



# VELS



INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)  
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PALLAVARAM - CHENNAI  
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## **Bachelor of Arts in Economics - ODL Mode (Semester Pattern)**



### **DCECN11: Micro Economics- I**

**School of Management Studies & Commerce**

**CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)**  
**VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES (VISTAS)**  
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**Vels Institute of Science, Technology and  
Advanced Studies (VISTAS)  
Centre for Distance and Online Education (CDOE)**

**Bachelor of Arts in Economics- ODL Mode  
(Semester Pattern)**

**DCECN11: Micro Economics- I**

March-2023

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## Course Introduction

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The Course Micro economics-I has been divided into five Blocks consisting of 20 Units. The concept of **Introduction to Micro Economics** has been given in Block-1.

Block-1 **Introduction to micro economics** has been divided into four Units. Unit-1 describes the Introduction to economics and various definitions of eminent economists. Unit 2 gives you the nature and scope of economics. Unit 3 explains demand, demand concepts and the law of demand concept in detail. Unit 4 comprises supply, supply concepts and the law of supply concepts.

Block-2 **Elasticity of Demand** is classified into four units. Unit 5 gives you concepts of elasticity of demand. Unit 6 includes the concepts specific to price elasticity of demand. Unit 7 explains about concept of consumer surplus. Unit 8 gives you the concept of the producer's surplus.

Block-3 **Utility Analysis** is further divided into four sub-units. Unit 9 gives you the concept of utility and types of utility. Unit 10 is about the Law of Diminishing marginal utility. Unit 11 describes the Indifference curve theory and its concepts. Unit 12 will give you a detailed explanation of Indifference curves in relation to consumer's equilibrium.

Block-4 **Production theory** is classified into four units. Unit 13 explains about factors of production. Unit 14 describes the production function and types of the production function. Unit 15 gives you various laws of the production function. Unit 16 will explain to you about Iso-Quant approach

Block-5 **Markets** is divided into four units. Unit 17 gives various market structures. Unit 18 explains the equilibrium of firm and Industry under perfect competition. Unit 19 describes pricing under perfect competition in the short run. Unit 20 includes pricing under perfect competition in the long run.



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**DCECN11: Micro Economics- I**

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# Unit -1

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## Introduction to Economics

### STRUCTURE

Overview

Learning Objectives

- 1.1 Introduction to Economics
- 1.2 Wealth Definition
- 1.3 Criticism of Wealth Definition
- 1.4 Welfare Definition
- 1.5 Criticism of Welfare Definition
- 1.6 Scarcity Definition
- 1.7 Criticism of Scarcity Definition
- 1.8 Growth Definition

Check your progress

Let Us Sum Up

Glossaries

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### Overview

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This unit introduction to economics explains various definitions of economics, i.e., welfare definition and its criticism, wealth definition and its criticism, scarcity definition and its criticism and growth definition. All this definition gives you basic knowledge of economics

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### Learning Objectives

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This chapter's goal is to present economics as a social science.

- To acquaint with the basic knowledge of Economics
  - To explore various dimensions of economics
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### 1.1. Introduction to Economics

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Productive activity is any activity that generates goods and services, whereas economic activity is any activity that creates valuable goods



and services. The primary goal of all economic activity is to generate revenue, which is the source of one's livelihood. Economic activities are interconnected and interdependent in the sense that producers produce what consumers desire, consumers can only consume what producers produce, and producers can only produce as much as consumers are willing to consume. Similarly, vendors can only sell what buyers want, and buyers can only buy what is available for purchase, and so on. This interconnectedness and interdependence of economic activity are carried out in a self-operated system.

An economy is a social organism in which people make a living by acting, interacting, cooperating, and competing in the production and consumption process. An economy is made up of the interconnected and interdependent economic activity of its participants. Individuals, households, businesses, farms, factories, financial institutions, and the government are all economic participants. Within the framework of an economic system, all types of economic activity are carried out. Two economic forces—demand for and supply of goods and services—create and manage a free economic system. A market system, also known as a market mechanism, is created by demand and supply factors. The interaction of demand and supply market forces forms the country's economic system. Making effective business decisions requires a comprehensive understanding of the economic system and how it works.

Economics is a social science investigating people's economic behaviour and its repercussions. Economic behaviour is analysing economic options available to an individual or a society and selecting the best opportunities, given available resources. This economic behaviour aims to get the most out of the available resources and opportunities. People must make several decisions about how to use their resources and spend their profits on optimising their gains from their resources. The basic function of economics is to observe, explain, and predict how people (individuals, households, businesses, and governments) make decisions about how to use their resources (land, labour, capital, knowledge and skills, technology, time and space, and so on) to maximize their income, as well as how they spend their income to maximize their total utility. The basic function of economics is to observe, explain, and predict how people (individuals, households, businesses, and governments) make decisions about how to use their resources (land, labour, capital, knowledge and skills, technology, time and space, and so on) to maximize their income, as well as how they spend their income to maximize their total utility.

Economics as a social science studies how people make their choices.

For the purpose of economic analysis, people are classified according to their decision-making capacity as individuals, households, firms and society, and according to the nature of their economic activity as consumers, producers, factor owners and economy managers, i.e., the government. As consumers, individuals and households, with their given income, must decide 'what to consume and how much to consume'. They have to make these decisions because consumers are, by nature, utility maximizers and consuming any commodity in any quantity does not maximize their gains, the satisfaction. As producers, firms, farms, factories, shopkeepers, banks, transporters, etc. have to choose 'what to produce, how much to produce and how to produce' because they too are gain maximizers and producing any commodity in any quantity by any technique will not maximize their gains (profits). As labour, they have to choose between alternative occupations and places of work because any occupation at any place will not maximize their earnings. Likewise, the government has to choose how to tax, whom to tax, how much to spend and how to spend so that social welfare is maximized at a given social cost.

This economic behaviour of individuals, households, firms, government and society forms the central theme of economics as a social science. Thus, economics is fundamentally the study of how people allocate their limited resources to produce and consume goods and services to satisfy their endless wants with the objective of maximizing their gains.

The word 'Economics' was derived from two Greek words, Oikos (a house) and Nemein (to manage), which means 'managing a household' using the limited funds available with maximum satisfaction.

The means refer to goods and services we use to satisfy our wants. Economic wants are desires that can be satisfied by consuming a good, service, or leisure activity. For example, food, shelter, clothing, etc., are economic human wants, and peace, love, and affection are non-economic wants. Human wants are unlimited in number. Whenever one want is satisfied, then automatically, several wants come up. This means to satisfy human wants is limited.

Human wants, desires and needs are endless in that they increase with the increase in people's ability to satisfy them. The endlessness of human wants can be attributed to (i) people's insatiable desire to raise their standard of living, comforts and efficiency; (ii) human tendency to accumulate things beyond their present need; (iii) increase in knowledge about inventions and innovations of new goods and services with greater convenience, efficiency and serviceability; (iv) multiplicative nature of

some want (e.g., buying the car creates want for many other things—petrol, driver, cleaning, parking place, safety locks, spare parts, insurance, etc.); (v) biological needs (e.g., food, water, etc.) are repetitive; (vi) imitative and competitive nature of human beings creating needs due to demonstration and bandwagon effects; and (vii) influence of advertisements in modern times creating new kind of wants. For these reasons, human wants to continue to increase endlessly.

Apart from being unlimited, another equally important feature of human wants is that they are gradable. In simple words, all human wants are not equally urgent and pressing at a point or over time. While some want to be satisfied as and when they arise (e.g., food, clothes and shelter) and some can be postponed, e.g., purchasing a car. Also, satisfying some gives greater satisfaction than others. Human wants can be arranged according to their priority given their intensity and urgency. The priority of wants, however, varies from person to person and from time to time for the same person. Therefore, the question arises as to 'which want to satisfy first' and 'which the last'. Economics studies how consumers (individuals and household) make choice between their wants and how they allocate their expenditure between different kinds of goods and services they choose to consume. Thus, consumers must choose 'what to consume' and 'how much to consume'.

While human needs are unlimited, resources available to satisfy human wants are limited. Resources can be classified as (i) natural resources (including land, space, water, minerals, forest, climate, jointly called land); (ii) human resources (including manpower, energy, talent, professional skills, and innovative ability and organizational skill, jointly called labour); and (iii) man-made resources (including machinery, equipment, tools, technology and building, jointly called capital). To this, economists add another category of resource called entrepreneurship, i.e., those who organize the resources and assume risk in business. Time and information are two other kinds of resources with economic value. All these resources have alternative uses yielding different benefits. The resources available to a person, society, or country—how so ever rich—at any time are limited. Resource scarcity is a relative term. It implies that resources are scarce in relation to their demand. The scarcity of resources is, in fact, the mother of all economic problems. Had resources been unlimited, like human wants, there would be no economic problem and no economics. The scarcity of resources in relation to human wants forces people to derive the maximum benefit from the available resources.

Thus, economics as a science studies economizing behaviour of the people and its consequences; it brings out cause-and-effect relationships between economic events; provides the tools and techniques for analyzing economic phenomena and for predicting the consequences of economic decisions and economic events. Economics studies economic phenomena systematically and methodically. This approach to economic inquiry imparts economics the status of a 'social science'. It may be added here that there is no precise and universally acceptable definition of economics. The reason is that the subject matter of economics continues to grow and expand in scope, size and character right from the days of its founder, Adam Smith, to date. Boundaries of economic science are not yet precisely marked, nor can they be. In the opinion of some economists, 'Economics is still a very young science and many problems in it are almost untouched' and 'Economics is an unfinished science'. Yet, economics is claimed to be 'the oldest and best developed of the social sciences' and continues to grow in content and analytical sophistication.

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## 1.2. Wealth Definition

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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 that studies the 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 society wants to promote only his gain, and he is led by an "invisible hand" to promote the interests of 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 with the distribution of wealth. The way in which wealth production and distribution will occur 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 wealth-related knowledge. John Stuart Mill (1806-73) argued that economics is the science of producing and distributing 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).

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### **1.3. Criticism of Wealth Definition**

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The following are the main criticisms of the classical definition:

- i. This definition is too narrow as it does not consider the major problems a society or an individual faces. Smith’s definition is based primarily on the assumption of an ‘economic man’ 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 the Smithian definition led us to emphasise human life’s material aspect, i.e., wealth generation. 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.’ The 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, the choice is unavoidable. Adam Smith ignored this simple but essential aspect of any economic system.

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### **1.4. Welfare Definition**

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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.

1. According to Marshall, economics studies individual and social actions aimed at promoting the economic welfare of people.
2. Marshall elevated it to the status of science by shifting the emphasis from 'Wealth' to 'Welfare'.
3. Marshall distinguishes between two types of things: material and immaterial. Material things can be seen, felt and touched (E.g.) books, 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.

