substitutes:* If a rise (or fall) in the price of one commodity leads to an increase (or decline) in the demand for another commodity, the two commodities are said to be substitutes. Example: tea and coffee.

*Complementary Commodities:* Complementary goods are those which cannot be used without each other. If, say, the price of cars rises and they become expensive, the demand for them will fall and so will the demand for petrol.

*Unrelated Goods:* If the two commodities are unrelated, say refrigerator and bicycle, a change in the price of one will have no effect on the quantity demanded of the other.

### **3. Income of the consumer**

A rise in the consumer's income raises the demand for a commodity, and a fall in his income reduces the demand for it.

### **4. Tastes and preferences**

When there is a change in the tastes of consumers in favour of a commodity, say due to fashion, its demand will rise, with no change in its price, in the prices of other commodities, and in the income of the consumer.

### **5. Government Policy**

This is also responsible in influencing the demand for the commodity. The government imposes taxes on various goods that leads to an increase in the price of the goods, as a result of which demand goes down.

### **6. Population Growth**

Increase in population leads to an increase in demand for all type of goods, whereas decrease in population means less demand for such commodities.

## **Law of Demand**

The law of demand states the relationship between the quantity demanded and the price of a commodity. In general, quantity demanded of a commodity depends on many other factors also, viz., consumer's income, price of the related goods (substitutes and complements), consumer's taste and preferences, advertisement, etc. However, price of a good is the most important and the only determinant of its demand in the short run because other factors remain constant. Therefore, the law of demand is linked to the price of the product.

The law of demand can be stated as 'all other things remaining constant, the quantity demanded of a commodity increases when its price decreases and decreases when its price increases'. This law implies that demand and price are

inversely related. Marshall states the law of demand as ‘the amount demanded increases with a fall in price and diminishes with a rise in price’. This law holds under ceteris paribus assumption, i.e., all other things remain unchanged. The law of demand can be illustrated through a demand schedule and a demand curve

**Definition:** The law of demand states that other factors being constant (ceteris paribus), price and quantity demand of any good and service are inversely related to each other.

**Assumptions of Law of Demand:**

The law of demand is mainly based on the following assumptions

- No change in Consumer’s income
- No change in Consumer’s tastes and preference should not change.
- Prices of other products should not change.
- Consumer’s customs and habits should not change
- All the units of the goods are homogeneous.
- Commodity should be a normal good.
- There should be no change in size of the population

**Demand Schedule**

The law of demand presented in the form of a table is called the demand schedule. The demand schedule is simply the representation of a price-quantity relationship which is reflected in the law of demand. The demand schedule is of two types. They are individual demand schedule and market demand schedule. Individual demand schedule refers to the quantity of a particular product which an individual will buy at various prices. On other hand, market demand schedule refers to the quantities of a particular product which all consumers will buy at various prices prevailing in a market. In other words market demand schedule is obtained from the horizontal summation of individual demand schedules.

**Table: 1 Demand Schedule:**

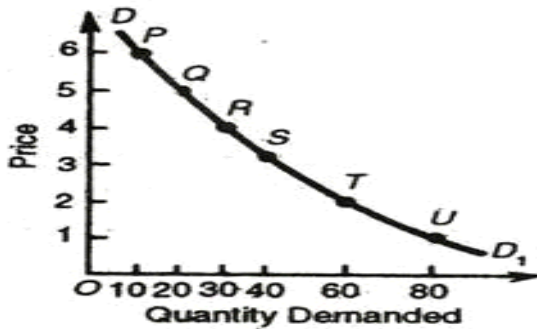
<b>Price (Rs.)</b>	<b>Quantity (units)</b>
6	10
5	20
4	30
3	40
2	60
1	80

The demand schedule reveals that when the price is Rs. 6, the quantity demanded is 10 units. If the price happens to be Rs 5, the quantity demanded is 20 units, and so on. The demand schedule shows that with a fall in price at each level, the quantity demanded tends to rise. There is, thus, an inverse relationship between price and quantity demanded.

### **Demand Curve**

Demand curve is simply a graphic representation of the demand schedule. It is a locus of points showing various alternative price quantity relationships. It is a curve showing how much of a particular product consumers are willing to buy as the price per unit changes. It slopes downward to the right. That is, it has a negative slope. The negative slope of the demand curve DD' shows the inverse relationship between the price of shirt and its quantity demanded. The inverse relationship means that demand increases with the decrease in price and decreases with the rise in price. The law of demand is based on an empirical fact. For example, when prices of smart phones and laptops, especially of the latter, were astronomically high, only few rich persons and big firms could afford them. Now with the revolution in computer and cell phone technology and the consequent fall in their prices, demand for these goods has shot up in India though other factors too contributed to rise in demand for these goods

**Figure 1**



$DD_1$  is the demand curve drawn on the basis of the above demand schedule (Table:1). The dotted points D, P, Q, R, S, T and U show the various price-quantity combinations. Marshall calls them “demand points”. The curve is generally downward sloping which implies that lower the price of a product, higher the quantity demanded. The demand curve is also known as Average Revenue (AR) Curve because the price per unit paid by the consumer is the revenue per unit to the seller of the product.

It should be noted that a demand schedule or a demand curve does not tell us what the price is; it only tells us how much quantity of the good would be purchased by the consumer at a various possible prices. Further, it will be seen from both the demand schedule and the demand curve that as the price of a commodity falls, more quantity of it is purchased or demanded. Since more is demanded at a lower price and less is demanded at a higher price, the demand curve slopes downward to the right. Thus, the downward-sloping demand curve is in accordance with the law of demand which, as stated above, describes inverse price-demand relationship.

It is important to note here that behind this demand curve or price-demand relationship always lie the tastes and preferences of the consumer, his income, the prices of substitutes and complementary goods, all of which are assumed to be constant in drawing a demand curve. If any change occurs in any of these other factors, the whole demand schedule or demand curve will change and new demand schedule or a demand curve will have to be drawn. Further, in

drawing a demand curve, we assume that the buyer or consumer does not exercise any influence over the price of a commodity, that is, he takes the price of the commodity as given and constant for him.

### **Why Does Demand Curve Slope Downwards from Left to Right?**

We have explained above that when price falls the quantity demanded of a commodity rises and vice versa, other things remaining the same. It is due to this law of demand that demand curve slopes downward to the right. Now, the important question is why the demand curve slopes downward, or in other words, why the law of demand which describes inverse price-demand relationship is valid. The demand curve generally slopes downwards from left to right because of the following reasons explained in detail:

#### **Law of Diminishing Marginal Utility:**

The law of demand is based on the law of Diminishing Marginal Utility. According to this law, when a consumer buys more units of a commodity, the marginal utility of that commodity continues to decline. Therefore, the consumer will buy more units of that commodity only when its price falls. When less units are available, utility will be high and the consumer will be prepared to pay more for the commodity. This proves that the demand will be more at a lower price and it will be less at a higher price. That is why the demand curve is downward sloping.

#### **Income Effect**

When the price of a commodity falls, the real income of the consumer increases because he has to spend less in order to buy the same quantity. On the contrary, with the rise in the price of the commodity, the real income of the consumer falls. This is called the income effect. Under the influence of this effect, with the fall in the price of the commodity the consumer buys more of it and also spends a portion of the increased income in buying other commodities. Under this effect, with a fall in the price of a product the consumer consumes more of it and spends

a part of his increased income in consuming other products. This is the reason for downward curve slopes downwards from left to right.

### **Substitution Effect:**

The other effect of change in the price of the commodity is the substitution effect. With the fall in the price of a commodity, the prices of its substitutes remaining the same, consumers will buy more of this commodity rather than the substitutes. As a result, its demand will increase. On the contrary, with the rise in the price of the commodity (under consideration) its demand will fall, given the prices of the substitutes. This is called substitution effect. With the influence of this effect, the shape of the demand curve will be downward sloping.

### **Change in number of uses:**

There are different uses of certain commodities and services that are responsible for the negative slope of the demand curve. With the increase in the price of such products, they will be used only for more important uses and their demand will fall. On the contrary, with the fall in price, they will be put to various uses and their demand will rise. For instance, with the increase in the electricity charges, power will be used primarily for domestic lighting, but if the charges are reduced, people will use power for cooking, fans, heaters, etc.

### **Change in number of Consumers**

Every commodity has certain consumers but when its price falls, new consumers start consuming it, as a result demand increases. On the contrary, with the increase in the price of the product, many consumers will either reduce or stop its consumption and the demand will be reduced. Thus, due to *the price effect* when consumers consume more or less of the commodity, the demand curve slopes downward.

### **Exceptions of Law of Demand:**

In certain cases, the demand curve slopes up from left to right, i.e., it has a

positive slope. Under certain circumstances, consumers buy more when the price of a commodity rises, and less when price falls. as shown by the D curve in below Figure 2 Many causes are attributed to an upward sloping demand curve.

**Figure : demand curve**

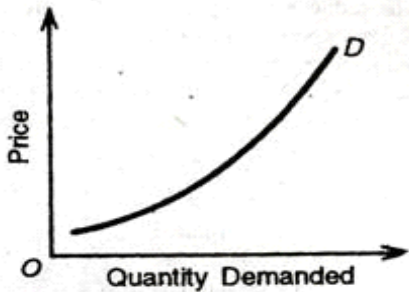


Figure 10.7

**Giffen Paradox:**

Robert Giffen discovered that the poor people will demand more of inferior goods if their prices rise and demand less if their prices fall. Poor people consuming larger amount of inferior cereals will find their real 'money-income' falling when the price of inferior goods rise. Hence they will reduce the expenditure on other superior items, conserve their little income, and demand more of the inferior commodity. Because of this Giffen goods means inferior goods. This makes the demand curve to have a positive slope.

**Veblen Effect:**

Abnormal behavior of a market where higher priced goods are bought even though lower priced substitutes are available. It is caused either by the belief that higher price means higher quality, or by the desire for conspicuous consumption (to be seen as buying an expensive, prestige item). Named after its discoverer, the US social-critic Thorstein Bunde Veblen (1857-1929).

**Bandwagon Effect:**

A psychological theory where individuals will do something primarily because other individuals are doing it, regardless of their own beliefs, which they will ignore or override. This effect has the capability to produce wide implications,

but is most often seen in the areas of politics as well as in consumer behavior. For instance, in politics, individuals may vote for a candidate because he or she is most popular and the voters want to be considered as part of the majority. The term *bandwagon* means, to “jump on the bandwagon,” to follow what others are doing.

**Ignorance Effect:**

Consumers buy more at a higher price under the influence of the “ignorance effect”, where a commodity may be mistaken for some other commodity, due to deceptive packing, label, etc.

**Speculation:**

Marshall mentions speculation as one of the important exceptions to the downward sloping demand curve. According to him, the law of demand does not apply to the demand in a campaign between groups of speculators. When a group unloads a great quantity of a thing on to the market, the price falls and the other group begins buying it. When it has raised the price of the thing, it arranges to sell a great deal quietly. Thus when price rises, demand also increases.

**War:**

If shortage is feared in anticipation of war, people “may start buying for building stocks or for hoarding even when the” price rises.

**Depression:**

During a depression, the prices of commodities are very low and the demand for them is also less. This is because of the lack of purchasing power with consumers.

**Market Demand Curve**

The determination of price of a commodity is more interested in the estimation of size of total market demand for the commodity. Apart from the factors affecting individual’s demand such as price of a product, his income, prices of related commodities, individual’s preferences, market demand for a product depends on an additional factor, namely the number of consumers which in turn depends on the population of a region or city or country (for which demand is being

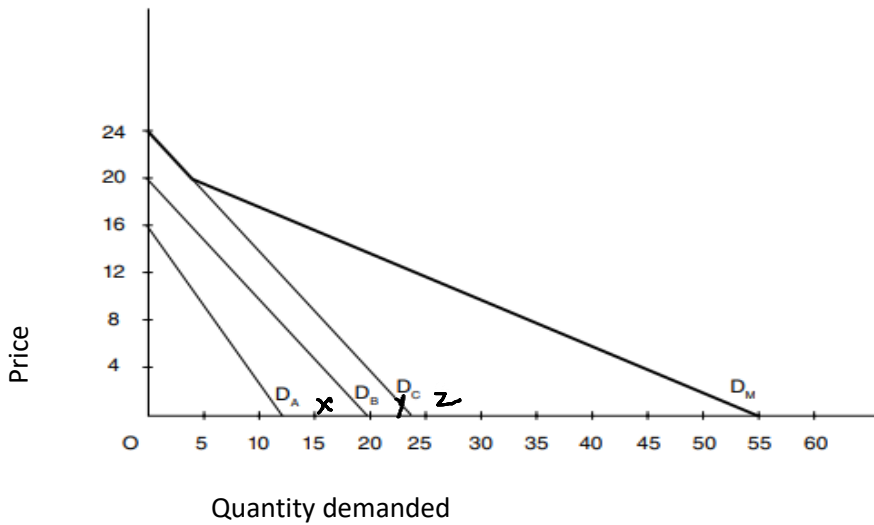
considered) who consume the product. Market demand refers to the quantity demanded in aggregate by individuals at different prices and time. Therefore, it demonstrates the demand of a product in the market at different prices. The market demand schedule can be derived by aggregating the individual demand schedules.

Table-2 represents the market demand schedule prepared through the individual demand schedule of three individuals:

<b>Table-2: Market Demand Schedule</b>				
<b>Price of A (per unit in ₹)</b>	<b>Individual Demand (per day)</b>			<b>Market Demand (per day)</b>
	<b>X</b>	<b>Y</b>	<b>Z</b>	
<b>4</b>	1	3	4	8
<b>3</b>	3	4	5	12
<b>2</b>	4	5	6	15
<b>1</b>	5	9	9	23

Market demand schedule also demonstrates an inverse relation between the quantity demanded and price of a product. It is important to note here that there is a significant difference between the individual demand curves and the market demand curves. The individual demand curves may not slope downward in case of many seasonal and occasional consumer goods, e.g., a book by an author, an umbrella, a cinema ticket for a show, or a passenger ticket. But market demand for all such goods slopes downward following the decrease in their prices because the fall in price causes increase in the number of consumers. In other words, even if individual demands are in the form of vertical lines, market demand curve slopes downward to the right.

**Figure: Market Demand Curve**



The market demand curve can be drawn straightaway by plotting the data in the last column of the above-mentioned Table. market demand curve can be derived graphically by horizontal summation of the individual demand curves at each price. Graphical derivation of the market demand curve is illustrated in figure. The individual demand curves of buyers x, y and z are shown by the demand curves  $D_x$ ,  $D_y$  and  $D_z$ , respectively. Horizontal summation of these demand curves produces weekly market demand curve as shown by the curve  $D_M$ . Thus, graphically, a market demand curve is horizontal summation of individual demand curves at different prices.

It is important to note here that there is a significant difference between the individual demand curves and the market demand curves. The individual demand curves may not slope downward in case of many seasonal and occasional consumer goods, e.g., a book by an author, an umbrella, a cinema ticket for a show, or a passenger ticket. But market demand for all such goods slopes downward following the decrease in their prices because the fall in price causes increase in the number of consumers. In other words, even if individual demands are in the form of vertical lines, market demand curve slopes downward

to the right.

### **Determinants of Market Demand**

Price of a product is the most important determinant of its market demand in the short run. In the long run, however, market demand for a product is determined by a number of other factors. We will discuss here some other important quantifiable and non-quantifiable determinants of demand for a product in the long run.

#### **i. Price of Substitutes and Complementary Goods.**

The demand for a commodity depends also on the prices of its substitutes and complementary goods. Two commodities are deemed to be substitutes for one another if (i) both the goods satisfy the same human need and (ii) change in price of one affects the demand for the other in the same direction. For instance, tea and coffee, hamburger and hot-dog, wheat and rice, alcohol and drugs are some common examples of common substitutes. By definition, the relation between demand for a product and price of its substitute is of positive nature. When price of a product (say, tea) falls (or increases), then the demand for its substitute (coffee) falls (or increases).

A commodity is deemed to be a complement of another when it complements the use of the other. For example, petrol is a complement to motor vehicles; butter and jam are complements to bread; milk and sugar are complement to tea and coffee and so on. As regard the relationship between the price of a good and the demand for its complement, an increase in the price of one causes a decrease in the demand for another. It implies that the nature of relationship between the complementary goods is similar to that between the demand for a normal good and its price. That is, there is an inverse relationship between the demand for a good and the price of its complement. For instance, an increase (or a decrease) in the price of petrol causes a decrease (or an increase) in the demand for car, other things remaining the same.

#### **ii. Consumers' Income and Engel Curves.**

Consumer income is the basic determinant of the quantity demanded of a

product. It is a common knowledge that the people with higher disposable income spend a larger amount on consumer goods and services than those with lower income. The relationship between income and consumer demand for goods and services was first studied by a German statistician, Ernst Engel; the nature and the slope of the Engel curve depend on the nature of the commodity—it varies from commodity to commodity. For the purpose of income–demand analysis, consumer goods and services may be grouped under four broad categories, viz. (a) essential goods; (b) normal goods; (c) inferior goods; and (d) prestige and luxury goods. The relationship between income and different kinds of goods is presented through the Engel curves.

### **iii. Consumer's Taste and Preference.**

Consumer's taste and preferences play an important role in determining the demand for a product. Taste and preferences depend, generally, on the social customs, religious values attached to a commodity, habits of the people, the general life-style of the society and also the age and sex of the consumers. Change in these factors changes consumers' taste and preferences. When there is a change in consumers' liking, tastes and preferences for certain goods and services following the change in fashion, people switch their consumption pattern from cheaper and old-fashioned goods over to costlier 'mod' goods, so long as price differentials commensurate with their preference. For example, preference for 'junk food' in the younger generation has increased as compared to normal home-made nutritious food. Consumers are prepared to pay higher prices for 'mod' goods even if their virtual utility is the same as that of old-fashioned goods. This fact reveals that tastes and preferences also influence demand for goods and services.

### **iv. Utility-Maximizing Behaviour.**

Most consumers have limited income to satisfy their unlimited wants. They spend their income on various goods they consume in such a manner that the total satisfaction derived out of their limited income is maximized. A consumer maximizes his total satisfaction or his total utility when marginal utility, per unit of expenditure, derived from each commodity is the same

#### **v. Consumers' Expectations.**

Consumers' expectations regarding the future course of economic events particularly expectations regarding changes in prices, income, and supply position of goods, etc., play an important role in determining the demand for goods and services in the short run. If consumers expect a rise in the price of a commodity, they would buy more of it at its current price, with a view to avoiding the pinch of price rise in future. On the contrary, if consumers expect prices of certain goods to fall, they postpone their purchases of such goods with a view to taking advantage of lower prices in future, mainly in case of non-essential goods. This behaviour of consumers reduces (or increases) the current demand for the goods whose prices are expected to decrease (or increase) in future. Similarly, an expected increase in income, say, on account of the announcement of revision of pay scales, dearness allowance, bonus, etc., induces increase in current purchase, and vice versa.

#### **vi. Demonstration Effect.**

When new commodities or new models of existing ones appear in the market, rich people buy them first. Some people buy new goods or new model of goods because they have genuine need for them while others buy because they want to exhibit their affluence. But once new commodities come in vogue, many households buy them, not because they have a genuine need for them but because others or neighbours have bought these goods. The purchase by the latter category of buyers is made out of such feelings as jealousy, competition, equality in the peer group, social inferiority and the desire to raise social status. Purchases made on account of these factors are the result of 'Demonstration Effect' or the 'Bandwagon Effect'. These effects have a positive effect on the demand. On the contrary, when a commodity becomes the thing of common use, some people, mostly rich, decrease or give up the consumptions of such goods. This is known as 'Snob Effect'. It has a negative effect on the demand for the related goods.

#### **vii. Consumer-Credit Facility.**

Availability of credit to the consumers from the sellers, banks, relations and

friends or from any other source encourages the consumers to buy more than what they would buy in the absence of credit facility. That is why the consumers who can borrow more consume more than those who can borrow less or cannot borrow at all. Credit facility affects mostly the demand for consumer durables, particularly those which require bulk payment at the time of purchase. For example, the rapid increase in demand for cars and residential flats in 2008 was due mainly to large availability of loans from both public and private sector banks.

#### **viii. Population of the Country.**

The market demand for a product depends also on the size of population. Given the price, per capita income, taste and preferences, etc., the larger the population, the larger the demand for a product of common use. With increase in population, employment percentage remaining the same, demand for the product increases. The relation between market demand for a product (normal) and the size of population is similar to the income–demand relationship.

#### **ix. Distribution of National Income.**

The distribution pattern of national income also affects the market demand for different kinds of goods. If national income is evenly distributed, market demand for normal goods will be the largest. If national income is unevenly distributed, i.e., if majority of population belongs to the lower income groups, market demand for essential goods will be the largest whereas the same for other kinds of goods will be relatively low.

### **Shifts in Demand Curve**

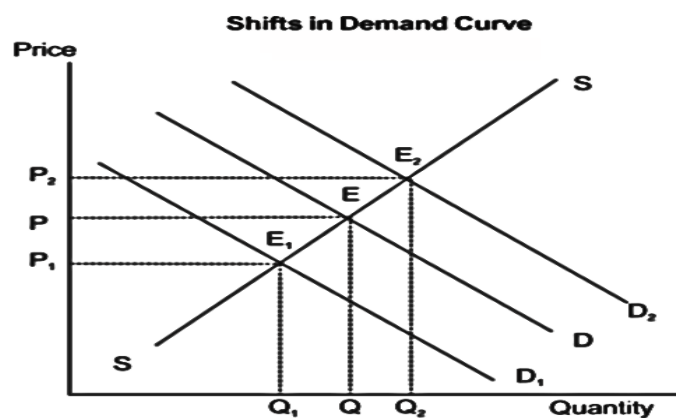
Shifts in a price-demand curve may take place owing to the change in one or more non-price determinants of the demand for a commodity. It is important for the business decision-makers to bear in mind the distinction between changes in demand due to: (i) shift in price-demand curve; and (ii) movement along the demand curve. In the former case, additional demand is obtained at the cost of some revenue. In the latter case, demand increases due to a shift in the demand curve on account of some other factors, such as increase in consumer's income,

increase in the price of substitutes, increase in population, etc. This kind of increase in demand results in increase in revenue. However, in case the demand curve is made to shift through advertisement or other sales promotion devices, the additional demand is not free of cost. Moreover, it is the latter kind of increase in demand which is hoped for and attempted by business firms.

**Increase and Decrease vs Extension and Contraction of Demand:**

Economists sometimes make a distinction between: (a) increase and decrease in demand, and (b) extension and contraction in demand. Increase and decrease in demand are associated with non-price-quantity relationships of demand whereas extension and contraction of demand are associated with the price-quantity relationship of demand.

The ‘other things’ that affect demand are also called as the determinants of demand. They include income of the consumer, tastes, prices of substitutes and many more. Changes in these determinants will change demand independently of price. If income of the consumer increases, they will buy more irrespective of the price. Similarly, a fall in income will bring a fall in demand even if there is no change in price.



From the above figure, D is the original demand curve with equilibrium price P and quantity Q. Any change in the determinants of demand like income and tastes will shift the demand curve. For instance, a fall in the income of consumer shifts the demand curve D to D<sub>1</sub> and the new equilibrium would be at point E<sub>1</sub>.

similarly any increase in income shifts the demand curve from D to D<sub>2</sub>. The equilibrium also moves from point E<sub>1</sub> to E<sub>2</sub>

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

### **Elasticity of Demand**

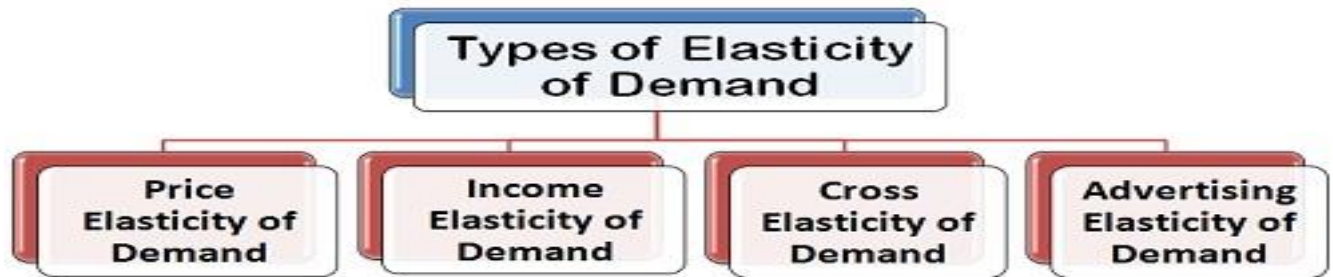
The law of demand tells us the *direction of change*. Elasticity of demand tells us about *quantum of change*. The relationship between small changes in price and the consequent changes in the amount demanded is known as **Elasticity of Demand**.

There are various other concepts of demand elasticity. As we have seen in the previous chapter, demand for a good is determined by its price, income of the people, prices of related goods, etc. Quantity demanded of a good will change as a result of change in any of these determinants of demand. The concept of elasticity of demand therefore refers to the degree of responsiveness of quantity demanded of a good to a change in its price, consumers' income and prices of related goods. Accordingly, there are three concepts of demand elasticity price elasticity, income elasticity, and cross elasticity. Price elasticity of demand relates to the degree of responsiveness of quantity demanded of a good to the change in its price. Income elasticity of demand refers to the sensitiveness of quantity demanded to a change in consumers' income. Cross elasticity of demand means the degree of responsiveness of demand of a good to a change in the price of a related good,

which may be either a substitute for it or a complementary with it. The concept of elasticity of demand has a very great importance in economic theory as well as formulation of suitable economic policies. According to Stonier and Hague, "Elasticity of demand is a technical term used to describe the **degree of responsiveness** of the demand for a commodity to a fall in its price."

## Types of Elasticity of Demand

Elasticity of demand is primarily related to extension or contraction of demand for a fall or rise in price. Hence it is referred to as Price Elasticity of Demand. However modern economists have extended this concept still further and we have Income Elasticity and Cross Elasticity of Demand as well.



### Price Elasticity of Demand

As mentioned above, price elasticity of demand indicates the degree of responsiveness of quantity demanded of a good to the change in its price, other factors such as consumers' income, prices of related commodities that determine demand are held constant. Precisely, price elasticity of demand is defined as the ratio of the percentage change in quantity demanded of a commodity to a given percentage change in price. Thus, the price elasticity of demand, commonly known as the elasticity of demand refers to the responsiveness and sensitiveness of demand for a product to the changes in its price. In other words, the price elasticity of demand is equal to

$$E_p = \frac{\text{Proportionate change in Quantity Demanded}}{\text{Proportionate change in Price}}$$

Numerically

$$E_p = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

Where  $E_p$  stands for price elasticity;  $q$  stands for quantity;  $p$  stand for price; and  $\Delta$  stand for small change.

However, it may be noted that a convention has been adopted in economics that price elasticity be expressed with a positive sign despite the fact that change in price and change in quantity demanded are inversely related to each other. This is because we are interested in measuring the magnitude of responsiveness of quantity demanded of a good to changes in its price. It follows from the above definition of price elasticity of demand that when the percentage change in quantity demanded a commodity is greater than the percentage change in price that brought it about, price elasticity of demand ( $e_p$ ) will be greater than one and in this case demand is said to be elastic. On the other hand, when a given percentage change in price of a commodity leads to a smaller percentage change in quantity demanded, elasticity will be less than one and demand in this case is said to be inelastic. Further, when the percentage change in quantity demanded of a commodity is equal to the percentage change in price that caused it, price elasticity is equal to one. Thus, in case of elastic demand, a given percentage change in price causes quite a large change in quantity demanded. And in case of inelastic demand, a given percentage change in price brings about a very small change in quantity demanded of a commodity. It is a matter of common knowledge and observation that there is a considerable difference between different goods in regard to the magnitude of response of demand to the changes in price. The demand for some goods is more responsive to the changes in price than those for others. In terminology of economics, we would say that demand for some goods is more elastic than those for the others or the price elasticity of demand of some goods is greater than those of the others. Marshall<sup>1</sup> who introduced the concept of elasticity into economic theory remarks that the elasticity or responsiveness of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price.

It should, however, be noted that terms elastic and inelastic demand are used in the relative sense. In other words, elasticity is a matter of degree only. Demand for some goods is only more or less elastic than others. Thus, when we say that demand for a good is elastic, we mean only that the demand for it is relatively

more elastic. Likewise, when we say that demand for a goods is inelastic, we do not mean that its demand is absolutely inelastic but only that it is relatively less elastic. In economic theory, elastic and inelastic demands have come to acquire precise meanings. Demand for a goods is said to be elastic if price elasticity of demand for it is greater than one. Similarly, the demand for a goods is called inelastic if price elasticity of demand for it is less than one. Price elasticity of demand equal to one, or in other words, unit elasticity of demand therefore represents the dividing line between elastic and inelastic demands. It will now be clear that by inelastic demand we do not mean perfectly inelastic but only that price elasticity of demand is less than unity, and by elastic demand we do not mean absolutely elastic but that price elasticity of demand is greater than one. In price causes quite a large change in quantity demanded. And in case of inelastic demand, a given percentage change in price brings about a very small change in quantity demanded of a commodity.

<b>TYPES OF PRICE</b>		<b>DESCRIPTION</b>
<b>E.D</b>		
<b>Elastic Demand</b>	$E_p > 1$	Demand is said to be elastic if the change in price causes a more than proportionate change in quantity demanded
<b>Inelastic Demand</b>	$E_p < 1$	When the change in price causes a less than proportionate change in quantity demanded, demand is inelastic.
<b>Unit elasticity of Demand</b>	$E_p = 1$	When the change in price causes the same proportionate change in quantity demanded, demand has unit elasticity.
<b>Perfectly Elastic Demand</b>	$E_p = \infty$	When a slight change in price causes a great change in quantity demanded, the value of elasticity of demand tends to be infinity and demand is said to be infinite or perfectly elastic.

<b>Perfectly Inelastic Demand</b>	$E_P = 0$	If quantity demanded becomes completely unresponsive to price changes, the coefficient tends to be zero.
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### 1.0 Cross Elasticity of Demand

The cross elasticity of demand refers to the change in quantity demanded for one commodity as a result of the change in the price of another commodity. This type of elasticity usually arises in the case of the interrelated goods such as substitutes and complementary goods. The cross elasticity of demand for goods X and Y can be expressed as:

$$E_c = \frac{\text{Proportionate Change in Purchase of Commodity X}}{\text{Proportionate change in the Price of Commodity Y}}$$

If two commodities are said to be complementary, the price of one commodity falls, then the demand for other increases, on the contrary, if the price of one commodity rises the demand for another commodity decreases. *For example, petrol and car are complementary goods.*

While the two commodities are said to be substitutes for each other, the price of one commodity falls, the demand for another commodity also decreases, on the other hand, if the price of one commodity rises the demand for the other commodity also increases. *For example, petrol and diesel are substitute goods.*

The same formula is used to measure the cross-elasticity of demand for a good in response to change in the price of its complementary goods. Electricity to electrical gadgets, petrol to automobile, butter to bread, sugar and milk to tea and coffee, are the examples of complementary goods. It is important to note here that when two goods are substitutes for each other, their demand has a positive cross-elasticity because increase in the price of one increases the

demand for the other. But, the demand for complementary goods has negative cross-elasticity, for increase in the price of a good decreases the demand for its complementary goods. Another important aspect of cross-elasticity is that if cross-elasticities between any two goods are positive, the two goods can be treated as substitutes for each other. Also, the higher the cross-elasticity, the closer the substitute. Similarly, if cross-elasticity of demand for any two related goods is negative, the two may be considered as complementary for each other: the higher the negative cross-elasticity, the higher the degree of complementarity.

### **Income Elasticity of Demand**

The income is the other factor that influences the demand for a product. Hence, the degree of responsiveness of a change in demand for a product due to the change in the income is known as income elasticity of demand. The formula to compute the income elasticity of demand is:

$$E_y = \frac{\text{Percentage Change in Demand for a product}}{\text{Percentage Change in Income}}$$

Unlike price elasticity of demand (which is negative except in case of Giffen goods), income elasticity of demand has a positive sign because there is a positive relationship between the income and the quantity demanded of a product. There is an exception to this rule. Income elasticity of demand for an inferior good is negative, because of negative income effect. The demand for inferior goods decreases with increase in consumer's income and vice versa. When income increases, consumers switch over to the consumption of superior commodities. That is, they substitute superior goods for inferior ones. For instance, when income rises, people prefer to buy more of rice and wheat and less of inferior food grains like bajra, ragi, etc. and use more of taxi and less of bus service and so on.

Income elasticity of demand for different categories of goods may, however, vary from household to household and from time to time, depending on choice, taste

and preference of the consumers; levels of their consumption and income; and their susceptibility to ‘demonstration effect’. The other factor which may cause deviation from the general pattern of income elasticities is the frequency of increase in income. If income increases regularly and frequently, income elasticities will conform to the general pattern, otherwise not.

Some important uses of income elasticity are following:

First, the concept of income elasticity can be used to estimate the future demand for a product provided the rate of increase in income and income elasticity of demand for the product are known. The knowledge of income elasticity can be used for forecasting demand, when a change in personal income is expected, other things remaining the same.

Secondly, the concept of income elasticity can also be used to define the ‘normal’ and ‘inferior’ goods. The goods whose income elasticity is positive for all levels of income are termed as ‘normal goods’. On the other hand, the goods for which income elasticities are negative, beyond a certain level of income, are termed as ‘inferior goods’

<b>TYPES OF INCOME E.D</b>		<b>DESCRIPTION</b>
<b>Zero Income Elastic</b>	$E_y = 0$	No effect of increase in consumer’s income on the demand of product.
<b>Negative Income elasticity Demand</b>	$E_y < 0$	Income elasticity of demand in which the demand for a product decreases with increase in consumer’s income.
<b>Unitary Income Elasticity of Demand</b>	$E_y = 1$	The proportionate change in the quantity demanded is equal to proportionate change in income.
<b>Income Elasticity of Demand Greater than One</b>	$E_y > 1$	The proportionate change in the quantity demanded is more than proportionate change in income.
<b>Income Elasticity of Demand is less than one</b>	$E_p < 1$	The proportionate change in, the quantity demanded is less than proportionate change in income.

### **Advertising Elasticity of Demand:**

The responsiveness of the change in demand to the change in advertising or rather promotional expenses, is known as advertising elasticity of demand. In other words, the change in the demand as a result of the change in advertisement and other promotional expenses is called as the advertising elasticity of demand. It can be expressed as:

$$E_a = \frac{\text{Proportionate change in Demand}}{\text{Proportionate change in Advertising Expenditure}}$$

Numerically,

$$E_a = \frac{\frac{Q_2 - Q_1}{Q_2 + Q_1}}{\frac{A_2 - A_1}{A_2 + A_1}}$$

Where,  $Q_1$  = Original Demand ,  $Q_2$ = New Demand,  $A_1$ = Original Advertisement Outlay,  $A_2$  = New Advertisement Outlay

### **Methods of Measuring Price Elasticity of Demand**

The price elasticity of demand, commonly known as the elasticity of demand refers to the responsiveness and sensitiveness of demand for a product to the changes in its price. There are various methods of measuring price elasticity of demand. Two major methods are

- 1. Arc Elasticity Method.**
- 2. Total Outlay (Expenditure) Method.**

#### **Measurement of Price Elasticity of Demand -Arc Method**

When price elasticity of demand is measured between any two finite points on a demand curve, it is called arc elasticity and elasticity measured at a point on the demand curve is called point elasticity. As noted above, the elasticity of demand measures the percentage change in the quantity demanded due to a certain percentage change in price. The percentage change in price may be considerably

high (e.g., 10 per cent, 20 per cent or even higher) or it may be very small—so small that it is not significantly different from zero. When change in price is significantly high, it shows a movement from one point on the demand curve to another point, making an arc. Therefore, the price elasticity measured for a considerably high change in price is called arc elasticity of demand. And, when price elasticity is measured for very small changes in price—not significantly different from zero—it is called point elasticity.

According to Prof. Baumol: “Arc elasticity is a measure of the average responsiveness to price change exhibited by a demand curve over some finite stretch of the curve”. This method is used to find out price elasticity of demand over a certain range of price and quantity. Thus, this method is applied while calculating PED when price or quantity demanded of the commodity is highly changed.

To calculate the Arc Price Elasticity of Demand we use the formulas:

$$\text{PED} = \frac{\% \text{ Change in Quantity Demanded}}{\% \text{ Change in Price}}$$

$$\% \text{ Change in Quantity Demanded} = \frac{\text{New Demand} - \text{Old Demand}}{\text{Old Demand} + \text{New Demand}} * 100$$

$$\% \text{ Change in Price} = \frac{\text{New Price} - \text{Old Price}}{\text{Old Price} + \text{New Price}} * 100$$

$$\% \text{ Change in Price} = \frac{\text{New Price} - \text{Old Price}}{\text{Old Price} + \text{New Price}} * 2$$

This Method is also known as “Average Elasticity”. The use of arc elasticity concept involves a risk of misinterpretation because the measure of arc elasticity between any two finite points on a demand curve produces two different elasticity coefficients for the same fall and rise in price in other words, the arc elasticity coefficient varies between the same two finite points on a demand curve when the direction of change in price is reversed.

### Total Expenditure Method

Marshall offered the method of total revenue or total outlay for estimating elasticity of demand. What the sellers receive from the sale of commodities is called total expenditure or outlay of buyers. There is no difference between total revenue and total outlay since what is spent by the buyers is received as income by the sellers. Thus, total outlay/revenue is the price multiplied by the quantity purchases, i.e.,  $TR = P \times Q$ .

Cases	Price (P)	Quantity demanded (Q)	Total outlay or expenditure (E = PXQ)	Price elasticity of demand (PED)
I	6	1	6	PED = 10/6, > 1
	5	2	10	
II	4	3	12	PED = 12/12, = 1
	3	4	12	
III	2	5	10	PED = 6/10, < 1
	1	6	6	

While comparing the expenditure, we may get one of three outcomes. They are  
*Elasticity of demand will be greater than unity ( $E_p > 1$ )*

*When total expenditure increases with fall in price and decreases with rise in price, the value of PED will be greater than 1. Here, rise in price and total outlay or expenditure move in opposite direction.*

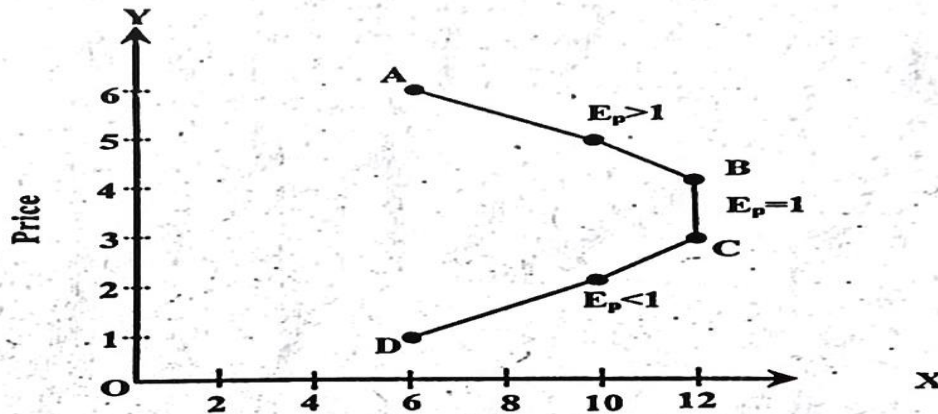
*Elasticity of demand will be equal to unity ( $E_p = 1$ )*

*When total expenditure on commodity remains unchanged in response to change in price of the commodity, the value of PED will be equal to 1.*

Elasticity of demand will be less than unity ( $E_p < 1$ )

When total expenditure decreases with fall in price and increases with rise in price, the value of PED will be less than 1. Here, price of commodity and total outlay move in same direction.

When the information from the above table is plotted in the graph, we get graph like the one shown below.



- In the graph, total outlay or expenditure is measured on the X-axis while price is measured on the Y-axis.
- In the figure, the movement from point A to point B shows elastic demand as we can see that total expenditure has increased with fall in price.
- The movement from point B to point C shows unitary elastic demand as total expenditure has remained unchanged with the change in price.
- The movement from point C to point D shows inelastic demand as total expenditure as well as price has decreased.

Total outlay method of measuring price elasticity of demand does not provide us exact numerical measurement of elasticity of demand but only indicates if the demand is elastic, inelastic or unitary in nature. Therefore, this method has limited scope.

### **Determinants of Price Elasticity of Demand**

Price elasticity of demand (PED) measures how responsive the quantity demanded of a good is to changes in its price. Several factors influence the elasticity:

- a. Nature of the Good
  - a. Necessities (e.g., food, medicine) tend to have inelastic demand, while luxuries (e.g., high-end gadgets) have elastic demand.
- b. Availability of Substitutes
  - a. Goods with close substitutes (e.g., tea and coffee) typically have elastic demand as consumers can switch to alternatives if prices rise.
- c. Proportion of Income Spent
  - a. Expensive goods that consume a larger portion of income (e.g., cars) have more elastic demand, while cheaper items (e.g., salt) are less elastic.
- d. Time Period
  - a. Demand tends to be more elastic over the long run as consumers adjust their behavior, while in the short run, it may be inelastic.
- e. Habitual Consumption
  - a. Goods that form consumption habits (e.g., cigarettes) tend to have inelastic demand as consumers are less responsive to price changes.
- f. Definition of the Market
  - a. Broadly defined markets (e.g., food) have inelastic demand, whereas narrowly defined markets (e.g., a specific brand of cereal) tend to have elastic demand.
- g. Durability of the Good
  - a. Durable goods (e.g., appliances) have elastic demand as consumers can postpone purchases, while perishable goods are more inelastic.
- h. Availability of Complementary Goods
  - a. The demand for goods that rely on complementary products may be less elastic if substitutes are unavailable.

Understanding these determinants helps businesses and policymakers predict consumer behavior and make informed pricing and policy decisions.

## **Importance of Elasticity of Demand**

Price elasticity of demand is a very important concept. Its importance can be realized from the following points:

**i. International trade:** In order to fix prices of the goods to be exported, it is important to have knowledge about the elasticity's of demand for such goods. A country may fix higher prices for the products with inelastic demand. However, if demand for such goods in the importing country is elastic, then the exporting country will have to fix lower prices.

**ii. Formulation of Government Policies:** The concept of price elasticity of demand is important for formulating government policies, especially the taxation policy. Government can impose higher taxes on goods with inelastic demand, whereas, low rates of taxes are imposed on commodities with elastic demand.

**iii. Factor Pricing:** Price elasticity of demand helps in determining price to be paid to the factors of production. Share of each factor in the national product is determined in proportion to its demand in the productive activity. If demand for a particular factor is inelastic as compared to the other factors, then it will attract more rewards.

**iv Decisions of Monopolist:** A monopolist considers the nature of demand while fixing price of his product. If demand for the product is elastic, then he will fix low price. However, if demand is inelastic, then he is in a position to fix a high price.

**v. Paradox of poverty amidst plenty:** A bumper crop, instead of bringing prosperity to farmers, brings poverty. This is called the paradox of poverty amidst plenty. It happens due to inelastic demand for most of the agricultural products. When supply of crops increases as a result of rich harvest, their prices drastically fall due to inelastic demand. As a result, their total income goes down.

## **Application of Price Elasticity of Demand**

The following points highlight the nine main practical applications of the concept of price elasticity of demand. The uses are: 1. Effects of changes in price upon demand 2. Effects of changes in price on revenue 3. Monopoly pricing 4. Price discrimination 5. Importance in taxation

**i. Effects of Changes in Price Upon Demand:**

The concept is very useful to study the reactions of the demand for a commodity to the changes in its price. If the demand is elastic, a small change in the price brings about a considerable change in the quantity demanded, but in the case of inelastic demand this consequential change in demand is relatively small. So, the concept is relevant to the decisions relating to business pricing and profits.

**ii. Effects of Changes in Price on Revenue:**

The concept enables us to determine the condition of equilibrium of a firm. And a profit-maximising firm reaches equilibrium when revenue = marginal cost.

**And, the value assumed by MR depends on price elasticity of demand.**

**iii. Monopoly Pricing:**

The concept is useful in monopoly price- decisions. The monopolist, being the sole supplier of a particular commodity, can raise price but cannot affect demand pattern of consumers. So, in fixing the price the monopolist will have, of necessity, to take note of the elasticity of demand for his product. He will fix the price at a low level when the demand is elastic and at a high level when it is inelastic.

**iv Price Discrimination:**

In perfect competition, the same price is charged from all the buyers. But, the downward slope of the demand curve of the monopolist gives scope for price discrimination. Price discrimination refers to the practice of charging different prices for the same product from different buyers at the same time. It can be profitably practised only when price elasticity of demand differs from market to market or from one segment of the market to another.

### ***v. Importance in Taxation:***

Furthermore, the concept is a useful tool in taxation. A finance minister is to consider the elasticity of demand of the different commodities for the purpose of taxation. If he pushes commodity tax rates up too much the consequent increase in price may make the total tax yield even lower than before. On the other hand, a small tax reduction may result in an increase in the tax yield.

### **Demand Forecasting**

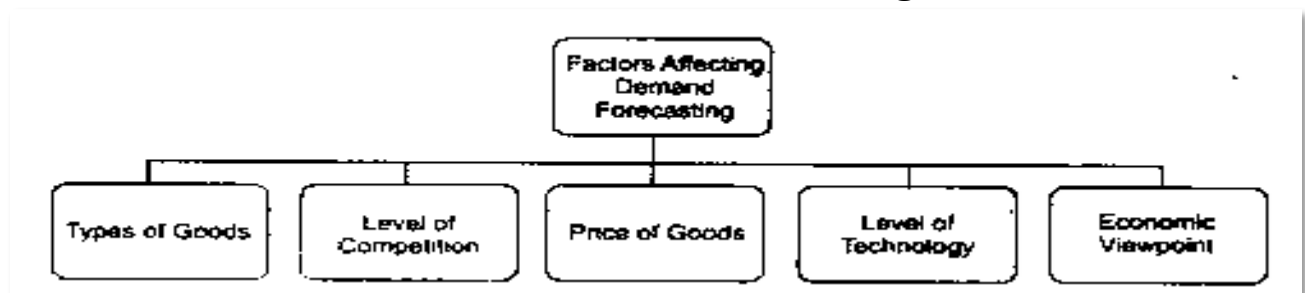
Forecasting demand denotes an estimation of the level of demand of the product at a future period under given circumstances. It is an **“Objective assessment of the future course of demand”**.

Demand forecasting is of great importance in business planning and the entrepreneurs have to plan for the future business by estimating the future situation. This is essential for a firm to enable it to produce the required quantities at the right time and push them in the market.

### **Factors Involved In Demand Forecasting**

Demand forecasting is a proactive process that helps in determining what products are needed where, when, and in what quantities. There are a number of factors that affect demand forecasting.

### **Some of the factors that influence demand forecasting are**



### **Types of Goods:**

Types of Goods affect the demand forecasting process to a larger extent. Goods can be producer's goods, consumer goods, or services. Apart from this, goods can be established and new goods. Established goods are those goods which already exist in the market, whereas new goods are those which are yet to be introduced in the market.

Information regarding the demand, substitutes and level of competition of goods is known only in case of established goods. On the other hand, it is difficult to forecast demand for the new goods. Therefore, forecasting is different for different types of goods.

**Competition Level:**

Competition level influences the process of demand forecasting. In a highly competitive market, demand for products also depends on the number of competitors existing in the market. Moreover, in a highly competitive market, there is always a risk of new entrants. In such a case, demand forecasting becomes difficult and challenging.

**Price of Goods:**

Price of goods acts as a major factor that influences the demand forecasting process. The demand forecasts of organizations are highly affected by change in their pricing policies. In such a scenario, it is difficult to estimate the exact demand of products.

**Level of Technology:**

Level of technology constitutes an important factor in obtaining reliable demand forecasts. If there is a rapid change in technology, the existing technology or products may become obsolete. For example, there is a high decline in the demand of floppy disks with the introduction of compact disks (CDs) and pen drives for saving data in computer. In such a case, it is difficult to forecast demand for existing products in future.

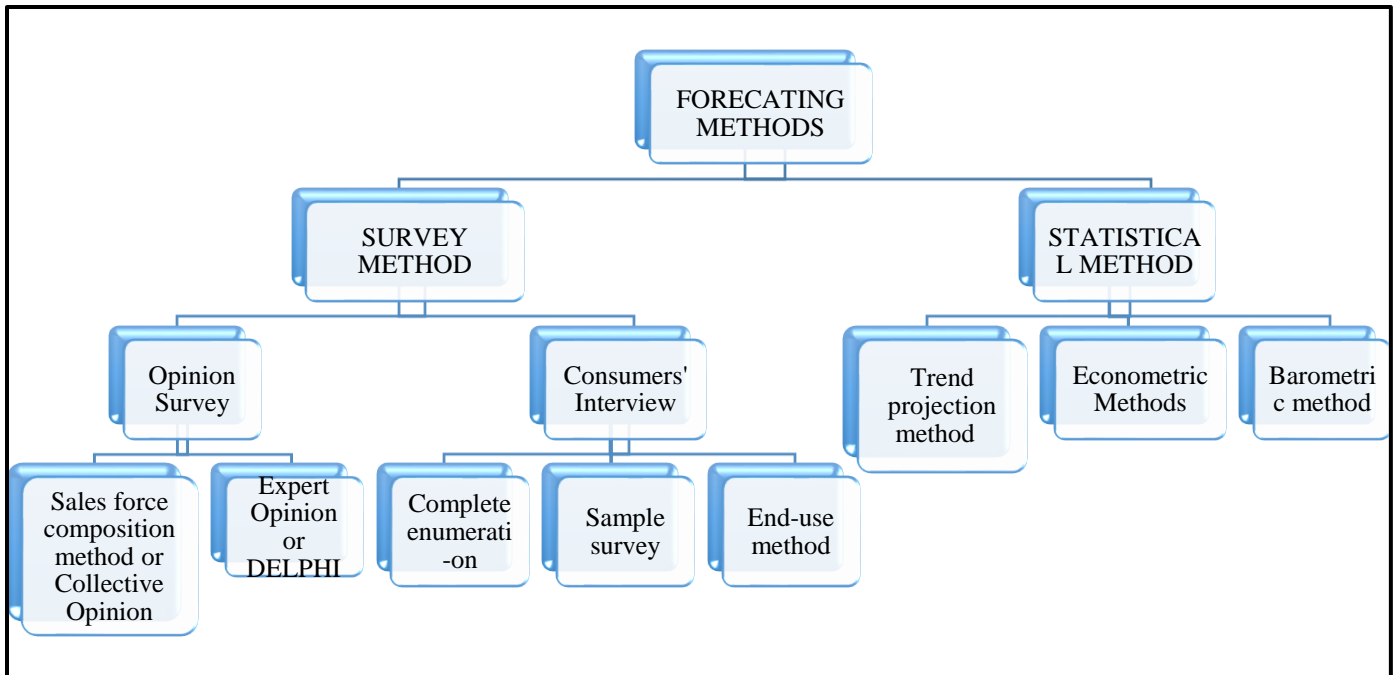
**Economic Viewpoint:**

Economic Views play a crucial role in obtaining demand forecasts. For example, if there is a positive development in an economy, such as globalization and high level of investment, the demand forecasts of organizations would also be positive.

**Methods Of Demand Forecasting**

There are several methods of demand forecasting applied in terms of; the purpose of forecasting, data required, data availability and the time frame within which the demand is to be forecasted. Each method varies from one another and hence the forecaster must select that method which best suits the requirement.

**The methods of forecasting can be classified into two broad categories:**



**SURVEY METHOD:**

Under the survey method, the consumers are contacted directly and are asked about their intentions for a product and their future purchase plans. This method is often used when the forecasting of a demand is to be done for a short period of time. **The survey method includes:**

1. **Opinion Survey**
2. **Consumer's Interview**

**Opinion Survey:** Under opinion method, opinion can be taken from Sales – Force-Composite method or Collective opinion method and expert opinion.

**Sales force composite method,** the expert salesmen are required to estimate the expected sales in their respective areas. The advantages of this method are its simplicity and its straight forwardness and also it involves minimum statistical work.

**Expert Opinion method,** Apart from company salesmen and consumers, others like distributors or outside experts may also be made use of in forecasting. This method is also called DELPHI method. Firms in advanced countries also take the services of outside experts for making assessment of future demand.

**Consumer's Interview Method:** In this method, forecasting is done by directly interviewing the consumers and asking them about their plans and preferences regarding the consumption of the product. This is done either by interviewing all the consumers or a selected group of consumers. It is very costly and difficult method.

Consumers' survey method may be of three types, viz.,

- i) ***Complete enumeration method:*** According to this method, an interview of all the consumers of the product under forecast is taken. The sum total of individual expected demands gives the demand forecast for the product.
- ii) ***Sample Survey Method:*** When there is a large number of consumers, sample survey method is used by selecting a sample of consumers for interview. This sampling may be random or stratified sampling.
- iii) ***End-Use Method:*** In order to make demand forecast for industrial materials this method is used. In this method we find out the demand for the end-use of the product and obtain demand separately for different sectors.

### **Statistical Methods**

The statistical methods are often used when the forecasting of demand is to be done for a longer period. The statistical methods utilize the time-series (historical) and cross-sectional data to estimate the long-term demand for a product. The statistical methods are used more often and are considered superior than the other techniques of demand forecasting due to the following reasons:

- There is a minimum element of subjectivity in the statistical methods.
- The estimation method is scientific and depends on the relationship between the dependent and independent variables.
- The estimates are more reliable
- Also, the cost involved in the estimation of demand is the minimum.

**The statistical methods include:**

***Trend Projection Methods:*** The past data is accumulated and this data is analyzed in order to establish the nature of trend in sales over a period, so possible trend in the future can be inferred.

***Barometric Methods:*** In this method events of the present are used to predict the directions of change in future

***Econometric Methods:*** We discover the nature and extent of relationships between the variables by means of statistical and econometric techniques.

These are the different kinds of methods available for demand forecasting. A forecaster must select the method which best satisfies the purpose of demand forecasting.

### **Demand Forecasting for New Product**

Forecasting demand for 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. Below are few approaches given by Joel Dean:

#### ***Substitute Approach***

It is based on the assumption that a new product will be analyzed as a substitute of an existing product. In this method, the demand of substitute product is analyzed and on the basis of such analysis (or survey) forecasts are made for the new product to be introduced in the market.

#### ***Evolutionary Approach***

This method of sales forecasting is based on the assumption that the new product will be considered an improvement over existing products. It is further assumed that the new product can follow some life-cycles as of existing products. The sales of existing product are analyzed and efforts are made to forecast the sales of the new product of the enterprise on this basis.

#### ***Growth curve approach:***

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 ponds powder will give an idea as to how a new cosmetic will be received in the market.

***Opinion Poll approach:***

The demand for the new product will be estimated by making direct enquiries from the ultimate customers. This is done by sample survey method.

***Vicarious approach (or Experts' opinion)***

This approach of sales forecasting of new product is based on the opinion of experts in the field of marketing, who know the needs, desires, tastes and preferences of customers. Experts are contacted and their opinions are collected regarding the utilities and possible demand of the product. Sales forecasts are prepared on the basis of opinion of these experts.

***Sales experience approach (or Market test method)***

In this method, the new product is offered for sale in a sample market for a fixed period. The results of the sales of the product are considered to be the base of forecasting the demand for the new product. The results of sales of the product in these segments are collected and deeply analyzed.

**Consumer Durables:**

Consumer goods, also known as final goods, are those tangible goods which are ready for consumption or purchased by individuals or households for final consumption to satisfy their wants. Consumer goods are further sub-divided into durable goods, nondurable goods and services.

**Consumer durables** are a category of consumer products that do not have to be purchased frequently because they are made to last for an extended period of time

**Capital Goods:**

Capital goods, alternately known as intermediate or producer goods, are the goods which are deployed by the organization as input in the production of consumer goods and services, such as plant and machinery, equipment, furniture, vehicles, office building.

The purchase of capital goods is an important expense for business as they require huge capital investment, whose benefit is received over the years.

**Difference Between Consumer Durables And Capital Goods:**

<b>Basis For Comparison</b>	<b>Consumer Durables</b>	<b>Capital Goods</b>
Meaning	Goods that are used by the end user that are made to last for a long period called consumer durables.	Goods that are deployed to produce consumer goods is called capital goods.
Marketing	Business to Consumer	Business to Business
Purpose	Bought for personal consumption.	Bought for making other products.
Buyer	Consumer	Manufacturers
Demand	High	Comparatively less
Price determination	By suppliers	By companies

### **Key Glossaries**

- **Demand:** The quantity of a good or service that consumers are willing and able to purchase at various price levels over a period.
- **Types of Demand:**
- **Individual Demand:** The demand of a single consumer for a particular good or service.
- **Market Demand:** The total demand for a product from all consumers in a market.
- **Joint Demand:** Demand for products that are used together (e.g., printers and ink cartridges).
- **Composite Demand:** Demand for a product that has multiple uses (e.g., milk for drinking, butter, cheese).

- **Derived Demand:** Demand for a good that arises from the demand for another good (e.g., demand for labor depends on demand for goods produced by labor).
- **Factors Influencing Demand:** Elements that affect the level of demand, such as income, consumer preferences, prices of related goods, expectations, and the number of consumers.
- **Law of Demand:** A fundamental principle that states that, ceteris paribus (other things being equal), the quantity demanded of a good falls as the price of the good rises, and vice versa.
- **Shifts in the Demand Curve:**
- **Rightward Shift:** Indicates an increase in demand due to factors such as rising income or a preference change in favor of the good.
- **Leftward Shift:** Indicates a decrease in demand due to factors such as a decrease in income or a preference change against the good.
- **Elasticity of Demand:** A measure of the responsiveness of quantity demanded to changes in price, income, or prices of other goods.
- **Price Elasticity of Demand:** Measures the responsiveness of quantity demanded to a change in price.
- **Income Elasticity of Demand:** Measures the responsiveness of demand to changes in consumer income.
- **Cross Elasticity of Demand:** Measures the responsiveness of demand for one good to the price change of another good.
- **Demand Forecasting:** The process of estimating future demand for a product or service based on past data, trends, and other influencing factors.

### Short Questions

1. What is the Law of Demand?
2. Define elasticity of demand.
3. What causes a shift in the demand curve?
4. Explain derived demand with an example.
5. What factors influence market demand?

### Brief Questions

1. Define demand and explain its types.
2. Identify the factors that influence demand.
3. Describe the Law of Demand.
4. Distinguish between a movement along the demand curve and a shift in the demand curve.
5. Explain elasticity of demand and its types.
6. Discuss the importance of demand forecasting

### Detailed Questions

1. Explain the Law of Demand in your own words.
2. Why do changes in factors such as income and preferences shift the demand curve?
3. Describe the concept of elasticity of demand and differentiate between its types.
4. Apply the Law of Demand to a real-world example where the price of a product affects its demand.
5. How would you apply the concept of elasticity of demand in deciding the price of a new product?
6. How can a business use demand forecasting to improve sales?

**SUPPLY ANALYSIS**

Supply and demand are two important concepts that link the market behavior of the consumer with price. **Supply** is the producer's willingness and ability to supply a given good at various price points, holding all else constant. An increase in price will increase producers' revenues, so they'll be willing to supply more; a decrease in price will reduce revenues, and so producers will supply less. This means that 'supply' refers to total supply offered for sale at a price, by retailers and wholesalers.

*Supply is defined as "How much of a good will be offered for sale at given time."*

**Factors Affecting Supply**

Factors influencing supply refer to various elements that affect the quantity of a product or service that producers are willing and able to sell at different prices. These factors include:

1. **Price of the Good or Service:** The primary factor influencing supply. As the price increases, producers are typically willing to supply more of the good or service, and vice versa.
2. **Production Costs:** Includes the cost of raw materials, labor, and other inputs. If production costs rise, the supply may decrease since it becomes more expensive to produce the good or service.
3. **Technology:** Advancements in technology can reduce production costs or increase efficiency, leading to an increase in supply.
4. **Number of Suppliers:** The more suppliers in the market, the greater the supply. If new firms enter the market, the supply increases.
5. **Government Policies:** Taxes, subsidies, and regulations can influence supply. For example, a subsidy might increase supply, while a tax could decrease it.

6. **Expectations of Future Prices:** If producers expect prices to rise in the future, they might hold back supply now to sell at a higher price later, and vice versa.
7. **Natural Conditions:** Weather, natural disasters, and other environmental factors can affect supply, especially in industries like agriculture.
8. **Price of Related Goods:** The supply of one good can be influenced by the price of another. For instance, if the price of a substitute in production rises, producers might switch to producing that good, reducing the supply of the original product.
9. **Capacity and Production Efficiency:** The production capacity and efficiency of the producers also determine the quantity of goods supplied in the market.

Understanding these factors is crucial for analyzing market dynamics and making informed business decisions.

### **The Law of Supply**

The law of supply is expressed generally in terms of price–quantity relationship. The law of supply states that “Other things being constant, the price of a commodity has a direct influence on the quantity supplied, As the price of a commodity rises, its supply is extended; as price falls, its supply is contracted.” Law of Supply is just opposite of Law of Demand. In other words, larger quantities supplied at high prices, and small quantities at lower prices.

### **Assumptions of Law of supply**

The term “other things remaining the same” refers to the following assumptions in the law of supply:

- No change in the state of technology.
- No change in the price of factors of production.
- No change in the number of firms in the market.
- No change in the goals of the firm.

- No change in the seller's expectations regarding future prices.
- No change in the tax and subsidy policy of the products.
- No change in the price of other goods.

### **The Supply Schedule**

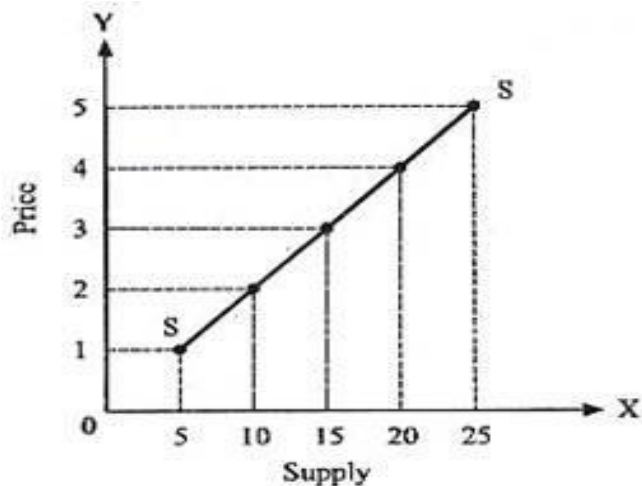
The law of supply can be depicted by a supply schedule and a supply curve. A supply schedule is a table showing different prices of a commodity and the corresponding quantity that suppliers are willing to offer for sale. The Supply schedule is a tabular statement that gives different prices of a commodity and the quantities which a producer is willing to supply per unit of time, at each price, assuming other factors affecting the supply to be constant. A hypothetical supply schedule is given in the following table.

Price (Rs.)	Quantity (Units)
1	5
2	10
3	15
4	20
5	25

### **The Supply Curve**

The relationship between price and supply can be shown by drawing the supply curve. The supply curve for a product depicts the direct relation between the price of that commodity and the quantity, producers wish to supply at that price. Supply curve based on this imaginary data is shown below

Figure: Supply curve



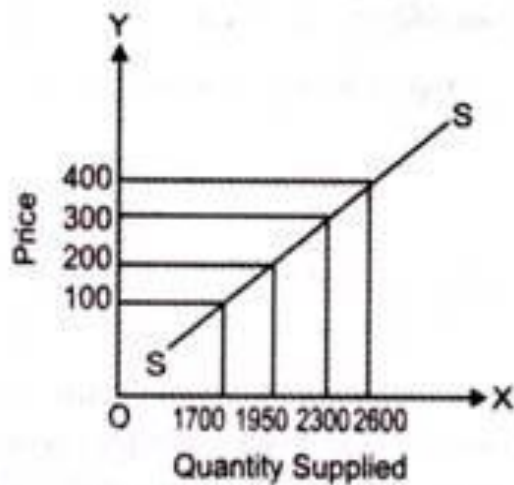
On the basis of the schedule given we can draw the supply curve taking quantities supplied in the 'X' axis and price on the 'Y' axis as shown in above figure. The supply curve SS slopes upwards from left to right showing larger supplies at a higher price. The positive slope of the supply curve is caused by seller's desire to make larger profit and, more importantly, by the rise in cost of production. In fact, when price of a commodity increases, its suppliers tend to supply more and more. To supply more and more, they need to produce more and more. When they increase production, cost of production increases due to the law of diminishing returns. In fact, supply curve is derived from the marginal cost curve.

### **Market Supply Curve**

Supply Means the Quantity of a Commodity Which Its Producers or Sellers Offer for Sell at a Given Price, Per Unit of Time Market supply, like market demand, is the sum of supplies of a commodity made by all individual firms or suppliers. A market supply that represents the different quantities of a product that all the suppliers in the market are willing to supply at different prices. Market supply schedule can be drawn by aggregating the individual supply schedules of all individual suppliers in the market.

Table- Market Supply Schedule				
Price of Product X (per unit in ₹)	Individual Supply (per day)			Market Supply (per day)
	A	B	C	
100	750	500	450	1700
200	800	650	500	1950
300	900	750	650	2300
400	1000	900	700	2600

The market supply curve of market supply schedule (represented in Table):



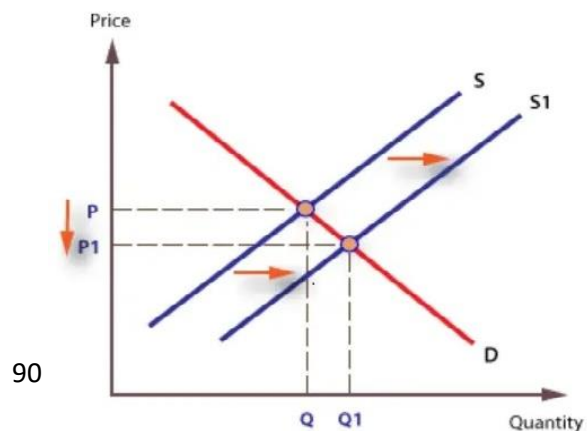
The slope of market supply curve can be obtained by calculating the supply of the slopes of individual supply curves. Market supply curve also represents the direct relationship between the quantity supplied and price of a product.

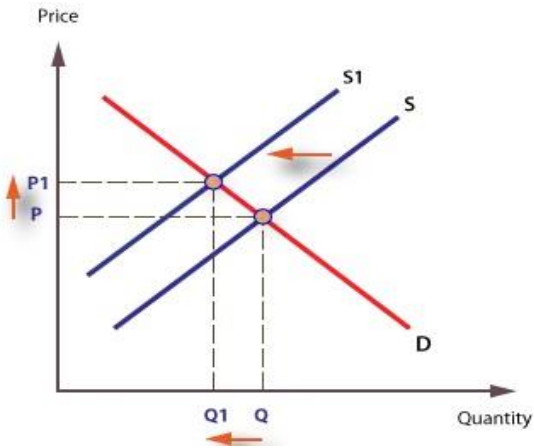
### Shifts in Supply Curve

As seen earlier, the supply curve shows the relationship between the price and quantity supplied keeping the 'other things' constant. The 'other things' which affect supply include number of sellers in the market, factor prices, etc. These factors affect quantity supplied independently of price.

Fig: Rise in the Supply Curve

Fig: Fall in the Supply Curve





If costs rise, less can be produced at any given price, and the supply curve will shift to the left. If costs fall, more can be produced, and the supply curve will shift to the right. Any change in an underlying determinant of supply, such as a change in the availability of factors, or changes in weather, taxes and subsidies will shift the supply curve to the left or right.

We have shown above that a change in the price of a commodity causes a change in its quantity supplied along a given supply curve. Although price of a commodity is the most important determinant of its supply, it is not the only determinant. Many other factors influence the supply of a commodity. Given the supply curve of a commodity, when there is a change in its other determinants, the supply curve shifts rightward or leftward depending on the effect of such changes. Let us now explain how other determinants of supply cause shift in the supply curve.

**i. Change in Input Prices.**

Input prices include the price of labour, raw materials, overheads, etc. When input prices decrease, the use of inputs increases. As a result, product supply increases and the supply curve shifts to the right.

**ii. Technological Progress.**

Technological progress reduces cost of production or increases labour productively or do both. Technological progress that reduces cost of production

or increases efficiency causes increase in product supply. For instance, introduction of high-yielding variety of paddy and new techniques of cultivation increased per-acre yield of rice in India in the 1970s. Such changes make the supply curve shift to the right.

**iii. Product Diversification and Cost Reduction.**

In production of many commodities, it is possible to produce some other goods which require a similar technology. For example, a refrigerator company can also produce ACs; Tatas famous for truck production can also produce Nano and other types of cars; Maruti Udyog can produce trucks and so on. Product diversification may cause reduction in the production cost of the main product. This may lead to the rise in the supply of the main product due to capacity utilization for profit maximization.

**iv. Nature and Size of the Industry.**

The supply of a commodity depends also on whether an industry is monopolized or competitive. Under monopoly, supply of a product is shorter than it is in a competitive market. When a monopolized industry is made competitive, the total supply increases. Besides, if size of an industry increases due to new firms joining the industry, the total supply increases and supply curve shifts rightward.

**v. Government Policy.**

When government imposes restrictions on production, e.g., import quota on inputs, rationing of or quota imposed on input supply, etc., production tends to fall. Such restrictions make supply curve to shift leftward.

**vi. Non-Economic Factors.**

The factors like labour strikes and lock-outs, war, droughts, floods, communal riots, epidemics, etc. also affect adversely the supply of commodities making supply curve shift leftward.

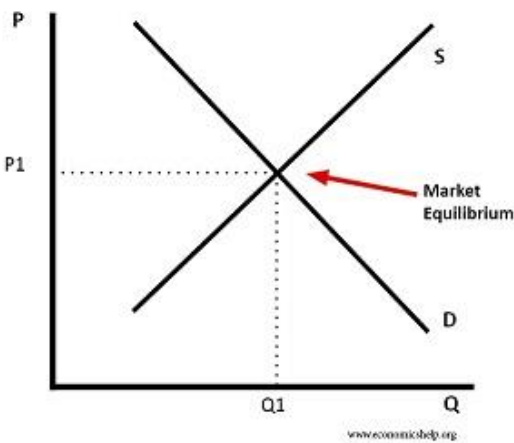
**Market Equilibrium**

In general sense, the term equilibrium means the 'state of rest'. In general sense, it means balance in opposite forces. In the context of market analysis,

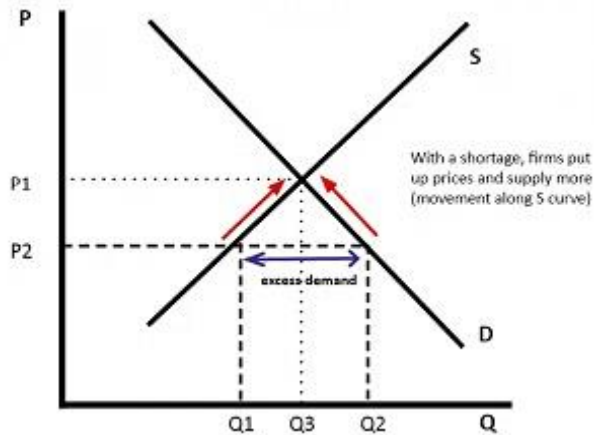
equilibrium refers to a state of market in which quantity demanded of a commodity equals the quantity supplied of the commodity. The equality of demand and supply produces an equilibrium price. The equilibrium price is the price at which quantity demanded of a commodity equals its quantity supplied. That is, at equilibrium price, demand and supply are in balance. Equilibrium price is also called market-clearing price. Market is cleared in the sense that there is no unsold stock and no unsupplied demand.

A market is in equilibrium if at the market price the quantity demanded is equal to the quantity supplied. The price at which the quantity demanded is equal to the quantity supplied is called the equilibrium price or market clearing price and the corresponding quantity is the equilibrium quantity.

Market equilibrium can be shown using supply and demand diagrams. In the diagram below, the equilibrium price is  $P_1$ . The equilibrium quantity is  $Q_1$ .

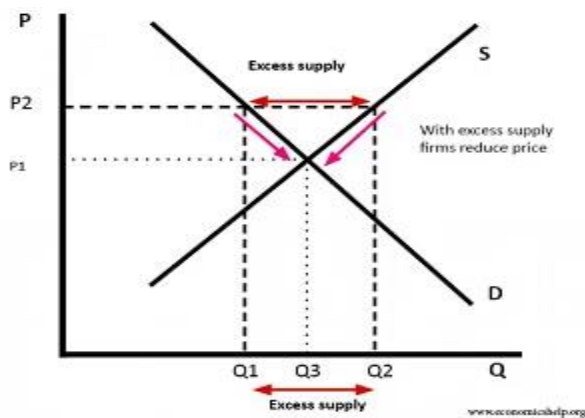


**If price is below the equilibrium**



- In the above diagram, price ( $P_2$ ) is below the equilibrium. At this price, demand would be greater than the supply. Therefore there is a shortage of ( $Q_2 - Q_1$ )
- If there is a shortage, firms will put up prices and supply more. As price rises, there will be a movement along the demand curve and less will be demanded.
- Therefore the price will rise to  $P_1$  until there is no shortage and supply = demand.

### If price is above the equilibrium



- If price was at  $P_2$ , this is above the equilibrium of  $P_1$ . At the price of  $P_2$ , then supply ( $Q_2$ ) would be greater than demand ( $Q_1$ ) and therefore there is too much supply. There is a surplus. ( $Q_2 - Q_1$ )
- Therefore firms would reduce price and supply less. This would encourage more demand and therefore the surplus will be eliminated. The new

market equilibrium will be at Q3 and P1.

## Elasticity of Supply

**Elasticity of Supply** measures how responsive the quantity supplied of a good or service is to a change in its price. It is an important concept in economics as it helps to understand how changes in market conditions affect the supply side of the economy.

Elasticity of Supply ( $E_s$ ) is defined as the percentage change in quantity supplied divided by the percentage change in price. Mathematically:

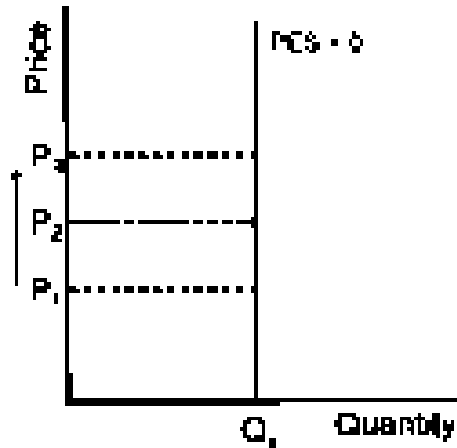
$$E_s = \frac{\% \text{ Change in Quantity Supplied}}{\% \text{ Change in Price}}$$

This formula shows how much the quantity supplied changes in response to a change in price.

Types of Elasticity of Supply

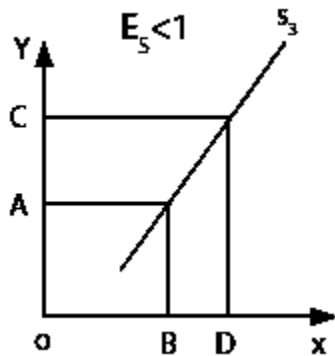
1. **Perfectly Inelastic Supply ( $E_s = 0$ ):**

- The quantity supplied does not change regardless of the price. The supply curve is vertical.
- Example: Unique artworks, rare collectibles, or goods with a fixed supply.



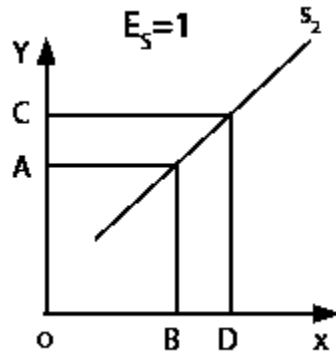
**2. Relatively Inelastic Supply ( $0 < E_s < 1$ ):**

- The percentage change in quantity supplied is less than the percentage change in price.
- Example: Agricultural products in the short run, where it is difficult to increase supply quickly.



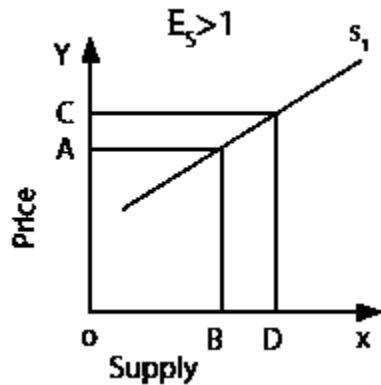
**3. Unitary Elastic Supply ( $E_s = 1$ ):**

- The percentage change in quantity supplied is exactly equal to the percentage change in price.
- Example: A situation where suppliers can easily adjust the quantity produced with price changes.



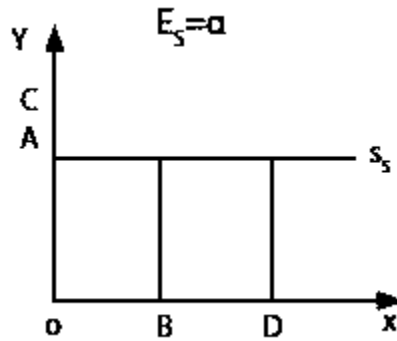
**4. Relatively Elastic Supply ( $E_s > 1$ ):**

- The percentage change in quantity supplied is greater than the percentage change in price.
- Example: Manufactured goods where production can be increased relatively easily with price changes.