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### **1.5 Criticism of Welfare Definition**

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Though Marshall's definition of economics was hailed as revolutionary, 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 Teal's 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 the economic life of man would remain outside the domain of economics.
- ii. Robbins argued that Marshall could not establish a link between the economic activities of human beings and human welfare. Various economic activities are detrimental to human welfare. The production of war materials, wine, etc., are economic activities but do not promote the 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. Economics is a positive science and not a normative science. 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 a value judgment. Ethics should make value judgments.

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

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## **1.6. Scarcity Definition**

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Lord Robbins gave the most accepted definition of economics 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 the subject matter of economics.

Lionel Robbins defined economics as "The science which studies human behaviour as a relationship between ends and scarce means which have alternative uses". In his book "An Essay on the Nature and Significance of Economic Science", Robbins gives the above definition.

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 to wants. If food were plentiful, if there were enough capital in the business and 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 wanted. Modern people also have wanted. Only wants change—and they are limitless.
- (ii) The scarcity of resources gives rise to many 'choice' problems. 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 a fundamental economic problem in any society. Even an affluent society experiences resource scarcity.
- (iii) Since prehistoric days, one has noticed constant efforts to satisfy human wants through the scarcest resources with alternative uses. The 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. The country will have to sacrifice jute production if it is used for steel production. So, resources are to be allocated to fulfil the

immediate wants. Thus, the problem of scarcity of resources gives rise to the problem of choice.

Society must decide which wants will be satisfied immediately and which will be postponed for now. This is the choice problem of an economy. Scarcity and choice go hand in hand in each economy: "It exists in the one-man community of Robinson Crusoe, in the patriarchal tribe of Central Africa, in medieval and feudal Europe, in modern capitalist America and Communist Russia."

In view of this, it is said that economics is fundamentally a study of scarcity and 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 to 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."

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### **1.7. Criticism of Scarcity Definition**

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1. Robbins' definition is not dynamic in nature because it has only discussed the problems of the present generation, not anything about the future generation.
2. Robbins does not distinguish between goods helpful to human welfare and those 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 the theory of resource allocation.
4. Robbins' definition does not cover the theory of economic growth and development.
5. Robbins' definition does not apply to a socialistic economy.



6. The economic problem for a prosperous and sound economy differs from the underdeveloped or poor economy, which is not discussed in the definition.

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### **1.8. Growth Definition**

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

Samuelson's definition tells us how society uses limited resources to produce goods and services for various people or groups' present and future consumption.

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 scarce resources to produce commodities over a period. Thus, the emotional 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. Initially, the distribution problem was unclear, 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 resource allocation method.

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### **Check Your Progress**

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1. Economics is a ----- science which deals with human wants and their satisfaction.
2. The resources are said to be \_\_\_\_\_ because they are limited compared to our wants and needs.
3. The author of the book The Wealth of Nations is \_\_\_\_\_

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## Let Us Sum Up

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- (i) The word 'Economics' was derived from two Greek words, Oikos (a house) and Nemein (to manage), which means 'managing a household.'
- (ii) Adam Smith, in his book "An Inquiry into Nature and Causes of Wealth of Nations" (1776), defined **economics as the science of wealth**
- (iii) Alfred Marshall (1842-1924) wrote a book on the Principles of Economics in 1890. In it, he defined economics as "a study of mankind in the ordinary business of life".
- (iv) Lionel Robbins defined economics as "The science which studies human behaviour as a relationship between ends and scarce means which have alternative uses".
- (v) 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."

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## Glossaries

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<b>Want:</b>	Economic desires can be satisfied by consuming a good, service, or leisure activity.
<b>Wealth Definition:</b>	An Inquiry into Nature and Causes of Wealth of Nations
<b>Welfare Definition:</b>	"a study of mankind in the ordinary business of life".
<b>Scarcity Definition:</b>	Relationship between ends and scarce means which have alternative uses.
<b>Growth Definition:</b>	Producing goods and services by using available societal resources for present and future consumption.

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## Answers To Check Your Progress

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1. Social
2. Scarce
3. Adam Smith

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## Suggested Readings

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1. Salvantore Dominick (2001). Managerial Economics in a Global Economy, Australia: Thomas South Western. 4<sup>th</sup> Edition
2. Koutsoyiannis, A. (1978), Modern Microeconomics, London: Macmillan, 2nd edition.,

## Unit-2

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### Nature and Scope of Economics

#### STRUCTURE

Overview

Objectives

2.1 Importance of Economics

2.2 Nature of Economics

2.3 Two Major Branches of Economics

2.4 Micro Economics as a Positive Economics

2.5 Micro Economics as a Normative Economics

2.6 Scope of Micro Economics

Let Us Sum Up

Check Your Progress

Glossaries

Model Questions

Answers to Check Your Progress

Suggested Readings

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#### Overview

This unit gives you an overview of the importance of economics, the nature of economics, and two major branches of economics, and we also discuss whether micro economics is normative economics or positive economics.

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#### Objectives

This chapter educates the students on the following topics:

- The definition and scope of microeconomics as a branch of economics;
- microeconomics is a positive or normative science,

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#### 2.1 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 important because you learn how societies, governments, businesses,

households, and individuals allocate scarce resources. Economics is concerned with the optimal distribution of resources in society. Economics can provide valuable knowledge for making decisions in everyday life. The study of economics contributes to the development of public policies. Most of the problems of the modern State are economic. 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 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 on industries**

Firms of all sizes and industries have to rely on economics, whether for product research and development, pricing strategies or advertising. This wide influence means that studying economics can open up a variety of career options across all sectors of the economy, from agriculture to manufacturing, 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 – historical and current – can provide useful insight into how different cultures and societies interact. For international corporations, understanding the world economy is key to driving success.

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**2.2. Nature of Economics**

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The nature of economics deals with whether economics falls into the category of science or arts. Various economists have argued in favour of science while others have reservations about the arts.

## **Economics is a Science**

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

- Science is a Systematic body of Knowledge. A body of knowledge determines or observes the internal and external environment for decision-making. It is based on methodical observation. Economics is also a science of making decisions with regard to scarce resources with alternative applications.
- 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, economics policies 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 must have the art of utilizing his capability, knowledge and understanding to achieve the organizational objective. Economists should have the art of putting into practice their theoretical knowledge regarding elements of the 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. Economics deals with the problems faced by the individual organization, such as the organisation's main objective, 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 organizations 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 the business cycle in which the economy is operating, exchange rate, the 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 resources, consumers, producers etc.). The nature and attitude differs from person to person. Thus, to cope with dynamism and vitality, managerial economics also changes itself over time.

### **Economics for the administration of the 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, which is the preeminent use of the resource.

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

Economics 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 is multi-disciplinary in dimension.

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## **2.3. Two Major Branches of Economics**

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Economics is divided into two categories: microeconomics and macroeconomics. Microeconomics studies individuals and business decisions, while macroeconomics looks at the decisions of countries and governments.

### **Microeconomics**

Microeconomics is a branch of economics that contemplates decision-maker's attributes within the economy, such as households, individuals, and enterprises. In other words, microeconomics refers to the social science that analyses the associations of human action, particularly how those choices influence the consumption and allocation of scarce resources.

The concept of microeconomics shows how and why different commodities have different values, how individuals make more practical

or efficient decisions, and how individuals organise and cooperate with each other.

The basic microeconomic problems are:

- What to produce and how much to produce?
- How to produce?
- For whom to produce or how to distribute the social output?

These problems assume a macro nature when considered at the economy level. However, we will discuss them first at the micro level.

- **What to Produce? The problem of Choice between Commodities**

The problem of 'what to produce' is the problem of choice between commodities. This problem arises mainly for two reasons:

(i) scarcity of resources does not permit the production of all the goods and services that people would like to consume; and

(ii) all the goods and services are not equally valued in terms of their utility by the consumers. Some commodities yield higher utility than others. Since all the goods and services cannot be produced for a lack of resources, and the consumers may not buy all that is produced, the problem of choice between the commodities arises. The problem of 'what to produce' is essentially the problem of efficient allocation of scarce resources so that the output is maximum and the output-mix is optimum. The objective is to satisfy the maximum needs of the maximum number of people.

The question 'how much to produce' is the problem of determining the quantity of each commodity and service to be produced. This problem, too, arises due to a scarcity of resources. For, surplus production would mean the wastage of scarce resources. This problem also implies allocating resources between various goods and services to be produced.

The basic economic problem of unlimited wants and limited resources makes it necessary for an economic system to devise some method of determining 'what to produce' and 'how much to produce' and ways and means to allocate the available resources for the production of goods and services. In a free enterprise



economy, the price mechanism provides the solution to the problems 'what to produce' and 'how much to produce'.

- **How to Produce? The problem of Choice of Technique**

The problem of 'how to produce' is the problem of choice of technique. Here, the problem is determining an optimum combination of inputs—labour and capital—to be used in producing goods or services. This problem, too, arises mainly because of the scarcity of resources. If labour and capital were available in unlimited quantities, any amount of labour and capital could be combined to produce a commodity. But, since resources are scarce, choosing a technology that uses resources most economically becomes imperative.

Another very important factor that gives rise to this problem is that a given quantity of a commodity can be produced with several alternative techniques, i.e., alternative input combinations. For example, it is always technically possible to produce a given quantity of wheat with more labour and less capital (i.e., with a labour-intensive technology) and with more capital and less labour (i.e., with a capital-intensive technology). The same is true of most commodities. In the case of some commodities, however, choices are limited. For example, the production of woollen carpets and other items of handicrafts is by nature labour-intensive, while the production of cars, TV sets, computers, aircraft, etc., is capital-intensive. In the case of most commodities, however, alternative technology may be available. But, the alternative techniques of production involve varying costs. Therefore, the problem of choice of technology arises.

In a free market economy, the market system itself provides the solution to the problem of choice of technology through the price mechanism. The market mechanism yields a pricing system that determines labour and capital prices. Factor prices and factor-quantities determine the cost of production for the business firms. Profit-maximizing firms find out an input combination which minimizes their cost of production. This becomes inevitable for the firms because their resources are limited and, with given resources, they intend to maximize their profits.

- **For Whom to Produce: How to Distribute Social Output**

In a modern economy, all the goods and services are produced by business firms. The total output generated by business firms is known as 'society's total product' or 'national output'. The total output ultimately flows to the households. Here a question arises: How is the national output shared among the households, or what determines the share of each household? A possible answer to this question is that, in a free enterprise economy, the price mechanism determines the distribution pattern of the national output. The price mechanism determines the price of each factor in the factor market. Once the factor price is determined, the income of each household is determined by the quantity of the factor(s) it sells in the factor market. Those who possess a large amount of highly-priced resources are able to earn higher incomes and consume a larger proportion of national output than those who possess a small quantity of low-priced resources.