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

- Even a tiny change in price leads to an infinite change in quantity supplied. The supply curve is horizontal.
- Example: Markets with perfect competition where suppliers can sell as much as they want at a given price.



## Determinants of Elasticity of Supply

### 1. Time Period:

- **Short Run:** Supply is usually inelastic because firms cannot quickly change their production levels.
- **Long Run:** Supply tends to be more elastic as firms can adjust their production capacity over time.

### 2. Availability of Resources:

- If resources are readily available and can be quickly mobilized, supply is more elastic.
- If resources are scarce or specialized, supply is less elastic.

### 3. Production Flexibility:

- Firms with flexible production processes can respond more quickly to price changes, making supply more elastic.

### 4. Stock Levels:

- Firms with large inventories can quickly increase supply when prices rise, leading to higher elasticity.
- Firms with low or no inventories may have inelastic supply.

### 5. Spare Production Capacity:

- Firms operating below full capacity can easily increase output when prices rise, leading to more elastic supply.

### 6. Ease of Entry and Exit:

- Industries where new firms can easily enter or exit the market tend to have more elastic supply.

#### 4. Importance of Elasticity of Supply

- **Pricing Decisions:** Understanding supply elasticity helps firms and policymakers make informed pricing decisions.
- **Taxation:** Governments can use elasticity concepts to predict the effects of taxes on supply and to design better tax policies.
- **Market Analysis:** Analyzing the elasticity of supply provides insights into how markets will respond to changes in demand, production costs, or government policies.
- **Resource Allocation:** Elasticity of supply helps in understanding how resources should be allocated to maximize efficiency.

#### **Examples of Elasticity of Supply in Real Life**

- **Agriculture:** In the short run, the supply of crops is relatively inelastic because it takes time to grow and harvest crops. However, in the long run, farmers can change their crop choices or adopt new farming techniques, making supply more elastic.
- **Manufacturing:** In industries like automobile manufacturing, supply can be relatively elastic in the long run, as firms can increase production by adding shifts, opening new factories, or outsourcing.
- **Housing Market:** The supply of housing is typically inelastic in the short run due to the time it takes to build new homes. However, over the long run, supply can become more elastic as developers respond to price changes by building more houses.

### **Consumer Surplus**

Consumer surplus is an economic measure of consumer benefit. It is calculated by analyzing the difference between what consumers are willing and able to pay for a good or service relative to its market price.

Prof. Marshall has said that “The excess of price which he (consumer) would be willing to pay rather than go without. The thing over that, which he actually does

pay, is the economic measure of this surplus satisfaction. It may be called “Consumer’s Surplus”.

Therefore, Consumer surplus = Price prepared to pay – price paid

(Or)

Total Utility – The Amount Spent

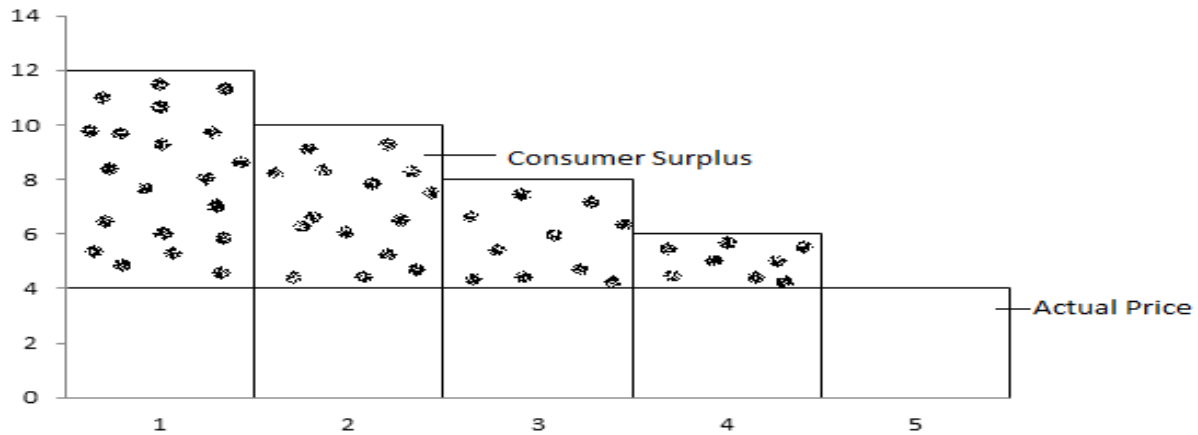
(Or)

Satisfaction -- sacrifice

We can explain this concept of commodity on the basis of given table:

Units of Commodity	Ready to pay M.U	Actual Price	Consumer Surplus
1	12	4	8
2	10	4	6
3	8	4	4
4	6	4	2
5	4	4	0
	Total Utility= 40	Total Amount Spent = 20	20

On the above table, when consumer purchase first unit of he/she is ready to pay Rs 12 but actual price is Rs 4. So consumer gets surplus. Similarly the consumer is ready to pay Rs. 10, 8, 6, 4 for 2, 3, 4, and 5th commodity where actual price is Rs 4 and he/she gets 6, 4, 2, and 0 surpluses respectively. Hence total consumer surplus = Total Utility – Total Amount spent = 40 – 20 = 20.



On the above figure, x and y-axis measures unit of commodity and price/M.U respectively. The shaded area is consumer surplus because it is the excess amount of satisfaction over the actual sacrifice made for the commodity.

### **Producer's Surplus**

Producer surplus is the difference between how much a person would be willing to accept for given quantity of a good versus how much they can receive by selling the good at the market price. The difference or surplus amount is the benefit the producer receives for selling the good in the market. A producer surplus is generated by market prices in excess of the lowest price producers would otherwise be willing to accept for their goods.

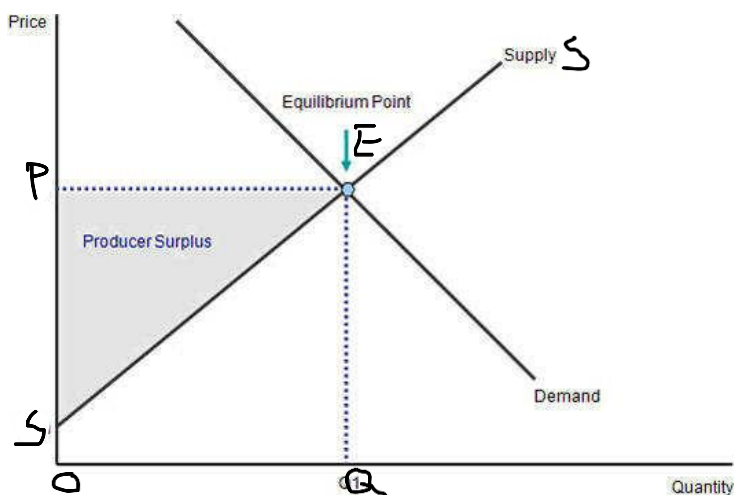
**Definition:** Producer surplus is defined as the difference between the amount the producer is willing to supply goods for and the actual amount received by him when he makes the trade. Producer surplus is a measure of producer welfare. It is shown graphically as the area above the supply curve and below the equilibrium.

### **Measure of Producer's Surplus**

Producer surplus is the excess of market price at which producers sell the quantity of a commodity over and above the minimum price at which they would be willing to supply it. The minimum price which the producers would accept to supply a unit of the commodity is its marginal cost which reflects the opportunity

cost of resources used for its production.

Using the same example with all the X and Y-axis numbers, the producer surplus is calculated using the same formula. Below is the graph for the illustration. Here the producer surplus is shown in gray. As the price increases, the incentive for producing more goods increases, thereby increasing the producer surplus. Demand curve DD and supply curve SS of a commodity intersect at point E and determine OP as the market price and OQ as the quantity sold and bought. It will be seen from the supply curve SS that producers produce the last Qth unit of the commodity at the marginal cost which is just equal to the market price OP. However, as is indicated by the supply curve SS the producers will be ready to supply the earlier successive units from zero to Qth unit at much less than the market price OP. Thus, from these earlier units the producers actually get more than their minimum acceptable supply price. The area OSEQ below the supply curve is indicator of the aggregate supply price of OQ units of the commodity produced and supplied by the producers. On the other hand, the total revenue earned by them is equal to the area OPEQ (market price OP x quantity OQ sold). Thus, the producers earn revenue equal to the shaded area SEP more than the aggregate supply price. This excess amount SEP over the aggregate supply price is the aggregate producer surplus earned by the producers. The producer surplus earned by the producers is the measure of benefits obtained by them for producing and exchanging the commodity.



### Practical Usefulness of the Concept

1. A producer surplus combined with a consumer surplus can calculate overall economic surplus or the benefit provided by producers and consumers interacting in a free market as opposed to one with price controls or quotas.
2. If a producer could price discriminate correctly, or charge every consumer the maximum price the consumer is willing to pay, then the producer could capture the entire economic surplus.

### Key Glossaries

- **Supply:** The quantity of a good or service that producers are willing and able to sell at various prices in a given time period.
- **Law of Supply:** A principle stating that, all else being equal, an increase in the price of a good leads to an increase in the quantity supplied.
- **Factors Influencing Supply:** Elements such as production costs, technology, number of suppliers, and government policies that affect the amount of a product supplied.
- **Shifts in Supply Curve:** Changes in supply due to factors other than the price of the good, causing the entire supply curve to shift.
- **Elasticity of Supply:** A measure of how responsive the quantity supplied is to a change in price.
- **Consumer Surplus:** The difference between what consumers are willing to pay for a good and what they actually pay.
- **Producer Surplus:** The difference between the actual amount a producer receives for a good and the minimum amount they are willing to accept.

### Short Questions

1. Define supply.
2. What is the law of supply?
3. Name two factors influencing supply.
4. What does a shift in the supply curve indicate?
5. Define elasticity of supply.

6. What is consumer surplus?
7. What is producer surplus?
8. Write the formula for elasticity of supply.
9. State one cause for a rightward shift in the supply curve.
10. Mention one example of producer surplus in real life.

### **Brief Questions**

1. Explain the law of supply with an example.
2. List the factors that influence supply.
3. Differentiate between movement along the supply curve and a shift in the supply curve.
4. Explain elasticity of supply and its significance.
5. How is consumer surplus calculated?
6. Discuss the significance of producer surplus in market economics.
7. Illustrate the effect of price changes on the elasticity of supply.
8. What are the implications of a leftward shift in the supply curve?
9. Explain how consumer surplus benefits buyers.
10. Provide examples where producer surplus plays a key role in decision-making.

### **Detailed Questions**

1. Discuss the law of supply with a diagram and its exceptions.
2. Explain the various factors influencing supply and their impact on production.
3. What are the differences between a movement along the supply curve and a shift in the supply curve? Illustrate with examples.
4. Analyze the concept of elasticity of supply with its types and examples.
5. Elaborate on consumer surplus with the help of a diagram and examples.
6. Describe producer surplus and explain how it affects producer decision-making.

7. How does a change in technology affect the supply curve? Discuss with examples.
8. Explain the relationship between consumer surplus and producer surplus in determining market equilibrium.
9. Evaluate the importance of elasticity of supply in business and policymaking.
10. How do government policies influence shifts in the supply curve? Provide detailed examples.

In this unit we will examine here how the costs of production of the firm depend on the nature of physical production function. We will be mainly concerned with how the cost of production varies with the increase in the level of output of the firm. In other words, we shall study how the cost and level of output are related to each other. How much cost a firm will incur on production depends on the level of output, given the factor prices and the state of technology. The quantity of a product that will be offered by the firm for supply in the market will depend to a great degree upon the cost of production incurred on the various possible levels of output. Cost of production is the most important factor governing the supply of a product. It should be pointed out here that it is assumed that for each level of output, the firm chooses least-cost combination of factors. We shall explain below the various concepts of costs that are used in modern economic theory and then turn to study the derivation of the short-run and the long-run cost curves. However, to begin with, we shall draw distinction between technological efficiency and economic efficiency as they are intimately connected with the study of costs of production.

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 is 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.

### **Different Cost Concepts**

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 analyse the cost function and type of cost involved in business decision making process under Managerial Economics.

- (i) Opportunity Cost Vs. Actual cost
- (ii) Past Cost Vs. Future Cost
- (iii) Traceable Cost Vs. Common Cost
- (iv) Out of Pocket Cost Vs. Book Cost
- (v) Incremental Cost Vs. Sunk Cost
- (vi) Avoidable Cost Vs. Unavoidable cost
- (vii) Private cost Vs. Social Cost
- (viii) Shut down Cost Vs. Abandonment Cost
- (ix) Implicit Cost Vs. Explicit cost
- (x) Controllable Vs. Non-Controllable cost
- (xi) Replacement Cost Vs. Historical Cost
- (xii) Short run cost Vs. Long run cost
- (xiii) Fixed cost Vs. Variable cost
- (xiv) Semi variable cost
- (xv) 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 give 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 compare 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 parities, 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 lookalike but there is 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 product lines, 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

expenditure 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 discuss 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 have 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 factors 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 out-dated 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  $AC = TC / Q$

TC = Total Cost

Q = No of Units produced

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.,

$MC = TC_n - TC_{n-1}$

### **Cost Function**

The relation between cost and output is called “cost function”. The cost function of the firm depends upon the nature of physical production function, the prices of the factors used for production and the technology used for production. 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:

$CT = f(Q_I, P_I)$

Where CT is the total cost of production:

$Q_I$ , is the quantities employed by the firm.

$P_I$  is the prices of respective inputs.

### **Role of Cost Function in Decision Making**

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 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 has 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 is a key component 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).

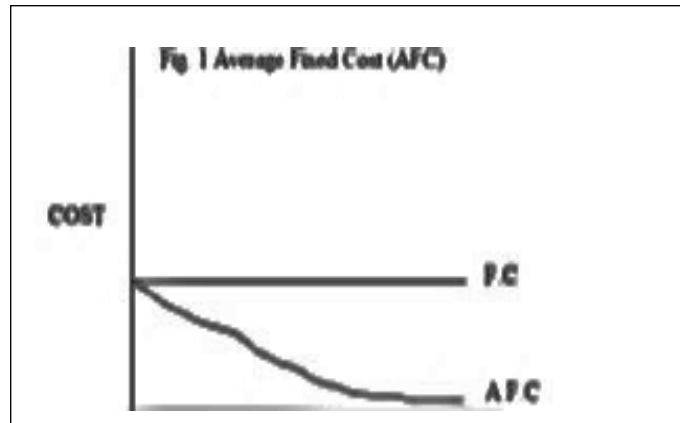
### **Short Run Cost Curves - Total Cost, Average Cost, Marginal Cost**

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.

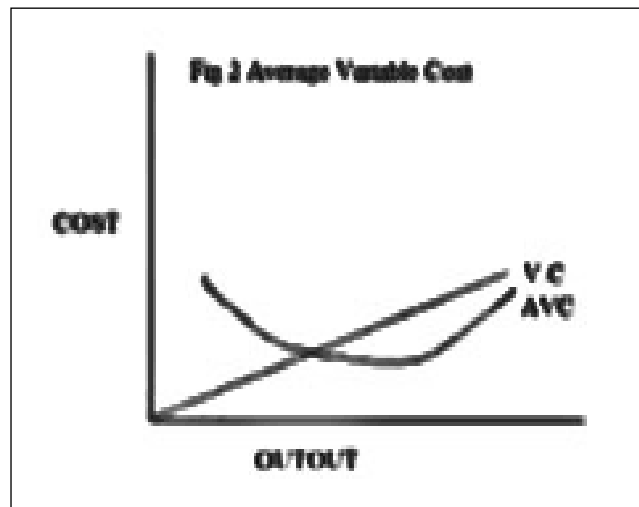
### Average Fixed Cost

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).

Some important relationships between costs used in analysing the short-run cost-behaviour may now be summed up as follows:

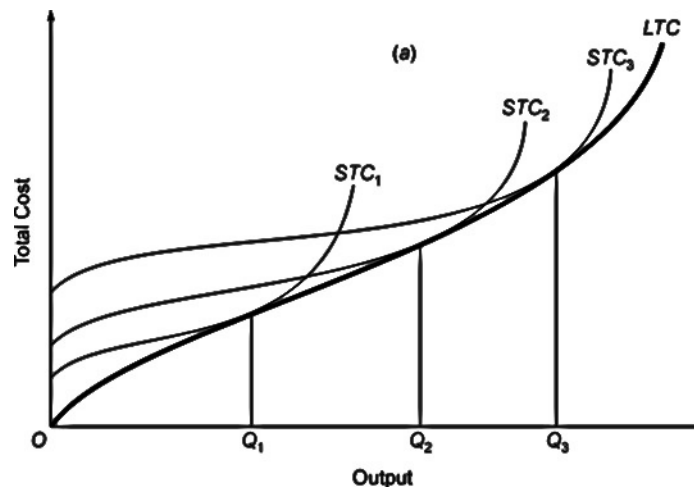
- (a) Over the range of output *AFC* and *AVC* fall, *AC* also falls.
- (b) When *AFC* falls but *AVC* increases, change in *AC* depends on the rate of change in *AFC* and *AVC*.
  - (i) If decrease in *AFC* > increase in *AVC*, then *AC* falls
  - (ii) If decrease in *AFC* = increase in *AVC*, *AC* remains constant
  - (iii) If decrease in *AFC* < increase in *AVC*, then *AC* increases
- (c) *AC* and *MC* are related in following ways.
  - (i) When *MC* falls, *AC* follows, over a certain range of output. When *MC* is falling, the rate of fall in *MC* is greater than that of *AC*, because while *MC* is attributed to a single marginal unit, *AC* is distributed over the entire output. Therefore, *AC* decreases at a lower rate than *MC*.
  - (ii) Similarly, when *MC* increases, *AC* also increases but at a lower rate.
  - (iii) *MC* curve intersects *AC* curve at its minimum. The reason is, while *AC* continues to decrease, *MC* begins to rise. Therefore, they are bound to intersect. Also, when *AC* is at its minimum, it is neither increasing nor decreasing: it is constant. When *AC* is constant,  $AC = MC$ . That is the point of intersection.

## Long Run Cost Curves - Total Cost, Average Cost, Marginal Cost

Long-run is defined as a period in which all the inputs become variable. The variability of inputs is based on the assumption that in the long-run, supply of all the inputs, including those (especially capital) held constant in the short-run, becomes elastic. The firms are, therefore, in a position to expand the scale of their production by hiring a larger quantity of all the inputs. The long-run cost output relations, therefore, imply the relationship between the changing scale of the firm and the total output, whereas in the short-run, this relationship is essentially one between the total output and the variable cost (labour). Specifically, long-run cost-output relations refers to the behaviour of TC, AC and MC in response to simultaneous and proportionate change in both labour and capital costs.

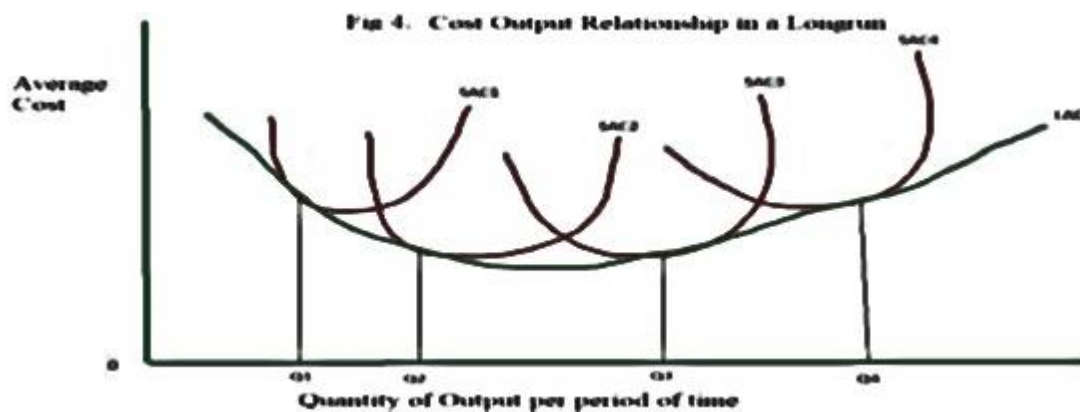
### Long-run Total Cost Curve (LTC)

In order to draw the long-run total cost curve, let us begin with a short-run situation. Suppose that a firm having only one plant has its short-run total cost curve as given by  $STC_1$ . Let us now suppose that the firm decides to add two



more plants over time, one after the other. As a result, two more short-run total cost curves are added to  $STC_1$ , in the manner shown by  $STC_2$  and  $STC_3$ . The LTC can now be drawn through the minimum points of  $STC_1$ ,  $STC_2$  and  $STC_3$  as shown by the LTC curve corresponding to each STC.

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 SAC1 curve is for the period of cost-output relation in the year 2015. The SAC2, SAC3, and SAC4 are the 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.



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 result 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.

The relationship between LTC and output, and between LAC and output can now be easily derived. It is obvious from the LTC that the long-run cost-output

relationship is similar to the short-run cost-output relation. With the subsequent increases in the output, LTC first increases at a decreasing rate, and then at an increasing rate. As a result, LAC initially decreases until the optimum utilization of the second plant and then it begins to increase. These cost-output relations follow the 'laws of returns to scale'. When the scale of the firm expands, unit cost of production initially decreases, but ultimately increases. The decrease in unit cost is attributed to the internal and external economies and the eventual increase in cost, to the internal and external diseconomies. The economies and diseconomies of scale are discussed in the following section.

### **Long-run Marginal Cost Curve (LMC)**

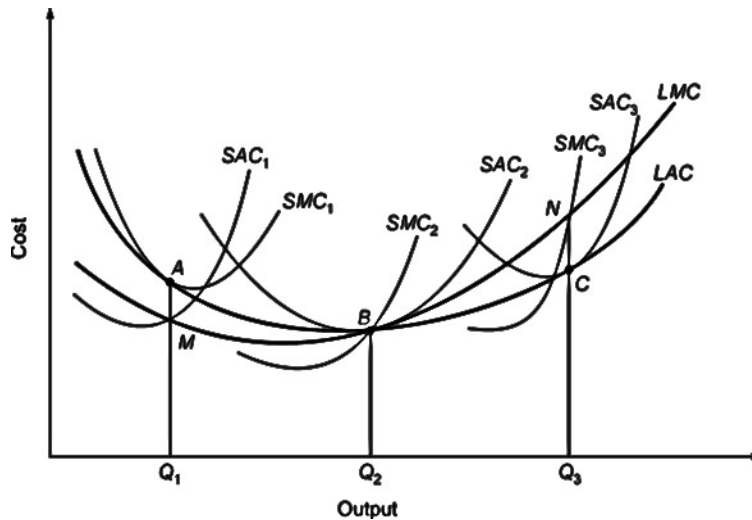
The long-run marginal cost curve (LMC) is derived from the short-run marginal cost curves (SMCs). To derive the LMC, consider the points of tangency between SACs and the LAC, i.e., points A, B and C. In the long-run production planning, these points determine the output at the different levels of production. Each of these outputs has an SMC. For example, if we draw a perpendicular from point A, it intersects  $SMC_1$  at point M determining SMC at  $MQ_1$ . The same process can be repeated

for points B and C to find out SMC at outputs  $Q_2$  and  $Q_3$ . Note that points B and C determine SMC at  $BQ_2$  and  $CQ_3$  respectively. A curve drawn through points M, B and N, as shown by the LMC, represents the behaviour of the marginal cost in the long-run. This curve is known as the long-run marginal cost curve, LMC. It shows the trends in the marginal cost in response to the changes in the scale of production.

Some important inferences may be drawn are as below

The LMC must be equal to SMC for the output at which the corresponding SAC is tangent to the LAC. At the point of tangency,  $LAC = SAC$ . Another important point to notice is that LMC intersects LAC when the latter is at its minimum, i.e., point B. There is one and only one short-run plant size whose minimum SAC coincides with the minimum LAC. This point is B where:

$$SAC_2 = SMC_2 = LAC = LMC$$



The optimum size of the firm consists of two plants represented by SAC<sub>1</sub> and SAC<sub>2</sub>. The two plants together produce OQ<sub>2</sub> units of a product at minimum long-run average cost (LAC) of BQ<sub>2</sub>. The downtrend in the LAC indicates that until output reaches the level of OQ<sub>2</sub>, the firm is of less than optimal size. Similarly, expansion of the firm beyond production capacity OQ<sub>2</sub>, causes a rise in SMC and, therefore, in LAC. It follows that given the technology, a firm aiming to minimize its average cost over time must choose a plant that gives minimum LAC where SAC = SMC = LAC = LMC. This size of plant assures the most efficient utilization of the resources. Any change in output level—increase or decrease—will make the firm enter the area of in optimality.

## Revenue

Revenue, in economics, the income that a firm receives from the sale of a good or service to its customers. Technically, revenue is calculated by multiplying the price (p) of the good by the quantity produced and sold (q). In algebraic form, revenue (R) is defined as  $R = p \times q$ .

The sum of revenues from all products and services that a company produces is called total revenue (TR). For a firm that produces n goods, this can be calculated as

$$TR = (P_1 \times Q_1) + (P_2 \times Q_2) + \dots + (P_n \times Q_n)$$

where  $p_i$  and  $q_i$  respectively denote the price and quantity of good  $i$ , for  $i = 1, \dots, n$ .

## **Types of Revenue**

### **Total Revenue**

The income earned by a seller or producer after selling the output is called the total revenue. In fact, total revenue is the multiple of price and output. The behavior of total revenue depends on the market where the firm produces or sells.

“Total revenue is the sum of all sales, receipts or income of a firm.” Dooley

Total revenue may be defined as the “product of planned sales (output) and expected selling price.” Clower and Due

“Total revenue at any output is equal to price per unit multiplied by quantity sold.” Stonier and Hague

$TR = \text{Price} \times \text{Quantity}$

### **Average Revenue**

Average revenue refers to the revenue obtained by the seller by selling the per unit commodity. It is obtained by dividing the total revenue by total output.

“The average revenue curve shows that the price of the firm’s product is the same at each level of output.” Stonier and Hague

Thus,  $AR = TR / Q$

Where AR = Average Revenue

TR = Total Revenue

Q = Output

### **Marginal Revenue:**

Marginal revenue is the net revenue obtained by selling an additional unit of the commodity. “Marginal revenue is the change in total revenue which results from the sale of one more or one less unit of output.” Ferguson. Thus, marginal revenue is the addition made to the total revenue by selling one more unit of the good. In algebraic terms, marginal revenue is the net addition to the total revenue by selling  $n$  units of a commodity instead of  $n - 1$ .

A. Koutsoyiannis, “The marginal revenue is the change in total revenue resulting from selling an additional unit of the commodity.”

If total revenue from (n) units is 110 and from (n – 1) units is 100. in that case

$$MR_{nth} = TR_n - TR_{n-1} = 110 - 100$$

$$MR_{nth} = 10$$

### **Relationship between AR and MR**

The following points gives a clear explanation of the relationship between TR,AR,MR

- a) When AR is decreasing, MR should be decreasing faster than AR.
- b) If AR is constant, MR is equal to AR.
- c) MR can be negative, but not AR.
- d) TR Curve starts from Origin
- e) TR is an upward sloping curve

The above mentioned points are clearly explained along with diagrammatic representation as below. When price remains same at all output levels (like in case of perfect competition), no firm is in a position to influence the market price of the product. A firm can sell more quantity of output at the same price. It means, the revenue from every additional unit (MR) is equal to AR.

**Table : AR and MR (When Price remains Constant):**

<b>Units sold</b>	<b>Price/AR (Rs.)</b>	<b>TR (Rs.)</b>	<b>MR(Rs.)</b>
1	5	5	5
2	5	10	5
3	5	15	5
4	5	20	5
5	5	25	5

As seen in the given schedule, price (AR) remains same at all level of output and is equal to MR. As a result, demand curve (or AR curve) is perfectly elastic.

Always remember that when a firm is able to sell more output at the same price, then  $AR = MR$  at all levels of output.

### **Relationship between TR and MR**

When price remains constant, firms can sell any quantity of output at the price fixed by the market. As a result, MR curve (and AR curve) is a horizontal straight line parallel to the X-axis. Since MR remains constant, TR also increases at a constant rate. Due to this reason, the TR curve is a positively sloped straight line. As TR is zero at zero level of output, the TR curve starts from the origin.

**Table : TR and MR (When Price remains Constant):**

Units sold	Price/AR (Rs.)	TR (Rs.)	MR (Rs.)
1	5	5	5
2	5	10	5
3	5	15	5
4	5	20	5
5	5	25	5

As seen in the given schedule, price (TR) is an upward sloping curve. Total revenue curve increases at a constant rate.

### **Revenue Curves**

In the imperfect competition market, the price is not constant. It may increase or decrease due to market forces. In order to increase sales, the seller will have to reduce the price of the commodity. But, when the price decreases, Average Revenue and Marginal Revenue also decrease. In the imperfect competition market, both Average revenue curve and Marginal revenue curve slope downwards from left to right. The relationship between total, average and marginal quantities can be illustrated geometrically. We explain this relationship by taking total revenue curve and deriving average and marginal revenue curves from it. A revenue schedule given below shows the amount of revenue generated by a firm at different prices.

<b>Price</b>	<b>Quantity</b>	<b>Total Revenue</b>	<b>Marginal Revenue</b>
10	1	10	0
9	2	18	8
8	3	24	6
7	4	28	4
6	5	30	2
5	6	30	0
4	7	28	-2
3	8	24	-4
2	9	18	-6
1	10	10	-8

The following implications can be drawn from the above table

#### **Total revenue**

Initially, as output increases total revenue (TR) also increases, but at a decreasing rate. It eventually reaches a maximum and then decreases with further output. Less competition in a given market is likely to lead to higher prices and the possibility of higher super-normal profits.

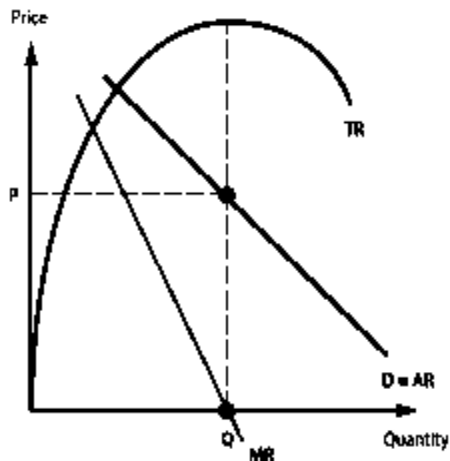
#### **Average revenue**

However, as output increases the average revenue (AR) curve slopes downwards. The AR curve is also the firm's demand curve.

#### **Marginal revenue**

The marginal revenue (MR) curve also slopes downwards, but at twice the rate of AR. This means that when MR is 0, TR will be at its maximum. Increases in output beyond the point where  $MR = 0$  will lead to a negative MR.

The above implications are diagrammatically represented below:



### Relationship between TR and MR

marginal revenue is the addition to total revenue associated with a unit increase in output or sales. Therefore, total revenue (TR) increases when marginal revenue (MR) is positive and total revenue (TR) decreases when marginal revenue (MR) is negative. Marginal revenue is

positive and as a result total revenue increases with output over this range. Marginal revenue becomes negative, total revenues (TR) to decrease. From this it follows that total revenue function will be maximized (or any function for that matter) at the point where marginal revenue (MR) changes from being positive to be negative. That is, total revenue is maximised when marginal revenue (MR) is zero. This is an important rule of marginal analysis. Another important rule of marginal analysis can be derived from the relation between total revenue (TR) and marginal revenue (MR). Since marginal revenue is addition to total revenue by each successive units of output, total revenue (TR) can be obtained by summing up marginal revenues of all the preceding units of output (including the last one). Thus  $TR = \sum MR$  of all the units of output produced and sold.

Thus with regard to relation between total revenue and marginal revenue we arrive at the

following important rules:

1. Total revenue increases when marginal revenue is positive.
2. Total revenue is maximized at the output level where marginal revenue (MR)

is equal  
to zero.

3. Total revenue at a certain level of output (or sales) is equal to the sum of all the preceding marginal revenues (including the last one) of the total units of output produced and sold.

The above relationships between total and marginal number apply equally to all the total and marginal concepts whether they relate to revenue, cost, profit or utility.

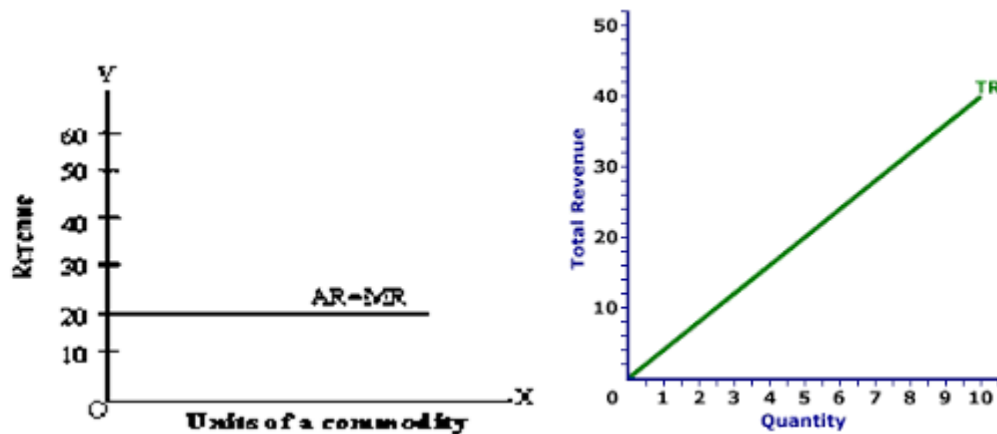
### **Relationship between AR and MR**

There is an important arithmetical relationship between average and marginal revenue which is extensively used in optimization analysis. Since a marginal revenue represents the change in total revenue as a result of a unit change in output, it follows that when marginal revenue is greater than average revenue, average revenue increases (that is, higher MR pulls up AR). When marginal revenue is less than average revenue, average revenue declines. And when marginal revenue is equal to average revenue, average revenue remains unchanged.

However, this relationship between average and marginal numbers is often misunderstood. It is often stated that when an average quantity falls, marginal quantity must also be falling and when average quantity rises, marginal quantity must also be rising. This is quite false. In fact what the relation between the two states is that when average quantity falls marginal quantity must be less than the average quantity; marginal quantity though remaining less than the average quantity may itself may be falling, rising or remain constant. If an average quantity is rising, marginal quantity need not be rising. What is true in this case is that when average is rising marginal must be greater than average, marginal number itself may be rising, falling or remaining constant.

## Revenues Curves in Perfect Competition Market

The concepts of total revenue, average revenue and marginal revenue when with the increase in output or sales by a firm, price of its product falls. However, when there prevails a perfect competition in the market for a product, price of the product is beyond the control of the firm, and it takes price as given and constant. As a result, demand curve facing a firm working in a perfectly competitive market is a horizontal straight-line at the given level of price of the product. Thus, a perfectly competitive firm can sell as much as it likes at the prevailing price in the market. If the price or average revenue remains the same when more units of the good are sold, the marginal revenue will be equal to average revenue. This is so because if one more unit is sold and the price does not fall, the addition made to the total revenue by that unit will be equal to the price at which it is sold, since no loss in revenue is incurred on the previous units in this case. Here, Average revenue curve is a straight line parallel to X-axis. Also, in this situation  $AR = MR$ . This is represented diagrammatically below



A firm in a perfectly competitive market has no influence over its price, it does determine the output it will produce. The relationship between market price and the firm's total revenue curve is a crucial one total revenue curve is a linear, upward-sloping curve. At any price, the greater the quantity a perfectly competitive firm sells, the greater its total revenue. Notice that the greater the price, the steeper the total revenue curve is.

## Key Glossaries

1. **Fixed Cost:** Costs that remain constant regardless of the level of output (e.g., rent, salaries).
2. **Variable Cost:** Costs that change with the level of output (e.g., raw materials, electricity).
3. **Total Cost (TC):** The sum of fixed and variable costs at each level of output.
4. **Average Cost (AC):** Total cost divided by the quantity of output produced.
  - a. Formula:  $AC = \frac{TC}{Q}$
5. **Marginal Cost (MC):** The additional cost incurred by producing one more unit of output.
  - a. Formula:  $MC = \frac{\Delta TC}{\Delta Q}$
6. **Opportunity Cost:** The cost of the next best alternative foregone.
7. **Sunk Cost:** Costs that have already been incurred and cannot be recovered.
8. **Explicit Cost:** Direct, out-of-pocket payments (e.g., wages, rent).
9. **Implicit Cost:** Opportunity costs of using resources owned by the firm (e.g., owner's time).
10. **Cost Function:** The mathematical relationship between cost and output.
11. **Total Cost Curve:** Shows the relationship between total cost and output.
12. **Average Cost Curve:** U-shaped curve representing average cost at different levels of output.
13. **Marginal Cost Curve:** Typically upward-sloping, showing the cost of producing an additional unit.
14. **Average Variable Cost Curve (AVC):** U-shaped curve representing variable costs per unit of output.
15. **Average Fixed Cost Curve (AFC):** Downward-sloping curve due to the spreading effect of fixed costs over more units.

16. **Total Revenue (TR):** The total income received from selling a certain quantity of goods or services.
  - a. Formula:  $TR = P \times Q$  (Price  $\times$  Quantity).
17. **Average Revenue (AR):** Revenue per unit of output sold.
  - a. Formula:  $AR = \frac{TR}{Q}$
18. **Marginal Revenue (MR):** The additional revenue generated by selling one more unit of output.
  - a. Formula:  $MR = \frac{\Delta TR}{\Delta Q}$
19. **Economic Revenue:** Total revenue adjusted for opportunity costs.
20. **Total Revenue Curve:** Depicts the relationship between total revenue and output; typically rises initially but may plateau or decline in monopolistic settings.
21. **Average Revenue Curve:** Typically downward-sloping, especially in imperfect competition, as price decreases with higher quantities sold.
22. **Marginal Revenue Curve:** Lies below the average revenue curve in imperfect competition; shows the rate of change of TR with output.

### Short Questions

1. What is marginal cost?
2. Differentiate between total revenue and marginal revenue.
3. List the different types of costs incurred by a firm.

### Brief Questions

1. Explain the relationship between average cost and marginal cost with the help of a diagram.
2. Describe the different types of revenue curves and their significance in a firm's decision-making process.
3. Analyze how changes in variable costs affect a firm's cost structure.

### **Detailed Questions**

1. Discuss the long-run cost function and explain how economies of scale influence the shape of the long-run average cost curve.
2. Examine the relationship between a firm's revenue and cost curves, and explain how they determine the profit-maximizing level of output.
3. Critically evaluate the impact of government intervention (such as taxes or subsidies) on a firm's cost and revenue curves and discuss the implications for its profitability.

In economics, the term ‘production’ means an activity by which resources (men, material, time and so on) are transformed into a different and more useful commodity or value-added service. In general, production means transforming inputs (labour, machines, raw materials, time and so on) into an output. This concept of production is, however, limited to only ‘manufacturing’. In economic sense, the production process may take a variety of forms other than manufacturing. Transporting a commodity in its original form from one place to another where it can be consumed or used in the process of production is production. For example, a sand dealer collects and transfers sand from the river bank to the construction site; a coal company does virtually nothing more than transporting coal from coal mines to the market place. Similarly, a fisherman only catches and transports fish from sea, lake and river to the fish market. Their activities, too, are ‘production’. Transporting men and materials from one place to another is a productive activity. For example, roadways, railways and airways produce service. Storing a commodity for future sale or consumption is also ‘production’. Wholesaling, retailing, packaging, assembling are all productive activities. These activities are just as good examples of production as manufacturing. Cultivation is the earliest form of productive activity. Besides, production process does not necessarily involve physical conversion of inputs into tangible goods. Some kinds of production involve an intangible input to produce an intangible output. For example, in the production of legal, medical, social and consultancy services both input and output are intangible; lawyers, doctors, social workers, consultants, hairdressers, musicians, orchestra players are all engaged in producing intangible goods.

In a gist, the processes and methods used to transform tangible inputs (raw materials, semi-finished goods, subassemblies) and intangible inputs (ideas, information, knowledge) into goods or services. Resources are used in this process to create an output that is suitable for use or has exchange value.

Production, according to Hicks, “Is any activity directed to the satisfaction of other people’s wants through exchange”. Production includes various processes to add utility to natural resources for gaining more satisfaction from them by

1. Changing the form of natural resources
2. Changing the place of the resources
3. Making available materials at times when they are not normally available.

An input is anything—a good or a service—that is used in the process of production. In the words of Baumol, ‘An input is simply anything which the firm buys for use in its production or other processes.’ Production process requires a wide variety of inputs, depending on the nature of product. But economists have classified inputs as:

1. land including area, underground and over ground resources;
2. labour including physical and mental effort and skill;  
capital, machinery, equipment, tools used in production and also factory and office buildings;
3. raw materials used for producing another good or material;
4. entrepreneurship including management skill and risk-bearing intention and ability;
5. technology—technique of production using different combination of labour and capital and
6. time—all kind of goods and services require some time for their production.

All these variables are treated as ‘flow’ variables, as they are measured per unit of time or output.

### **Factors Of Production**

Production takes place only with the combination of factors of production. The four factors of production are land, labor, capital, and entrepreneurship. They are the inputs needed for supply. They produce all the goods and services in an economy.

#### **Land**

Land is short for all the natural resources available to create supply. It includes raw property and anything that comes from the ground. It can be a non-renewable resource.

That includes commodities such as oil and gold. It can also be a renewable resource, such as timber. Once man changes it from its original condition, it becomes a capital good. For example, oil is a natural resource, but gasoline is a capital good. Farmland is a natural resource, but a shopping center is a capital good.

The income earned by owners of land and other resources is called rent.

Features of Land:

*i. Free Gift of Nature:* Man has to make efforts in order to acquire other factors of production. But to acquire land no human efforts are needed.

*ii. Fixed Quantity:* The total quantity of land does not undergo any change. It is limited and cannot be increased or decreased with human efforts.

*iii. Land is Permanent:* All man-made things are perishable, and these may even go out of existence. But land is indestructible. Thus, it cannot go out of existence. It is not destructible.

*iv. Land is a Primary Factor of Production:* Any kind of production process, we have to start with land. For example, in industries, it helps to provide raw materials, and in agriculture, crops are produced on land.

*v. Land is a Passive Factor of Production:* This is because it cannot produce anything by itself. For example, wheat cannot grow on a piece of land automatically. To grow wheat, man has to cultivate land. Labour is an active factor but land is a passive factor of production.

*vi. Land is Immovable:* It cannot be transported from one place to another. For instance, no portion of India's surface can be transported to some other country.

## **Labour**

Labor is the work done by people. The value of the workforce depends on workers' education, skills, and motivation. It also depends on productivity. That measures how much each hour of worker time produces in output. The reward or income for labor is wages.

Features of Labour:

*i. Labour means Human Exertion:* Labour means only human exertion and not the exertion of the cattle or machine. Labour always involves the mental or physical pain and sacrifice. For example, when a man works and is busy for a few hours, he becomes tired and so he needs rest.

*ii. A Man's Labour is part of himself:* This means the labour cannot be separated from the labourer. When the labourer sells his labour, he has to deliver it in person and he cannot sell his labour like land and capital.

*iii. Labour is Perishable:* The labour power withheld once is lost forever and cannot be stored. It cannot be regained. A day without work is gone irrevocably. As there is no stock, the labourer has to sell his labour immediately irrespective of the price. Labour is a flow of service of labourer.

*iv. Labour has low Bargaining Power:* Usually labourers have no reserve and are compelled to accept low wages. But the development of the trade unions has considerably improved the bargaining power of the labour in recent times.

*v. Labour Power and Labour Co-exist:* The labour power exists as long as the labourer exists. It becomes invalid or disappears when the labourer retires or expires.

## **Capital**

Capital is short for capital goods. These are man-made objects like machinery, equipment, and chemicals that are used in production. That's what differentiates them from consumer goods. For example, capital goods include industrial and commercial buildings, but not private housing. A commercial aircraft is a capital

good, but a private jet is not. The income earned by owners of capital goods is called interest.

### **Features of capital**

*i. Man Produces Capital:* Capital is that wealth which is used in the production of goods. Capital is the result of human labour. Thus, every type of capital such as roads, machines, buildings and factories etc. are produced by man. It is a produced factor of production.

*ii. Capital is a Passive Factor of Production:* Capital cannot produce without the help of the active services of labour. To produce with machines, labour is required. Thus, labour is an active, whereas capital is a passive factor of production. Capital on its own cannot produce anything until labour works on it.

*iii. Capital is a Produced Means of Production:* The composition or supply of capital is not automatic, but it is produced with the joint efforts of labour and land. Therefore, capital is a produced means of production.

*iv. Capital is Variable:* The total supply of land cannot be changed, whereas the supply of capital can be increased or decreased. If the residents of a country produce more or save more from their income, and these savings are invested in factories or capital goods, it increases the supply of capital.

*v. Capital is more Mobile than other Factors of Production:* Of all the factors of production, capital is the most mobile. Land is perfectly immobile. Labour and entrepreneur also lack mobility. Capital can be easily transported from one place to another.

*vi. Capital Depreciates:* As we go on using capital, the value of capital goes on depreciating. When machines are used continuously for some time, these depreciate and their value falls.

### **13.5 Entrepreneurship**

Entrepreneurship is the drive to develop an idea into a business. An entrepreneur combines the other three factors of production to add to supply.

The most successful are innovative risk-takers. The income entrepreneurs earn is profits.

Features of entrepreneurship

*i. Economic and dynamic activity:* Entrepreneurship is an economic activity because it involves the creation and operation of an enterprise with a view to creating value or wealth by ensuring optimum utilisation of scarce resources. Since this value creation activity is performed continuously in the midst of uncertain business environment, therefore, entrepreneurship is regarded as a dynamic force.

*ii. Related to innovation:* Entrepreneurship involves a continuous search for new ideas. Entrepreneurship compels an individual to continuously evaluate the existing modes of business operations so that more efficient and effective systems can be evolved and adopted

*iii. Profit potential:* “Profit potential is the likely level of return or compensation to the entrepreneur for taking on the risk of developing an idea into an actual business venture.” Without profit potential, the efforts of entrepreneurs would remain only an abstract and a theoretical leisure activity.

*iv. Risk bearing:* The essence of entrepreneurship is the ‘willingness to assume risk’ arising out of the creation and implementation of new ideas. New ideas are always tentative and their results may not be instantaneous and positive.

### **Variable Factors**

An input whose quantity can be changed in the time period under consideration. The most common example of a variable input is labour. Variable inputs provide the means used by a firm to control short-run production. A variable input is a resource or factor of production which can be changed in the short run by a firm as it seeks to change the quantity of output produced. Most firms use several variable inputs in short-run production, especially labour, material inputs, and energy. However, in the analysis of short-run production, a great deal of insight is achieved by focusing on the variable use of labour.

## **Fixed Factors**

The alternative to variable input is fixed input. A fixed input, like capital, provides the capacity constraint in production. As larger quantities of a variable input, like labor, are added to a fixed input like capital, the variable input becomes less productive, which is the law of diminishing marginal returns.

## **Short run and Long run**

The reference to time period involved in production process is another important concept used in production analysis. The two reference periods are short run and long run. Short run refers to a period of time in which the supply and the use of certain inputs (e.g., plant, building, machinery and so on) is fixed. In the short run, therefore, production of a commodity can be increased to a limited quantity by increasing the use of only variable inputs (labour). It is important to note here that 'short run' and 'long run' are economists' jargon. They do not refer to any fixed time period. While in some industries short run may be a matter of few weeks or few months, in some others (e.g., electricity and power industry, automobiles and so on), it may mean three or more years. The long run refers to a period of time in which the supply of all the inputs is elastic, but not enough to permit a change in technology. That is, in the long run, all the inputs are variable. Therefore, in the long run, a firm can employ more of both variable and fixed inputs to increase its production. Economists use another term, i.e., (very long run) which refers to a period in which the technology of production is also supposed to change. In the very long-run period, the production function also changes. The technological advances result in a larger output from a given quantity of inputs.

## **Production Function**

We know that the output of a commodity depends on the inputs used. In other words, the quantity produced of a commodity depends on the quantity of inputs used to produce the commodity. It means that there is a relationship between

input and output. When input–output relationship is expressed in the form of an equation, it is called production function. By definition, production function is a mathematical statement which describes the technological relationship between inputs and output in physical terms. In its general form, it states that production of a commodity depends on certain specific inputs. In its specific form, it presents the quantitative relationships between inputs and output.

Production function refers to the functional relationship between the quantity of a good produced (output) and factors of production (inputs). “The production function is purely a technical relation which connects factor inputs and output.” Prof. Koutsoyiannis

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

Mathematically, such a basic relationship between inputs and outputs may be expressed as:

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

Where Q = Quantity of output ;L = Labour; C = Capital; N = Land.

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

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

The reasons for ignoring other inputs are following. Land and building (LB), as inputs, are constant

for the economy as a whole, and hence it does not enter into the aggregate production function. In the case of individual firms, land and building are lumped with ‘capital’. In case of ‘raw materials’, it has been observed that ‘this input bears a constant relation to output at all levels of production’. For example, cloth bears a constant relation to the number of ready-made garments. Similarly, for a given size of a house, the quantity of bricks, cement, steel and so on remains

constant, irrespective of number of houses constructed. In car manufacturing of a particular brand or size, the quantity of steel, number of the engine, and number of tyres and tubes are fixed per car. This constancy of input–output relations leaves the methods of production unaffected. So is the case, generally, with time. That is why; in most production functions, only two inputs—labour and capital—are included.

### **Managerial Uses of Production Function:**

1. To find the most profitable rate of operation of the firm.
2. To determine the optimum quantity of output to be produced and supplied.
3. To determine in advance the cost of business operations.
4. To locate weak points in production management to minimize costs.
5. To fix the price of the product.
6. To decide what sales channel to use.
7. To have a clear understanding of alternative plans and the right costs involved in them.
8. To have clarity about the various cost concepts.
9. To decide and determine the very existence of a firm in the production field.
10. To regulate the number of firms engaged in production.
11. To decide about the method of cost estimation or calculations.
12. To find out decision making costs by reclassifications of elements, reprising of input factors etc, so as to fit the relevant costs into management planning, choice etc.

### **Features of Production Function:**

Following are the main features of production function:

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

2. Complementary: The factors of production are also complementary to one another, that is, the two or more inputs are to be used together as nothing will be produced if the quantity of either of the inputs used in the production process is zero.

The principles of returns to scale is another manifestation of complementarity of inputs as it reveals that the quantity of all inputs are to be increased simultaneously in order to attain a higher scale of total output.

3. Specificity: It reveals that the inputs are specific to the production of a particular product. Machines and equipment's, specialized workers and raw materials are a few examples of the specificity of factors of production. This reveals that in the production process none of the factors can be ignored and in some cases ignorance to even slightest extent is not possible if the factors are perfectly specific.

### **Examples of production function**

The production function can be seen using the formula for its inputs. This looks something like:  $Q = f(\text{Input\#1, Input\#2, Input\#3, Input\#4...})$ . This would represent the four factors of production in land, labour, capital, and entrepreneurship. So the quantity output is dependent on the various inputs from land, labour, capital, and entrepreneurship. Let us now look at an example. Company X is a business that sells burgers to consumers. It has three main inputs – burger ingredients (land/natural resources), cooker (capital), and an employee (labor). These variables come together to form the production function which stipulates how much output will be achieved from a specific number of inputs.

In this example, there are ingredients that are needed in the form of buns and burgers, which is input number one. There is also a cooker which is needed which can cook 6 burgers every half hour. However, those cannot be cooked on their own, so an employee is needed. They can produce 5 burgers every ten minutes. The production function can therefore be constructed as per below:

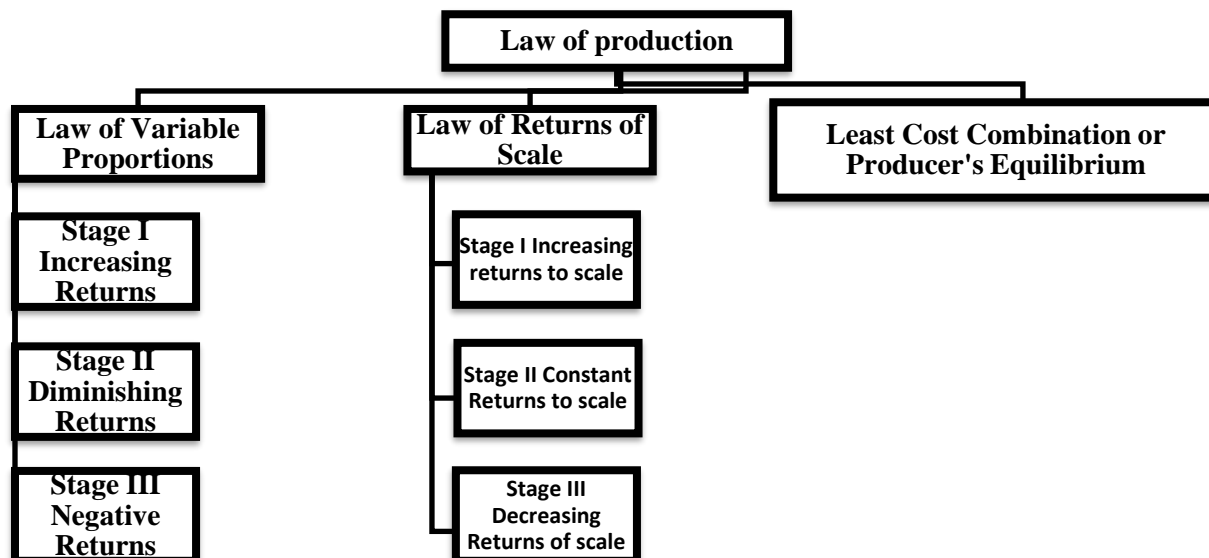
Burger per hour = min( burger ingredients, 12 x no of cookers, 30 x no.of. employees)

This formula calculates how the output achieved when all variables are considered as part of the production function. One important point to note is that the output is naturally limited to the minimum number of outputs any variable can produce. For instance, if there is only enough ingredients for one burger, then only one burger is made. If there is only one cooker, then only 12 burgers can be made. Similarly, if there is only one employee, then only 30 burgers can be made.

### **Law of Production**

Production function helps in making long-run as well as short run decisions. By definition, short run refers to the period during which supply of capital is inelastic and long run is the period during which supply of both labour and capital is elastic. In the short run, therefore, the firm can increase coal production by increasing labour only since the supply of capital in the short run is fixed. In the long run, however, the firm can employ more of both capital and labour because supply of capital also becomes elastic over time. Accordingly, there can be two kinds of production functions.

1. Short-run production function and
2. Long-run production function.



production can be studied under three headings as:

**Statement Law of Variable Proportions:**

Law of variable proportions occupies an important place in economic theory. This law examines the production function with one factor variable, keeping the quantities of other factors fixed. In other words, it refers to the input-output relation when output is increased by varying the quantity of one input. When the quantity of one factor is varied, keeping the quantity of other factors constant, the proportion between the variable factor and the fixed factor is altered; Since under this law we study the effects on output of variation in factor proportions, this is also known as the law of proportionality. “As the proportion of one factor in a combination of factors is increased, after a point, first the marginal and then the average product of that factor will diminish.” (F. Benham)

“An increase in some inputs relative to other fixed inputs will, in a given state of technology, cause output to increase; but after a point the extra output resulting from the same addition of extra inputs will become less.” (Paul A. Samuelson)

**Assumptions of Law of Variable Proportions**

1. First, the state of technology is assumed to be given and unchanged.
2. Secondly, there must be some inputs whose quantity is kept fixed

3. Thirdly the law is based upon the possibility of varying the proportions in which the various factors can be combined to produce a product. The law does not apply to those cases where the factors must be used in fixed proportions.

### **Explanation of Law of Variable Proportions**

The law of variable proportions is illustrated in the following Table and Figure. Assume that there is a given fixed amount of land, with which more units of the variable factor labour, is used to produce.

Table: Law of variable proportions

<b>Units of Land (Fixed factor)</b>	<b>Units of Labour (Variable Factor)</b>	<b>Total production</b>	<b>Average production</b>	<b>Marginal production</b>	<b>Description of Stages</b>
10 Acres	0	--	--	--	Stage I - $MP > AP$
10 Acres	1	20	20	20	
10 Acres	2	50	25	30	
10 Acres	3	90	30	40	
10 Acres	4	120	30	30	AP=MP
10 Acres	5	140	28	20	Stage II - $MP = 0$ and TP maximum
10 Acres	6	150	25	10	
10 Acres	7	150	21.3	0	
10 Acres	8	140	17.5	-10	Stage III - $MP < 0$

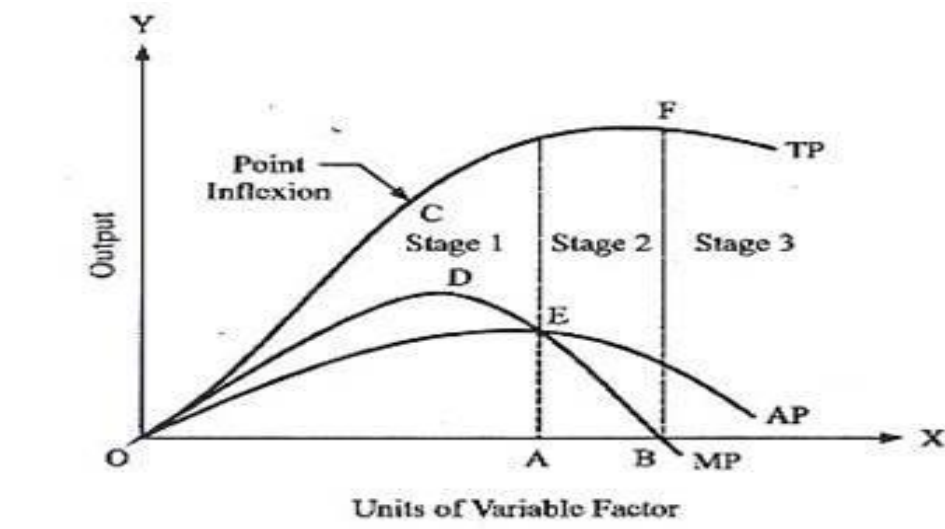
**Stage I: Increasing Returns :** From the table it is clear that there are three stages of the law of variable proportion. In the first stage average production increases as there are more and more doses of labour and capital employed with fixed factors (land). We see that total product, average product, and marginal product increases but average product and marginal product increases up to 40

units. Later on, both start decreasing because proportion of workers to land was sufficient and land is not properly used. This is the end of the first stage.

**Stage II: Decreasing Returns:** The second stage starts from where the first stage ends or where  $AP=MP$ . In this stage, average product and marginal product start falling. We should note that marginal product falls at a faster rate than the average product. Here, total product increases at a diminishing rate. It is also maximum at 70 units of labour where marginal product becomes zero while average product is never zero or negative.

**Stage III: Negative Returns:** The third stage begins where second stage ends. This starts from 8th unit. Here, marginal product is negative and total product falls but average product is still positive. At this stage, any additional dose leads to positive nuisance because additional dose leads to negative marginal product.

**Graphical Representation:** we have graphically illustrated the production function with one factor variable (for the sake of convenience), while all other factors are held constant. Quantity of the variable factor is shown on the X-axis and total product, average product and marginal product are measured along the Y-axis.



**The three stages of the law of returns to a factor or the law of variable proportions which takes place in the short run can be summarized in the form of a table as below**

<b>Stages</b>	<b>Terms Used</b>	<b>TP</b>	<b>AP</b>	<b>MP</b>	<b>Reference point in the figure</b>	<b>Reasons</b>
I	Increasing returns of the factor	Starts from origin increases at an increasing rate and then increasing at a decreasing rate	Starts from the origin and then increases till its maximum point	Increases, reaches a maximum and then starts falling	From Origin to point A	The fixed factor is more intensively and effectively utilized. Variable factor in the initial stage give increasing returns. It becomes possible to introduce specialization or division of labour which results in higher productivity.
II	Diminishing returns to the factor	Increases at a decreasing rate till it reaches the maximum point	Falls-Continuously	Falls Continuously till it is equal to zero	From Point A to B	The contributions to the production made by the variable factor after a optimum point become less and less because the additional units of the variable factor have less and less of the fixed factor to work with.
III	Negative returns to the factor	Falls	Falls Continuously	It is Negative	From point B onwards	As the amount of a variable factor continues to be increased to a fixed quantity of the other factor, a stage is reached when the total product declines and the marginal product of the variable factor becomes negative.

## **Law of returns to scale**

The law of returns to scale operates in the long period. It explains the production behavior of the firm with all variable factors. There is no fixed factor of production in the long run. The law of returns to scale describes the relationship between variable inputs and output when all the inputs, or factors are increased in the same proportion. The law of returns to scale analysis the effects of scale on the level of output. Here we find out in what proportions the output changes when there is proportionate change in the quantities of all inputs.

According to Koutsoyiannis, “The term returns to scale refers to the changes in output as all factors change by the same proportion”.

According to Liebhafsky, “Returns to scale relates to the behavior of total output as all inputs are varied and is a long run concept”.

### **Assumptions of Law of Returns to scale**

This law is based on the following assumptions:

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

### **Explanation of Law of Returns to scale**

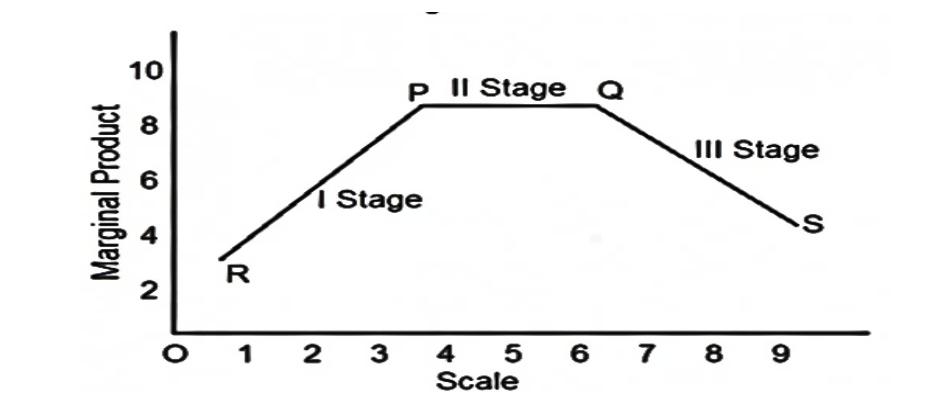
There are three phases of returns in the long-run which may be separately described as (1) the law of increasing returns (2) the law of constant returns and (3) the law of decreasing returns.

Depending on whether the proportionate change in output equals, exceeds, or falls short of the proportionate change in both the inputs, a production function is classified as showing constant, increasing or decreasing returns to scale.

Let us take a numerical example to explain the behavior of the law of returns to scale.

Units of Labour	Units of Land ( in acres)	Total Returns	Marginal Returns	Stages
1	2	4	4	(Stage I - Increasing Returns)
2	4	10	6	
3	6	18	8	
4	8	28	10	(Stage II - Constant Returns)
5	10	38	10	
6	12	48	10	
7	14	56	8	(Stage III - Decreasing Returns)
8	16	62	6	

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



RS = Returns to scale curve ; RP = Segment; increasing returns to scale; PQ = segment; constant returns to scale; QS = segment; decreasing returns to scale

**Increasing Returns to Scale:** In figure, stage I represents increasing returns to scale. During this stage, the firm enjoys various internal and external economies

such as dimensional economies, economies flowing from indivisibility, economies of specialization, technical economies, managerial economies and marketing economies. Economies simply mean advantages for the firm. Due to these economies, the firm realizes increasing returns to scale. Marshall explains increasing returns in terms of “increased efficiency” of labor and capital in the improved organization with the expanding scale of output and employment factor unit. It is referred to as the economy of organization in the earlier stages of production.

**Constant Returns to Scale:** In figure, the stage II represents constant returns to scale. During this stage, the economies accrued during the first stage start vanishing and diseconomies arise. Diseconomies refer to the limiting factors for the firm’s expansion. Emergence of diseconomies is a natural process when a firm expands beyond certain stage. In the stage II, the economies and diseconomies of scale are exactly in balance over a particular range of output. When a firm is at constant returns to scale, an increase in all inputs leads to a proportionate increase in output but to an extent.

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

### **Producer’s Equilibrium**

The producers are always faced with the problem of deciding about combination of inputs that should be used for producing a commodity. A given level of output can be produced by employing various combination of inputs. A rational producer will always choose optimum combination of inputs to produce that given level of output. The combination of inputs is optimum if the given quantity

of output can be produced with minimum cost or if the maximum quantity of output can be produced with a given cost of production. This decision of the producers is called as “Producer’s Equilibrium”.

### Iso-Quant Curves

The term ‘isoquant’ has been derived from a Greek word ‘iso’ meaning equal and a Latin word ‘quantus’ meaning quantity. The ‘isoquant curve’ is, therefore, also known as equal product curve and production indifference curve. By definition, an isoquant is locus of points representing different combinations of two inputs (labour and capital) yielding the same output.

Isoquants, which are also called equal-product curves, are similar to the indifference curves of the theory of consumer’s behaviour. An isoquant represents all those input combinations which are capable of producing the same level of output. The isoquants are thus contour lines which trace the loci of equal outputs. Since an isoquant represents those combinations of inputs which are capable of producing an equal quantity of output, the producer would be indifferent between them. Therefore, another name which is often given to the equal product curves is production-indifference curves. An isoquant is a curve that show all the combinations of inputs that yield the same level of output. ‘Iso’ means equal and ‘quant’ means quantity. Therefore, an isoquant represents a constant quantity of output. The isoquant curve is also known as an “Equal Product Curve” or “Production Indifference Curve” or Iso-Product Curve.”

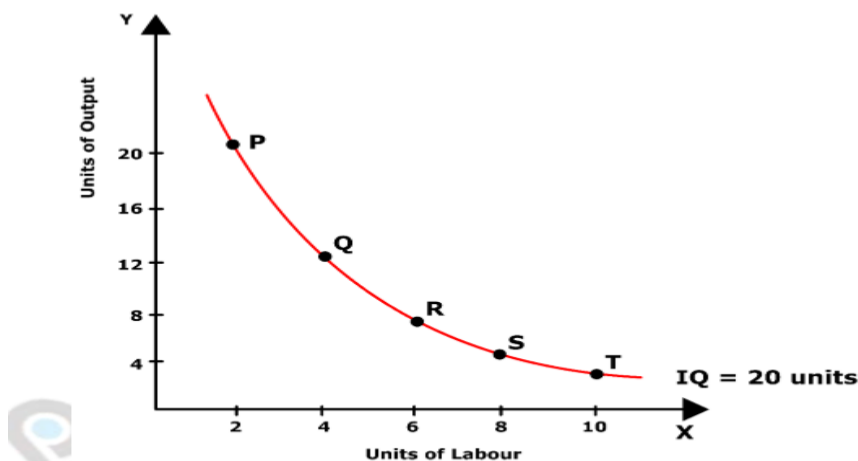
### **The Derivation of Iso-quant Curve**

An isoquant represents all possible combinations of labour & capital that can be employed to produce a given level of output. Along an isoquant, the ratio of inputs keeps on changing. It is also known producer’s indifference curve or production indifference curve because the producer is indifferent between these combinations of factors. All combinations lying on the same isoquant produce the same level of output.

Let us suppose a firm producing 20 units of a product using different combination of factors. It is shown below:

Factor Combination	Units of labour	Units of Capital	Total units of Output
P	2	20	20
Q	4	12	20
R	6	7	20
S	8	5	20
T	10	4	20

The above table shows that 20 units of output can be produced by employing 2 units of labour and 20 units of capital or 4 units of labour and 14 units of capital or any other combination of labour& capital.



Above figure shows that all different combinations of factors such P, Q, R, Sand T are capable of producing 20 units of output.

### **Assumptions of Iso-quant Curve**

Isoquant curves represent combinations of different inputs (like labor and capital) that produce the same level of output. The assumptions underlying isoquant curves are essential to understanding their shape and properties. Here are the key assumptions:

#### 1. Two Inputs:

- It is assumed that only two inputs are used in the production process, typically labor and capital, which are variable.

## 2. Smooth Substitution:

- The inputs can be substituted for each other in varying proportions while still producing the same level of output. This means that if the use of one input decreases, the other must increase to maintain the same level of output.

## 3. Diminishing Marginal Rate of Technical Substitution (MRTS):

- As you substitute one input for another (e.g., labor for capital), the rate at which you can substitute them decreases. This implies that isoquant curves are convex to the origin.

## 4. No Intersection:

- Isoquant curves do not intersect because each curve represents a different level of output. If they intersect, it would imply that the same combination of inputs could produce two different levels of output, which is impossible.

## 5. Higher Isoquants Represent Higher Output:

- An isoquant curve that lies above and to the right of another represents a higher level of output. This is because higher levels of input generally lead to higher output.

## 6. Continuous and Smooth Curves:

- Isoquant curves are assumed to be continuous and smooth, allowing for a flexible substitution between inputs.

## 7. Non-Satiation of Inputs:

- The assumption here is that more of either input will not decrease the output, meaning the more you use, the more you can produce, assuming the other input remains constant.

These assumptions provide the foundation for analyzing how firms can optimize production by choosing the best combination of inputs to achieve a given level of output.

## **Properties of Iso-quant Curve**

The following are the main properties of isoquants:

- i.** Isoquants are downward sloping from left to right - Isoquant have a negative

slope because if a firm wants to employ more units of one factor, than it has to reduce the units of other factor to produce same level of output. It is assumed that marginal product of the factors is positive i.e. increase in the quantity of factor leads to positive increase in the output. Thus if the amount of one factor is increases, the amount of other factor has to be decrease to produce the same level of output.

- ii.** Isoquants are convex to the origin - This feature of isoquants is based upon the 'Principle of Diminishing Marginal Rate of Technical Substitution'. The slope of an isoquant is known as marginal rate of technical substitution. It is defined as the quantity of capital (K) that a firm is willing to sacrifice for an additional quantity of labour (L) to keep the same level of output.

$$MRTs = \Delta K / \Delta L$$

The MRTs goes on declining as we move down on the isoquant showing that the quantity of capital that is needed to be sacrificed by employing more units of labour, declines so as to maintain the same level of output. Along the downward sloping isoquant, marginal productivity of labour decreases with the increase in units of labour and simultaneously marginal productivities of capital increase with the reduction in the units of capital. Thus, lesser amount of capital is required to keep the output constant.

- iii.** Two Isoquants never intersect or touch each other - it is not possible that one combination of factors can produce two different level of output. This is illogical and absurd. Thus, isoquants never intersect each other.

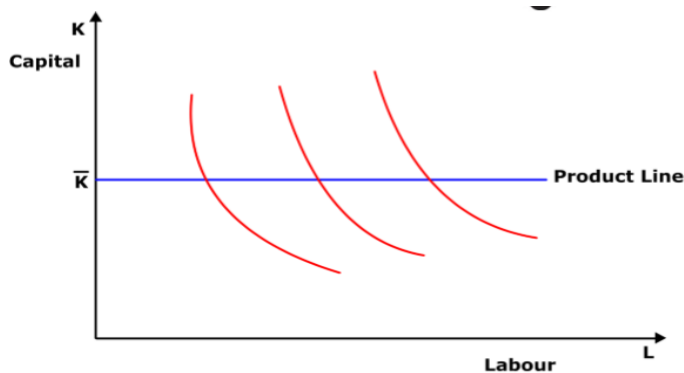
Higher isoquant represents a higher level of output: Higher Isoquant indicates higher level of output and lower Isoquant indicates lower level of output. In other words, Isoquants laying to the right represent a larger output than those lying to the left, which indicate lower output.

### **Iso-quant Map**

An equal product map of isoquant map represents the various factor combinations which can yield various levels of output, every isoquant showing those factor combinations each of which can produce a specified level of output.

Thus, an isoquant map represents the production function of a product with two variable factors. Therefore, an isoquant map represents the technical conditions of production for a product. On the other hand, a family of iso-cost line represents the various levels of total cost outlay, given the prices of two factors. The entrepreneur may desire to minimize his cost for producing a given level of output, or he may desire to maximize his output level for a given cost outlay. Let us suppose that the entrepreneur has already decided about the level of output to be produced. Then the question is with which factor combination the entrepreneur will try to produce the given level of output. To produce a given level of output, the entrepreneur will choose the combination of factors which minimizes his cost of production, for only in this way he will be maximizing his profits. Thus a producer will try to produce a given level of output with least-cost combination of factors. This least cost combination of factors will be optimum for him.

Isoquant Map – A number of isoquants depicting different levels of output are known as isoquant map.



Above Figure shows an isoquant map where isoquant IQ1 depicts the lowest level of output of 20 units while isoquants IQ2 and IQ3 depict higher level of output of 30 units and 40 units respectively. Higher isoquant represents higher level of output than the lower one.4.

### Key Glossaries

1. **Production:** The process of transforming inputs (resources) into outputs (goods or services).

2. **Output:** The quantity of goods or services produced.
3. **Input:** Resources such as labor, capital, land, and raw materials used in production.
4. **Land:** Natural resources used in production (e.g., land, water, minerals).
5. **Labor:** Human effort, both physical and mental, used in production.
6. **Capital:** Man-made resources like machinery, tools, and buildings used in production.
7. **Entrepreneurship:** The ability to organize, manage, and take risks to bring the other factors of production together effectively.
8. **Production Function:** A mathematical representation of the relationship between inputs and output.
  - a. Example:  $Q=f(L,K)$ , where  $Q$  is output,  $L$  is labor, and  $K$  is capital.
9. **Short-Run Production Function:** A scenario where at least one input (e.g., capital) is fixed.
10. **Long-Run Production Function:** A situation where all inputs can be varied.
11. **Marginal Product (MP):** The additional output produced by using one more unit of a particular input.
  - a. Formula:  $MP = \frac{\Delta Q}{\Delta \text{Input}}$
12. **Average Product (AP):** The output per unit of a particular input.
  - a. Formula:  $AP = \frac{Q}{\text{Input}}$
13. **Diminishing Marginal Returns:** A principle stating that as more of a variable input is added to fixed inputs, the additional output eventually decreases.
14. **Law of Variable Proportions:** In the short run, as the quantity of one input increases while others are held fixed, the marginal product of the variable input initially rises but eventually falls.
15. **Returns to Scale:** Describes how output changes as all inputs are scaled up or down.

- a. **Increasing Returns to Scale:** Output increases by a greater proportion than inputs.
  - b. **Constant Returns to Scale:** Output increases in the same proportion as inputs.
  - c. **Decreasing Returns to Scale:** Output increases by a lesser proportion than inputs.
16. **Isoquant:** A curve that represents all combinations of inputs (e.g., labor and capital) that produce the same level of output.
17. **Marginal Rate of Technical Substitution (MRTS):** The rate at which one input can be substituted for another while keeping output constant.
- a. Formula:  $MRTS = -\frac{\Delta K}{\Delta L}$
18. **Isoquant Map:** A collection of isoquants showing various output levels.
19. **Properties of Isoquants:**
- a. **Downward Sloping:** Inputs can substitute each other.
  - b. **Convex to the Origin:** Reflects diminishing MRTS.
  - c. **Non-Intersecting:** Each isoquant represents a unique output level.
20. **Economic Region of Production:** The area where isoquants exhibit efficient input combinations.

### Short Questions

1. Define the production function.
2. List the four main factors of production.
3. What is the Law of Diminishing Returns?

### Brief Questions

1. Explain the concept of an isoquant curve and its significance in production analysis.
2. Describe the relationship between the short-run and long-run production functions.
3. Discuss the role of each factor of production in the production process.

## Detailed Questions

1. Critically analyze the Law of Variable Proportions and its impact on the shape of the production function.
2. Examine how isoquant curves can be used by firms to determine the optimal combination of inputs to minimize costs and maximize output.
3. Discuss the different stages of production in the context of the Law of Returns to Scale and analyze how these stages affect a firm's production decisions.

In the economic sense, a market is a system through which buyers and sellers bargain for the price of a product, settle the price and transact their business—buy and sell a product. Personal contact between the buyers and sellers is not necessary. In some cases, e.g., forward sale and purchase, even immediate transfer of ownership of goods is not necessary. Market does not necessarily mean a place. The market for a commodity may be local, regional, national or international. What makes a market is a set of buyers, a set of sellers and a commodity. Buyers are willing to buy and sellers are willing to sell, and there is a price for the commodity.

The determination of price of a commodity depends on the number of sellers and the number of buyers. Barring a few cases, e.g., occasional phases in share and property markets, the number of buyers is larger than the number of sellers. The number of sellers of a product in a market determines the nature and degree of competition in the market. The nature and degree of competition make the structure of the market. A market is a place where two parties can gather to facilitate the exchange of goods and services.

The market may be physical like a retail outlet, where people meet face-to-face, or virtual like an online market, where there is no direct physical contact between buyers and sellers.

In Economics it has no reference to a place, but to a commodity which is being bought and sold. For instance, we speak of cotton market or wheat covering not a single region but the entire world.