But the problem does not end here. Other questions then arise: why do some people have a command over a larger proportion of resources than others? Why do those who have more get more and more? Why do those who have less get less and less? In other words, why do the rich get richer and the poor get poorer? Is this distribution of national production fair? If not, how can disparities in incomes or sources of income be removed or at least reduced? The price mechanism of the free enterprise system has not been able to answer these questions. These problems have long been debated inconclusively. They remain as alive today as they were during the days of Adam Smith and David Ricardo. These questions are the subject of the 'Theory of Distribution'. When questions related to production and distribution are looked into from the efficiency point of view, the economists address themselves to other questions: How efficient is society's production and distribution system? How does it affect the welfare of society? How can production and distribution be made more efficient or welfare oriented? Economists' attempts to answer these questions have led to the growth of another branch of economics, i.e., Welfare Economics.

## **Macro Economics**

Macroeconomics is a branch of economics that depicts a substantial picture. It scrutinises itself with the economy at a massive scale and considers several economic issues. The issues confronted by an economy and the headway that it makes are measured and apprehended as part and parcel of macroeconomics. When one speaks of the issues an economy confronts, inflation, unemployment, increasing tax burden, etc., are all contemplated. This makes it apparent that macroeconomics focuses on large numbers.

There are certain macroeconomic problems of prime importance confronted by an economy. These problems may be specified as follows:

- **How to increase the production capacity of the economy?**

This is essentially the problem related to the economic growth of the country. The need to increase the economy's production capacity arises for at least two reasons. First, most economies of the world have realized by experience that their population has grown at a rate much higher than their productive resources. This leads to poverty, especially in less-developed countries. Poverty, in itself, is a cause of a number of socio-economic problems. Besides, it has frequently jeopardized the sovereignty and integrity of nations. The colonization of poor nations by the richer and more powerful imperialist nations during the pre-twentieth century is evidence of this fact. Therefore, the growth of the economy and sparing resources for defence has become necessary. Second, over time, some economies have grown faster than others, while some economies have remained almost stagnant. The poor nations have been subjected to exploitation and economic discrimination. This has impelled the poor nations to grow their economies, protect themselves from exploitation, and give their people a respectable status in the international community. While various economies have been facing the problem of growth, economists have engaged themselves in finding an answer to such questions as What makes an economy grow? Why do some economies grow faster than others? This has led to the Theories of Economic Growth.

- **How to stabilize the economy?**

Though economic ups and downs are not unknown in controlled economies, free enterprise economies have experienced it more frequently and more severely. An important feature of the free enterprise system has been the economic fluctuation of these economies. Economic fluctuations cause wastage of resources, e.g., idleness of manpower or involuntary unemployment, idle capital stock, particularly during periods of depression. Economists have devoted a good deal of attention to explaining this phenomenon. This problem is studied under Trade Cycles or Business Cycles.

- **Other problems of macro nature**

In addition to the macro problems mentioned above, there are many other economic problems of this nature, which economists have studied extensively and intensively. The most important problems in this category are the problems of unemployment and inflation. While widespread unemployment is the biggest problem confronting developing economies, inflation is a global problem. Another set of macro problems is associated with international trade. Economists have devoted a good deal of their attention to major questions: What is the basis of trade between the nations? How are the gains from trade shared between the nations? Why do deficits and surpluses arise in trade balances? How is an economy affected by deficits or surpluses in its balance of payment position? New problems continue to emerge as an economy passes through different phases of economic growth.

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

Microeconomic theory or microeconomics, whose literal translation is 'economics in the small,' studies the economic actions of individuals, firms and groups of individuals and firms in the economy. For example, the determination of equilibrium output and price for a single firm lies in the domain of microeconomic theory. Macroeconomic theory or macroeconomics is concerned with studying economy-wide aggregates, such as the analysis of the total output and employment, total consumption, total investment, total saving and national product. Thus, while the former analysis presents a microscopic view of the economy, the latter furnishes us with its macroscopic view. Microeconomic theories are concerned with the partial equilibrium analysis of the firm's price-output determination under different market situations and allocating given economic resources between their rival uses. Macroeconomic theories, on the other hand, are interested in the analysis of the levels of

national product, total saving and investment, total employment of the economy's resources and total money supply. Macroeconomic analysis is the analysis of the economy-wide or aggregate variables. In short, it studies the economy's aggregate output, investment, saving, money supply, employment, general price level and other macroeconomic variables.

Macro economics answers such important and broad questions as: What determines the aggregate employment and output levels in the economy? How is the general price level in the economy determined? What is the relative importance of the various factors which influence the general price level? What determines the level of aggregate economic activity in the economy and its expansion or contraction over time? Why are cyclical fluctuations caused, and how do these affect the economy's overall performance?

On the other hand, the concern of microeconomics is to answer such questions as How, *ceteris paribus*, is the purchasing behaviour of a consumer influenced by any given change in the price of a commodity? Under given market conditions, how does a firm determine the output of any given good or service it will produce and the price at which it will sell it? How will a firm in equilibrium combine the different inputs to produce any given good or service?

Microeconomic theory employs the technique of partial equilibrium analysis to study the price-output determination of a single commodity or service in any given market situation on the assumption of *ceteris paribus*. It studies the determination of relative prices of particular products, factors, and changes in these prices. Macroeconomic theory, on the other hand, employs the technique of general equilibrium in order to study the determination of the general price level, money supply, total employment and output levels and fluctuations in these aggregate magnitudes. General equilibrium analysis stresses interdependence between the different markets and sectors in the economy. Consequently, it studies the interdependence between prices and outputs of the entire range of goods and services produced in the economy. In other words, while microeconomics studies happenings in a particular market or sector in splendid isolation, macroeconomics never ignores the fact of close interdependence between the economy's different sectors, with everything depending on everything else in the economy. According to the general equilibrium approach employed in macroeconomics, a change in any one market or sector has ramifications on the other markets or sectors of the economy. In short,

while macroeconomic theory simplifies by aggregation, microeconomic theory simplifies by assuming 'other things remain the same'.

In whatever words it is defined, macroeconomics is concerned with the study of the functioning of the whole economy, including how the total output of goods and services and the total employment of resources are determined in the economy and what causes fluctuations in their size. It analyses why at one time, 15 per cent of the total labour force in the economy is unemployed while at another time, only 5 per cent of the total labour force cannot find employment in the economy. It studies the phenomenon of inflation and deflation and seeks to explain why the economy's growth rate at one time is 8 per cent while at another time it is only 2 per cent or even less. The Great Depression of the 30s and the war and post-war hyperinflations are among those economic phenomena which deeply concern the macroeconomist, and to prevent this, he strives hard to find effective solutions reflected in the monetary and fiscal policies of the government.

According to Gardner Ackley, 'macroeconomics deals with economic affairs "in the large". It concerns the overall dimensions of economic life. It looks at the total size, shape and functioning of the "elephant" of economic experience, rather than the individual parts' working or articulation or dimensions. To alter the metaphor, it studies the character of the forest independently of the trees which compose it. More specifically, macroeconomics concerns itself with such variables as the aggregate volume of an economy's output, the extent to which its resources are employed, the size of the national income, and the general price level.' Emphasizing that macroeconomics is the study of economy-wide aggregates, Edward Shapiro has stated that a major task of macroeconomics is explaining what determines the aggregate output of goods and services. It deals with the functioning of the economy as a whole, including how the economy's total output of goods and services, the price level of goods and services and the total employment of resources are determined and what causes these magnitudes to fluctuate. According to R. G. D. Allen, 'the term "macro-economies", introduced by Ragnar Frisch in 1933, applies to the study of relations between broad economic aggregates, as opposed to the decision-making processes of individuals and firms, which is the subject matter of micro-economics.

Microeconomics abstracts from the study of these aggregative macroeconomic variables. Its unit of study is the part and not the whole. Consequently, a micro economist picks up the problem of determination

of the profit-maximizing output of a firm for his study. He is interested in finding out what particular output, out of the many possible ones, a firm must produce in order to maximize its total profit function or what particular factor- combination, out of the many possible ones, a firm should choose in order to produce a given quantity of output so as to minimize its total cost function. Microeconomic theory helps him find out the equilibrium (most cosy position) of the firm at that level, which corresponds to the tangency between the firm's isoquant and isocost line.

Similarly, microeconomics is concerned with the study of how an individual consumer allocates his given income among the many goods and services available to him to maximize his total satisfaction or utility. Assuming the economy's total output, total employment and total spending as given, it analyses how the total output and employment are distributed between the different individual firms and industries in the economy. According to Gardner Ackley, 'microeconomics deals with dividing total output among industries, products, and firms, and allocating resources among competing uses. It considers problems of the income distribution. Its interest is in relative prices of particular goods and services.'

Most, though not all, of the contents of the traditional economic theory, until the last 70 years, have consisted of microeconomic theory. Price and value theory, the theory of the household, firm and industry, and a major part of protection and welfare theory belong to the microeconomic theory. However, monetary and business cycle theories have a long history and are clearly macroeconomic analyses. The classical economic theory was almost wholly macroeconomics, while the neoclassical theory was entirely microeconomics. Macroeconomics staged a grand comeback with John Maynard Keynes in the latter part of the thirties and virtually replaced microeconomics for over a decade.

While microeconomics assumes the aggregate output for the economy as a whole as given, macroeconomics is an important variable whose size and changes in that size it aims to explain. On the other hand, while macroeconomics treats the distribution of total output, employment and spending among the various individual goods and services produced by the particular firms and industries as given, these are regarded as a variable by microeconomics. Similarly, with regard to prices, while microeconomics regards the relative prices of various different goods and services variable by treating the general price level as given, macroeconomics stresses the variability of the general price level by

treating the relative prices as given. In the language of a metaphor, while macroeconomics is concerned with studying an elephant as a whole, microeconomics studies the working of the particular parts of it. Macroeconomics studies the forest independently of the trees composing it while microeconomics looks at the dimensions and characteristics of the individual trees that constitute the forest. To alter the metaphor, while macroeconomics presents a bird's-eye view of the economy, microeconomics presents only a worm's-eye view confined to some specific part of the economy.

### **Relationship between Micro economics and Macro economics**

Despite important differences between the microeconomic and macroeconomic theories, these two have considerable overlapping. Consequently, it is difficult to draw any precise line of demarcation between these two analyses. The two economic analyses are not mutually exclusive. In practice, the economy is not analysed separately in two watertight compartments. Consequently, there is only one 'economics'. Obviously, this fact should make us aware that macroeconomics has a foundation in microeconomics and vice versa. In any meaningful analysis of the macroeconomic variables and their relationships, the role of changes in those microeconomic variables influencing the macroeconomic variables and vice versa must be recognized. For instance, if workers do not move away from the declining industry located in one area to the growing industry located in a different region, the total output and employment would be smaller than if the workers were mobile. In any meaningful analysis of the economic processes determining the nation's economic welfare, both the microeconomic and macroeconomic aspects of the nation's economic welfare must be considered.