### **Characteristics of Market**

Essential characteristics of a market are as follows:

i. One commodity:

In practical life, a market is understood as a place where commodities are bought and sold at retail or wholesale price, but in economics “Market” does not refer to

a particular place as such but it refers to a market for a commodity or commodities i.e., a wheat market, a tea market or a gold market and so on.

ii. Area:

In economics, market does not refer only to a fixed location. It refers to the whole area or region of operation of demand and supply

iii. Buyers and Sellers:

To create a market for a commodity what we need is only a group of potential sellers and potential buyers. They must be present in the market of course at different places.

iv. Perfect Competition:

In the market there must be the existence of perfect competition between buyers and sellers. But the opinion of modern economist is that in the market the situation of imperfect competition also exists, therefore, the existence of both is found.

v. Business relationship between Buyers and Sellers:

For a market, there must exist perfect business relationship between buyers and sellers. They may not be physically present in the market, but the business relationship must be carried on.

vi. Perfect Knowledge of the Market:

Buyers and sellers must have perfect knowledge of the market regarding the demand of the customers, regarding their habits, tastes, fashions etc.

vii. One Price:

One and only one price be in existence in the market which is possible only through perfect competition and not otherwise.

viii. Sound Monetary System:

Sound monetary system should be prevalent in the market, it means money exchange system, if possible, be prevalent in the market.

ix. Presence of Speculators:

Presence of speculators is essential just to supply business information's and prices prevalent in the market.

## **Market Structure**

The term market structure refers to the organizational features of an industry that influence the firm's behaviour in its choice of price and output. The difference in the market structure is an economically significant feature of the market. It determines the powers and the behaviour of firms in respect of their production and pricing decisions. Market structure is classified on the basis of the nature of competition in the industry, more specifically, on the basis of degree of competition among the firms. In general, the organizational features include the number of firms, distinctiveness of their products, elasticity of demand and the degree of firm's control over the price of the product.

Market structure refers to how different industries are classified and differentiated based on their degree and nature of competition for services and goods. The four popular types of market structures include perfect competition, oligopoly market, monopoly market, and monopolistic competition. Market structures show the relations between sellers and other sellers, sellers to buyers, or more. In economics, market structures can be understood well by closely examining an array of factors or features exhibited by different players. It is common to differentiate these markets across the following seven distinct features.

1. The industry's buyer structure
2. The turnover of customers
3. The extent of product differentiation
4. The nature of costs of inputs
5. The number of players in the market
6. Vertical integration extent in the same industry
7. The largest player's market share

By cross-examining the above features against each other, similar traits can be established. Therefore, it becomes easier to categorize and differentiate companies across related industries. Based on the above features, economists

have used this information to describe four distinct types of market structures. They include perfect competition, oligopoly market, monopoly market, and monopolistic competition.

### Forms of Market Structure

The popular basis of classifying market structures rests on three crucial elements, (1) the number of firms producing a product, (2) the nature of product produced by the firms, that is, whether it is homogeneous or differentiated, and (3) the ease with which new firms can enter the industry. The price elasticity of demand for a firm's product depends upon the number of competitive firms producing the same or similar product as well as on the degree of substitution which is possible between the product of a firm and other products produced by rival firms. Therefore, a distinguishing feature of different market categories is the degree of price elasticity of demand faced by an individual firm.

The following are the various types of market structure

Type of Market	Number of Firms	Freedom of Entry	Nature of product	Examples	Implications of demand curve faced by firm
Perfect Competition	Very many	Unrestricted	Homogenous (Undifferentiated)	Vegetable sellers etc	<u>Horizontal</u> : firm is a price taker
<b>Imperfect Competition</b>					
Monopolistic Competition	Many	Unrestricted	Differentiated	Builders etc	<u>Downward Sloping</u> : but relatively elastic
Oligopoly	Few	Restricted	Undifferentiated or differentiated	Cement, electrical appliances	<u>Downward sloping</u> : Relatively inelastic
Monopoly	One	Restricted or completely blocked	Unique	Train operators	<u>Downward sloping</u> : more inelastic than oligopoly. Firm has considerable control over price

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### **Market Structure: Perfect Competition**

A perfectly competitive market is one in which there is large number of buyers and sellers of a homogeneous product and neither a seller nor a buyer has any control on the price of the product. As mentioned earlier, perfect competition as perceived by the economists is a rare phenomenon. Nevertheless, analysis of price and output determination under perfect competition 'lays the foundation' of pricing theory. This kind of a notional market is therefore created by assumption for theoretical purpose. A perfectly competitive market is assumed to have the following characteristics:

#### ***Features of Perfect Competition***

**i. Large number of buyers and sellers:** There are a large number of buyers and sellers in a perfect competitive market that neither a single buyer nor a single seller can influence the price. The price is determined by market forces namely the demand for and the supply of the product. There will be uniform price in the market. Sellers accept this price and adjust the quantity produced to maximize their profit. Thus, the sellers in the perfect competitive market are price-takers and quantity adjusters.

**ii. Homogeneous Product:** The products produced by all the firms in the perfectly competitive market must be homogeneous and identical in all respects i.e. the products in the market are the same in quantity, size, taste, etc. The products of different firms are perfect substitutes and the cross-elasticity is

infinite.

**iii. Perfect knowledge about market conditions:** Both buyers and sellers are fully aware of the current price in the market. Therefore, the buyer will not offer high price and the sellers will not accept a price less than the one prevailing in the market.

**iv. Free entry and Free exit:** There must be complete freedom for the entry of new firms or the exit of the existing firms from the industry. When the existing firms are earning super-normal profits, new firms enter into the market. When there is loss in the industry, some firms leave the industry. The free entry and free exit are possible only in the long run. That is because the size of the plant cannot be changed in the short run.

**v. Perfect mobility of factors of production:** The factors of productions should be free to move from one use to another or from one industry to another easily to get better remuneration. The assumption of perfect mobility of factors is essential to fulfil the first condition namely large number of producers in the market.

**vi. Absence of transport cost:** In a perfectly competitive market, it is assumed that there are no transport costs. Under perfect competition, a commodity is sold at uniform price throughout the market. If transport cost is incurred, the firms nearer to the market will charge a low price than the firms far away. Hence it is assumed that there is no transport cost.

**vii. Absence of Government or artificial restrictions or collusions:** There are no government controls or restrictions on supply, pricing etc. There is also no collusion among buyers or sellers. The price in the perfectly competitive market is free to change in response to changes in demand and supply conditions.

### **Perfect Competition and Pure Competition**

Sometimes, a distinction is made between perfect competition and pure competition. The difference between the two kinds of competition is a matter of degree. While 'perfect competition' has all the features mentioned earlier, under 'pure competition', there are no perfect mobility of factors and no perfect knowledge about market conditions. That is, perfect competition less 'perfect

mobility' and 'perfect knowledge' is pure competition. 'Pure competition' is 'pure' in the sense that it has absolutely no element of monopoly. The perfect competition, with its all characteristics mentioned earlier is considered as a rare phenomenon in the real business world. The actual markets that approximate to the conditions of a perfectly competitive market include markets for stocks and bonds and agricultural market. Despite its limited scope, perfect competition model has been widely used in economic theories due to its analytical value.

To brief, pure competition is a market situation in which the first three features of perfect competitive market will exist. In other words, a market said to be pure competition when the market has

1. Large number of buyers and sellers;
2. Homogeneous product and
3. Uniform price and Free entry and exit of firms

Therefore, pure competition is an integral part of perfect competition.

Perfect competition is a market in which there are large number of buyers and sellers, with homogeneous product and Uniform price, free entry and exit of firms, perfect mobility of factors of production, perfect knowledge about the market, absence of transport cost and no Government intervention. It is an ideal and imaginary market. Cent per cent perfect competition cannot be seen. The firm in the perfect competition are called price takers as there is a uniform price exists.

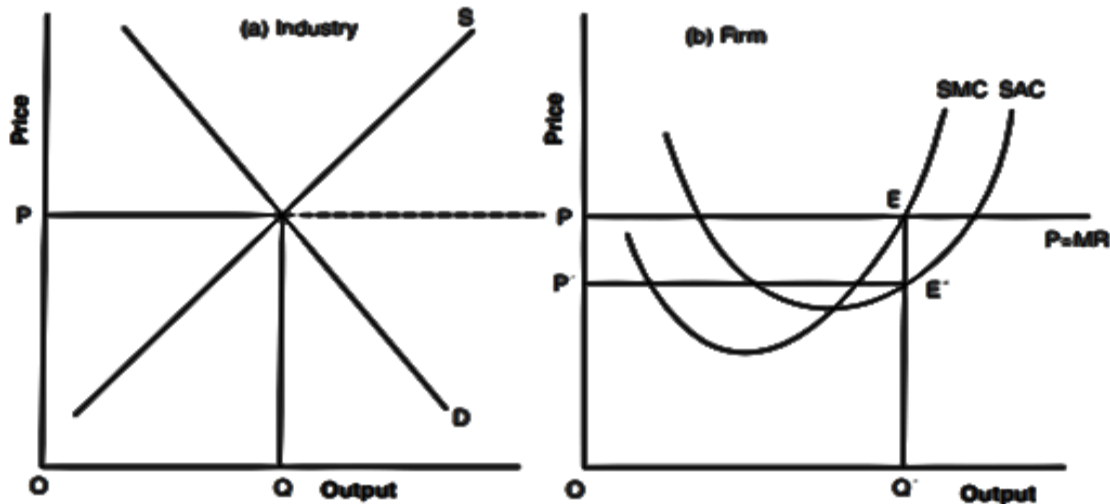
### **Equilibrium of Firm under Perfect competition**

As explained earlier, in the traditional theory of firm, the equilibrium of a firm is determined in the following conditions: (i) profit maximization is assumed to be the basic objective of a business firm and (ii) profit is maximized at the level of output at which  $MR = MC$ , under rising MC. Given these conditions, profit-maximizing firm attains its equilibrium at the level of output at which its  $MC = MR$ . This condition applies in both short run and long run, even though MR and MC conditions are somewhat different in the long run. In this section, we discuss firm's short-run equilibrium. Long-run equilibrium of the firm will be discussed in the forthcoming section.

## Assumptions

The short-run equilibrium of a firm is analysed under the following assumptions:

1. capital cost is fixed but labour cost is variable;
2. prices of inputs are given;
3. price of the commodity is fixed; and
4. the firm is faced with short-run U-shaped cost curves.



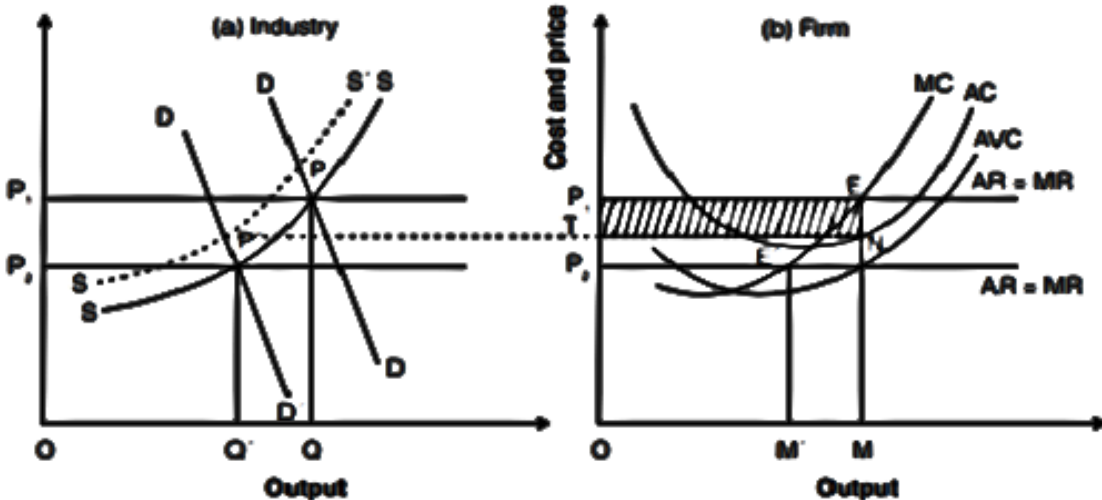
The firm's equilibrium in the short run is illustrated in above Figure. The determination of market price is shown in panel Figure, the market price of a commodity is determined at  $OP$  by the market forces—demand and supply—in a perfectly competitive market. The price  $OP$  is fixed for all the firms of the industry. Therefore, a firm faces a straight line or horizontal demand curve, as shown by the line  $P = MR$ . The straight horizontal demand line implies that price equals marginal revenue, i.e.,  $AR = MR$ . The short-run average and marginal cost curves of the firm are shown by  $SAC$  and  $SMC$ , respectively.

Firm's short-run equilibrium is illustrated in panel Figure  $SMC$  curve intersects the  $P = MR$  line at point  $E$ , from below. At point  $E$ ,  $SMC = MR$ . Point  $E$  determines, therefore, the point of firm's equilibrium. A perpendicular drawn from point  $E$  to the output axis determines the equilibrium output at  $OQ$ . It can be seen in the figure that output  $OQ$  meets both the first and the second order conditions of profit maximization. At output  $OQ$ , therefore, profit is maximum. The output  $OQ$

is, thus, the equilibrium output. At this output, the firm is in equilibrium and is making maximum profit. Firm's maximum pure profit is shown by the area PEE'P' which equals  $PP' \times OQ (=PE)$  where  $PP'$  is the per unit super normal profit at output  $OQ$ .

### Equilibrium of Industry Under Perfect Competition

The short-run equilibrium of the firm and industry have been analysed separately in the previous sections. There exists, however, a link between a firm's and industry's equilibrium. In a perfectly competitive market, change in the equilibrium of an individual firm does not affect the industry's equilibrium, for the simple reason that the total output of a single firm constitutes a small fraction of the industry's output. But, a change in the industry's equilibrium does alter the equilibrium of an individual firm. In this section, we show how individual firms move from one equilibrium position to another, when there is a change in industry's equilibrium. For the sake of simplicity, we assume that all the firms of an industry have identical cost conditions and cost curves.



The link between industry's and firm's equilibrium is illustrated in the figure below. Suppose industry's initial demand and supply curves are given as  $DD$  and  $SS$ , respectively. As shown in Figure industry's demand and supply curves intersect each other at point  $P$ , determining the market price at  $PQ = OP_1$  and industry's equilibrium output is  $OQ$ . Thus, the price  $PQ$  is given to all the firms

of the industry. Given the price  $PQ$  and firm's cost curves, an individual firm finds its equilibrium at point  $E$  in Figure 16.8(b), where its  $MC = MR$ . Firm's equilibrium output is  $OM$ . At price  $EM = PQ$ , the firm is making an abnormal profit in the short run to the extent of  $EN$  per unit of output. The firm's total pure profit is shown by the shaded area,  $P_1 ENT$ .

Let industry demand curve  $DD$  now shift downward for some reason to  $DD'$ , supply curve remaining unchanged. As a result, market price falls to  $P'Q'$  and industry's equilibrium output falls to  $QQ'$ . With the fall in price, firm's equilibrium shifts from point  $E$  to  $E'$  where its  $MC = MR$ . At this point, the firm is making a loss because its  $AR$  which equals  $E'M'$  is lower than its  $AC$  (see the difference between  $AC$  curve at point  $E'$ ). Thus, change in industry's equilibrium changes firm's equilibrium. Firm making loss is, however, a short-run situation. Losses will disappear in the long run through a process of market adjustment. The process of market adjustment begins with loss-making firms exiting the industry. When loss-making firms quit the industry, supply declined, and the supply curve shifts left side as shown by the dotted supply curve  $SS'$ . Price goes up and loss disappears, and firm reaches another equilibrium point.

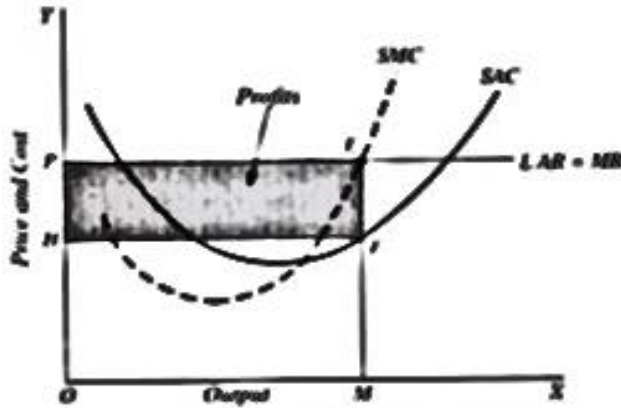
### **Equilibrium price under Perfect Competition in Short run - Super Normal Profit**

Since a firm in the perfectly competitive market is a price-taker, it has to adjust its level of output to maximize its profit. The aim of any producer is to maximize his profit. The short run is a period in which the number and plant size of the firms are fixed. In this period, the firm can produce more only by increasing the variable inputs. As the entry of new firms or exit of the existing firms are not possible in the short-run, the firm in the perfectly competitive market can either earn supernormal profit or normal profit or incur loss in the short period.

#### **Super-normal Profit**

When the average revenue of the firm is greater than its average cost, the firm is earning super-normal profit.

#### **Short-run equilibrium with super-normal profits**

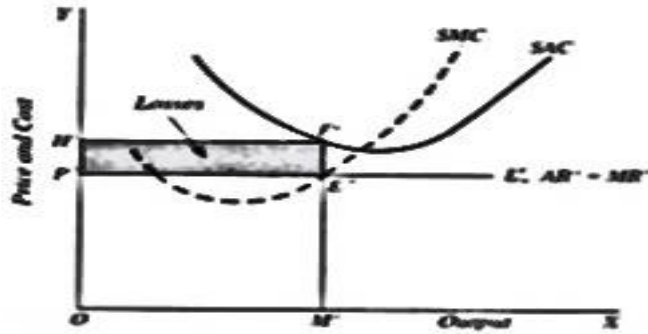


In figure output is measured along the x-axis and price, revenue and cost along the y-axis. OP is the prevailing price in the market. PL is the demand curve or average and the marginal revenue curve. SAC and SMC are the short run average and marginal cost curves. The firm is in equilibrium at point 'E' where  $MR = MC$  and MC curve cuts MR curve from below at the point of equilibrium.

Therefore, the firm will be producing OM level of output. At the OM level of output, ME is the AR and MF is the average cost. The profit per unit of output is EF (the difference between ME and MF). The total profits earned by the firm will be equal to EF (profit per unit) multiplied by OM or HF (total output). Thus the total profits will be equal to the area HFEP. HFEP is the supernormal profits earned by the firm.

### **Equilibrium price under Perfect Competition in Short run - Loss**

Now the prevailing market price of the product is such that the price line or average and marginal revenue curve lies below average cost curve throughout. This case is illustrated in the below figure where the ruling price is  $OP'$  which is taken as given by the firm.



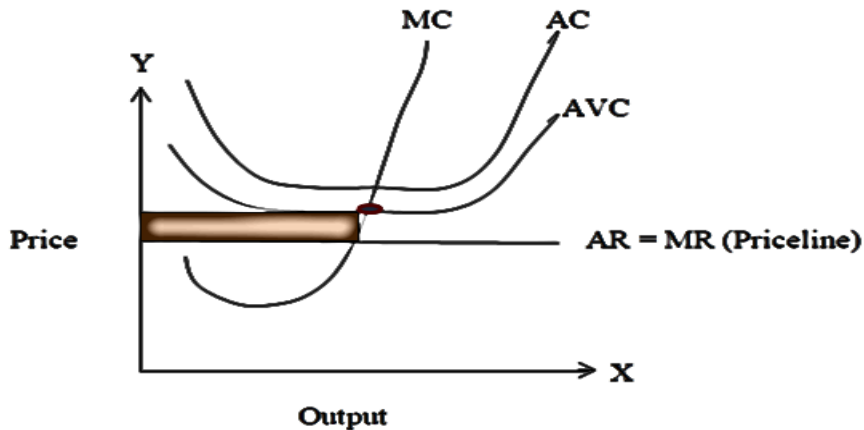
$P'L'$  is the price line which lies below AC curve at all levels of output. The firm will be in equilibrium at point E at which marginal cost is equal to price (or marginal revenue) and marginal cost curve is rising. Firm would be producing  $OM'$  output but would be making losses, since average revenue (or price) which is equal to  $ME'$  is less than average cost which is equal to  $MF$ . The loss per unit of output is equal to  $E'F'$  and total loss will be equal to  $P'E'F'H$  which is the minimum loss that a firm can make under the given price-cost situation. Since all the firms are working under the same cost conditions, all would be in equilibrium at point E' or output  $OM'$  and every one will be making losses equal to  $P'E'F'H$ . As a result, the firms will have a tendency to quit the industry in order to search for earning at least normal profits elsewhere. We thus see that at price  $OP'$  the firms will be in equilibrium at E' but there will be a tendency for firms to leave it through they cannot do so in the short period.

### **Equilibrium price under Perfect Competition in Short run - Shut down point**

in the analysis of firm's decision to continue operating or to shut down in the short run, the difference between variable costs and fixed costs is important. It will be remembered that variable costs are costs incurred on factors such as labour, raw materials, fuel or electricity which can be easily varied in the short run. When a firm shuts down in the short run and stops producing the commodity, the variable costs also fall to zero. On the other hand, a firm cannot escape from fixed costs even if it ceases production in the short run. It should

be noted that fixed costs are costs incurred on those factors which cannot be varied in the short run.

### Shut down point



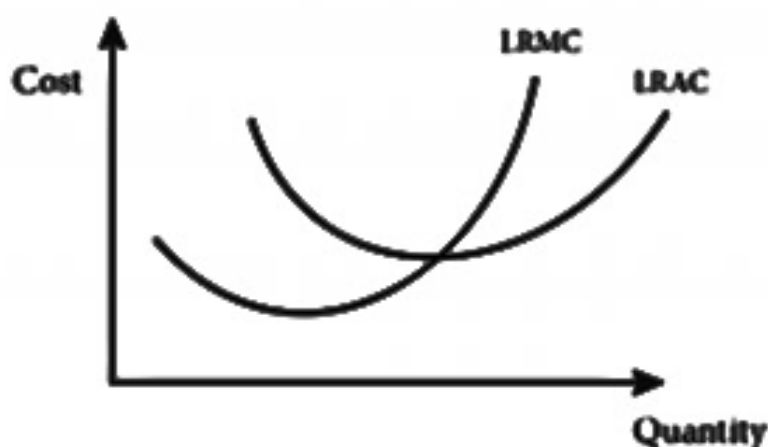
Consider the price is measured in vertical axis and output is measured in horizontal axis. Due to price uniformity the Average Revenue (AR) is equal to Marginal Revenue (MR) and at that level the price level are fixed. If the Marginal Cost (MC) curve intersect the Marginal Revenue (MR) curve from below, at that intersection point  $MC=MR$  and the output is optimum. The above diagram shows the shutdown area and point at which MC intersect AVC is shutdown point. The average variable cost is greater than the average revenue therefore the firm is in shutdown state.

### Cost Curves in Long run under Perfect Competition

Long-term is the period in which the firm can vary all of its inputs. There are no fixed costs and therefore, the AFC or Average Fixed Cost curve vanishes. Also, the Average Cost (AC) curve represents the Average Total Cost (ATC) curve. Further, since the firm can vary all its inputs, it can close own and leave the market. We know that in the long-run, the AC curve which is formed by its short-run AC curves is also U-shaped. This means that up to a certain limit, the firm experiences increasing returns and the AC curve slopes downwards. A phase of constant

returns follows in which the AC curve neither rises nor falls. Subsequently, diminishing returns to scale phase starts in which the AC curve slopes upwards.

Figure: Long run cost curves under perfect competition



### **Revenue curves in Long run under Perfect Competition**

Relationship between total, average and marginal concepts is highly useful in marginal analysis of optimum decision making. This relationship between total, average and marginal numbers holds in case of all concepts such as revenue, cost of production, profit, utility. We explain here the relationship by taking total, average and marginal revenue concepts. Total revenue from the production and sale of a product of a firm is the total quantity of the product produced and sold multiplied by price of the product.

In a perfect competition in the market for a product, price of the product is beyond the control of the firm, and it takes price as given and constant. As a result, demand curve facing a firm working in a perfectly competitive market is a horizontal straight-line at the given level of price of the product. Thus, a perfectly competitive firm can sell as much as it likes at the prevailing price in the market. If the price or average revenue remains the same when more units of the good are sold, the marginal revenue will be equal to average revenue. This

is so because if one more unit is sold and the price does not fall, the addition made to the total revenue by that unit will be equal to the price at which it is sold, since no loss in revenue is incurred on the previous units in this case. The case of perfect competition when for an individual firm average revenue (or price) remains constant and marginal revenue is equal to average revenue

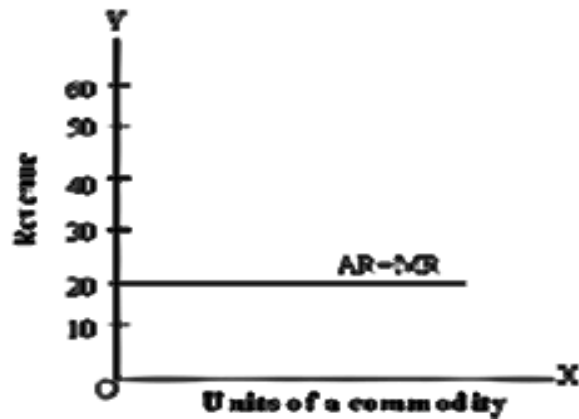
Under perfect competition, the firm has to accept the price prevailing in the market-determined by market forces such as demand and supply. Hence, it means that the average revenue or the price would remain constant for the firm. Furthermore, constant AR implies constant MR. Thus, it means that under perfect competition,  $AR=MR=Price$ . It can be well explained with the help of tabular and graphical representation:

### **Tabular Representation:**

The following schedule illustrates the behaviour of AR, MR and TR in a perfectly competitive market:

<b>Output/Sales (in units) Q</b>	<b>Average Revenue AR = TR/Q =Price (In Rs.)</b>	<b>Total Revenue TR= AR*Q (In Rs)</b>	<b>Marginal Revenue MR = TR<sub>n</sub>- TR<sub>n-1</sub> (In Rs.)</b>
1	20	1*20=20	20
2	20	2*20=40	20
3	20	3*20=60	20
4	20	4*20=80	20
5	20	5*20=100	20

In the above table, it is clearly evident that the price or AR of the product for the firm is Rs.10 per unit. Also, It remains constant for all levels of output. Furthermore, Constant AR leads to one constant MR and another is  $AR =MR$



In fig, X-axis shows the output sold and the Y-axis shows the revenue. Here, the horizontal straight line A indicates the firm's revenue curve (price line or demand curve). It implies that at Rs.10 per unit, the seller or firm can sell any quantity of output. Therefore, the firm's AR curve is perfectly elastic under perfect competition.

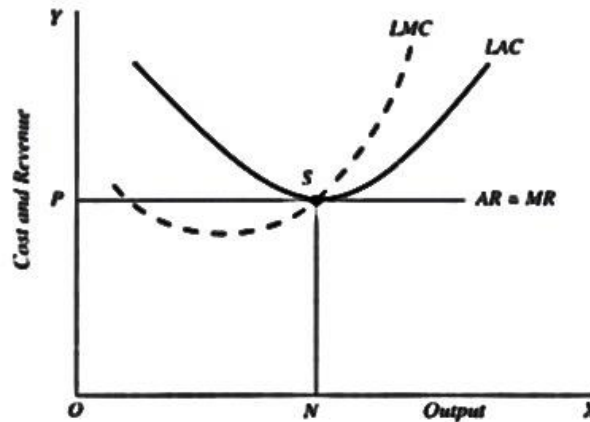
### **Equilibrium price under Perfect Competition in Long run – Normal Profit**

Long run equilibrium, price and output determination In the long run, all factors are variable. The firms can increase their output by increasing the number and plant size of the firms. Moreover, new firms can enter the industry and the existing firms can leave the industry. As a result, all the existing firms will earn only normal profit in the long run. If the existing firms earn supernormal profit, the new firms will enter the industry to compete with the existing firms.

As a result, the output produced will increase. When the total output increases, the demand for factors of production will increase leading to increase in prices of the factors.

This will result in increase in average cost. On the other side, when the output produced increases, the supply of the product increases. The demand remaining the same, when the supply of the product increases, the price of the product comes down. Hence the average revenue will come down. A fall in average revenue and the rise in average cost will continue till both become equal. (AR =

AC). Thus, all the perfectly competitive firms will earn normal profit in the long run.



The above Figure represents long run equilibrium of firm under perfect competition. The firm is in equilibrium at point S where  $LMC = MR = AR = LAC$ . The long run equilibrium output is ON. The firm is earning just the normal profit. The equilibrium price is OP. If the price rises above OP, the firm will earn abnormal profit, which will attract new firms into the industry. If the price is less than OP, there will be loss and the tendency will be to exit. So in the long run equilibrium, OP will be the price and marginal cost will be equal to average cost and average revenue. Thus the firm in the long run will earn only normal profit. Competitive firms are in equilibrium at the minimum point of LAC curve. Operating at the minimum point of LAC curve signifies that the firm is of optimum size i.e. producing output at the lowest possible average cost.

### **Equilibrium of the Firm and Industry**

In a perfectly competitive market, the role of a firm is limited to producing a commodity or service and selling it at the market determined price. In fact, an individual firm is one among a very large number of firms producing an almost identical commodity. The share of a firm in the total supply of the commodity is, therefore, very small. A firm's status in a perfectly competitive market can be described as follows.

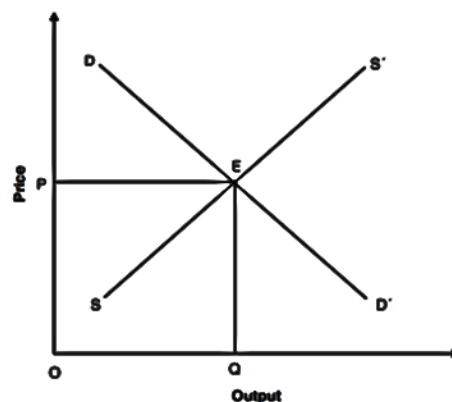
**i. A Firm Has No Control Over Price:** As mentioned earlier, the market share of an individual firm is so small, rather insignificant, that a firm cannot determine the price of its own product, nor it can influence the prevailing market

price by changing its supply. In other words, an individual firm has no control over the market price.

**ii. A Firm is a Price-Taker:** Under perfect competition, an individual firm does not determine the price of its own product. Price for its product is determined by the market demand and market supply for the industry.

**iii. No Control over Cost :** Because of its small purchase of inputs (labour and capital), under perfect competition a firm has no control over input prices. Nor can it influence the technology. Therefore, cost function for an individual firm is given. This point is, however, not specific to firms in a perfectly competitive market. This condition applies to all kinds of market except in case of bilateral monopoly.

An industry is in equilibrium in the short run when market is cleared at a given price, i.e., when the total supply of the industry equals the total demand for its product. The price at which the market is cleared is the equilibrium price. When an industry reaches its equilibrium, there is no tendency to expand or to contract the output. The equilibrium of industry is shown at point E. The industry demand curve  $DD'$  and supply curve  $SS'$  intersect at point E, determining equilibrium price  $OP$ . At price  $OP$ ,  $D = S$ . The industry is supplying as much as consumers demand. In the short-run equilibrium of the industry, some individual firms may make pure profits, some normal profits and some may make even losses, depending on their cost and revenue conditions. As we have explained below, this situation will, however, not continue in the long run.



The short-run equilibrium of the firm and industry have been analysed separately in the previous sections. There exists, however, a link between a firm's and industry's equilibrium. In a perfectly competitive market, change in the equilibrium of an individual firm does not affect the industry's equilibrium, for the simple reason that the total output of a single firm constitutes a small fraction of the industry's output. But, a change in the industry's equilibrium does alter the equilibrium of an individual firm. In this section, we show how individual firms move from one equilibrium position to another, when there is a change in industry's equilibrium. For the sake of simplicity, we assume that all the firms of an industry have identical cost conditions and cost curves.

The long-run equilibrium of the firm and industry let us have comparative look at the short- and long-run market conditions. The short run is, by definition, a period in which (i) firm's cost and revenue curves are given, (ii) firms cannot change their size—their capital is fixed, (iii) existing firms do not have the opportunity to leave the industry and (iv) new firms do not have the opportunity to enter the industry. In contrast, long run is a period in which these constraints disappear. The long run permits improvement in production technology and a larger employment of both labour and capital, i.e., firms can change their size. Some of the existing firms may leave and new firms may enter the industry. In the long run, the supply curve not only shifts downward but also becomes more elastic. The firms of industry reach their equilibrium in the long run where both short- and long-run equilibrium conditions are satisfied simultaneously.

## **Monopoly**

Monopoly, as is now generally understood, means the existence of a single producer or seller which is producing or selling a product which has no close substitutes. Since a monopoly firm has a sole control over the supply of a product, which can have only remote substitutes, it has a very large control over the price of its product. The expansion and contraction in output of the product by a monopolist will considerably affect the price of the product, contraction in

output will raise its price and expansion in output will lower it. Therefore, the demand curve facing a monopolist is downward sloping and has a steep slope. Thus, according to F. Machlup, “Monopolistic competition would then comprise the cases of closer substitutes and more elastic demand curves, while monopoly would comprise those of remote substitutes and steeper demand curves.” Besides, in monopoly there are strong barriers to the entry of new firms in the industry

“Monopoly is made of two words—‘Mono’ and ‘Poly’. ‘Mono’ means single and ‘Poly’ means seller. Thus, ‘Monopoly refers to a market situation where one firm or a group of firms which are combined to have a control over the supply of the product. “Monopoly is a market situation in which there is a single seller. There are no close substitutes of the commodity it produces, there are barriers to entry”. A market structure characterized by a single seller, selling a unique product in the market. In a monopoly market, the seller faces no competition, as he is the sole seller of goods with no close substitute.

In a monopoly market, factors like government license, ownership of resources, copyright and patent and high starting cost make an entity a single seller of goods. All these factors restrict the entry of other sellers in the market. Monopolies also possess some information that is not known to other sellers.

Different authors have defined the term monopoly in different ways. The following definitions are useful to understand the concept Monopoly.

According to McConnel,<sup>1</sup> 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 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**

### **1. One Seller and Large Number of Buyers**

The monopolist’s firm is the only firm; it is an industry. But the number of buyers is assumed to be large.

### **2. No Close Substitutes**

There shall not be any close substitutes for the product sold by the monopolist. The cross elasticity of demand between the product of the monopolist and others must be negligible or zero.

### **3. Difficulty of Entry of New Firms**

There are either natural or artificial restrictions on the entry of firms into the industry, even when the firm is making abnormal profits.

### **4. Monopoly is also an Industry**

Under monopoly there is only one firm which constitutes the industry. Difference between firm and industry comes to an end.

### **5. Price Maker**

Under monopoly, monopolist has full control over the supply of the commodity. But due to large number of buyers, demand of any one buyer constitutes an infinitely small part of the total demand. Therefore, buyers have to pay the price fixed by the monopolist.

## **Types of Monopoly**

Monopoly may be defined as that – “Market form in which a single producer controls the whole supply of a single commodity which has no close substitutes.”

Monopoly is of following kinds:

### **1. Simple Monopoly and Discriminating Monopoly:**

A simple monopoly firm charges a uniform price for its output sold to all the buyers. While a discriminating monopoly firm charges different prices for the same product to different buyers. A simple monopoly operates in a single market a discriminating monopoly operates in more than one market.

### **2. Pure Monopoly and Imperfect Monopoly:**

Pure monopoly is that type of monopoly in which a single firm which controls the supply of a commodity which has no substitutes not even a remote one. It possesses an absolute Monopoly power. Such a Monopoly is very rare. While imperfect monopoly means a limited degree of Monopoly. It refers to a single firm which produces a commodity having no close substitutes. The degree of

Monopoly is less than perfect in this case and it relates to the availability of the closeness of a substitute. In practice, there are many cases of such imperfect monopoly.

### **3. Natural Monopoly:**

When a Monopoly is established due to natural causes then it is called natural monopoly. To-day India has got Monopoly in mica production and Canada has got Monopoly in nickel production. These Monopoly natures has provided to these countries.

**4. Legal Monopoly:** When anybody receives or acquires Monopoly due to legal provisions in the country.

For Example:

When legal monopolies emerge on account of legal provisions like patents, trade-marks, copyrights etc. The law forbids the potential competitors to imitate the design and form of products registered under the given brand names, patent or trade-marks. This is done to safeguard the interests of those who have done much research and undertaken risks of innovating a particular product.

### **5. Industrial Monopolies or Public Monopolies:**

In the general interest of the nation, when a government nationalizes certain industries in the public sector, whereby industrial or public monopolies are created. The Industrial Policy Resolution 1956, in India, for instance, categorically lays down that certain fields like arms and ammunition, atomic energy, railways and air transport will be the sole monopoly of the Central Government. In this way industrial monopolies are created through statutory measures.

## **Causes of Monopoly**

The emergence and survival of a monopoly firm is attributed to the factors which prevent the entry of other firms into the industry and eliminate the existing ones. The barriers to entry are, therefore, the major sources of monopoly power. The main barriers to entry are:

- Legal restrictions or barriers to entry of new firms
- Sole control over the supply of scarce and key raw materials

- Efficiency in production
- Economies of scale

**(i) Legal restrictions**

Some monopolies are created by law in the public interest. Most of the erstwhile monopolies in the public utility sector in India, e.g., postal, telegraph and telephone services, telecommunication services, generation and distribution of electricity, Indian Railways, Indian Airlines and State Roadways, were public monopolies. Entry to these industries was prevented by law. Now most of these industries are being gradually opened to the private sector. Also, the state may create monopolies in the private sector also, through licence or patent, provided they show the potential of and opportunity for reducing cost of production to the minimum by enlarging size and investing in technological innovations. Such monopolies are known as franchise monopolies.

**(ii) Control over key raw materials**

Some firms acquire monopoly power because of their traditional control over certain scarce and key raw materials which are essential for the production of certain goods, e.g., bauxite, graphite, diamond, etc. For instance, Aluminium Company of America had monopolized the aluminium industry before World War II because it had acquired control over almost all sources of bauxite supply<sup>4</sup>. Such monopolies are often called 'raw material monopolies'. The monopolies of this kind emerge also because of monopoly over certain specific knowledge of technique of production.

**(iii) Efficiency in production**

Efficiency in production, especially under imperfect market conditions, may be the result of long experience, innovative ability, financial strength, availability of market finance at lower cost, low marketing cost, managerial efficiency, etc. Efficiency in production reduces cost of production. As a result, a firm's gains higher competitive strength and can eliminate rival firms and gain the status of a monopoly. Such firms are able to gain governments' favour and protection.

#### **(iv) Economies of scale**

The economies of scale are a primary and technical reason for the emergence and existence of monopolies in an unregulated market. If a firm's long-run minimum cost of production or its most efficient scale of production almost coincides with the size of the market, then the large-size firm finds it profitable in the long-run to eliminate competition through price cutting in the short-run. Once its monopoly is established, it becomes almost impossible for the new firms to enter the industry and survive. Monopolies created on account of this factor are known as natural monopolies. A natural monopoly may emerge out of the technical conditions of efficiency or may be created by law on efficiency grounds.