From the microeconomic point of view, the material welfare of the community will be higher if the economy is closer to the level of optimum allocation of its given total resources, given the intensity of utilization of these resources. From macroeconomic consideration alone, the national material welfare will be higher if the economy attains fuller utilization of the total economic resources taking the allocation of these resources as a given. Therefore, it is obvious that microeconomic and macroeconomic analyses are complementary and the maximum national economic welfare will only be achieved when all the available economic resources are fully utilized and optimally allocated between their different competing uses.



Economics is not a schizophrenic subject but a unified and cohesive discipline, as the two branches of economics, macroeconomics and microeconomics, differ only in the degree of aggregation involved. For example, while the economy's total output and employment involve aggregation of the output and employment generated in the various sectors of the economy, the total production of the sugar industry is an aggregate of the output of different sugar factories composing the sugar industry in the economy. Similarly, the total consumer demand for sugar is an aggregate of the demands of many household units. A well-meaning general theory of the economy will, therefore, have to be a combination of both the microeconomic and macroeconomic theories. Emphasizing the fact of interdependence and the difficulty of drawing any sharp line of demarcation between macroeconomic and microeconomic theories, Gardner Ackley has correctly stated:

Actually, the line between macroeconomic and microeconomic theory cannot be precisely drawn. A truly 'general' theory of the economy would clearly embrace both: it would explain individual behaviour, individual outputs, incomes and prices, and the sums or averages of the individual results would constitute the aggregates with which macroeconomics is concerned. Such a general theory exists, but its very generality leaves it with little substantive content.

Although microeconomic and macroeconomic analyses are so closely interrelated that one draws from the other, the two analyses differ. Consequently, a microeconomic proposition cannot be extended to macroeconomic situations. For example, an individual can become richer by spending less and saving more out of his given income. A nation cannot, however, become richer unless it produces more. An attempt on the part of all individuals to save more out of their given incomes will not lead to an increase in total national savings because, to the extent one individual spends less, the incomes of the rest of the people in the economy are reduced.

Consequently, their savings are reduced. In fact, efforts to save more out of the given national income on the part of all individuals in the community may actually end up in reduced total savings. This is the so-called famous 'paradox of thrift' in macroeconomic theory.

Similarly, an individual can withdraw from his bank account his entire deposit money without the bank failing. If, however, all the depositors were to withdraw their bank deposits simultaneously, the bank would certainly fail. Again, a person becomes richer when he wins prize money in a lottery, but the nation does not become richer because, to the extent

the lottery winner has gained, the other lottery ticket holders have lost. Similarly, when one finds a ten-rupee banknote on the road one becomes richer to the extent of his find, but the community's income remains unchanged because someone's gain is someone else's loss.

Furthermore, while in a fully employed economy, it is possible for a single firm to increase its total output by weaning away inputs from other competing uses by offering higher factor rewards, the economy cannot increase the total output by the such resort on the part of some firms because the decrease in the output of others cancels out the increase in the output of some firms. Moreover, it is possible that in certain situations, the fall in the output of other firms may more than neutralize the increase in a particular firm's output resulting in a net fall in the total output.

It is, therefore, obvious that microeconomic statements cannot always be valid for the macroeconomic decisions. Nor are the macroeconomic statements always reliable for drawing correct microeconomic conclusions. For example, a substantial increase in the total agricultural output due to a bumper crop harvest causes an increase in the national product, causing a substantial increase in the community's economic welfare. It does not, however, always follow from this that the economic condition of the agriculturists has also improved, although macroeconomic theory lends strong support to this belief. In fact, since the elasticity of demand for most agricultural products is less than unity (at any rate, it is so in the short period), the larger output of bumper harvest will have to be sold at more than proportionately reduced price yielding lower total revenue (income) to the farmers.

Consequently, the economic condition of the agriculturists would deteriorate rather than improve while the nation as a whole would enjoy larger material well-being resulting from the bumper harvest. This is known as the familiar 'fallacy of composition'. Again, it would be wrong to say that everyone in the economy necessarily becomes richer with a higher gross national product. Even a higher per capita income is not an infallible indicator of the better economic condition of every individual living in the country. Higher national products may co-exist with greater mass poverty if in the process of producing the larger national product, the distribution of the national product becomes more skewed. For example, in the oil-producing Gulf countries very high national product and mass poverty coexist as the distribution of national product in these countries is highly skewed.

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## 2.4. Micro Economics as Positive Economics

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**Economics as a science:** Science is a branch of knowledge associated with the cause-and-effect relationship and analyses economic factors. Additionally, economics combines various science sections 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 does not furnish any value judgement, meaning it only states 'what is' and deals with just the facts related to the economy.

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## 2.5. Micro Economics as Normative Economics

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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 ought to be.

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

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## 2.6. Scope of Economics

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Economists use different economic theories to solve various economic problems in society. Its applicability is very vast. Economic laws come into play from a small organization to a multinational firm. The scope of economics can be understood under two subheads: Microeconomics and Macroeconomics. Let us 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 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.
- 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 a country's economy status.

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### **Check Your Progress**

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1. The most fundamental economic problem is\_\_\_\_\_.
2. Positive statement involves \_\_\_\_\_.
3. \_\_\_\_\_ is the problem of choice between commodities

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### **Let Us Sum Up**

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- Economics has become one of the important branches of social sciences. It is of great practical value in our daily life.
- Economics is a science and art
- Economics has major branches of economics, ie., micro economics and macro economics
- Economics is positive and normative science in nature

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### **Glossaries**

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**Micro Economics:** Microeconomics studies the decisions of individuals and firms

**Macro Economics:** Macroeconomics studies the behaviour and performance of an economy as a whole

**Positive Science:** which means that it only states 'what is' and deals with just the facts related to the economy.

**Normative Science:** Normative economics is subjective and value-based, originating from personal perspectives or opinions involved in the decision-making process

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### **Answers To Check Your Progress**

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1. scarcity.
2. Statement of facts
3. What to produce

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### **Suggested Readings**

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1. Jhingan M.L.(2002), Micro Economic Theory, Vrinda Publications, New Delhi, 40<sup>th</sup> Edition
2. Browning, E.K. and Browing, J.M. (1998), Microeconomic Theory and Applications, New Delhi Hall: Kalyani Publishers, 2nd edition.,

## Unit -3

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### Demand and Law of Demand

#### STRUCTURE

Overview

Objectives

3.1 Meaning of Demand

3.2 Types of Demand

3.3 Factors Influencing Demand

3.4 Law of Demand

3.5 The Demand Schedule

3.6 The Demand Curve

3.7 Why the Demand Curve slopes downwards from left to right.

3.8 Exceptions of Law of Demand

3.9 Market Demand Curve

3.10 Shifts in Demand Curve

Let Us Sum Up

Check Your Progress

Glossaries

Model Questions

Answers to Check Your Progress

Suggested Readings

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#### Overview

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This unit explains the core demand concepts. In core demand concepts, we discuss the meaning of demand, types of demand, factors influencing demand, the law of demand along with demand schedule, demand curve and why the demand curve slopes downwards from left to right. In addition to the above concepts, exceptions to the law of demand, market demand and shifts in demand curves are explained.

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#### Objectives

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- We introduce some basic economic laws in this unit.

- The core objective of this unit is to explain the concept of Demand and the law of demand.
- A clear study of this unit will give knowledge on the meaning of
- demand, the law of demand concept, how a demand curve will be derived, factors affecting demand, market demand etc.,

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### 3.1. Meaning of Demand

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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 various prices of related goods.”

Demand is an economic term that refers to the products or services 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 is the amount of products or services that consumers can purchase.

The relationship can be written as an equation thus:

$$Q=f(p)$$

Q= quantity demanded of the product

P = Price of the product

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### 3.2. Types of Demand

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Demand is generally classified based on various factors, such as the 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 below Figure) are discussed as follows:**

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

Refers to the classification of demand for a product based on the number of consumers in the market. Individual demand can be defined as the quantity demanded by an individual for a product at a particular price and within a 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 for a product is influenced by the price of a product, the income of customers, and their tastes and preferences. On the other hand, the total quantity demanded of 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 litres, 40 litres, 50 litres, and 60 litres of oil, respectively, in a month. Thus, the market demand for oil is 180 litres in a month.

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

Refers to the classification of demand based on the market. The demand for an organisation's products at a given price over 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's demand. The distinction between organization and industry demand is not 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 only forecast the demand for its products 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 for other products is known as autonomous or direct demand. 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 consumers' biological, physical, and other personal needs. 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 from the demand.

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

Demand for perishable and Durable goods refers to the classification of demand on the basis of the usage of goods. The goods are divided into two categories, perishable goods and durable goods. Perishable or non-durable goods refer to 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.

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

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 frequently changes, while the demand for durable goods changes over a longer period.

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

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

For example, the demand for umbrellas, raincoats, sweaters, and 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.

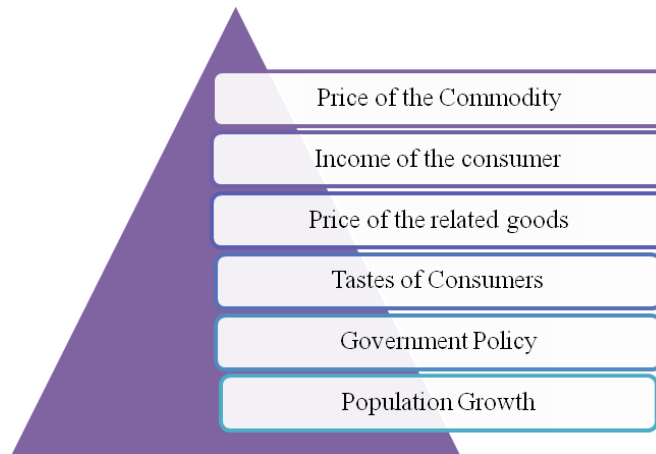
The short-term and long-term concepts of demand are essential for an organization to design a new product. Generally, durable goods have long-term demand. The long-term demand for a product depends on a number of factors, such as changes in technology, type of competition, promotional activities, and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

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**3.3. Factors Influencing Demand**

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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 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 not affect 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 demand.

### 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 for influencing the demand for the commodity. The government imposes taxes on various goods, leading to an increase in the price of the goods, resulting in demand decreasing.

## **6. Population Growth**

An increase in population leads to an increase in demand for all types of goods, whereas a decrease in population means less demand for such commodities.

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### **3.4. Law of Demand**

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The law of demand states the relationship between the quantity demanded and the price of a commodity. In general, the 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 demanding 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.

#### **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 preferences should not change.
- Prices of other products should not change.
- Consumer 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 the size of the population

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### 3.5. The Demand Schedule

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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 schedules and market demand schedules. Individual demand schedule refers to the quantity of a particular product that an individual buys at various prices. On the 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, the market demand schedule is obtained from the horizontal summation of individual demand schedules.

**Table: 1 Demand Schedule:**

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

The demand schedule shows that with a fall in price at each level, the quantity demanded tends to rise. 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. There is, thus, an inverse relationship between price and quantity demanded.

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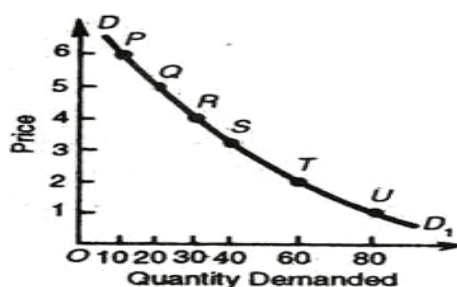
### 3.6. The Demand Curve

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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 particular product consumers will buy as the price per unit changes. It slopes down 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 a shirt and its quantity demanded. The inverse relationship means that demand increases with the price decrease 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 a 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 rising in demand for these goods

**Figure 1**



The curve is generally downward sloping, which implies that lower the price of a product, higher the quantity demanded. DD1 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 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 the consumer would purchase much quantity of the good at 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 an 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 a 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 influence a commodity's price. That is, he takes the commodity's price as given and constant for him.

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### **3.7. Why Does Demand Curve Slope Downwards From Left To Right?**

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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. We have explained above that when price falls the quantity demanded of a commodity rises and vice versa, other things remaining the same. Due to this law of demand, demand curve slopes downward to the right. 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 fewer 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 consumer's real income increases because he has to spend less to buy the same quantity. On the contrary, with the rise in the commodity's price, the consumer's real income falls. This is called the income effect. Under the influence of this effect, with the fall in the commodity's price, the consumer buys more of it and spends a portion of the increased income on 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 on 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 this effect's influence, the demand curve's shape 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. Thus, the demand curve slopes downward due to the price effect when consumers consume more or less of the commodity. 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.

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### **3.8. Exceptions of Law of Demand**

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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**



#### **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 amounts of inferior cereals will find their real 'money income' falling when the price of inferior goods rises. 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 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 "jumping 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 another commodity due to deceptive packing, labels, 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 among consumers.

**3.9. Market Demand Curve**

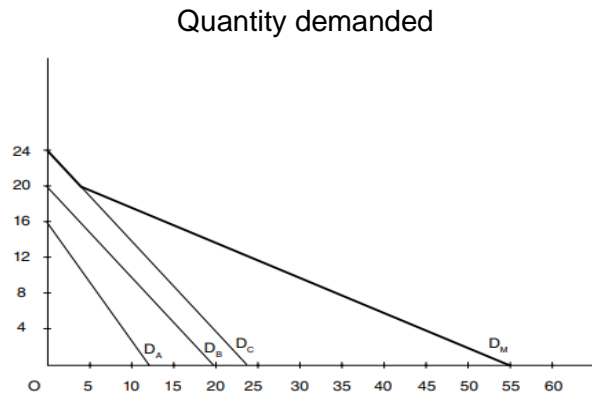
The determination of price of a commodity is more interested in the estimation of size of total market demand for the commodity. Apart from the factors affecting individual’s demand such as price of a product, his income, prices of related commodities, individual’s preferences, market demand for a product 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 times. 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:

Table-2: Market Demand Schedule				
Price of A (per unit in ₹)	Individual Demand (per day)			Market Demand (per day)
	X	Y	Z	
4	1	3	4	8
3	3	4	5	12
2	4	5	6	15
1	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 and 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  $DM$ . 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 and 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 also depends 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 its substitute's price is positive. 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 cars, 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, the younger generation's preference for 'junk food' has increased 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 so that the total satisfaction derived from 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. 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. This behaviour of consumers reduces (or increases) the current demand for the

goods whose prices are expected to decrease (or increase) in future.

- 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 models 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 genuinely need 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 consumption 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 any other source encourages the consumers to buy more than what they would buy without a 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 also depends on the population size. 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.

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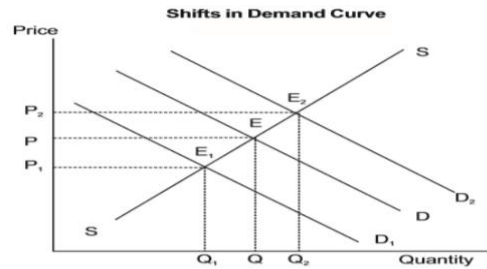
### 3.10. Shifts In Demand Curve

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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 distinguish 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 consumer income, tastes, substitutes prices 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 to 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.

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### Check Your Progress

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1. The 'Law of demand' states about the relation between\_\_\_\_\_
2. The 'Law of demand' was given by\_\_\_\_\_
3. The demand curves slopes\_\_\_\_\_ from \_\_\_\_\_

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### Let Us Sum Up

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We mean the various quantities of a given commodity or services that 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. 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. Market demand refers to the quantity demanded in aggregate by individuals at different prices and time

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### Glossaries

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- Demand:** Desire backed by necessary purchasing power
- Law of Demand:** Inverse relationship between quantity demand and price of the product
- Market Demand:** aggregate of individual demand

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

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1. Price and Quantity demanded
2. Alfred Marshall
3. Downwards, left to right

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### **Suggested Readings**

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1. J. R. Hicks(1956), A Revision of Demand Theory, Oxford University Press, p. 128
2. Pindyck, R.S. and Rubinfeld, D.L. (2001), Microeconomics- New York, NY: Prentice Hall, 5th edition



## Unit- 4

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### Supply and Law of Supply

#### STRUCTURE

Overview

Objectives

4.1 Meaning of Supply

4.2 The Law of Supply

4.3 The Supply Schedule

4.4 The Supply Curve

4.5 Factors Influencing Supply

4.6 Market Supply Curve

4.7 Shifts in Supply Curve

4.8 Market Equilibrium

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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#### Overview

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The unit elaborates on supply concepts. Supply concepts include understanding the meaning of supply law, which includes supply schedule and supply curve. In addition to this, the units give you explanation of factors influencing supply, market supply curve, shifts in supply curve and market equilibrium

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#### Objectives

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- This unit's main objective is to introduce the supply concept to the learners.
- The study of this unit will give knowledge regarding supply, law of supply, factors affecting supply, market equilibrium etc.,

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## **4.1. Meaning Of Supply**

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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 will 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."*

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## **4.2. The Law of Supply**

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Law of Supply is just opposite of Law of Demand. 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." 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.
- 

## **4.3. The Supply Schedule**

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A supply schedule and a supply curve can depict the law of supply. A supply schedule is a table showing different commodity prices and the corresponding quantity 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

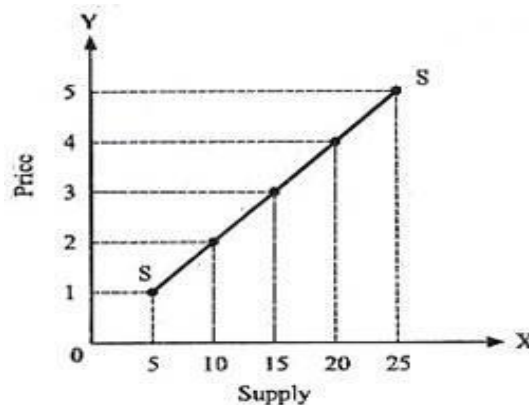
be constant. A hypothetical supply schedule is given in the following table.

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

#### 4.4. 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.

#### 4.5. Factors Influencing Supply

The following are factors influencing the supply:

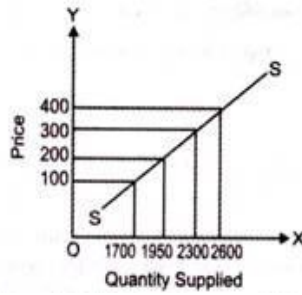
1. **Production technology:** State of production technology affects the supply function. Old technology will not increase the supply. If advanced technology is used in the country, large scale production is possible. Hence supply will increase.
2. **Prices of factors:** When the prices of factors rise, cost of production will increase. This will result in a decrease in supply.
3. **Prices of other products:** Any change in the prices of other products will influence the supply. An increase in the price of other products will influence the producer to shift the production in favour of that product. Supply of the original product will be reduced.
4. **Number of producers or firms:** If the number of producers producing the product increases, the supply of the product will increase in the market.
5. **Future price expectations:** If producers expect that there will be a rise in the prices of products in future, they will not supply their products at present.

#### 4.6. 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 represents the different quantities of a product that all the suppliers in the market are willing to supply at different prices. Market supply schedules can be drawn by aggregating the individual supply schedules of all suppliers in the market.

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.

#### 4.7. 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

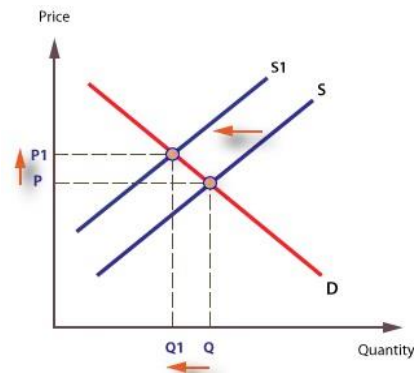
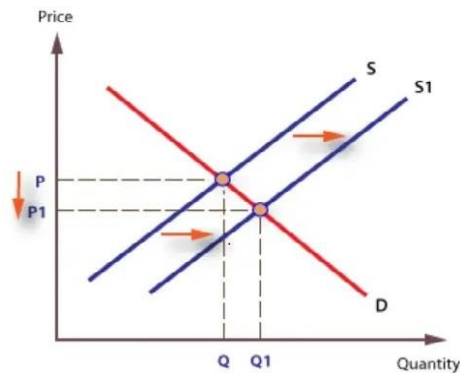


Fig: Fall in the Supply Curve



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 shifts 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 does 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 other goods requiring 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:** A commodity's supply also depends on whether an industry is monopolized or competitive. Under monopoly, a product's supply is shorter than 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 shift leftward.
- vi. **Non-Economic Factors:** The factors like labour strikes and lock-outs, war, droughts, floods, communal riots, epidemics, etc. also adversely affect the supply of commodities making supply curve shift leftward.