Monopolist, like a perfectly competitive firm, tries to maximize his profits. Profit maximization assumption on which is based the equilibrium analysis of the perfectly competitive firm is also taken to be the most valid assumption about the behaviour of the monopolist too. The motive of monopolist is the same as the motive of the perfectly competitive firm, that is, both aim at maximizing money profits. We thus do not attribute any more sinister motive to the monopolist. If the results of monopolist's behaviour on the basis of profit maximization motive are different from those of the firm under perfect competition, it is not due to any more sinister motive of monopolist but due to the circumstances and situation in which he is placed. A firm under perfect competition faces a horizontal straight-line demand curve and marginal revenue is equal to average revenue (or price), but a monopolist faces a downward sloping demand (or AR) curve and his marginal revenue curve lies below the average revenue curve. This difference in the demand conditions facing the monopolist and the perfectly competitive firm makes all the difference in the results of their equilibrium, even though both work on the basis of the same profit-maximization motive.

There is no certainty that a monopoly firm will always earn an economic or supernormal profit. Whether a monopoly firm earns economic profit or normal profit or incurs loss depends on:

- Its cost and revenue conditions
- Threat from potential competitors

- Government policy in respect of monopoly

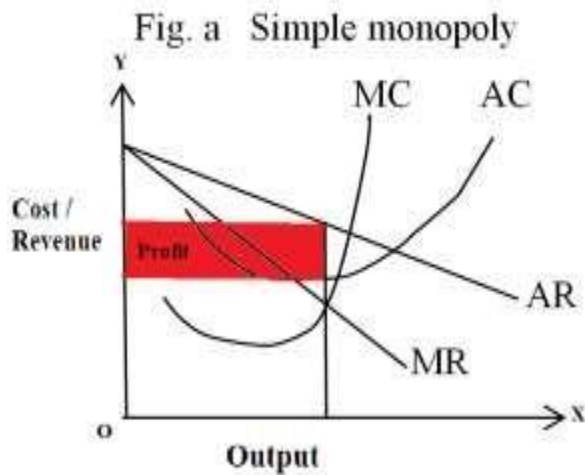
If a monopoly firm operates at the level of output where  $MR = MC$ , its profit depends on the relative levels of  $AR$  and  $AC$ . Given the level of output, there are three possibilities.

- If  $AR > AC$ , there is economic profit for the firm
- If  $AR = AC$ , the firm earns only normal profit
- If  $AR < AC$ , though only a theoretical possibility, the firm makes losses

The decision rules regarding optimal output and pricing in the long-run are the same as in the short-run. In the long-run, however, a monopolist gets an opportunity to expand the size of its firm with a view to enhance its long-run profits. The expansion of the plant size may, however, be subject to such conditions as: (a) size of the market, (b) expected economic profit and (c) risk of inviting legal restrictions. Let us assume, for the time being, that none of these conditions limits the expansion of a monopoly firm and discuss the price and output determination in the long-run.

### Price Output Determination in 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

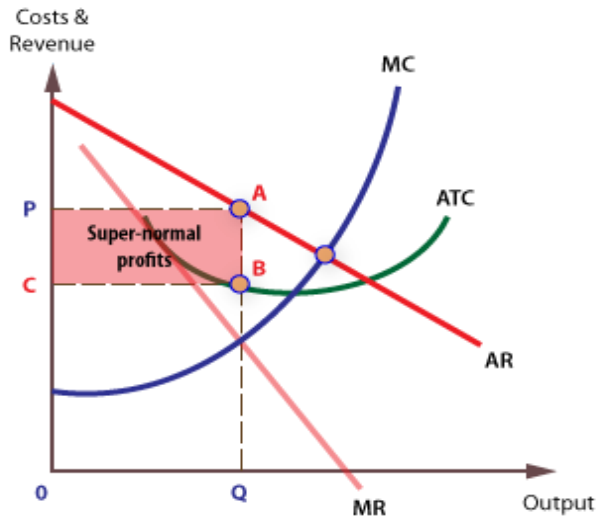
the  $MR > MC$ . Because he attains equilibrium at the level of output when  $MC = MR$ . beyond this point, the monopolist may incur more cost than the revenue. The following case study is helpful to understand the revenue function and cost function under monopoly.

### **Price Output Determination – Super normal Profit**

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.

The monopolist will go on producing additional units of output as long as marginal revenue exceeds marginal cost. This is because it is profitable to produce an additional unit if it adds more to revenue than to cost. His profits will be maximum and he will attain equilibrium at the level of output at which marginal revenue equals marginal cost. If he stops short of the level of output at which  $MR$  equals  $MC$ , he will be unnecessarily foregoing some profits which otherwise he could make.

There is a significant difference between monopoly equilibrium and perfectly competitive equilibrium. The price under perfectly competitive equilibrium is equal to marginal cost, but price exceeds marginal cost under monopoly. This is so because the monopolist, unlike perfectly competitive firm, faces a downward-sloping average revenue curve and his marginal revenue curve lies below average revenue curve. Therefore, in monopoly equilibrium when marginal cost is equal to marginal revenue, it is less than price (or average revenue)



In the above diagram axis measures output and y axis measures cost and revenue. MC Curve cuts the MR curve at point E. AB is the profit from per unit of a commodity. The monopolist earns supernormal profit equal to the area CBAP.

It may be noted at the end that if there are barriers to entry, the monopoly firm may not reach the optimal scale of production in the long-run, nor can it make full utilization of its existing capacity. The firm's decision regarding plant expansion and full utilization of its capacity depends solely on the market conditions. If long-run market conditions (i.e., revenue and cost conditions and the absence of competition) permit, the firm may reach its optimal level of output.

Price Discrimination is an imperfect market, the monopoly firm charges different prices 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.

Price discrimination means selling the same or slightly differentiated product to different sections of consumers at different prices, not commensurate with the cost of differentiation. Consumers are discriminated on the basis of their income or purchasing power, geographical location, age, sex, colour, marital status, quantity purchased, time of purchase, etc. When consumers are discriminated on the basis of these factors in regard to price charged from them, it is called **price discrimination**. There is another kind of price discrimination. The same price is charged from the consumers of different areas while cost of production in two different plants located in different areas is not the same. Some common examples of price discrimination, not necessarily by a monopolist, are given below:

- Physicians and hospitals, lawyers, consultants, etc., charge their customers at different rates mostly on the basis of the latter's ability to pay
- Merchandise sellers sell goods to relatives, friends, old customers, etc., at lower prices than to others and offer off-season discounts to the same set of customers
- Railways and airlines charge lower fares from the children and students, and for different classes of travelers.
- Cinema houses and auditoria charge differential rates for cinema shows, musical concerts, etc
- Some multinationals charge higher prices in domestic and lower prices in foreign
- markets, called 'dumping'
- Lower rates for the first few telephone calls, lower rates for the evening and night trunk-calls; higher electricity rates for commercial use and lower for domestic consumption, etc. are some other examples of price

discrimination.

## **8.2 Conditions for Price discrimination**

### **Necessary Conditions**

First, different markets must be separable for a seller to be able to practice discriminatory pricing. The markets for different classes of consumers must be so separated that buyers of one market are not in a position to resell the commodity in the other. Markets are separated by: (i) geographical distance involving high cost of transportation, i.e., domestic versus foreign markets; (ii) exclusive use of the commodity, e.g., doctor's services; (iii) lack of distribution channels, e.g., transfer of electricity from domestic use to industrial use

Second, the elasticity of demand for the product must be different in different markets. The purpose of price discrimination is to maximize the profit by exploiting the markets with different price elasticities. It is the difference in the elasticity which provides monopoly firm with an opportunity for price discrimination. If price elasticities of demand in different markets are the same, price discrimination would reduce the profit by reducing demand in the high price markets.

Third, there should be imperfect competition in the market. The firm must have monopoly over the supply of the product to be able to discriminate between different classes of consumers, and charge different prices.

Fourth, profit maximizing output must be much larger than the quantity demanded in a single market or by a section of consumers.

To brief out the following conditions must be met for price discrimination to be successful:

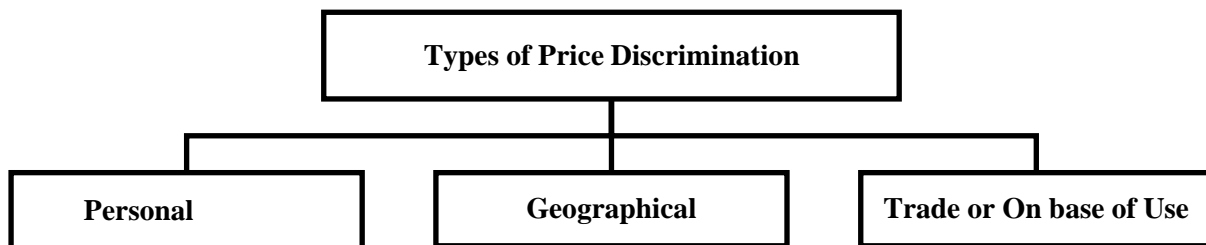
1. Firms must be able to control supply;
2. Firms must prevent resale of products from one buyer to another; and

3. There must be a difference in price elasticity in the different markets for the product.
4. The firm can 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.

### 8.3 Types of Price Discrimination

Price discrimination is a common pricing strategy' used by a monopolist having discretionary pricing power. This strategy is practiced by the monopolist to gain market advantage or to capture market position.

There are three types of price discrimination, which are shown in Figure



i. **Personal Price Discrimination:** Refers to price discrimination when different prices are charged from different individuals. The different prices are charged according to the level of income of consumers as well as their willingness to purchase a product. For example, a doctor charges different fees from poor and rich patients.

ii. **Geographical Price Discrimination:** :Refers to price discrimination when the monopolist charges different prices at different places for the same product. This type of discrimination is also called dumping.

iii. **Trade or On the basis of use:** Occurs when different prices are charged

according to the use of a product. For instance, an electricity supply board charges lower rates for domestic consumption of electricity and higher rates for commercial consumption.

### **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

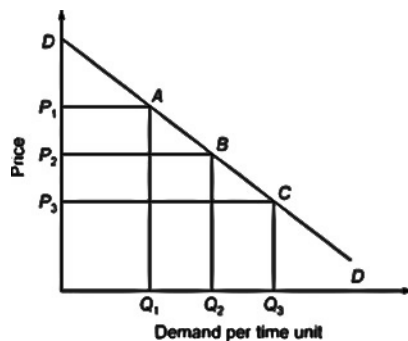
Price discrimination has become widespread in almost every market. In economic jargon, price discrimination is also called monopoly price discrimination or yield management. The degree of price discrimination varies in different markets.

The degree of price discrimination refers to the extent to which a seller can divide the market or the consumers and can take advantage of it in extracting the consumer's surplus. The economic literature presents three degrees of price discrimination.

**First degree:** The first degree price discrimination is the limit of discriminatory pricing. First degree or perfect price discrimination is feasible when the market size of the product is small and the monopolist is in a position to know the price each consumer or each group of consumers is willing to pay, (i.e., he knows his buyer's demand curve for his product), then he sets the price accordingly and tries to extract the entire consumer surplus. What the seller does is that he sets the price at its highest level—the level at which all those who are willing to buy the commodity buy at least one unit each. After extracting the consumer surplus of this segment of consumers for the first unit of commodity, the monopolist gradually lowers down the price, so that the consumer surplus of the users of the second unit is extracted. This procedure is continued until the entire

consumers' surplus available at the equilibrium price, i.e., at the price at which  $MC = MR$ , is extracted. Consider, for example, the case of medical services of exclusive use. A doctor who knows or can guess the paying capacity of his patients can charge the highest possible fee from presumably the richest patient and the lowest fee from the poorest patient.

**Second degree:** Where market size is very large, perfect discrimination is neither feasible nor desirable. In that case, a monopolist uses second degree discrimination or the 'block pricing method'. A monopolist adopting the second degree price discrimination intends to siphon off only the major part of the consumer's surplus, rather than the whole of it. The monopolist divides the potential buyers into blocks, e.g., rich, middle class and poor, and sells the commodity in blocks. The monopolist sells its product first to the rich customers at the highest possible price. Once this part of the market is supplied, the firm lowers down the price for middle class buyers. Finally, bottom price is used for the poor class of buyers.



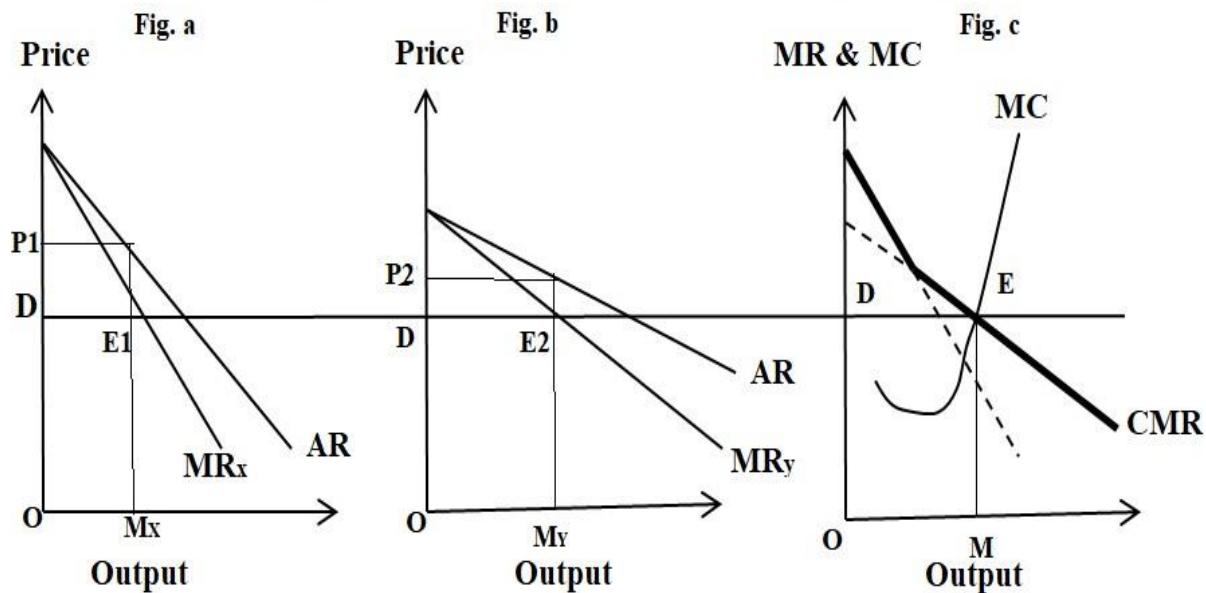
The second degree price discrimination is feasible where: (i) the number of consumers is large and price rationing can be done, as in case of utility services like telephones, supply of water, etc.; (ii) demand curve for all the consumers is identical; (iii) a single rate is applicable for a large number of buyers. As shown in figure a monopolist practising second degree price discrimination, charges the highest price  $OP_1$  for  $OQ_1$  units and a lower price  $OP_2$  for the next  $Q_1Q_2$  units, and the lowest price  $OP_3$  for the next  $Q_2Q_3$  units.

**Third degree:** When a profit maximizing monopolist sets different prices in different markets having demand curves with different elasticities, he is practising the third degree price discrimination. It happens quite often that a monopolist has to sell his goods in two or more markets, completely separated from one another, each having a demand curve with different elasticity. A uniform price cannot be set for all the markets without losing profits. The monopolist is, therefore, required to find different price-quantity combinations that can maximize his profit in each market. For this purpose, he divides his total output between the market segments so that his  $MC = MR$  in each market, and fixes price accordingly.

### Price and Output of Discriminating Monopoly

Under discriminating monopoly, the market divided into submarkets based on

#### Price and output determination under Discriminating Monopoly



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 curve slopes downwards from left to right with different elasticity AR<sub>x</sub> and AR<sub>y</sub> respectively. The respective Marginal Revenue curves MR<sub>x</sub> and MR<sub>y</sub> 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.

### **Measures of Monopoly Power**

Like perfect competition, pure private monopolies are rare phenomena. The real business world is, in fact, characterized largely by monopolistic competition and oligopoly. In these kinds of markets firms hold some monopoly power in the industry which they exercise in determining the price and output. Some economists have suggested methods of measuring monopoly power of a firm in the kinds of markets in their own ways. Before we proceed, let us have a look at the measures of monopoly power of monopolistic and oligopoly firms, suggested by the economists.

It may be noted at the outset that measuring monopoly power has been a difficult proposition. The efforts to devise a measure of monopoly power have not yielded a universal or non-controversial measure. As Alex Hunter has observed, 'The idea of devising a measure of monopoly power, with reference both to its general incidence and to particular situation, has been and probably always will remain, an attractive prospect for economists who wish to probe in this field'. If

not for any other reason, for 'sheer intellectual curiosity' economic theorists feel compelled to work on this problem, for they could not with good conscience go on talking about 'great' or 'little' monopoly power or about various degrees of monopoly power without trying to ascertain the meaning of these words. Therefore, devising at least a 'conceivable' measure of monopoly, even if 'practical' measurement is impossible, continues to interest economists, for at least two reasons.

First, apart from intellectual curiosity, people would like to know about the economy in which they live, about the industrial structure, and about the industries from which they get their supplies and how their prices are determined.

Second, growth of private monopolies has often led to economic inefficiency and exploitation of consumers. Therefore, the governments of many countries have found it necessary to formulate policies and to devise legislative measures to control and regulate monopolies. If the government is to succeed in its policy of restraining monopoly, it must have at least some practicable measure of monopoly power and monopolistic trade practices.

### **Suggestions to control Monopoly Power**

In spite of problems in measuring the power of monopoly, economists have devised a number of measures of monopoly power though none of these measures is free from flaws. Yet the various measures do provide an insight into monopoly power and its impact on the market structure. Besides, they also help in formulating an appropriate public policy to control and regulate the existing monopolies and to prevent their growth. We discuss here briefly the various measures of monopoly power suggested by the economists.

**Number-of-firms criterion:** One of the simplest measures of degree of monopoly power of firms is to count the number of firms in an industry. The smaller the number of firms, the greater the degree of monopoly power of each firm in the industry, and conversely, the larger the number of firms, the greater the possibility of absence of monopoly power. As a corollary of this, if there is a single firm in an industry, the firm has absolute monopoly power. On the

contrary, in an industry characterized by perfect competition, the number of firms is so large that each firm supplies an insignificant proportion of the market and no firm has any control on the price, and, hence, no monopoly power whatsoever.

This criterion however has a serious drawback. The number of firms alone does not reveal much about the relative position of the firms within the industry because:

(i) 'firms are not of equal size' and (ii) their number does not indicate the degree of control each firm exercises in the industry. Therefore, the 'number-of-firms' criterion of measuring monopoly power is of little practical use.

**Concentration ratio:** The concentration ratio is one of the widely used criteria for measuring monopoly power. The concentration ratio is obtained by calculating the percentage share of a group of large firms in the total output of the industry. 'The number of firms chosen for calculating the ratio usually depends on some fortuitous element—normally the census of production arrangement of the country concerned'. However, the number of firms chosen may be as large as 20 depending on the market size and purpose of enquiry. Apart from the share of the largest firms in the industry output, 'size of the firm and the concentration of control in the industry may be measured ... in terms of production capacity, value of assets, number of employees or some other characteristics. Concentration ratio, although a very widely used measure of monopoly power, has its own shortcomings.

First, the measures of concentration ratio involve statistical and conceptual problems. For example, production capacity may not be used straightaway as it may include 'unused, obsolete or excess capacity' and the value of assets involves valuation problem as accounting method of valuation and market valuation of assets may differ. Employment figure may not be relevant in case of capital-intensive industries and their use may be misleading. The two other convenient measures are 'gross output value' or 'net output' (value added). But the former involves the risk of double counting and the latter, the omission of inter-establishment transfers.

Second, the measures of concentration ratio do not take into account the size of the market. The size of the market may be national or local. A large number of firms supplying the national market may be much less competitive than the small number of firms supplying the local market. For, it is quite likely that the national market is divided among a thousand sellers, each seller being a monopolist in his own area.

Third, the most serious defect of concentration ratio as an index of monopoly power is that it does not reflect the competition from other industries. The degree of competition is measured by the elasticity of substitution that may be different under different classification of industries. Therefore, an industry that has concentration ratio under one may have a very low elasticity of substitution and hence a high degree of monopoly. But, if classification of industries is altered, the same industry with a high concentration ratio may have a very low elasticity of substitution, and hence, may show a low degree of monopoly.

**Excess profit criterion:** J. S. Bain and, following him, many other economists have used excess profit, i.e., profit in excess of the opportunity cost, as a measure of monopoly power. If profit rate of a firm continues to remain sufficiently higher than all opportunity costs required to remain in the industry, it implies that neither competition among sellers nor entry of new firms prevents the firm from making a pure or monopoly profit. While calculating excess profit, the opportunity cost of owner's capital and a margin for the risk must be deducted from the actual profit made by the firm. Assuming no risk, the degree of monopoly may be obtained as the ratio of the divergence between the opportunity costs (O) and the actual profit (R), to the latter. Thus degree of monopoly power may be expressed as:

$$\text{Monopoly Power} = (R - O) / R$$

If  $(R - O)/R = 0$ , there exists no monopoly, and if it is greater than zero, there is monopoly. The higher the value of  $(R - O)/R$ , the greater the degree of monopoly.

**Triffin's cross-elasticity criterion:** According to Robert Triffin, cross-elasticity of demand for the product of a monopoly firm can be used as a measure of its monopoly power. Triffin's criterion seems to have been derived from the

definition of monopoly itself. According to his criterion, cross-elasticity is taken as the measure of degree of monopoly. The lower the cross-elasticity of the product of a firm, the greater the degree of its monopoly power. But, this criterion indicates only the relative power of each firm. It does not provide a single index of monopoly power.

### **Monopolistic Competition**

Monopolistic competition is a market structure which combines elements of monopoly and competitive markets. Essentially a monopolistic competitive market is one with freedom of entry and exit, but firms can differentiate their products. Therefore, they have an inelastic demand curve and so they can set prices. However, because there is freedom of entry, supernormal profits will encourage more firms to enter the market leading to normal profits in the long term.

#### **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.

#### **Difference between Monopolistic Competition and Monopoly**

<b>Monopoly</b>	<b>Monopolistic Competition</b>
<b>What does it mean?</b>	
A monopoly is the type of imperfect competition where a seller or producer captures the majority of	A monopolistic competition is a type of imperfect competition where many sellers try to capture the market share by differentiating their products.

the market share due to the lack of substitutes or competitors.	
<b>Number of players</b>	
One	Many
<b>Degree of competition</b>	
No competition exists, as only one seller is present in the market.	A very high competition exists, as there are many sellers.
<b>Barriers to entry</b>	
High barriers to entry	Low barriers to entry
<b>Demand curve</b>	
Steep	Flat
<b>Price control</b>	
Due to steep demands and only one seller, the price is controlled by the seller.	Some level of price control is exercised by buyers, as many sellers are available in the market.

### **Monopolistic Competition and Perfect competition**

Monopolistic competition is, in many respects, like perfect competition. There are, however, three big differences between the two.

(i) Under perfect competition, products are homogeneous, whereas under monopolistic competition, products are differentiated. Products are differentiated generally by a different brand name, trade mark, design, colour and shape, packaging, credit terms, quality of after-sales service, etc. Products are so differentiated that buyers can easily distinguish between the products supplied by different firms. Despite product differentiation, each product remains a close substitute for the rival products. Although there are many firms, each one possesses a quasi-monopoly over its product.

(ii) There is another difference between perfect competition and monopolistic competition. While decision-making under perfect competition is independent of

other firms, in monopolistic competition, firms' decisions and business behaviour are not independent of each other.

(iii) Another important factor that distinguishes monopolistic competition from perfect competition is the difference in the number of sellers. Under perfect competition, the number of sellers is very large as in case of agricultural products, retail business and share markets, whereas, under monopolistic competition, the number of sellers is large but limited—50 to 100 or even more.<sup>18</sup> What is more important, conceptually, is that the number of sellers is so large that each seller expects that his/her business decisions, tactics and actions will go unnoticed and will not extract a reaction from rival firms.

Monopolistic competition, as defined and explained above, is most common now in retail trade with firms acquiring agencies and also in service sectors. More and more industries are now tending towards oligopolistic market structure. However, some industries in India, viz., clothing, fabrics, footwear, paper, sugar, vegetable oils, coffee, spices, computers, cars and mobile phones have the characteristics of monopolistic competition.

### **Price – Output Determination in short run**

Although monopolistic competition is characteristically close to perfect competition, pricing and output decisions under this kind of market are similar to those under monopoly. The reason is that a firm under monopolistic competition, like a monopolist, faces a downward sloping demand curve. This kind of demand curve is the result of: (i) a strong preference of a section of consumers for the product and (ii) the quasi-monopoly of the seller over the supply. The strong preference or brand loyalty of the consumers gives the seller an opportunity to raise the price and yet retain some customers. Besides, since each product is a substitute for the other, the firms can attract the consumers of other products by lowering their prices. 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.

In Short run, the firm either earn supernormal profit or suffers with loss. But in long run, firms can achieve only normal profit.

#### Short Term Equilibrium - Monopolistic Competition

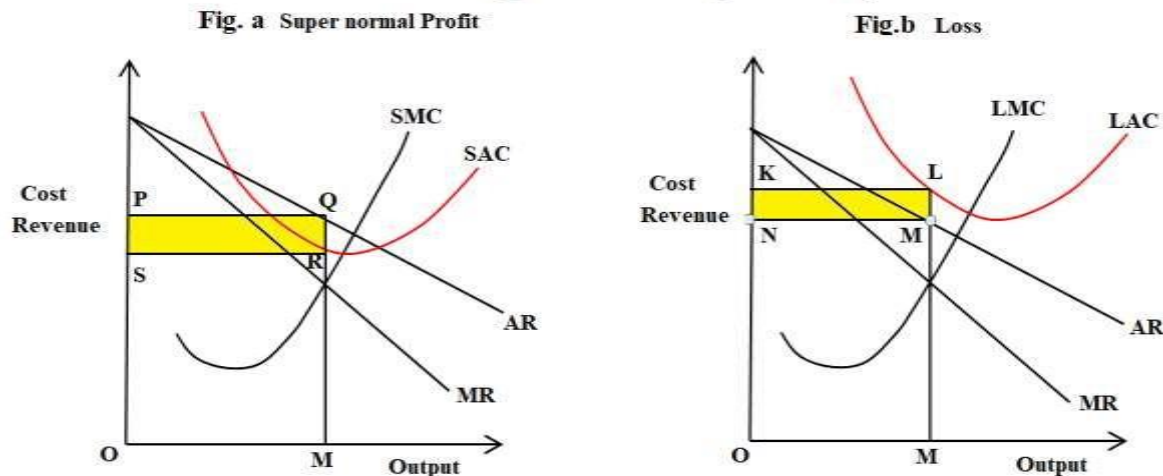


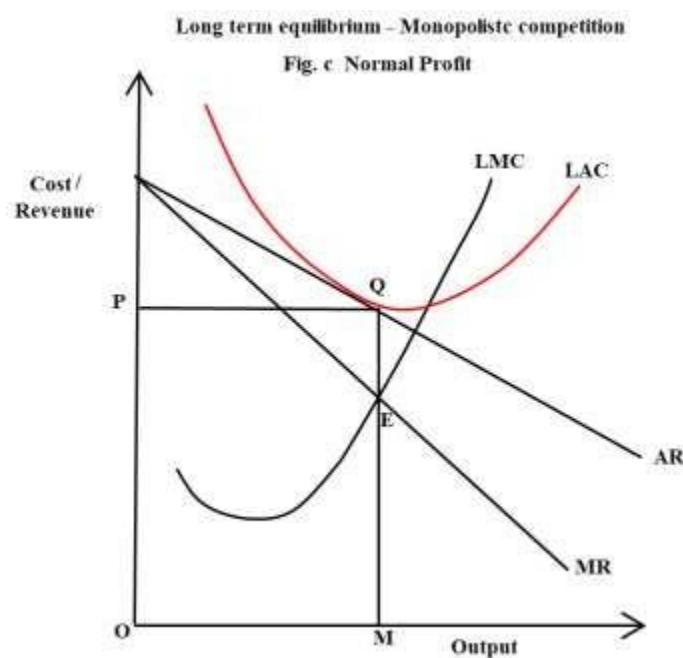
Fig.a represents short run price and output determination with supernormal profit and fig. b represents short run price and output determination with loss. In fig a. the SAC curve lies below the AR curve, and the profit is expressed in shaded area PQRS at OP level of Price and OM level of output where 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.

Economic profit exists in the short run because there is no or little possibility of new firms entering the industry. But the rate of profit would not be the same for all the firms under monopolistic competition because of the difference in the elasticity of demand for their products. Some firms may earn only a normal profit if their costs are higher than those of others. For the same reason, some firms may make even losses in the short-run.

#### **Price - Output Determination in Long run**

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 closer 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  $MR = MC$ .



Let us now see what happens in the long-run. The supernormal profit brings about two important changes in a monopolistically competitive market in the long-run.

First, the supernormal profit attracts new firms to the industry. As a result, the existing firms lose a part of their market share to new firms. Consequently, their demand curve shifts downward to the left until AR is tangent to LAC.

Second, the increasing number of firms intensifies the price competition between them. Price competition increases because losing firms try to regain or retain their market share by cutting down the price of their product. And, new firms in order to penetrate the market set comparatively low prices for their product. The price competition increases the slope of the firms' demand curve

or, in other words, it makes the demand curve more elastic. Under monopolistic competition, firms make only normal profit in the long-run. Once all the firms reach this stage, there is no attraction (i.e., super normal profit) for the new firms to enter the industry, nor is there any reason for the existing firms to quit the industry. This signifies the long-run equilibrium of the industry.

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

### **Critical Appraisal of the theory**

Chamberlin's theory of monopolistic competition propounded in the early 1930s is still regarded to be a major contribution to the theory of pricing. In fact, there is no better theoretical explanation of price determination under monopolistic competition. However, his theory has been criticized on both theoretical and empirical grounds. Let us now look into its theoretical weaknesses and empirical relevance.

First, Chamberlin assumes that monopolistic competitors act independently and their price manoeuvring goes unnoticed by the rival firms. This assumption has been questioned on the ground that firms are bound to be affected by decisions of the rival firms since their products are close substitutes for one another and, therefore, they are bound to react.

Second, Chamberlin's model implicitly assumes that monopolistically competitive firms do not learn from their past experience. They continue to commit the mistake of reducing their prices even if successive price reductions lead to decrease in their profits. Such an assumption can hardly be accepted.

Third, Chamberlin's concept of industry as a 'product group' is ambiguous. It is also incompatible with product differentiation. In fact, each firm is an industry by virtue of its specialized and unique product.

Fourth, his 'heroic assumptions' of identical cost and revenue curves are

questionable. Since each firm is an industry in itself, there is a greater possibility of variations in the costs and revenue conditions of the various firms.

Fifth, Chamberlin's assumption of free entry is also considered to be incompatible with product differentiation. Even if there are no legal barriers, product differentiation and brand loyalties are in themselves barriers to entry.

Finally, so far as empirical validity of Chamberlin's concept of monopolistic competition is concerned, it is difficult to find any example in the real world to which his model of monopolistic competition is relevant. Most markets that exist in the real world may be classified under perfect or pure competition, oligopoly or monopoly. It is, therefore, alleged that Chamberlin's model of monopolistic competition analyses an unrealistic market. Some economists, e.g., Cohen and Cyert, hold the position that the model of monopolistic competition is not a useful addition to economic theory because it does not describe any market in the real world.

Despite the above criticism, Chamberlin's contribution to the theory of price cannot be denied. Chamberlin was the first to introduce the concept of differentiated product and selling costs as a decision variable and to offer a systematic analysis of these factors. Another important contribution of Chamberlin is the introduction of the concept of demand curve based on market share as a tool of analysing behaviour of firms, which later became the basis of the kinked-demand curve analysis.

### **Oligopoly**

Oligopoly is defined as a market structure in which there are a few sellers selling homogeneous or differentiated products. Where oligopoly firms sell a homogeneous product, it is called pure or homogeneous oligopoly. For example, industries producing bread, cement, steel, petrol, cooking gas, chemicals, aluminium and sugar are industries characterized by homogeneous oligopoly. And, where firms of an oligopoly industry sell differentiated products, it is called differentiated or heterogeneous oligopoly. Automobiles, television sets, soaps and detergents, refrigerators, soft drinks, computers, cigarettes, etc. are some examples of industries characterized by differentiated or heterogeneous

oligopoly.

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.

### **Sources of Oligopoly**

There are certain reasons which have led to the emergence of oligopoly. These are:

#### **Large Investment of Capital**

The number of firms in an industry may be small due to the large requirements of capital. No entrepreneur will like to venture to invest large sums in an industry in which addition to output to the existing one may likely to depress prices.

#### **Control of Indispensable Resources**

A few firms may control some indispensable resources which may enable them to secure several advantages in costs over all others. This enables them to operate profitably at a price at which others cannot survive.

#### **Economies of Scale**

Another factor responsible for emergence of oligopoly is the large scale firm. In some industries, a few firms can meet the entire demand for the product. It is possible that the demand may be satisfied by a large number of firms, while small firms cannot secure the economies of large scale production. In those industries where there is a lot of mechanization and where economies of large scale are considerable a few firms will survive.

#### **Mergers**

Many oligopolies have been created by combining two or more independent firms. The combination of two or more firms into one firm is known a merger. The main motives of mergers include increasing market powers, more resources,

economies of scale and market extensions etc.

## **Characteristics of Oligopoly**

Let us now look at the important characteristics of oligopolistic industries.

### **Small number of sellers**

As already mentioned, there is a small number of sellers under oligopoly. How small is the number of sellers in oligopoly markets is difficult to specify precisely for it depends largely on the size of the market. Conceptually, however, the number of sellers is so small that the market share of each firm is large enough for a single firm to influence the market price and the business strategy of its rival firms. The number may vary from industry to industry.

### **Interdependence of decision-making**

The most striking feature of an oligopolistic market structure is the interdependence of oligopoly firms in their decision-making. The characteristic fewness of firms under oligopoly brings the firms in keen competition with each other. The competition between the firms takes the form of action, reaction and counter-action in the absence of collusion between the firms. For example, car companies have changed their prices following the change in price made by one of the companies. They have introduced new models in competition with one another. Since the number of firms in the industry is small, the business strategy of each firm in respect of pricing, advertising and product modification is closely watched by the rival firms and it evokes imitation and retaliation. What is equally important is that firms initiating a new business strategy anticipate and take into account the possible counter-action by the rival firms. This is called interdependence of oligopoly firms.

### **Barriers to entry**

Barriers to entry to an oligopolistic industry arise due to such market conditions as: (i) huge investment requirement to match the production capacity of the existing ones, (ii) economies of scale and absolute cost advantage enjoyed by the existing firms, (iii) strong consumer loyalty to the products of the established firms based on their quality and service and (iv) preventing entry of

new firms by the established firms through price cutting. However, the new entrants that can cross these barriers can and do enter the industry, though only a few, that too mostly the branches of MNCs that survive.

### **Indeterminate price and output**

Another important feature, though a controversial one, of the oligopolistic market structure is the indeterminateness of price and output. The characteristic fewness and interdependence of oligopoly firms makes derivation of the demand curve a difficult proposition. Therefore, price and output are said to be indeterminate. However, price and output are said to be determinate under collusive oligopoly. But, there too, collusion may last or it may break down. An opposite view is that price under oligopoly is sticky, i.e., if price is once determined, it tends to stabilize.

### **Types of Oligopoly**

The following are few types of oligopoly in existence

**Pure or Perfect Oligopoly:** If the firms produce homogeneous products, then it is called pure or perfect oligopoly. Though, it is rare to find pure oligopoly situation, yet, cement, steel, aluminum and chemicals producing industries approach pure oligopoly.

**Imperfect or Differentiated Oligopoly:** If the firms produce differentiated products, then it is called differentiated or imperfect oligopoly. For example, passenger cars, cigarettes or soft drinks. The goods produced by different firms have their own distinguishing characteristics, yet all of them are close substitutes of each other.

**Collusive Oligopoly:** If the firms cooperate with each other in determining price or output or both, it is called collusive oligopoly or cooperative oligopoly.

**Non-collusive Oligopoly:** If firms in an oligopoly market compete with each other, it is called a non-collusive or non-cooperative oligopoly.

As already mentioned, under oligopolistic conditions, rival firms indulge in an intricate pattern of actions, reactions and counter-actions showing a variety of behavioural patterns. As Baumol puts it, 'Under these circumstances, a very wide variety of behaviour pattern becomes possible. Rivals may decide to get

together and cooperate in the pursuit of their objectives or at the other extreme, may try to fight each other to the death. Even if they enter an agreement, it may last or it may break down. The economists have, therefore, found it extremely difficult to make a systematic analysis of price and output determination under oligopoly. This has, however, not deterred the economists from their efforts to find an agreeable solution to the problem.

In accordance with the wide variety of behavioural patterns, the economists have developed a variety of analytical models based on different behavioural assumptions. The widely quoted oligopoly models include Cournot's duopoly model (1838), Bertrand's leadership model (1880), Edgeworth's duopoly model (1897), Stackelberg's model (1933), Sweezy's kinked demand curve model (1939), Neumann and Morgenstern Game Theory model (1944) and Baumol's sales maximization model (1959). None of these models, however, provides a universally acceptable analysis of oligopoly, though these models do provide an insight into oligopolistic behaviour.

In this section, we discuss some selected oligopoly models with the purpose of showing the behaviour of oligopoly firms and working of the oligopolistic markets. The following oligopoly models.

- (i) Cournot's duopoly model
- (ii) Sweezy's kinked demand curve model
- (iii) Price leadership models:
  - (a) Price leadership by low-cost firm, (b) Price leadership by dominant firm and (c) Price leadership by barometric firm
- (iv) Collusive model: The Cartel Arrangement
- (v) The Game Theory model of oligopoly
- (vi) Prisoner's Dilemma

From the above-mentioned various models of oligopoly, we will discuss selected models in the below section.

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### **The Sweezy Model Of Kinked Demand Curve**

The kinked demand curve of oligopoly was developed by Paul M. Sweezy in 1939.

The model advocates that the behavior of oligopolistic organizations remain stable when the price and output are determined. This implies that an oligopolistic market is characterized by a certain degree of price rigidity or stability, especially when there is a change in prices in downward direction. For example, if an organization under oligopoly reduces price of products, the competitor organizations would also follow it and neutralize the expected gain from the price reduction.

On the other hand, if the organization increases the price, the competitor organizations would also cut down their prices. In such a case, the organization that has raised its prices would lose some part of its market share. The kinked demand curve model seeks to explain the reason of price rigidity under oligopolistic market situations. Therefore, to understand the kinked demand curve model, it is important to note the reactions of rival organizations on the price changes made by respective oligopolistic organizations.