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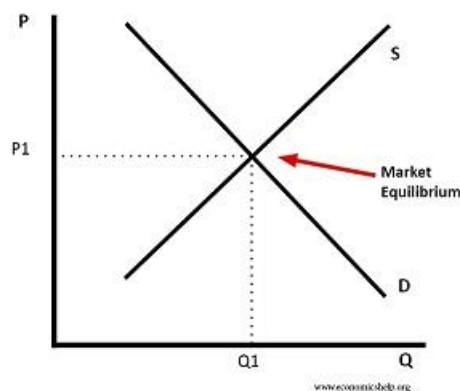
#### 4.8. Market Equilibrium

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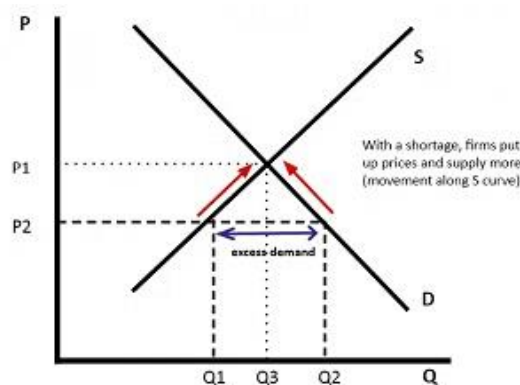
In general sense, the term equilibrium means the 'state of rest'. In general sense, it means balance in opposite forces. In the context of market analysis, equilibrium refers to a state of market in which quantity demanded of a commodity equals the quantity supplied of the commodity. The equality of 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 the quantity demanded is equal to the quantity supplied at the market price. 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  $Q_1$ .

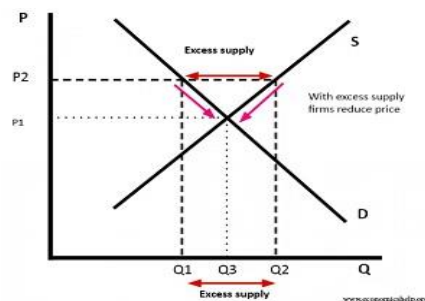


### If price is below the equilibrium



- In the above diagram, price (P2) is below the equilibrium. At this price, demand would be greater than the supply. Therefore there is a shortage of (Q2 – Q1)
- 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 P1 until there is no shortage and supply = demand.

### If price is above the equilibrium



- If price was at P2, this is above the equilibrium of P1. At the price of P2, supply (Q2) would be greater than demand (Q1), so there is too much supply. There is a surplus. (Q2-Q1)
- Therefore firms would reduce prices 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.

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### Let Us Sum Up

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**Supply means** “an amount of a commodity or service which sellers are willing and able to sell at a given price during a given period of time”. Law of supply expresses a relationship between the supply and price of



a product. Other things remaining unchanged, the supply of a commodity expands with a rise in its price and contracts with a fall in its price. A Market Supply represents the different quantities of a product that all the suppliers in the market are willing to supply at different prices

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### Check Your Progress

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1. The law of supply expresses the relationship between\_\_\_\_\_
2. Supply slopes\_\_\_\_\_ from \_\_\_\_\_
3. If the market supply of commodity X changes due to improvement in technology, the market supply curve will\_\_\_\_\_ -

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### Glossaries

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**Supply:** How much of a good will be offered for sale at given time

**Law of Supply :** larger quantities supplied at high prices, and small quantities at lower prices.

**Supply Schedule:** tabular statement that gives different prices of a commodity and the quantities

**Supply Curve:** Diagrammatic representation of supply schedule

**Market Supply Curve:** Locus of all individual supply curves

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### Answers to Check Your Progress

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1. Price and quantity supplied
2. Upwards, left to right
3. Shift rightwards

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### Suggested Readings

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1. J. R. Hicks(1956), A Revision of Demand Theory, Oxford University Press, p. 128
2. Milton H Spencer and Louis Siegelman (1969), Managerial Economics, Irwin, Illinois,

## Unit-5

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### Elasticity of Demand

#### STRUCTURE

Overview

Objectives

5.1 Introduction to Elasticity of Demand

5.2 Types of Elasticity of Demand

5.3 Price Elasticity of Demand

5.4 Cross Elasticity of Demand

5.5 Income Elasticity of Demand

Let Us Sum Up

Check Your Progress

Glossaries

Model Questions

Answers to Check Your Progress

Suggested Readings

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#### Overview

The unit is about elasticity of demand. It describes various types of elasticity of demand i.e., about price elasticity, income elasticity, cross elasticity and advertising elasticity, and their mathematical formulas.

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#### Objectives

- This unit will explain the effect of change in price over the demand.
- Study of this unit will equip the learner the knowledge of quantum changes of demand, how it is calculated, factors effecting the quantum change.

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#### 5.1. Introduction to 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,

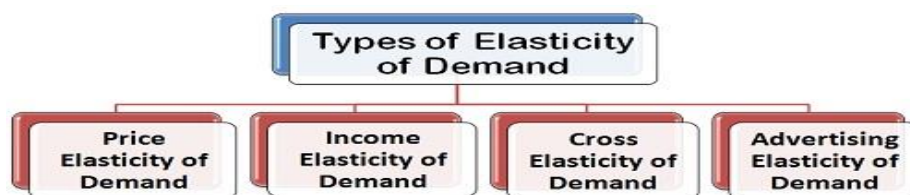
which may be either a substitute for it or a complementary with it. The concept of elasticity of demand is very important in economic theory and formulation of suitable economic policies. According to Stonier and Hague, "Elasticity of demand is a technical term used to describe the **degree of responsiveness**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

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## 5.2. Types of Elasticity of Demand

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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 further, and we have Income Elasticity and Cross Elasticity of Demand.



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## 5.3. Price Elasticity Of Demand

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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  $\Delta$  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 of 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 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 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 E.D</b>		<b>DESCRIPTION</b>
<b><i>Elastic Demand</i></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.

#### 5.4. 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 the price of its complementary goods change. Electricity to electrical gadgets, petrol to automobiles, 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 complementary: the higher the negative cross-elasticity, the higher the degree of complementarity.

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### **5.5. Income Elasticity of Demand**

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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 rice and wheat and less inferior food grains like bajra, ragi, etc. and use more of taxi and less of bus services.

However, income elasticity of demand for different categories of goods may vary from household to household and from time to time, depending on the consumers' choice, taste and preference; 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>
<i>Zero Income Elastic</i>	$E_y = 0$	No effect of increase in consumer's income on the demand of product.
<i>Negative Income elasticity Demand</i>	$E_y < 0$	Income elasticity of demand in which the demand for a product decreases with increase in consumer's income.
<i>Unitary Income Elasticity of Demand</i>	$E_y = 1$	The proportionate change in the quantity demanded is equal to proportionate change in income.
<i>Income Elasticity of Demand Greater than One</i>	$E_y > 1$	The proportionate change in the quantity demanded is more than proportionate change in income.
<i>Income Elasticity of Demand is less than one</i>	$E_p < 1$	The proportionate change in, the quantity demanded is less than proportionate change in income.

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### **Let Us Sum Up**

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*. Elasticity of Demand is classified as price, income, and cross elasticity. 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. 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 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.

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### **Check Your Progress**

1. The cross elasticity of demand dealing with\_\_\_\_\_



2. If the value of price elasticity is greater than one, then the elasticity of demand is
3. In the case of perfect elasticity, the demand curve is \_\_\_\_\_

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### **Glossaries**

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<b>Elasticity of Demand:</b>	quantum of change
<b>Price Elasticity of demand:</b>	Ratio of price change and quantity demanded
<b>Income Elasticity of demand:</b>	Ratio of Income change and quantity demanded.
<b>Cross Elasticity of demand:</b>	Ratio of change in Price of another commodity and quantity demand

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

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1. Substitutes or complementary goods
  2. Relatively elastic
  3. Horizontal
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### **Suggested Readings**

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1. William F Samuelson and Stephen G Marks (2012), Managerial Economics' 7th Edition, John Wiley and Sons.
2. Christopher Thomas and S Charles Maurice (2007) Managerial Economics'9th Edition, McGraw-Hill Education.

## Unit-6

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### Price Elasticity of Demand

#### STRUCTURE

Overview

Objectives

6.1 Introduction

6.2 Measurement of Price Elasticity of Demand – Arc Method

6.3 Total Expenditure Method

6.4 Determinants of Price Elasticity of Demand

6.5 Importance of Price Elasticity

6.6 Application of Price Elasticity of Demand

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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#### Overview

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This unit gives you a detailed explanation of measurement of price elasticity of demand. Under the measurement techniques, the unit explains total expenditure method and arc method. Further the units give you details about determinants of price elasticity of demand, its importance and application of price elasticity of demand.

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#### Objectives

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- The objective of this unit is to explain more price elasticity of demand, which is considered crucial in measuring the quantum change of demand.
  - To understand the practical applications of price elasticity of demand
- 

#### 6.1. Introduction

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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.

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

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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:

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

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

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

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

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.

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### 6.3. Total Expenditure Method

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

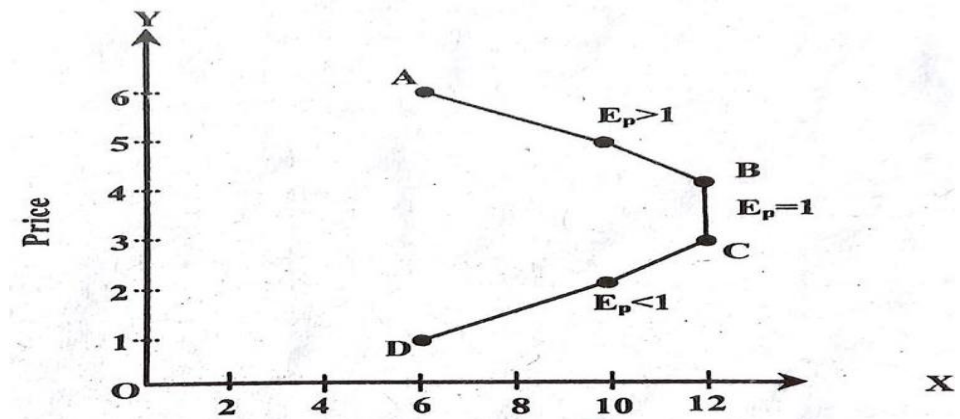
Elasticity of demand will be equal to unity ( $E_p = 1$ )

When total expenditure on commodity remains unchanged in response to the price change, 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 price fall and increases with price rise, 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 and price have 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.