There can be two possible reactions of rival organizations when there are changes in the price of a particular oligopolistic organization.

1. The rival organizations would either follow price cuts, but not price hikes
2. They may not follow changes in prices at all.

### **Assumptions**

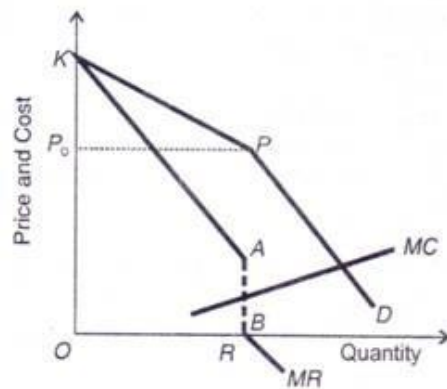
The kinked demand curve hypothesis of price rigidity is based on the following assumptions:

- (1) There are few firms in the oligopolistic industry.
- (2) The product produced by one firm is a close substitute for the other firms.
- (3) The product is of the same quality. There is no product differentiation.
- (4) There are no advertising expenditures.
- (5) There is an established or prevailing market price for the product at which all the sellers are satisfied.
- (6) Each seller's attitude depends on the attitude of his rivals.
- (7) Any attempt on the part of a seller to push up his sales by reducing the price of his product will be counteracted by the other sellers who will follow his move.

(8) If he raises the price, others will not follow him. Rather they will stick to the prevailing price and cater to the customers, leaving the price-raising seller.

(9) The marginal cost curve passes through the dotted portion of the marginal revenue curve so that changes in marginal cost do not affect output and price.

a kinked demand curve model is explained with the help of figure



Given these assumptions, the price-output relationship in the oligopolist market is explained in Figure 1 where KPD is the kinked demand curve and  $OP_0$  the prevailing price in the oligopoly market for the  $OR$  product of one seller. Starting from point  $P$ , corresponding to the current price  $OP_1$ , any increase in price above it will considerably reduce his sales, for his rivals are not expected to follow his price increase. This is so because the  $KP$  portion of the kinked demand curve is elastic, and the corresponding portion  $KA$  of the  $MR$  curve is positive. Therefore, any price-increase will not only reduce his total sale but also his total revenue and profit.

On the other hand, if the seller reduces the price of the product below  $OP_0$  (or  $P$ ), his rivals will also reduce their prices. Though he will increase his sales, his profit would be less than before. The reason is that the  $PD$  portion of the kinked demand curve below  $P$  is less elastic and the corresponding part of marginal revenue curve below  $R$  is negative. Thus in both the price-raising and price-reducing situations, the seller will be a loser. He would stick to the prevailing market price  $OP_0$  which remains rigid. In order to study the working of the kinked demand curve, let us analyse the effect of changes in cost and demand conditions on price stability in the oligopolistic market.

### **Reasons for price rigidity or stability.**

There are a number of reasons for price rigidity in certain oligopoly markets:

- (1) Individual sellers in an oligopolistic industry might have learnt through experience the futility of price wars and thus prefer price stability.
- (2) They may be content with the current prices, outputs and profits and avoid any involvement in unnecessary insecurity and uncertainty.
- (3) They may also prefer to stick to the present price level to prevent new firms from entering the industry.
- (4) The sellers may intensify their sales promotion efforts at the current price instead of reducing it. They may view non-price competition better than price rivalry.
- (5) After spending a lot of money on advertising his product, a seller may not like to raise its price to deprive himself of the fruits of his hard labour. Naturally, he would stick to the going price of the product.

### **some of the major points of criticism are as follows:**

- i. Lays emphasis on price rigidity, but does not explain price itself.
- ii. Assumes that rival organizations only follow price decrease, which does not hold true empirically.
- iii. Ignores non-price competition among organizations. Non-price competition can be in terms of product differentiation, advertising, and other tools used by organizations to promote their sales.
- iv. Ignores the application of price leadership and cartels, which account for larger share of the oligopolistic market

### **Collusion Model-The Cartel**

In oligopolistic market situations, organizations are indulged in high competition with each other, which may lead to price wars. For avoiding such type of problems, organizations enter into an agreement regarding uniform price-output policy. This agreement is known as collusion, which is opposite to competition. Under collusion, organizations are involved in collaboration with

each other to take combined actions for keeping their bargaining power stronger against consumers.

According to Samuelson, “Collusion denotes a situation in which two or more firms jointly set that prices or output, divide the market among them, or make other business decisions.” Collusion helps oligopolistic organizations in many ways.

Cartel type of collusions are formed with a view to:

- (i) eliminating uncertainty surrounding the market and
- (ii) restraining competition and thereby ensuring monopolistic gains to the cartel group.

The cartel works through a Board of Control. One of the main functions of the board is to determine the market share for each of its members. For this purpose, the board calculates the marginal cost and marginal revenue for the industry. MC for the industry is the summation of MCs of individual firms. On the basis of industry’s MR and MC, the total output for the industry is determined. The total output is then allocated between the member firms on the basis of their own MC.

Some of the benefits of collusion are as follows:

- i. Helps organizations to increase their performance
- ii. Helps organizations in preventing uncertainties
- iii. Provides opportunities to prevent the entry of new organizations

The agreement of collusion formed may be tacit or formal in nature. A formal agreement formed among competing organizations is known as cartel. In other words, cartel can be defined as a group of organizations that together make pricing and output decisions.

Some of the management experts have defined cartel in the following ways:

According to Leftwitch, “the firms jointly establish a cartel organization to make price and output decisions, to establish production quotas for each firm, and to supervise market activities of the firms in the industry.”

According to Khemani and Shapiro, “Cartels are productive structures involving multiple producers acting in unison that allow producers to exercise monopoly power.”

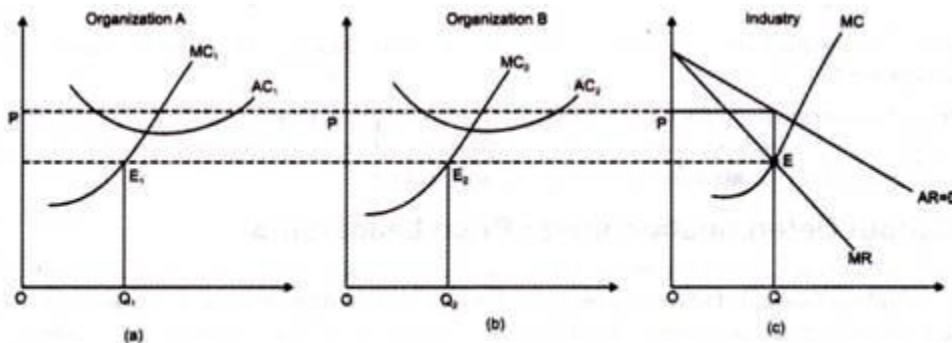
In the words of Boyce and Melvin, “A cartel is an organization of independent firms, whose purpose is to control and limit production and maintain or increase prices and profits.”

According to Webster, “A cartel is a formal agreement among firms in an oligopolistic industry to allocate market share and/or industry profit.”

Under cartels, the price and output determination is done by the common administrative authority, which aims at equal profit distribution among all member organizations under cartel. The total profits are distributed in proportion as decided among member organizations. The most famous example of cartel is Organization of the Petroleum Exporting Countries (OPEC), which has shared control of petroleum markets.

Let us understand price and output decisions under cartels with the help of an example. Assume that there are two organizations that have formed a cartel.

The price and output decisions of these two organizations are shown in Figure:



**Figure- Cartel- Price and Output Determination**

In Figure AR is the aggregate demand curve of both the organizations and MC curves are the addition of  $MC_1$  and  $MC_2$  curves of organizations A and B, respectively. The total output of industry is determined according to MR and MC of the industry. In Figure-3 (c), OQ and OP are the equilibrium price and output of the industry.

Now, this output will be allocated among the organizations. This can be done by drawing a horizontal line from equilibrium point E of industry, towards MC curves of organizations A and B. The points of intersection  $E_1$  and  $E_2$  are the equilibrium levels of the organizations, A and B, respectively.  $OQ_1$  is the equilibrium output of organization A and  $OQ_2$  is the equilibrium output of organization B. Thus,  $OQ_1 + OQ_2 = OQ$ . These levels of outputs ensure the maximum joint profits of member organizations.

### Key Glossaries

1. **Market:** A system or place where buyers and sellers interact to exchange goods, services, or resources, typically influenced by supply and demand.
2. **Market Characteristics:** Features defining a market, including the number of buyers and sellers, product homogeneity, pricing mechanisms, entry and exit barriers, and the degree of competition.
3. **Market Structure:** The organizational and competitive characteristics of a market, determined by the number of firms, product differentiation, and ease of entry or exit.
4. **Perfect Competition:** A market structure with many buyers and sellers, homogeneous products, no barriers to entry or exit, and perfect information for all participants.
5. **Monopoly:** A market structure where a single seller dominates the market, producing a unique product with no close substitutes and significant barriers to entry.
6. **Monopolistic Competition:** A market structure characterized by many firms selling similar but differentiated products, with relatively low barriers to entry and some control over pricing.

7. **Oligopoly:** A market structure with a few dominant firms that control the market, often producing similar or interdependent products, with significant barriers to entry.
8. **Product Differentiation:** The process by which firms make their products distinct from competitors' offerings through quality, branding, features, or services.
9. **Barriers to Entry:** Factors that prevent or discourage new firms from entering a market, including high startup costs, regulatory requirements, and established brand loyalty.
10. **Price Maker and Price Taker:**
  - **Price Maker:** A firm with the power to influence the market price of its product (e.g., monopoly).
  - **Price Taker:** A firm that must accept the prevailing market price for its product (e.g., perfect competition).

### Short Questions

1. What is Perfect Competition, and how does it differ from other market structures?
2. What are the main features of a monopoly?
3. Explain the concept of Oligopoly with an example.
4. What is Monopolistic Competition? How does it differ from Monopoly?

### Brief Questions

1. Explain the concept of Monopolistic Competition and discuss how product differentiation plays a role in this market structure.
2. Discuss the characteristics of Oligopoly and explain how firms in an oligopoly can influence market prices.
3. How do barriers to entry affect the market power of a Monopoly? Discuss with examples.
4. Compare Perfect Competition and Monopolistic Competition in terms of pricing, output, and efficiency.

## Detailed Questions

1. Analyze the role of barriers to entry in shaping the market structure of Monopoly and Oligopoly. Discuss the implications for consumer choice and market efficiency.
2. Examine how firms in an Oligopoly compete and collaborate. Discuss the impact of this market structure on prices, output, and innovation, using real-world examples.
3. Critically evaluate the efficiency of different market structures—Perfect Competition, Monopoly, Monopolistic Competition, and Oligopoly—in achieving consumer welfare and economic growth. Use diagrams and examples to support your analysis.

Rent is defined as the payment made for the use of land or any other natural resource that has a fixed supply. Since land cannot be increased in response to demand, any payment made over the cost of maintaining the land's productivity is termed **economic rent**. Rent, in this sense, reflects the income earned from factors of production with perfectly inelastic supply. Dwivedi also explains that economic rent extends beyond just land, applying to other resources or inputs that have restricted supply and thus earn surplus income when in high demand, such as skilled labor in certain professions.

### **Ricardian Theory of Rent**

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 defines 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." It is the economic return to landowners that arises from the differential fertility and productivity of land.

### **Assumptions of the Theory**

**Heterogeneous Land Fertility:** Land differs in fertility, meaning some plots are naturally more productive than others.

**Law of Diminishing Returns:** When successive units of labor and capital are applied to land, beyond a certain point, the additional output from each new unit of input will diminish.

**Perfect Competition:** The theory assumes a perfectly competitive market where factors like labor, capital, and land are mobile, and prices are determined by supply and demand.

**Fixed Supply of Land:** The total quantity of land is fixed, and its supply cannot be increased.

**Cultivation Order:** Lands are cultivated in descending order of fertility, starting with the most fertile land.

### **Key Concepts in Ricardian Rent**

**Differential Rent:** Rent arises due to differences in the fertility or location of various plots of land.

**Marginal Land:** The land that yields just enough to cover its costs of production without any surplus. This land earns no rent (i.e., zero rent).

**Intra-Marginal Land:** More fertile lands that yield surplus over the cost of production, thereby generating rent.

**Super-Marginal Land:** The most fertile or best-located lands that produce the highest surplus and therefore the highest rent.

### **How Rent Arises: Differential Rent Explanation:**

Rent is determined by the difference in productivity between more fertile and less fertile lands.

When demand for agricultural products increases, less fertile lands must be cultivated to meet this demand. The rent for more fertile lands arises from the differential productivity between these lands and the least fertile land in use (marginal land).

**Extensive Cultivation:** As the population grows, additional lands of lower fertility are brought under cultivation (extensive margin). The rent for more fertile lands increases as the difference in productivity between these and the newly cultivated marginal land becomes more pronounced.

**Intensive Cultivation:** When more labor and capital are applied to a fixed piece of land to increase production, diminishing returns set in. The first units of input produce higher returns, while subsequent units produce progressively less. Rent, in this case, is the surplus resulting from these initial high-yielding inputs.

## Illustration

- The total cost for cultivation (e.g., seeds, labor, equipment) is INR 50,000 for each grade of land.
- The value of output (in INR) indicates the productivity of each grade, with the most fertile land producing the highest output.

Example: Rent Earned on Different Grades of Land

Grade of Land	Amount Spent (INR)	Value of Output (INR)	Rent Earned (Value of Output - Amount Spent) (INR)
I (Most Fertile)	50,000	3,00,000	$3,00,000 - 50,000 = 2,50,000$
II	50,000	2,50,000	$2,50,000 - 50,000 = 2,00,000$
III	50,000	2,00,000	$2,00,000 - 50,000 = 1,50,000$
IV	50,000	1,50,000	$1,50,000 - 50,000 = 1,00,000$
V (Marginal)	50,000	50,000	$50,000 - 50,000 = 0$
VI (Uncultivated)	50,000	NIL	-

### Explanation:

- **Grade I Land:** The most fertile land produces an output valued at INR 3,00,000. After deducting the cost of INR 50,000, the rent earned is INR 2,50,000.
- **Grade II Land:** Slightly less fertile, this land produces an output valued at INR 2,50,000. The rent earned is INR 2,00,000.
- **Grade III Land:** This land produces an output of INR 2,00,000, with a rent of INR 1,50,000.
- **Grade IV Land:** Here, the output is INR 1,50,000, and the rent is INR 1,00,000.

- **Grade V Land:** This is the marginal land where the value of the output equals the amount spent (INR 50,000). Therefore, the rent is zero.
- **Grade VI Land:** This land is not cultivated because the output is nil, making it irrational to spend INR 50,000 on its cultivation.

The concept of differential rent arising due to differences in the fertility of different plots of land is illustrated in Fig

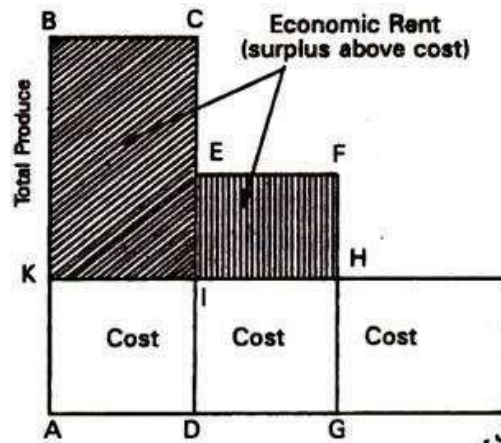


Fig 2. Differential Rent

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

### Criticism of Ricardian Theory of Rent

The Ricardian theory of rent, proposed by David Ricardo, has faced several criticisms over time:

1. **Unrealistic Assumptions:** Ricardo's theory assumes that land differs only in fertility and location, which critics argue oversimplifies real-world

agricultural conditions. In reality, land productivity can vary due to factors like technology, irrigation, and management practices.

2. **Neglect of Non-Agricultural Land:** Ricardo focuses exclusively on agricultural land, ignoring rent possibilities for land used for industrial, commercial, or residential purposes, which are significant in modern economies.
3. **Static Nature:** The theory assumes a fixed supply of land and does not consider technological advancements that can increase land productivity, thus potentially reducing the differential rent over time.
4. **One-Sided View of Demand:** Ricardo emphasizes the supply-side factor (fertility) but largely overlooks demand's role in determining rent. Modern economics recognizes that rent also depends on the demand for land in various uses.
5. **Application Limited to Marginal Land:** Ricardo's concept of rent is based on marginal land (land yielding no rent), which is challenging to identify in real-world conditions, making his theory difficult to apply practically.

These critiques highlight that while Ricardo's theory laid a foundational understanding of rent as a differential concept, it has limitations in explaining modern land use and economic conditions.

### Modern Theory of Rent

Modern theory of rent was discussed at first by J.S Mills and later on developed by various economist like Jevons, Pareto , Marshall, John Robinson etc. The **Modern Theory of Rent** represents a broader and more flexible approach to understanding rent in economics. Unlike classical theories, which were limited to agricultural land, the modern theory applies to any factor of production with limited supply and derives income beyond what's necessary to retain it in its current use.

According to the modern version rent is the surplus that arises due to the difference between actual earnings and opportunity cost or transfer earnings.

$$\text{RENT} = \text{ACTUAL EARNING} - \text{TRANSFER EARNINGS}$$

**Transfer Earning:** All factors of production can be employed in various ways. When a factor is shifted from one use to another, the income it would have earned in its previous role is sacrificed, known as **opportunity cost** or **transfer earnings**. For instance, consider a teacher in Lucknow earning a salary of ₹50,000 per month. If this teacher moves to Delhi and receives ₹60,000 per month, the **economic rent** earned would be ₹10,000 (₹60,000 - ₹50,000), which reflects the added income due to scarcity. Here, the opportunity cost of moving is the ₹50,000 the teacher would have earned in Lucknow. This concept shows that rent can apply to all factors of production, not just land.

### **Modern Definition of Rent**

Modern Definitions of Rent view rent as a form of income arising from any factor of production with limited supply, rather than solely from land. In modern economics, economic rent is defined as the payment received by a factor over and above its opportunity cost or the minimum required to keep it in its current use. Here are some prominent definitions:

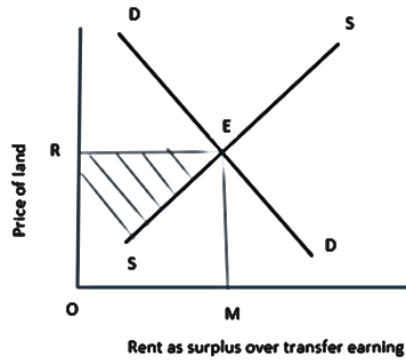
1. **Economist Definition:** Rent is an income received from any resource with a perfectly inelastic supply, like unique skills or limited natural resources.
2. **Generalized Definition:** Economic rent is the surplus earned by any factor of production due to its scarcity or limited availability in the market.
3. **Marshall's View:** Alfred Marshall expanded rent beyond land to include any factor with a fixed supply that earns more than necessary to retain it.

### **Features of Modern Theory of Rent**

- **Applicability to All Factors:** Unlike traditional views, rent can apply to any factor of production with limited supply, such as land, labor, or capital, which earn more when in high demand.
- **Inelastic Supply:** Rent arises due to the inelastic or limited supply of a resource. This inelasticity creates scarcity, resulting in a higher price and rent above its opportunity cost.

- **Economic Surplus:** Rent is considered an economic surplus. It represents additional income above what's necessary to keep a resource in its current use, based on the demand and supply dynamics.
- **Determined by Demand and Supply:** Modern rent is influenced by both demand and supply conditions. Higher demand for a scarce factor pushes up its rent, reflecting the factor's scarcity and value.
- **Not a Cost of Production:** Since rent is surplus income, it is not a necessary cost of production in the same way wages or capital costs are.
- **Quasi-Rent:** Quasi-rent refers to short-term economic rent earned by capital and other resources that are inelastic in the short run but may become elastic in the long run as supply adjusts.
- **Potential in Monopolistic Situations:** Rent can also arise in monopoly settings, where a single firm controls supply, creating **monopoly rent** due to limited competition.

According to modern economic theory, rent arises from the scarcity of land and other factors like labor and capital, which can be limited in supply relative to demand. When these factors earn income exceeding their minimum required earnings, this excess is termed **economic rent**. Professor Wieser classified production factors into **specific** and **non-specific** factors. Specific factors are limited to a single use, like a farm only used to grow wheat, and they lack mobility. In contrast, non-specific factors can be used in various ways and are mobile. Rent originates primarily from the specificity of certain factors, as their inability to be repurposed means their opportunity cost or transfer earnings are zero, making their entire income in their current use qualify as rent.



In the above diagram demand and supply curve intersect each other at point E. according to the equilibrium the price per unit of land is OR and quantity of land is OM. The total earning of the factor is  $OR \cdot OM = OREM$ . Now we have to find out the opportunity cost or supply price. The supply price of the first unit is OS and the supply price of the last unit is EM. Hence, the total supply price of the factor is OSEM and therefore the amount of rent is SRE which is shown as shaded portion in the above diagram. This rent shown as a shaded portion in the above diagram is due to the scarcity of the factor of production.

### **Criticism of Modern Theory of Rent**

The Modern Theory of Rent, developed by economists like Marshall and others, has faced criticism on several grounds. Here are some key critiques:

1. **Assumptions about Perfect Competition:** The theory assumes perfect competition in factor markets, which is rarely observed in reality. In real-world markets, factors like land and capital are often subject to imperfect competition, which affects the rent determination process.
2. **Neglects Opportunity Cost in Full:** Modern rent theory focuses on the opportunity cost of land use but does not always fully consider the impact of alternative uses for resources and other factors in land valuation.
3. **Applicability Beyond Land:** While the theory has been extended to include other factors of production, critics argue that this extension can be misleading. Rent for other factors, like labor and capital, is often influenced by different dynamics and cannot be directly equated with land rent.

4. **Static Framework:** The Modern Theory of Rent tends to adopt a static perspective, assuming that land supply is fixed. This can overlook changes in land use, technological advancements, or policy changes that can influence both supply and demand for land.
5. **Limited Explanation for Urban Land Rent:** The theory does not always apply well to urban contexts, where land values are driven by location, zoning laws, and other specific factors that differ significantly from agricultural land.
6. **Complex Interdependence with Other Factors:** Critics argue that the theory oversimplifies the interdependence between land and other factors of production. It assumes a straightforward rent determination process without fully accounting for the complex interactions with labor, capital, and entrepreneurial input.

These critiques suggest that while the Modern Theory of Rent provides foundational insights, it may not fully capture the complexities of real-world rent dynamics, especially in varied economic contexts.

### **Wages: Real Wages Vs Nominal Wages**

**Definition:** Wages represent the compensation paid to workers for their labor, generally expressed in terms of money. This compensation can include hourly rates, monthly salaries, bonuses, benefits, and any additional remuneration for services rendered.

#### **Nominal Wages**

- **Definition:** Nominal wages are the wages earned by workers expressed in current monetary terms, without adjusting for inflation or changes in purchasing power.
- **Example:** If a worker earns \$15 per hour, this is the nominal wage. It shows the money received but does not indicate how much the worker can actually buy with that income.
- **Limitation:** Nominal wages alone do not reflect the true value of earnings since they do not account for changes in the cost of living.

## **Real Wages**

- **Definition:** Real wages refer to wages adjusted for inflation, reflecting the actual purchasing power of the income received. Real wages indicate how much goods and services the nominal wage can buy in a specific time period.
- **Example:** If a worker's nominal wage increases from \$15 to \$16 per hour but inflation also rises by 5%, the real wage may not have increased because the cost of goods and services has also gone up.
- **Importance:** Real wages are a better measure of an individual's standard of living, as they account for inflation and provide insight into whether workers' purchasing power is increasing or decreasing over time.

## **The Marginal Productivity Theory of Distribution**

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. Assumptions of the Theory: The marginal productivity theory of distribution is based on the following seven **assumptions**:

1. **Perfect competition in both product and factor markets:** Firstly, the theory assumes the perfect competition in both product and factor markets. It means that both the price of the product and the price of the factor (say, labour) remains unchanged.

2. **Operation of the law of diminishing returns:** Secondly, the theory assumes that the marginal product of a factor would diminish as additional units of the factor are employed while keeping other factors constant.

3. **Homogeneity and divisibility of the factor:** Thirdly, all the units of a factor are assumed to be divisible and homogeneous. It means that a factor can be divided into small units and each unit of it will be of the same kind and of the same quality.

4. **Operation of the law of substitution:** Fourthly, the theory assumes the possibility of the substitution of different factors. It means that the factors like labour, capital and others can be freely and easily substituted for one another. For example, land can be substituted by labour and labour by capital.

5. **Profit maximisation:** Fifthly, the employer is assumed to employ the different factors in such a way and in such a proportion that he gets the maximum profits. This can be achieved by employing each factor up to that level at which the price of each is equal to the value of its marginal product.

6. **Full employment of factors:** Sixthly, the theory assumes full employment for factors. Otherwise each factor cannot be paid in accordance with its marginal product. If some units of a particular factor remain unemployed, they would be then willing to accept the employment at a price less than the value of their marginal product.

7. **Exhaustion of the total product:** Finally, the theory assumes that the payment to each factor according to its marginal productivity completely exhausts the total product, leaving neither a surplus nor a deficit at the end.

### **Key Concepts:**

The theory is also based on key certain concepts.

These are the following:

1. **Marginal Physical Product 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. Value Of The Marginal Product 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.

**3. Marginal Revenue Product 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 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 <i>AW=MW</i>
1 unit	1 unit	1 unit	10 units	×	×	Rs. 20
"	"	2 units	16 "	6 units	Rs. 30	"
"	"	3 units	21 "	5 units	Rs. 25	"
"	"	4 units	25 units	4 units	Rs. 20	"
"	"	5 units	28 "	3 units	Rs. 15	"
"	"	6 units	30 "	2 units	Rs. 10	"

Table 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. 12) 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.

### **Criticisms of the Theory:**

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.

### Key Glossary

- **Rent:** Payment for the use of land or other natural resources which are in fixed supply.
- **Ricardian Theory of Rent:** A theory by David Ricardo stating that rent is the difference between the productivity of a particular piece of land and the least productive land in use.
- **Modern Theory of Rent:** Expands on Ricardo's theory, suggesting that rent applies to any factor in limited supply, not just land.
- **Wages:** Payment to labor for its contribution to the production process.
- **Real Wages:** Wages adjusted for inflation, reflecting the purchasing power of income.
- **Nominal Wages:** The actual amount of money received by a worker, without adjustment for inflation.
- **Marginal Productivity Theory of Wages:** A theory suggesting that wages are determined by the additional output generated by an additional unit of labor.

### Short Questions

1. What is rent in economics?
2. Who introduced the Ricardian Theory of Rent?
3. What is the difference between real and nominal wages?
4. Define the Marginal Productivity Theory of Wages.

5. What does the Modern Theory of Rent explain?

### **Brief Questions**

1. Explain the concept of rent in economics.
2. What is the Ricardian Theory of Rent?
3. How does the Modern Theory of Rent differ from Ricardian Theory?
4. Define real wages and nominal wages with examples.
5. Summarize the Marginal Productivity Theory of Wages.

### **Detailed Questions**

1. Discuss the Ricardian Theory of Rent, including its assumptions and limitations.
2. Compare and contrast the Ricardian and Modern theories of rent.
3. Explain real wages and nominal wages, and discuss factors that can affect each.
4. Describe the Marginal Productivity Theory of Wages and discuss its implications for wage determination.

The fundamental activity in a country's financial market is the borrowing and lending of money. The lender charges, and the borrower agrees to pay, an additional amount on top of the principal borrowed. This extra amount is commonly known as interest. In economic terms, interest is a type of factor payment, similar to rent and wages, as it compensates for the use of capital as a factor of production. Essentially, interest represents the cost of using capital over a certain period.

The term "capital" has two main meanings: (i) **money or financial capital**, which refers to loanable or investible funds, and (ii) **physical assets**, such as land, buildings, plants, and machinery. Financial capital, held in forms like bank deposits, shares, and debentures, generates different types of income, such as interest and dividends. Investment in physical capital, however, produces a return known as the "return on capital." Money capital often transforms into physical capital, and the interest paid on money capital then becomes known as the "cost of capital."

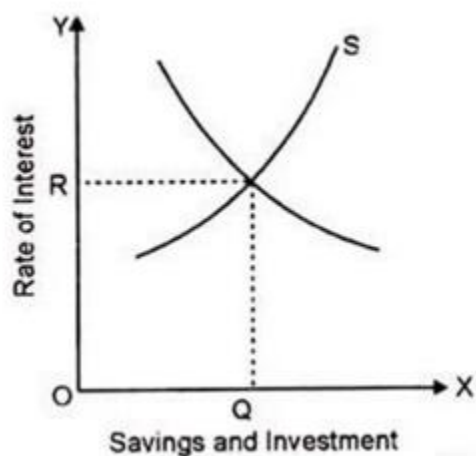
Based on these two meanings of capital, economists distinguish between two types of interest theories: (i) **monetary theories of interest** and (ii) **real theories of interest**, the latter closely linked to the Theory of Capital. This book focuses on the monetary theories of interest and examines how interest influences investment decisions.

### **The Classical Theory of Interest**

In the classical view, the interest rate is determined by the demand for investment and the willingness to save. As Keynes explains, investment represents the demand for investible resources, while saving represents the supply. The rate of interest acts as the "price" of these investible resources, balancing demand and supply. Just as the price of a commodity settles where its demand equals its supply, the interest rate is determined by the point where the amount of investment aligns with the amount of saving at that interest rate,

stabilized by the forces of the market. In other words, according to classical economists, interest is the reward for saving. They believed that savings are influenced by the interest rate: the higher the interest rate, the greater the amount of savings, and vice versa. On the other hand, the demand for savings, which is used for investment, is inversely related to the interest rate. Higher interest rates lead to lower investment, while lower rates encourage more investment. This theory posits that interest is the reward for the productive use of capital, which is equal to the marginal productivity of physical capital. As such, it is also referred to as the supply and demand theory of waiting or saving. Capital is in demand because it is productive; it generates income beyond its cost. The demand for capital is shaped by the marginal productivity curve of capital, which declines as investment increases, resulting in a downward-sloping demand curve. Thus, there is an inverse relationship between the interest rate and investment. The supply of capital, on the other hand, depends on the availability of savings within the economy. Savings stem from people's willingness and ability to save, which is influenced by their preference for delayed consumption or "waiting." Therefore, a higher interest rate provides a greater reward, leading to increased savings and establishing a positive relationship between the interest rate and savings.

### **Interest Rate Equilibrium**



The equilibrium rate of interest is determined where the downward-sloping demand curve for capital intersects the upward-sloping supply curve of capital. At this intersection, the amount of savings equals the amount of investment. In the diagram, OR represents the equilibrium interest rate, set at the point where the savings supply curve meets the investment demand curve. At this equilibrium rate, an amount OQ of savings is supplied and invested, indicating that the demand for capital (OQ) equals the supply of capital (OQ) at the interest rate OR.

### **Criticism of The Classical Theory of Interest**

The classical theory of interest, also known as the demand and supply theory, has faced several criticisms over time. Some of the key points of criticism include:

- **Assumption of Full Employment:** The classical theory assumes full employment in the economy, which is rarely the case in the real world. At full employment, savings and investment are balanced by the interest rate, but in reality, there are fluctuations in employment levels that affect savings and investment independently of the interest rate.
- **Neglect of Liquidity Preference:** Classical economists did not account for the role of liquidity preference, or the desire to hold money for transactions, precautionary, and speculative motives. Keynes later argued that people's preference to hold cash can influence the interest rate significantly, especially during periods of economic uncertainty.
- **Simplistic View of Savings and Investment:** The theory assumes a simple, direct relationship between savings, investment, and interest rates. However, modern economists argue that savings and investment decisions are influenced by many other factors, such as income levels, fiscal policy, and future expectations. This means that changes in the interest rate alone may not adequately adjust savings and investment.
- **Ignores Role of Central Banks:** The classical theory does not consider the role of central banks in influencing the interest rate. Central banks can

adjust interest rates directly through monetary policy, impacting savings and investment beyond the natural equilibrium suggested by the theory.

- **Failure to Explain Interest Rate Rigidity:** The classical theory assumes interest rates are flexible and adjust automatically to bring savings and investment into balance. In practice, interest rates are often rigid due to institutional factors, policy controls, and long-term financial contracts, which may prevent the rate from adjusting freely.
- **Inflexible Assumption of Time Preference:** The theory's reliance on time preference (the willingness to delay consumption) is considered overly simplistic. People's savings behavior is influenced by a wide range of economic and psychological factors, not just the interest rate or preference for future over present consumption.
- **Lack of Short-Term Relevance:** The classical theory is more suited for long-term equilibrium analysis and may not accurately reflect short-term interest rate fluctuations. Short-term rates are often affected by liquidity demands, speculative activities, and central bank interventions rather than long-term saving and investment balances.

These criticisms highlight the limitations of the classical theory of interest in explaining real-world interest rate determination, leading to the development of alternative theories, such as Keynes' liquidity preference theory, which provides a more comprehensive view by incorporating these additional factors.

## **The Loanable Funds Theory of Interest: The Neo-Classical Theory of Interest**

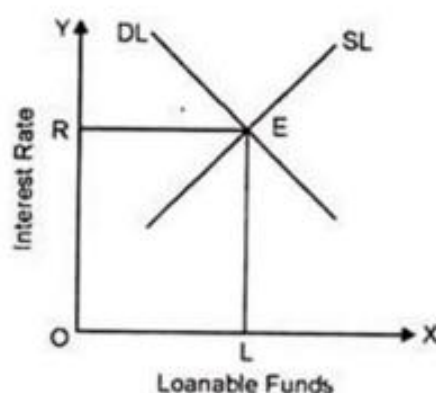
The Neo-Classical or Loanable Funds Theory, developed by the economist Knut Wicksell and further refined by economists such as Ohlin, Robertson, and Pigou, aimed to enhance the classical theory of interest. According to this theory, the rate of interest is the "price" of credit, determined by the interaction between the demand for and supply of loanable funds. These economists argued that the classical theory was limited, as it considered only two factors affecting interest rates. They proposed incorporating additional factors to more accurately determine the interest rate.

**Demand for Loanable Funds:** The demand for loanable funds represents the amount of money needed for borrowing, for which interest is paid. Various groups, including the government, businesses, and consumers, seek loans for investment, hoarding, and consumption. This demand is inversely related to the interest rate: the higher the interest rate, the lower the demand for loanable funds, and vice versa.

**Supply of Loanable Funds:** The supply of loanable funds comes from sources such as savings, dishoarding, bank credit, and disinvestment. As the interest rate rises, the incentive to save increases, leading to a greater supply of loanable funds. Consequently, there is a positive relationship between the interest rate and the supply of loanable funds, which creates an upward-sloping supply curve from left to right.

**Determination of the Interest Rate :**The market rate of interest is determined at the equilibrium point where the aggregate demand and supply of loanable funds meet or the intersection of their respective curves. The aggregate demand curve for loanable funds is derived by combining the downward-sloping curves for investment, consumption, and hoarding, each of which has a negative relationship with the interest rate. Meanwhile, the aggregate supply curve is obtained by summing the upward-sloping curves of savings, bank credit, dishoarding, and disinvestment, each showing a positive relationship with the interest rate. This equilibrium point reflects the market rate of interest, where

loanable funds demanded and supplied are balanced. In the diagram, the aggregate demand curve for loanable funds (DL) and the aggregate supply curve of loanable funds (SL) intersect at point E. Thus, point E represents the equilibrium point, with OR as the equilibrium interest rate. At this interest rate, both the demand for and supply of loanable funds equal OL.



If the supply of loanable funds remains constant but the demand for loanable funds increases, the interest rate will also rise. Conversely, if the demand for loanable funds decreases, the interest rate will fall. Similarly, if the demand for loanable funds remains unchanged, a decrease in the supply of loanable funds will cause the interest rate to rise, while an increase in supply will cause it to fall. Therefore, the equilibrium rate of interest is determined at the point where SL equals DL.

### **Criticism of Loanable Theory of Interest**

The Loanable Funds Theory of Interest has faced several criticisms for its assumptions and limitations. Here are some of the main points in simple terms:

- **Ignores the Role of Money Supply:** The theory doesn't fully consider how the total amount of money in the economy, which is controlled by the central bank, affects interest rates. Keynesians argue that interest rates aren't just about loanable funds—money supply and monetary policies also play a big role in setting these rates.

- **Assumes a Stable Economy:** The theory assumes that the economy is stable with full employment and steady prices, which doesn't match reality. In real life, we face ups and downs in the economy, like recessions and inflation, that can influence interest rates in ways this theory doesn't account for.
- **Overly Simplified View of Saving and Investment:** This theory suggests that saving and investment are determined mostly by the interest rate, but it overlooks other key factors, like people's incomes, expectations about the future, and government policies. Interest rates alone don't always balance saving and borrowing.
- **Ignores Liquidity Preference:** People often prefer holding onto cash rather than saving or investing it, especially when there's uncertainty. This desire to hold money (liquidity preference) affects interest rates, but the Loanable Funds Theory doesn't consider it. Keynes argued that people's desire to keep cash on hand impacts interest rates, especially in uncertain times.
- **Limited Explanation of Short-Term Rates:** The theory is better at explaining long-term interest rates and doesn't fully capture why short-term interest rates might change quickly. Short-term rates are often affected by things like bank policies and immediate economic needs, not just the demand and supply for loanable funds.

### **Keynes Liquidity Preference Theory**

The Liquidity Preference Theory, introduced by John Maynard Keynes in his seminal work *The General Theory of Employment, Interest, and Money* (1936), offers a unique explanation of interest rate determination by focusing on individuals' desire to hold cash (liquidity) rather than investing it. Keynes argued that interest rates are not solely the result of supply and demand for loanable funds but are also influenced by people's preference for liquidity. Here are the key elements of the theory.

- According to Keynes, the interest rate is essentially a reward for giving up liquidity. People prefer liquidity because cash offers flexibility and safety; they can use it for transactions, emergencies, or other needs without having to sell investments.
- Keynes proposed that interest rates are determined by the demand for money (liquidity preference) and the available money supply, not just by saving and investing decisions as earlier theories suggested.
- Keynes identified three main motives for holding cash or money rather than investing it. These motives influence how much money people want to hold at different interest rates otherwise known as demand for money .
  1. Transaction Motive
  2. Precautionary Motive
  3. Speculatory Motive

### **Demand for Money**

**Transaction Motive:** Money being medium of exchange, this motive refers to the need for cash to handle regular, everyday expenses in personal and business exchanges. It is further categorized into two motives:

- **Income Motive:** This involves keeping cash on hand to cover expenses during the period between receiving income and spending it.
- **Business Motive:** This involves holding cash to cover the time between incurring business costs and receiving sales revenue.