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#### 6.4. Determinants of Price Elasticity Of Demand

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The price elasticity of demand varies from commodity to commodity depending on the nature of the commodity. While the demand for some commodities is highly elastic, it is highly inelastic for some. Besides,

given the nature of a commodity, several other factors determine the price elasticity of demand for a commodity. This section describes the main determinants of the price elasticities of demand:

### **Availability of Substitutes**

One of the most important determinants of price elasticity of demand for a commodity is the availability of its substitutes. The closer the substitute, the greater the price elasticity of demand for a commodity. For instance, coffee and tea may be considered as close substitutes for one another. If price of one of these goods (say, coffee) increases, then the demand for coffee decreases more heavily. The reason is that the other commodity (tea) becomes relatively cheaper. Therefore, consumers buy more of the relatively cheaper good (tea) and less of the costlier one. The elasticity of demand for both these goods will be higher. Besides, the wider the range of the substitutes, the greater the elasticity. For instance, soaps, toothpastes, cigarettes, etc. are available in different brand names, each brand being a close substitute for the other, all other things remaining the same. Therefore, the price elasticity of demand for each brand will be much greater than the generic commodity. On the other hand, sugar and salt do not have their close substitute and hence their price elasticity is lower

### **Nature of Commodity**

Price elasticity of demand depends also on the nature of a commodity. Commodities can be grouped broadly as luxuries, comforts and necessities, on the basis of the degree of intensity of the need they satisfy. Demand for luxury goods (e.g., air conditioners, costly TV sets, cars, and decoration items) is more elastic than the demand for other kinds of goods because consumption of luxury goods can be postponed when their price rises. On the other hand, consumption of necessities (e.g., sugar, clothes, vegetables, and electricity, medicines) cannot be postponed; hence, their demand is inelastic. Demand for comforts is generally more elastic than that for necessities and less elastic than the demand for luxuries. Commodities may also be classified as durable goods and non-durable goods. Demand for durable goods is more elastic than that for non-durable goods—mainly necessities because when the price of the former increases, people either get the old one repaired instead of replacing it or buy a 'second-hand'

### **Proportion of Income Spent**

Another factor that influences the elasticity of demand is the proportion of consumers' income spent on a particular commodity. If proportion of income spent on a commodity is very small, its demand will be inelastic,

and vice versa. Classic examples of such commodities are salt, matches, books, toothpastes, which claim a very small proportion of consumers' income. Demand for these goods is generally inelastic because increase in the price of such goods does not substantially affect consumers' budgets.

### **Time Factor**

Demand elasticity for high-price goods also depends on the time consumers can adjust their consumption expenditure to buy a new commodity—the shorter the time taken, the greater the elasticity. Consumers are able to adjust their expenditure pattern to price changes over a short period of time. For instance, if price of TV sets is decreased, demand will immediately increase if people possess excess purchasing power and require a short time to take decisions. But, if not, people may not be able to adjust their expenditure pattern over a short period to buy a TV set at the (new) lower price. If consumption adjustment takes a long period, it creates uncertainty and makes elasticity lower.

### **Range of Alternative Uses of a Commodity**

The wider the range of alternative uses of a product, the higher the elasticity of its demand for decrease in price and the lower elasticity for rise in price. Decrease in the price of a multi-use commodity encourages the extension of their use. Therefore, the demand for such a commodity generally increases more than the proportionate decrease in its price. For instance, milk can be taken as it is, it may be converted into curd, cheese, ghee and butter milk. The demand for milk will, therefore, be highly elastic.

Similarly, electricity can be used for lighting, cooking, heating, and industrial purposes. Therefore, demand for electricity is highly elastic, especially for decrease in price. Reverse is the case for rise in their price.

### **The Proportion of Market Supplied**

Technically, the elasticity of market demand depends also on the proportion of the market supplied at the ruling price. If less than half of the market is supplied, elasticity of demand will be higher and if more than half of the market is supplied elasticity will be lower. That is, towards the upper end, demand curve is more elastic than towards the lower end.

### **Direction of Change in Price.**

The direction of change in price, i.e., where price rises or falls, also determines the elasticity coefficient. Between any two points on the demand curve, price elasticity coefficient is higher for the fall in price and it is lower for the same rise in price. (for proof, see section 'Measuring Arc Elasticity'; Problem in Using Arc Elasticity)

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## **6.5. Importance of Elasticity of Demand**

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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 the product demand is elastic, he will fix low prices. 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 crops' supply increases due to rich harvest, their*



*prices drastically fall due to inelastic demand. As a result, their total income goes down.*

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## **5.6. Application of Price Elasticity of Demand**

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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 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 monopolist's demand curve 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.

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### Let Us Sum Up

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The price elasticity of demand as many practical uses. Price elasticity of demand is crucial among the elasticity of demand. There are various methods of measuring price elasticity of demand. Two major methods are explained in the above unit ie., total expenditure method and ARC method.

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### Check Your Progress

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1. Total revenue is calculated as the product of \_\_\_\_\_ and \_\_\_\_\_
2. Total outlay method is otherwise called as \_\_\_\_\_
3. What does the price elasticity of demand measures \_\_\_\_\_?

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### Glossaries

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**ARC method:** Arc elasticity is a measure of the average responsiveness to price change exhibited by a demand curve

**Total Expenditure method:** total outlay/revenue is the price multiplied by the quantity purchases, i.e.,  $TR = P \times Q$ .

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### Answers To Check Your Progress

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1. Price and Quantity
2. Expenditure methods
3. Responsiveness of demand to price changes

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### Suggested Readings

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1. Pindyck, R.S. and Rubinfeld, D.L. (2001), Microeconomics- New York, NY: Prentice Hall, 5th edition.
2. Christopher T Thomas (2017), Managerial Economics 12th Edition, Publisher Richard. Irwin .

## Unit-7

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### Consumer Surplus

#### STRUCTURE

Overview

Objectives

7.1 Introduction

7.2 Measure of Consumer's Surplus

7.3 Diagrammatic Representation of Consumer's Surplus

7.4 Practical Usefulness of the Concept

7.5 Critical Evaluation of the Concept of Consumer's Surplus

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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#### Overview

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The unit elaborates concept of consumer surplus. It includes the measurement of consumer's surplus along with diagrammatic representation of consumer surplus. Further it gives practical usefulness of the concept and critical evaluation of the concept.

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#### Objectives

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- This unit aims to acquaint the student with knowledge of consumer surplus, as Consumer surplus is crucial in determining the positive and negative effects of government policy initiatives.

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#### 7.1. Introduction

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Dupuit first formulated the concept of consumer surplus in 1844 to measure social benefits of public goods such as canals, bridges, national highways. Marshall further refined and popularized this in his 'Principles of Economics' published in 1890. The concept of consumer surplus became the basis of old welfare economics. Marshall's concept

of consumer's surplus was based on the cardinal measurability and interpersonal comparisons of utility. According to him, every increase in consumer surplus indicates the increase in social welfare. As we shall see below, consumer's surplus is simply the difference between the price that 'one is willing to pay' and 'the price one actually pays' for a particular product.

Concept of consumer's surplus is a very important concept in economic theory, especially in theory of demand and welfare economics. This concept is important not only in economic theory but also in formulation of economic policies such as taxation by the Government and price policy pursued by the monopolistic seller of a product. The essence of the consumer's surplus is that a consumer derives extra satisfaction from the daily purchases over the price he actually pays for them. In other words, people generally get more utility from the consumption of goods than the price they actually pay for them. It has been found that people are prepared to pay more price for the goods than they actually pay for them. This extra satisfaction which the consumers obtain from buying a good has been called consumer surplus. Thus, Marshall defines the consumer's surplus in the following words: "excess of the price which a consumer would be willing to pay rather than go without a thing over that which he actually does pay is the economic measure of this surplus satisfaction, it may be called consumer's surplus."

The amount of money a person is willing to pay for a good indicates the utility he derives from that good; the greater the amount of money he is willing to pay, the greater the utility he obtains from it. Therefore, the marginal utility of a unit of a good determines the price a consumer will be prepared to pay for that unit. The total utility which a person gets from a good is given by the sum of marginal utilities ( $\Sigma MU$ ) of the units of a good purchased and the total price which he actually pays is equal to the price per unit of the good multiplied by the number of units of it purchased.

**Thus:**

Consumer's surplus = What a consumer is willing to pay minus what he actually pays.

=  $\Sigma$  Marginal utility – (Price  $\times$  Number of units of a commodity purchased)

Consumer surplus is experienced in highly useful but relatively cheap commodities. For example, newspaper, salt, match box, postage stamp etc. For these commodities, we are ready to pay more than what we

actually pay, if the alternative is to go without them. The extra satisfaction a consumer derives is called consumer's surplus. Suppose a consumer wants to buy a shirt. He is willing to pay Rs 250 for it. But the actual price is only Rs 200. Thus, he enjoys a surplus of Rs 50. This is called consumer's surplus.

### **Definition**

Marshall defines Consumer's surplus as follows: "The excess of price which a person 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 of satisfaction. It may be called consumer's surplus."

The concept of consumer surplus is derived from the law of diminishing marginal utility. As we purchase more units of a good, its marginal utility goes on diminishing. Because of the diminishing marginal utility, consumer's willingness to pay for additional units of a commodity declines as he has more units of the commodity. The consumer is in equilibrium when marginal utility becomes equal to the given price. In other words, consumer purchases the number of units of a commodity at which marginal utility is equal to price. This means that at the margin what a consumer will be willing to pay (i.e., marginal utility) is equal to the price he actually pays. But for the previous units which he purchases, his willingness to pay (or the marginal utility he derives from the commodity) is greater than the price he actually pays for them. This is because the price of the commodity is given and constant for him.

### **Assumptions**

1. Cardinal utility, that is, utility of a commodity is measured in money terms.
2. Marshall assumes that there is definite relationship between expected satisfaction (utility) and realized satisfaction (actual).
3. Marginal utility of money is constant.

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## **7.2. Measure of Consumer's Surplus**

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Consumer surplus measures extra utility or satisfaction which a consumer obtains from the consumption of a certain amount of commodity over and above the utility of its market value. Due to diminishing marginal utility, a consumer gets total utility from the consumption of a commodity greater than the utility of its market value. Thus the total utility obtained from consuming water is immense while its market value is negligible. Marshall tried to obtain the monetary measure of this surplus: how many rupees this surplus of utility is worth to the

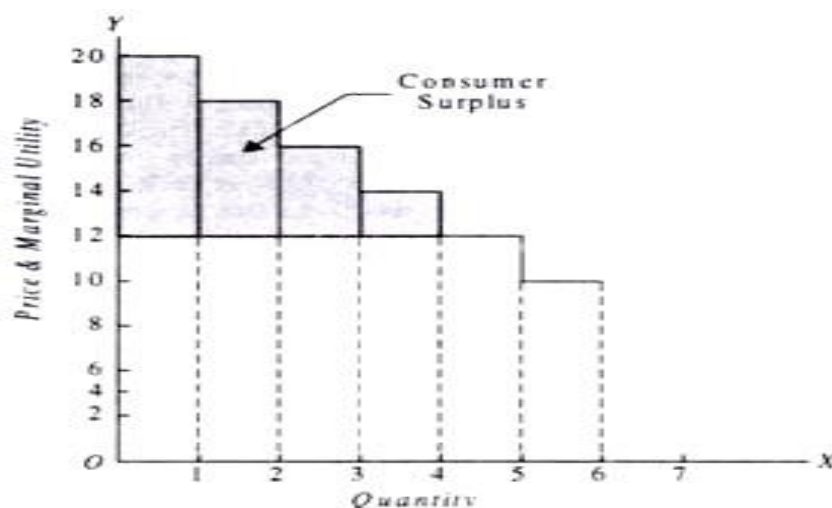
consumer. It is the monetary value of this surplus that Marshall called consumer surplus. To determine this monetary measure of consumer surplus, we must measure two things. First is the total utility in terms of money that a consumer expects to get from consuming a certain amount of a commodity. Second, the total market value of the amount of commodity consumed. It is quite easy to measure the total market value as it is equal to market price of a commodity multiplied by its quantity purchased (i.e. P.Q.). Marshall's important contribution has been how he devised to determine the monetary measure of the total utility a consumer obtains from the commodity. The marginal utility of a unit of a good determines the price a consumer will be prepared to pay for that unit. The total utility which a person gets from a good is given by the sum of marginal utilities of the units of a good purchased and the total price which he actually pays is equal to the price per unit of the good multiplied by the number of units of it purchased.