If the time gap between spending and income is short, people hold less cash for transactions, and if it's longer, they hold more. In addition, size of income is determining factor of transaction motive, they are positively related to each other, higher the size of income, higher the cash holdings for transaction.

**Precautionary Motive:** The precautionary motive is the desire to have cash set aside for unexpected situations that may require immediate spending, like sudden opportunities for profitable purchases or unforeseen emergencies. Individuals keep cash for situations such as illness, accidents, or unemployment. Similarly, businesses maintain cash reserves to weather

economic downturns or to seize unexpected, advantageous opportunities. According to Keynes, the precautionary demand for money is also a function of the size of income so both transactions and precautionary motive of money is function of size of income. This can be symbolically represented as

$$L_1 = f(Y)$$

Where  $L$  is Transactions demand for money and Speculative demand for money,  $Y$  is the Money income

**Speculative Motive:** The speculative motive is the desire to hold cash to potentially profit from future changes in interest rates. After setting aside money for transactions and precautionary needs, individuals and businesses often hold some funds in anticipation of investing them in bonds or other interest-bearing securities when the timing is right. The demand for money for speculative purposes is inversely related to the interest rate: people prefer to hold more cash when interest rates are low (expecting rates to rise and make investments more profitable in the future) and less cash when interest rates are high. Therefore, the liquidity preference curve, which shows this relationship, slopes downward. Symbolically it can be represented as

$$L_2 = f(i)$$

Where  $L_2$  is Precaution demand for money,  $I$  is the rate of interest

The total demand for money will be the sum of all three motives which can be symbolically represented as

$$L = L_1 + L_2$$

$$L = f(Y) + f(i)$$

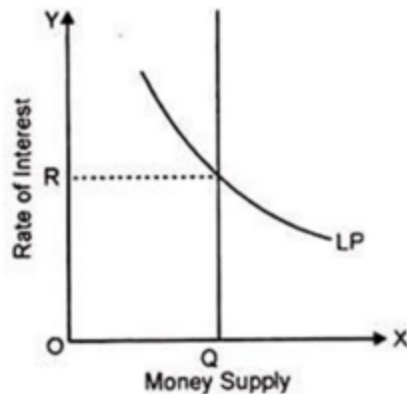
### **Supply of Money**

The supply of money represents the total amount of money available in a country for all uses at any given time. While the money supply does relate somewhat to interest rates, it is largely set by monetary authorities and is generally viewed as fixed. This means the supply curve for money is considered perfectly inelastic. The supply of money in an economy is determined by government and central bank policies and consists of coins, currency notes, and bank deposits. Since

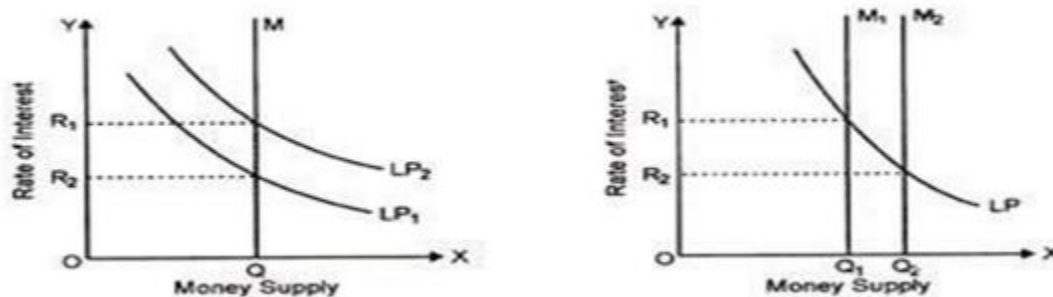
the interest rate does not influence the money supply, it remains constant over the short term.

### Determination of Interest rate

According to the Liquidity-Preference Theory the equilibrium rate of interest is determined by the interaction between the liquidity preference function (the demand for money) and the supply of money, as presented in figure below:



OR is the equilibrium rate of interest. The theory further states that any change in the liquidity preferences function (LP) or change in money supply or changes in both respectively cause changes in the rate of interest. Thus as shown in figure below, given the money supply the liquidity preference curve (LP) shifts from  $LP_1$  to  $LP_2$  implying thereby an increase in demand for money, the equilibrium rate of interest also rises (please read  $R_2$  as  $R_1$  and vice-versa in the first figure below).



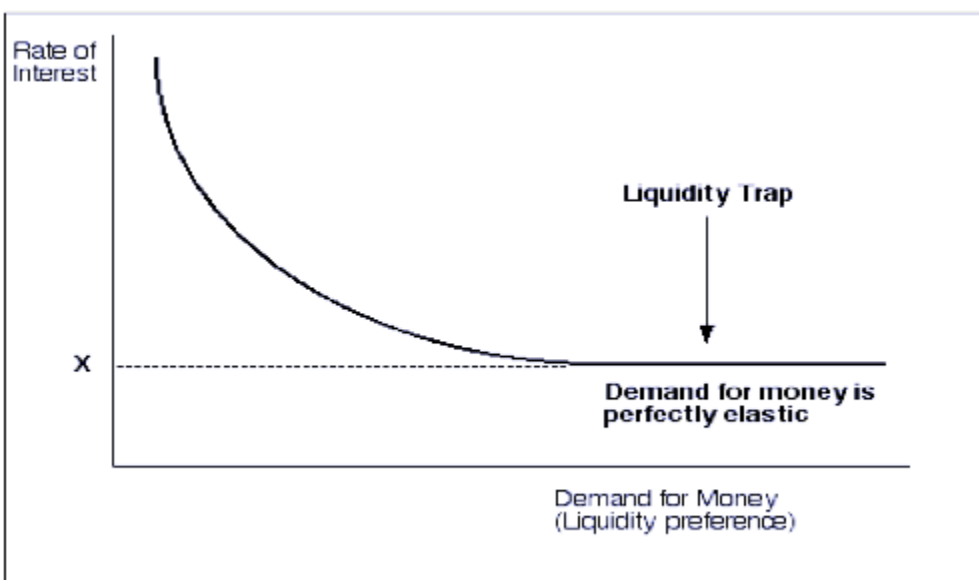
In the same way if there was an increase in money supply from  $Q_1$  to  $Q_2$ , the interest rate reduced from  $R_1$  to  $R_2$

### Liquidity Trap

A **liquidity trap** occurs when interest rates are so low that monetary policy becomes ineffective in stimulating economic activity. In this situation, people and

businesses prefer to hold on to cash rather than invest it or spend it, even if interest rates are very low. Essentially, the demand for money becomes highly insensitive to changes in the interest rate, leading to a situation where monetary policy (such as lowering interest rates further) no longer encourages borrowing or spending.

In other words, A liquidity trap happens when increasing the money supply doesn't lower interest rates but instead just adds to people's cash holdings. Normally, when the money supply increases, people have extra cash, which they would use to buy bonds or other assets, causing bond prices to rise and interest rates to fall. However, in a liquidity trap, people believe that bond prices are already too high and that they might drop, causing interest rates to rise. Because of this, they avoid buying bonds, fearing they will lose money, and instead hold on to cash. As a result, increasing the money supply only leads to more cash being held without affecting interest rates.



1

Key features of a liquidity trap:

- **Very low or zero interest rates:** The central bank has lowered interest rates as much as possible to stimulate the economy, but these rates are so low that they cannot be reduced further.

- **People prefer holding cash:** Despite low interest rates, individuals and businesses may still prefer to hold onto cash, fearing economic uncertainty or deflation, rather than investing or spending.
- **Monetary policy becomes ineffective:** Since interest rates cannot be lowered further to encourage borrowing and investment, traditional monetary policy tools lose their effectiveness.

A liquidity trap is often associated with periods of economic stagnation or recession, where even large increases in the money supply do not result in increased economic activity. This situation can lead to persistent low inflation or deflation and slow economic growth.

### **Profit: Theories of Profit**

In economics, profit is the financial gain a business or individual receives when revenues from sales exceed the costs associated with production and operations. It is a fundamental concept reflecting the efficiency and success of economic activities, representing the reward for entrepreneurship, investment, and risk-taking. Profit serves as an essential indicator of economic health, guiding business decisions and resource allocation within the economy. Economists view profit in different ways which are presented as theories. Some of the crucial theories are discussed below.

### **Schumpeter's Innovative Theory**

Schumpeter's Innovative Theory of Profit highlights the essential role of innovation in driving economic growth and generating profit. According to Joseph Schumpeter, profit is not simply a reward for risk or capital investment but rather a reward for introducing new and disruptive innovations into the market. He believed that entrepreneurs who create new products, develop advanced technologies, or implement unique production processes gain a temporary competitive advantage, enabling them to earn profits above the normal market rate.

Schumpeter defined innovation broadly, including the introduction of new goods, new production methods, new markets, new supply sources, and organizational changes. He argued that these innovations disrupt the existing equilibrium in the economy, leading to a temporary monopoly position for the innovator, where they can capture significant profits before others catch up. However, these profits are not permanent. As competitors imitate the innovation or develop alternatives, the competitive advantage diminishes, and profits return to normal levels. This continuous cycle of innovation and imitation is what Schumpeter referred to as “creative destruction,” where new ideas continuously reshape and renew the economic landscape, making older technologies and methods obsolete.

In summary, Schumpeter’s theory positions profit as a temporary but crucial motivator for entrepreneurs to take on the risks associated with innovation. This innovation-driven cycle of creative destruction is fundamental for economic advancement, as it pushes the economy toward higher levels of efficiency, productivity, and growth.

### **Risk and Uncertainty Theory**

This theory was propounded by an American economist Prof. Frank H. Knight. This theory, starts on the foundation of Hawley’s risk bearing theory. Knight agrees with Hawley that profit is a reward for risk-taking. There are two types of risks viz. foreseeable risk and unforeseeable risk. According to Knight unforeseeable risk is called uncertainty bearing.

Knight, regards profit as the reward for bearing non-insurable risks and uncertainties. He distinguishes between insurable and non-insurable risks. Certain risks are measurable; the probability of their occurrence can be statistically calculated. The risks of fire, theft, flood and death by accident are insurable. These risks are borne by the insurance company. The premium paid for insurance is included in the cost of production. According to Knight these foreseen risks are not genuine economic risks eligible for any remuneration of profit. In other words insurable risk does not give rise to profit.

According to Knight profit is due to non-insurable risk or unforeseeable risk.

**Some of the non- insurable risks which arise in modern business are as follows:**

**(a) Competitive risk:**

Some new firms enter into the market unexpectedly. The existing firms may have to face serious competition from them. This will inevitably lower down the profit of the firms.

**(b) Technical risk:**

This risk arises from the possibility of machinery becoming obsolete due to the discovery of new processes. The existing firm may not be in a position to adopt these changes into its organization, and hence suffer losses.

**(c) Risk of government intervention:**

The government, in course of time, interferes into the affairs of the industry such as price control, tax policy, import and export restrictions, etc., which might reduce the profits of the firm.

**(d) Cyclical risk:**

This risk emerges from business cycles. Due to business recession or depression, consumer's purchasing power is reduced, consequently demand for the product of the firm also falls.

**(e) Risk of demand:**

This is generated by a shift or change of demand in the market.

Prof. Knight calls these risks as 'uncertainties' and 'it is uncertainties in this sense which explains profit in the proper use of the term'. These risks cannot be foreseen and measured, they become non- insurable and the uncertainties have to be borne by the entrepreneur. According to this theory there is a direct relationship between profit and uncertainty bearing.

Greater the uncertainty bearing the higher the level of profit. Uncertainty bearing has become so important in business enterprise in modern days, it has come to be considered as a separate factor of production. Like other factors it has a supply price and entrepreneurs undertake uncertainty bearing in the expectation of earning certain level of profit. Profit is thus the reward for assuming uncertainty.

In the modern days production has to take place in advance of consumption. The producers have to face their rival producers and the future is uncertain and unknown. These are uncertainties. Some entrepreneurs are able to see it more clearly than others and therefore able to earn profit.

**Criticism:**

1. According to this theory, profit is the reward for uncertainty bearing. But critics point out that sometimes an entrepreneur earns no profit in spite of uncertainty bearing.
2. Uncertainty bearing is one of the determinants of profit and it is not the only determinant. Profit is also a reward for many other activities performed by entrepreneur like initiating, coordinating and bargaining, etc.
3. It is not possible to measure uncertainty in quantitative terms as depicted in this theory.
4. In modern business corporations ownership is separate from control. Decision-making is done by the salaried managers who control and organise the corporation. Ownership rests with the shareholders who ultimately bear uncertainties of business. Knight does not separate ownership and control and this theory becomes unrealistic.
5. Uncertainty bearing cannot be looked upon as a separate factor of production like land, labour or capital. It is a psychological concept which forms part of the real cost of production.

6. Monopoly firms earn much larger profits than competitive firms and they are not due to the presence of uncertainty. This theory throws no light on monopoly profit.

Knight's theory of profit is more elaborate than other theories, because it combines the conception of risk, of economic change and of the role of business ability.

### **Break Even Analysis**

Break-even analysis is a function of three factors, i.e. sales volume, cost and profit. It aims at classifying the dynamic relationship existing between total cost and sale volume of a company. It helps to know the operating condition that exists when a company 'breaks-even'.

**Break Even Point:** The break-even point may be defined as that level of sales in which total revenues equal total costs and net income is equal to zero. **This is also known as no-profit no-loss point.**

**Determination of Break-even Point:** The formula for calculating the break-even point is

$$\text{BEP} = \frac{\text{Total Fixed Cost}}{\text{Contribution Margin Per Unit}}$$

Contribution margin per unit can be found out by deducting the average variable cost from the selling price. So the formula will be

(OR)

$$\text{BEP} = \frac{\text{Total Fixed Cost}}{\text{Selling Price} - \text{AVC}}$$

### **Methods Of Measuring Break Even Point**

The break-even point (B.E.P.) of a firm can be found out in two ways. It may be determined in terms of physical units, i.e., volume of output or it may be determined in terms of money value, i.e., value of sales.

#### ***BEP in terms of Physical Units:***

This method is convenient for a firm producing ONE product. **The break-even point in terms of Physical units is illustrated in the below Table 1:**

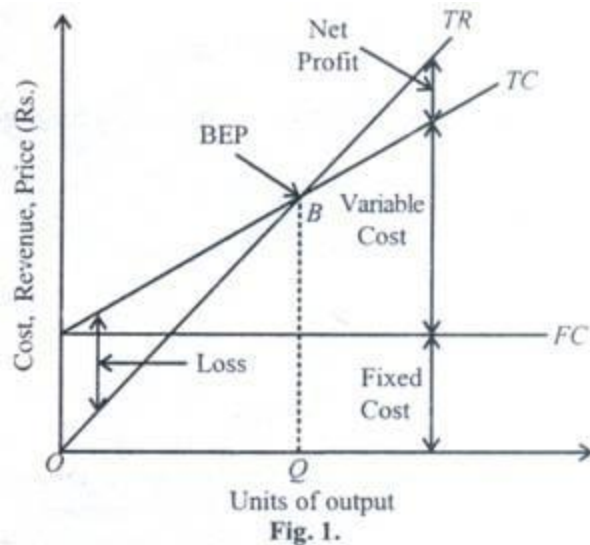
**Table 1: Total Revenue and Total Cost and BEP**

<b>Output in units</b>	<b>Total Revenue</b>	<b>Total Fixed Cost</b>	<b>Total Variable Cost</b>	<b>Total Cost (TFC + TVC)</b>
0	0	150	0	150
50	200	150	150	300
100	400	150	300	450
150	600	150	450	600 BEP
200	800	150	600	750
250	1000	150	750	900
300	1200	150	900	1050

1. The price of the commodity is assumed to be constant at Rs. 4 per unit, i.e., perfect competition is assumed. Therefore, the total revenue is increasing proportionately to the output.
2. All the units of the output are sold out.
3. The total fixed cost is kept constant at Rs. 150 at all levels of output.
4. From the Table we can see that when the output is zero, the firm incurs only fixed cost. When the output is 50, the total cost is Rs. 300. The total revenue is Rs. 200. The firm incurs a loss of Rs. 100.
5. At the level of output 150 units, the total revenue is equal to the total cost. At this level, the firm is working at a point where there is no profit or loss.
6. From the level of output of 200, the firm is making profit.

**Break-Even Chart:**

The break even chart shows the extent of profit or loss to the firm at different levels of activity. The following Fig. 1 illustrates the typical break-even chart.



1. In x-axis we measure Output, in Y-axis we measure costs and revenue
2. Total revenue (TR) curve is shown as linear, as it is assumed that the price is constant, irrespective of the output.
3. Linearity of the total cost (TC) curve results from the assumption of constant variable cost.
4. TR curve is drawn as a straight line through the origin (i.e., every unit of the output contributes a constant amount to total revenue),
5. TC curve is a straight line originating from the vertical axis because total cost comprises constant / fixed cost plus variable cost which rise linearly.
6. In the figure, B is the break-even point at OQ level of output.

### **BEP In Term of Sales Value:**

Multi-product firms are not in a position to measure the break-even point in terms of any common unit of product. They find it convenient to determine the break-even point in terms of total rupee sales. Here again the break-even point would be where the contribution margin (sales value—variable costs) would be

equal to fixed costs. The contribution margin however, is expressed as a ratio to sales. The formula for calculating the break-even point is

BEP = Fixed Cost/Contribution Ratio

$$\text{Contribution Ratio (CR)} = \frac{\text{Total Revenue (TR)} - \text{Total Variable Cost (TVC)}}{\text{Total Revenue (TR)}}$$

### Key Glossaries

- **Interest:** Payment made by a borrower to a lender for the use of borrowed money, usually expressed as a percentage of the principal.
- **Classical Theory of Interest:** Theory that states interest is determined by the supply and demand for capital; savings supply capital, and investment creates demand.
- **Neo-Classical Theory of Interest (Loanable Funds Theory):** Theory suggesting that interest rates are determined by the demand and supply of loanable funds, including factors like savings, bank credit, and disinvestment.
- **Keynes' Liquidity Preference Theory of Interest:** Theory proposing that interest rates are determined by the preference for holding cash versus investing it; people hold money for transactions, precaution, and speculation.
- **Profit:** The financial gain made when revenue exceeds costs; a reward for business risk and entrepreneurship.
- **Theories of Profit:** Various explanations of profit, including Schumpeter's Innovation Theory, Risk-Bearing Theory, Monopoly Theory, and Dynamic Theory.
- **Break-Even Analysis:** A financial calculation to determine when a business will be able to cover its costs with revenue, marking the point at which profit begins.

### **Short Questions**

1. Define interest.
2. What does the Classical Theory of Interest propose?
3. Describe the Loanable Funds Theory of interest.
4. What are the main motives for holding money in Keynes' Liquidity Preference Theory?
5. Define profit in economics.
6. What is the Schumpeterian Innovation Theory of Profit?
7. Explain break-even analysis.

### **Brief Questions**

1. What is the Classical Theory of Interest, and how does it explain interest rates?
2. Explain the Loanable Funds Theory of interest and the role of savings and investment in it.
3. Summarize Keynes' Liquidity Preference Theory and the three motives for holding money.
4. Describe the Risk-Bearing Theory of Profit.
5. What is the importance of break-even analysis for a business?
6. How does Schumpeter's Innovation Theory explain profit?
7. What is the relationship between interest rate and investment in the Classical Theory?

### **Detailed Questions**

1. Discuss the Classical Theory of Interest in detail.
2. Discuss how savings influence the supply of funds and investment influences the demand.
3. Explain how interest rates are determined by the demand and supply of capital.
4. Explain the Neo-Classical Loanable Funds Theory of Interest.
5. What are the main aspects of Keynes' Liquidity Preference Theory of Interest?

6. Compare the Classical Theory, Neo-Classical Theory, and Keynesian Liquidity Preference Theory of Interest.
7. Explain the different theories of profit in economics.
8. Discuss Schumpeter's Innovation Theory of Profit in detail.
9. Explain the concept of the liquidity trap in Keynes' Liquidity Preference Theory.
10. What is the significance of the interest rate in economic decision-making?
11. Describe the Monopoly Theory and the Dynamic Theory of Profit.

A **firm** is a commercial enterprise, a company that buys and sells products and/or services to consumers with the aim of making a profit. A business entity such as a corporation, limited liability company, public limited company, sole proprietorship, or partnership that has products or services for sale is a firm.

While most firms have just one location, a single firm can consist of one or more establishments, as long as they fall under the same ownership and utilize the same Employer Identification Number (EIN).

The theory of the firm is the microeconomic concept founded in neoclassical economics that states that firms exist and make decisions to maximize profits. Firms interact with the market to determine pricing and demand and then allocate resources according to models that look to maximize net profits.

In the theory of the firm, the behavior of any business entity is said to be driven by profit maximization. This theory governs decision making in a variety of areas including resource allocation, production technique, pricing adjustments, and volume production.

Economists have advanced a number of approaches relating to economic decisions of management.

1. Economic Theory of Firm
  - a. Baumol's Sales Revenue Maximisation Model
  
2. Behavioral Theory of Firm
  - a. Cyret and March
  
3. Managerial Theory of Firm
  - a. Marris Theory

## b. William's Theory

### **Baumol's Sales Revenue Maximisation Model**

**Sales maximization model** is an alternative model for profit maximization. This model is developed by Prof. Baumol, an American economist. This alternative goal has assumed greater significance in the context of the growth of Oligopolistic firms.

Baumol's sales revenue maximization model highlights that the primary objective of a firm is to maximize its sales rather than profit maximization. It states that the goal of the firm is maximization of sales revenue subject to a minimum profit constraint. Maximization of sales does not mean maximization of physical sales but maximization of total sales revenue. Hence, the managers are more interested in maximizing sales rather than profit. The basic philosophy is that when sales are maximized automatically profits of the company would also go up. Hence, attention is diverted to increase the sales of the company in recent years in the context of highly competitive markets. Maximizing sales revenue is an alternative to profit maximization

#### Rationalization of Baumol's Sales Revenue Maximization Model

1. There is evidence that salaries and other earnings of top managers are correlated more closely with sales than with profits.
2. The banks and other financial institutions keep a close eye on the sales of firms and are more willing to finance firms with large and growing sales.
3. Personnel problems are handled more satisfactorily when sales are growing. The employees at all levels can be given higher earnings and better terms of work in general.
4. Large sales, growing over time, give prestige to the managers, while large profits go into the pockets of shareholders.
5. Managers, prefer a steady performance with satisfactory profits to spectacular profit maximization projects. If they realize maximum high profits in one

period, they might find themselves in trouble in other periods when profits are less than maximum.

6. Large growing sales strengthen the power to adopt competitive tactics, while a low or declining share of the market weakens the competitive position of the firm and its bargaining power vis-à-vis rivals.

### **Arguments in favour of Maximisation of Sales Goal**

Following arguments are given in favour of maximisation of sales goal:

i. **More Realistic:** Goal of maximization of sales is a more realistic goal- In fact, firms accord more importance to the goal of sales maximisation than profit maximization. It is so because success of a firm is generally judged from its total sales. According to Ferguson and Krupps, 'Among the various alternatives advanced, Baumoul's thesis has great advantage — it raises the other models in the direction of reality and plausibility while still permitting a rather general theoretical analysis.'

ii. **More Practical:** Revenue maximisation thesis of Baumol is more practical. It is so because goal of revenue (Sales) maximisation leads to more production which, in turn, leads to fall in price. As a result, consumers' welfare is promoted. They also endorse this goal of the firms.

iii. **More Availability of Loans:** At the time of sanctioning loan to a firm, financial institutions mainly consider its sales. Prospects of loans are bright for such firms as have large total sales.

iv. **Strong Position in the Market:** Maximum sales of a firm symbolize its strong position in the market. Sales of a firm will be large only in that situation when consumers like its production, firm has more competitive power and has been expanding. All these features are indicative of the progress of the firm.

v. **More Advantageous to the Managers:** It is more to the advantage of the managers that the firm should aim at sales maximisation. This way their credibility enhances in the market. Maximum sales is a reflection of the competence of the managers It has a favorable effect on their wages. Firm is in a position to offer higher wages to the employees. Consequently, employer-employee

relations become more cordial. It is the constant endeavour of the managers to maximize the sales of the firm after attaining a given level of profit.

### **Arguments Against Sales Maximization Model**

In defence of this model, the following arguments are given.

1. Increase in sales and expansion in its market share is a sign of healthy growth of a normal company.
2. It increases the competitive ability of the firm and enhances its influence in the market.
3. The amount of slack earnings and salaries of the top managers are directly linked to it.
4. It helps in enhancing the prestige and reputation of top management, distribute more dividends to share holders and increase the wages of workers and keep them happy.
5. The financial and other lending institutions always keep a watch on the sales revenues of a firm as it is an indication of financial health of a firm.
6. It helps the managers to pursue a policy of steady performance with satisfactory levels of profits rather than spectacular profit maximization over a period of time.

Managers are reluctant to take up those kinds of projects which yield high level of profits having high degree of risks and uncertainties. The risk averting and avoiding managers prefer to select those projects which ensure steady and satisfactory levels of profits.

### **Types of Baumol's Sales Revenue Maximization Models**

Prof. Baumol has developed two models. The first is static model and the second one is the dynamic model.

#### **The Static Model of Sales Maximization**

This model is based on the following assumptions.

1. The model is applicable to a particular time period and the model does not operate at different periods of time.
2. The firm aims at maximizing its sales revenue subject to a minimum profit constraint.

3. The demand curve of the firm slope downwards from left to right.
4. The average cost curve of the firm is unshaped one.

### **The Dynamic Model of Sales Maximization**

In the real world many changes takes place which affects business decisions of a firm. In order to include such changes, Boumol has developed another dynamic model. This model explains how changes in advertisement expenditure, a major determinant of demand, would affect the sales revenue of a firm under severe competitions.

Assumptions of dynamic model:

1. Higher advertisement expenditure would certainly increase sales revenue of a firm.
2. Market price remains constant.
3. Demand and cost curves of the firm are conventional in nature.

Generally under competitive conditions, a firm in order to increase its volume of sales and sales revenue would go for aggressive advertisements. This leads to a shift in the demand curve to the right. Forward shift in demand curve implies increased advertisement expenditure resulting in higher sales and sales revenue. A price cut may increase sales in general. But increase in sales mainly depends on whether the demand for a product is elastic or inelastic.

A price reduction policy may increase its sales only when the demand is elastic and if the demand is inelastic; such a policy would have adverse effects on sales. Hence, to promote sales, advertisements become an effective instrument today. It is the experience of most of the firms that with an increase in advertisement expenditure, sales of the company would also go up.

A sales maximizer would generally incur higher amounts of advertisement expenditure than a profit maximizer. However, it is to be remembered that amount allotted for sales promotion should bring more than proportionate increase in sales and total profits of a firm. Otherwise, it will have a negative effect on business decisions

Thus, by introducing, a non-price variable in to his model, Boumol makes a successful attempt to analyze the behavior of a competitive firm under oligopoly market conditions. Under oligopoly conditions as there are only a few big firms competing with each other either producing similar or differentiated products, would resort to heavy advertisements as an effective means to increase their sales and sales revenue. This appears to be more practical in the present day situations.

### **Behavioral Theory of Firm Of Cyert And March:**

The **behavioral theory of the firm** first appeared in the 1963 book *A Behavioral Theory of the Firm* by Richard M. Cyert and James G. March. Before this model was formed, the existing theory of the firm had two main assumptions: profit maximization and perfect knowledge. Cyert and March questioned these two critical assumptions.

These researchers offered four major research themes

- A small number of key economic decisions
- Development of a general theory, generalizing the results from studies of specific firms
- Linkage of empirical data to models
- Orientation towards process rather than outcomes

**Theory Of Construction:** The behavioral approach takes the firm as the basic unit of analysis. It attempts to predict behaviour with respect to price, output and resource allocation decisions. It emphasizes the decision-making process.

**The Firm As A Coalition Of Groups:** The theory argues that while small firms may operate under the guidance of the entrepreneur, such a simple model does not describe larger corporations. These larger firms are coalitions of individuals or groups, which may include managers, stockholders, workers, suppliers and so on. According to Cyert and March, these groups participate in setting goals and making decisions. Priorities and information may vary by group, potentially creating conflicts. Cyert and March mentioned five goals which real world firms generally possess: production; inventory; market share; sales and profits.

**Production Goal:** It reflects pressures towards things as stable employment, ease of scheduling, development of acceptable cost performance and growth. This goal is related to output decisions.

**Inventory Goal:** It is affected by pressures on the inventory from salesmen and customers. This goal is related to decisions in output and sales areas.

**Sales Goal:** The sales goal aims at meeting the demand of coalition members connected with sales, who regard sales necessary for the stability of the organisation.

**Market-Share Goal:** The market-share goal is an alternative to the sales goal. It is related to the demands of sales management of the coalition who are primarily interested in the comparative success of the organisation and its growth. Like the sales goal, the market-share goal is related to sales decisions.

**Profit Goal:** The profit goal is in terms of an aspiration level with respect to the money amount of profit. Thus the profit goal is related to pricing and resource allocation decisions.

According to the behavioral theory, all the goals must be satisfied, following an implicit order of priority among them

**Satisficing Behaviour:** Cyert and March proposed that real firms aim at satisficing rather than maximizing their results. I.e., some groups may settle for "good enough" achievements rather than striving for the best possible outcome. This came from a concept known as bounded rationality, which was developed by Herbert Simon.<sup>[4]</sup> Bounded rationality means prudent behaviour under a given set of circumstances.

**The Process Of Decision Making:** In the model, top management sets the goals of the organization. But these goals are implemented through decision making at two levels, one at the top and the second at lower management levels. During approval of proposals of various departments, two criteria are generally employed. A financial measure assesses the availability of the required funds given resources. An improvement measure assesses whether the proposal improves the health of the organization. According to Cyert and March,

information is required to take the most appropriate decisions. However, information gathering itself is not costless and requires resources.

**Organizational Slack:** To keep the various groups in the organization, payments had to be in excess of what was required for the efficient working of the firm. The difference between the total resources and the necessary payments is called the organizational slack. In conventional economic theory organizational slack is zero, at least at equilibrium. Cyert and March claim that organizational slack plays a stabilizing and adaptive role.

Cyert and March gave many examples of organizational slack such as high dividends paid to shareholders, prices set lower than necessary and wages paid in excess of those required.

### **Managerial Theory of the Firm: Marris Theory**

The Managerial Theory of the Firm suggests that firms are not solely profit-maximizing entities, as assumed in traditional economic theory. Instead, they aim to satisfy various objectives that may reflect the goals of managers rather than solely those of owners or shareholders. In large firms, managers often have considerable discretion to pursue objectives that align with their own interests, such as growth, sales revenue maximization, or employee welfare, rather than maximizing shareholder profit.

#### **Key Concepts:**

- **Separation of Ownership and Control:** In large firms, owners (shareholders) and managers are often separate entities. While owners prioritize profit, managers may prioritize objectives like growth, market share, or job security.
- **Managerial Discretion:** Managers have discretion over decisions and are often motivated by personal incentives, leading them to pursue objectives that provide benefits such as bonuses, job security, or higher salaries.

The following two models are prominent in this theory: **Marris' Growth Maximization Theory** and **Williamson's Managerial Discretion Theory**.

## **Marris' Growth Maximization Theory**

Proposed by economist Robin Marris, this theory posits that managers are motivated to maximize the balanced growth rate of the firm, aiming for both growth in demand for the firm's products and growth in its capital. Marris' model suggests that managers aim to strike a balance between maximizing the firm's growth and maintaining financial stability.

### **Key Elements:**

**Managerial Objective:** Marris argues that managers are motivated to maximize the firm's balanced growth rate to ensure both sales revenue and firm size increase over time. Growth maximization offers managers prestige, power, and job security.

### **Dual Growth Goals:**

**Growth of Demand (Gd):** Managers focus on maximizing the growth in demand for the firm's products and services.

**Growth of Capital (Gc):** Growth in capital is essential for maintaining stability, as rapid growth in demand must be matched by financial growth to prevent the firm from becoming over-leveraged.

### **Constraints:**

**Financial Constraint:** Firms need to maintain financial stability to satisfy shareholders and creditors.

**Managerial Constraint:** The firm's managerial resources are limited, and growth is only sustainable as long as the firm has sufficient managerial talent and organizational capacity.

**Shareholder Satisfaction:** Managers also need to ensure shareholder satisfaction to prevent takeovers, which would jeopardize their control over the firm. Thus, they need to provide reasonable returns to shareholders to maintain control and independence.

**Balance between Gd and Gc:** The model implies a balancing act—if the firm grows too fast ( $G_d > G_c$ ), it risks financial instability, which can result in poor shareholder satisfaction and the risk of takeovers. If  $G_c$  is too high compared to  $G_d$ , it could lead to underutilized resources and lower growth potential.

### **Implications:**

- The theory suggests a sustainable approach to growth, as firms strive to balance expansion with financial health.
- Managers prioritize stable growth rather than rapid, high-risk expansion, as this benefits both their job security and shareholder expectations.

### **Williamson's Managerial Discretion Theory**

Proposed by economist Oliver Williamson, this theory posits that managers have significant discretion in decision-making due to the separation of ownership and control in large corporations. According to Williamson, managers often aim to maximize their utility, which may not always align with maximizing shareholder profit.

#### **Key Elements:**

**Managerial Utility Maximization:** Unlike traditional profit-maximizing models, Williamson's theory suggests that managers are driven by personal utility maximization, including benefits like salaries, job security, and perks.

**Utility Function of Managers:** Williamson defines the managerial utility function as:

$$U=f(S,M,ID)U = f(S, M, ID)U=f(S,M,ID)$$

where:

**S:** Managerial Salary – Managers seek to maximize their compensation.

**M:** Management Slack – Managers may increase the firm's expenses on staff, office luxuries, and other non-essential items that increase comfort.

**ID:** Discretionary Investments – Managers invest in projects that enhance their prestige and influence within the firm.

**Sub-Optimal Profit:** Since managers prioritize utility over profit, the firm may not achieve maximum possible profit, as managers allocate resources to their utility-maximizing activities. Shareholders, aware of this, set a minimum acceptable profit constraint to control managerial behavior and prevent managerial excess.

#### **Constraints on Managerial Discretion:**

**Minimum Profit Constraint:** Shareholders impose this to ensure they receive an adequate return on investment. If the profit falls below this threshold, they may intervene or replace management.

**Market Discipline:** Competitive pressures and the potential for takeover if profits are too low can act as a deterrent to excessive managerial discretion.

**Managerial Discretion and Firm Behavior:**

**Expense Preference:** Managers may indulge in expenses that do not contribute directly to profit but enhance their comfort or prestige.

**Expansion of Staff and Overheads:** Managers may expand teams and overheads to justify higher pay and prestige, which may not necessarily contribute to firm profitability.

**Investment in Projects with Lower Profitability:** Managers may select projects that increase their influence or reduce their risk but may yield lower profits.

**Implications:**

- The theory highlights the potential divergence between managerial interests and shareholder interests.
- Williamson's model indicates that firms may be less efficient than in traditional profit-maximizing models, as managerial objectives could lead to higher operating costs and lower profitability.
- Shareholders employ mechanisms to counterbalance managerial discretion, such as profit constraints, incentive structures, and monitoring.

### Key Glossaries

- **Sales Revenue Maximization:** A theory by Baumol proposing that managers prioritize maximizing sales revenue rather than profits, as this can enhance managerial compensation, job security, and market share.
- **Behavioral Theory of the Firm:** Developed by Cyert and March, this theory suggests that firms operate with multiple goals and a bounded rationality, adjusting their behavior based on a set of goals, negotiation, and satisfying decision-making processes.

- **Managerial Discretion:** Refers to the freedom that managers have in making decisions within a firm, which may allow them to pursue objectives beyond profit maximization.
- **Growth Maximization:** Marris' concept that managers aim to maximize balanced growth, ensuring both market expansion and financial stability, thus benefiting both managers and shareholders.
- **Satisficing:** A decision-making strategy, as per Behavioral Theory, where firms aim to achieve satisfactory results rather than optimal ones due to bounded rationality.
- **Bounded Rationality:** The concept that decision-makers are limited by the information they have and their cognitive capacity, leading them to make satisfactory rather than optimal decisions.
- **Expense Preference:** Williamson's concept where managers allocate resources toward expenses that enhance their job satisfaction or prestige but may not directly benefit shareholders.
- **Organizational Slack:** Resources within an organization that are more than needed, providing managers a cushion for unexpected events or decision-making flexibility.

### Short Questions

1. What is Baumol's Sales Revenue Maximization Model?
2. Define the Behavioral Theory of the Firm.
3. Explain managerial discretion in the context of the firm.
4. What does Marris mean by "balanced growth"?
5. Describe the term "satisficing" as used by Cyert and March.
6. What is meant by "bounded rationality"?
7. Explain "expense preference" in Williamson's Managerial Theory.
8. What is organizational slack, and why is it important?

### Brief Questions

1. Why might managers prioritize sales revenue maximization over profit maximization?
2. How does the Behavioral Theory of the Firm by Cyert and March differ from traditional profit-maximizing theories?
3. Discuss the concept of bounded rationality and how it affects firm decision-making.
4. Explain Marris' Growth Maximization Theory and its relevance to managerial objectives.
5. Describe the managerial utility function in Williamson's Managerial Theory of the Firm.
6. How does organizational slack benefit a firm according to Cyert and March?
7. What is the minimum profit constraint in Williamson's theory, and why is it important?
8. How does Baumol's model address competition within industries?

### Detailed Questions

1. Explain Baumol's Sales Revenue Maximization Model. How does it differ from traditional profit maximization models, and what implications does it have on firm pricing and advertising strategies?

- 2.** Discuss the Behavioral Theory of the Firm as proposed by Cyert and March, focusing on the concepts of “satisficing” and internal goal conflict. How does this model address the complex decision-making processes in modern organizations?
- 3.** Describe Marris’s Managerial Theory of Firm Growth Maximization, including the concept of balanced growth. How does Marris’s model explain the roles of managers and shareholders in driving firm expansion?
- 4.** Critically assess the contributions and limitations of William’s Managerial Theory of Firm. How does it address managerial motivations, and the risks involved in growth strategies?
- 5.** Compare and contrast the traditional Classical Theory of the Firm with the Neo-Classical Theory and Keynes’s Liquidity Preference Theory in terms of interest rate determination and their relevance to firm behavior and financial decision-making.



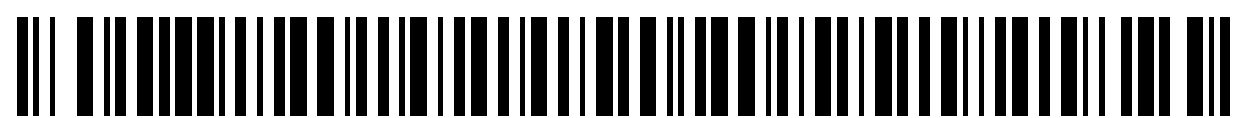
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