### 7.3. Diagrammatic Representation of Consumer Surplus

Marshall's important contribution has been how he devised to determine the monetary measure of the total utility a consumer obtained from the commodity. Consider Table below which has been graphically shown in the below figure

**Table: Measurement of Consumer Surplus**

No of Units	Marginal Utility (in Rs)	Price	Net Marginal Benefit
1	20	12	8
2	18	12	6
3	16	12	4
4	14	12	2
5	12	12	0
6	10	12	-2
Total Consumer Surplus ( from 5 units) = 20			



Suppose the consumer is prepared to pay Rs. 20 for the first unit of the commodity. This means that the first unit of the commodity is at least worth Rs. 20 to him. In other words, he derives marginal utility equal to Rs. 20 from the first unit.

For the second unit of the commodity, he is willing to pay Rs. 18, that is, the second unit is at least worth Rs. 18 to him. This is in accordance with the law of diminishing marginal utility. Similarly, the marginal utility of the commodity's third, fourth, fifth and sixth units fall to Rs. 16, 14, 12 and 10 respectively.

Suppose the current market price of the commodity is Rs. 12. It will be seen from the Table and Fig that the consumer will buy 5 units of the commodity at this price because his marginal utility of the fifth unit just equals the market price of Rs. 12.

This shows that his marginal utility of the first four units is greater than the market price which he actually pays for them. He will therefore obtain surplus or net marginal benefit of Rs. 8 (Rs. 20 – 12) from the first unit, Rs. 6 (= Rs. 18-12) from the second unit, Rs. 4 from the third unit and Rs. 2 from the fourth unit and zero from the fifth unit. He thus obtains total consumer surplus or total net benefit equal to Rs. 20.

Now, we can interpret the demand prices of these units in a slightly different way. The prices that the consumer is prepared to pay for various units of the commodity means the marginal valuation he places on these units of the commodity he demands. This marginal valuation of a commodity unit shows the individual's willingness to pay for it. However, actually he has not to pay the sum of money equal to the marginal valuation he places on them. For all the units of the commodity he has to pay the current market price. Suppose the current market price of the commodity is Rs. 12. The consumer will buy 5 units of the

commodity at this price because his marginal valuation of the fifth unit just equals the market price of Rs. 12. This shows that his marginal valuation of the first four units is greater than the market price which he factually pays for them. He will therefore obtain surplus or, net marginal benefit of Rs. 8 (Rs. 20 – 12) from the first unit, Rs. 6 (= Rs. 18 – 12) from the second unit, Rs. 4 on the third unit and Rs. 2 from the fourth unit and zero on the fifth unit. He thus obtains total consumer surplus or total net benefit) from 5 units equal to Rs. 20.

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#### **7.4. Practical Usefulness of The Concept**

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**Some of the theoretical and practical uses of the concept are discussed below:**

1. Consumer's surplus points to the distinction between the use value (i.e., utility) and the exchange value (i.e., the market price) of a thing.
2. The concept of consumer's surplus has a great importance in modern welfare economics, because it measures individual welfare.
3. Consumer's surplus from international transactions enables us to compare the relative gains from the international trade of the different countries.
4. consumer's surplus enjoyed by the different people at different places and at different times, enables us to compare their living standards.
5. consumer's surplus enjoyed by the different people at different places and at different times, enables us to compare their living standards.
6. The concept is very practical to the government in determining the desirability of imposing a tax on a certain commodity.

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#### **7.5. Critical Evaluation of The Concept of Consumer's Surplus**

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The concept of consumer's surplus has been severely criticised ever since Marshall propounded and developed it in his Principles of Economics. Critics have described it as quite imaginary, unreal and useless. Most of the criticism of the concept has been levelled against the Marshallian method of measuring it as the area under the demand curve. However, some critics have challenged the validity of the concept itself. Marshallian concept of consumer's surplus has also been criticised on the ground of its being based upon unrealistic and questionable



assumptions. We shall explain below the various criticisms levelled against this concept and will critically appraise them.

i. Several economists pointed out that the concept of consumer's surplus is quite hypothetical, imaginary and illusionary. They say that a consumer cannot afford to pay for a commodity more than his income. The maximum amount a person can pay for a commodity or a number of commodities is limited by the amount of his money income. And, as is well known, a consumer has a number of wants on which he has to spend his money. The total sum of money spent by him on the goods cannot be greater than his total income. Thus, what a person can be prepared to pay for a number of goods he purchases cannot be greater than the amount of his money income. Viewed in this light, there can be no question of consumer getting any consumer's surplus for his total purchases of the goods. Thus Prof. A. K. Das Gupta writes, "Taking consumer's surplus to mean simply a difference between the potential price and the actual price, Ulisse Gobbi, for instance, has argued that in ultimate analysis this surplus must necessarily be reduced to zero. When account is taken of the totality of purchases that a consumer makes, the price which he would be willing to pay just coincides with the price which he actually pays; because both are limited by the amount of money that he has command over, that is to say, by his income. If an individual start with a given income, he may be supposed to be willing to spend the whole of it on one good. As he secures the good for a smaller sum, he turns to a second good, this time offering only what it is left with after the purchase of the first good. If again there arises a margin he turns to a third good and so on—the margin between the offer price and the actual price becoming narrower as the series of actions is extended, until it vanishes as he completes his final purchases."

ii. Another criticism against consumer's surplus is that it is based upon the invalid assumption that different units of the goods give different amounts of satisfaction to the consumer. We have explained above how Marshall calculated consumer's surplus derived by the consumer from a good. Consumer purchases the amount of a good at which marginal utility is equal to its price. It is assumed that marginal utility of a good diminishes as the consumer has more units of it. This means that while at the margin of the purchase, marginal utility of the good is equal to its price, for the previous intra-marginal units, marginal utility is higher than the price and on these intra-marginal units, consumer obtains consumer's surplus. Now, the critics point out that when a consumer takes more units of a commodity it is not only the utility of the marginal unit that declines but also all previous units of the commodity he

hastaken. Thus, as all units of a commodity are assumed alike, all would have the same utility. And when the margin price is equal to the marginal utility of the last unit purchased, the price will also be equal to the utility of the previous units and the consumer would, therefore, not get any consumer's surplus. Let us take an example. Suppose a consumer has six units of the commodity marginal utility is equal to 10 and is equal to the given price. The critics argue that when the consumer has 6 units, it is not only the utility of the 6th unit that will be equal to 10, but all the previous five units will also yield utility equal to 10 each, since all units are alike. The total utility derived from 6 units will be equal to ` 60. The total price he pays for 6 units of the good is also 60; therefore, he does not derive any excess utility from his purchases.

iii. The concept of consumer's surplus has also been criticised on the ground that it ignores the interdependence between the goods, that is, the relations of substitute and complementary goods. Thus, it is pointed out that if only tea were available and no other substitute drinks such as milk, coffee, etc., then the consumer would have been prepared to pay much more for tea than in the presence of substitute drinks. Thus, the magnitude of consumer's surplus derived from a commodity depends upon the availability of substitutes. This is because if only tea were available, consumers will have no choice and would be afraid that if he does not get tea, he cannot satisfy his given want from any other commodity. Therefore, he will be willing to pay more for a cup of tea rather than go without it. But if substitutes of tea are available he would not be prepared to pay as much high price since he will think that if he is deprived of tea, he will take other substitute drinks like milk and coffee. Thus, it is said that consumer's surplus is not a definite, precise and unambiguous concept, it depends upon the availability of substitutes.

iv. The concept of consumer's surplus has also been criticised on the ground that it is based upon questionable assumptions of cardinal measurability of utility and constancy of the marginal utility of money. Critics point out that utility is a psychic entity and cannot be measured in quantitative cardinal terms. In view of this, they point out that consumer's surplus cannot be measured by the area under the demand curve, as Marshall did it. This is because Marshallian demand curve is based on the marginal utility curve in drawing which it is assumed that utility is cardinally measurable. Further, as has been explained in earlier chapters, by assuming constant marginal utility of money, Marshall ignored income effect of the price change. Of course, income effect of the price change in case of most of the commodities is negligible and can be validly ignored. But in case of some important commodities such

as food grains, income effect of the price change is quite significant and cannot be validly ignored. Therefore, the Marshallian method of measurement as area under the demand curve, ignoring the income effect, is not perfectly correct. However, this does not invalidate the concept of consumer's surplus. As explained above, J. R. Hicks has provided a money measure of consumer's surplus with his indifference curves technique of ordinal utility analysis which does not assume cardinal measurement of utility and constant marginal utility of money. Hicks has not only rehabilitated the concept of consumer's surplus but also extended and developed it further.

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### **Let Us Sum Up**

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Consumer surplus is experienced in highly useful but relatively cheap commodities. For example, newspaper, salt, match box, postage stamp etc. For these commodities, we are ready to pay more than what we actually pay, if the alternative is to go without them. Consumer surplus have great practical importance in customer welfare, international trade, taxation, market conditions.

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### **Check Your Progress**

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1. Consumer surplus is difference between \_\_\_\_\_ and \_\_\_\_\_
2. In most markets, consumers individually or collectively gain more total utility or satisfaction when the actual or equilibrium price they have to pay for a product is \_\_\_\_\_ than what they would have been willing to pay to obtain the product
3. Consumer surplus and price are \_\_\_\_\_ related

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### **Glossaries**

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**Consumer Surplus:** What a consumer is willing to pay minus what he actually pays.

**Marginal Utility:** Marginal utility is the added satisfaction a consumer gets from having one more unit of a good or service.

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

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1. Consumers willing to pay and actual pay
2. Less
3. positively

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### **Suggested Readings**

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1. Alfred Stonier W, Douglas Hague C (2008), A Textbook of Economic Theory, Eastern Book Company, 5th Edition
2. Christopher Thomas and S Charles Maurice(2007) Managerial Economics' 9th Edition, McGraw-Hill Education.

## **Unit-8**

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# Producer's Surplus

## STRUCTURE

Overview

Objectives

8.1 Introduction

8.2 Measure of Producer's Surplus

8.3 Practical Usefulness of the Concept

Let Us Sum Up

Check Your Progress

Glossaries

Model Questions

Answers to Check Your Progress

Suggested Readings

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### Overview

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This unit describes the concept of producer surplus. Further, it explains measure of producer's surplus and its practical usefulness.

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### Objectives

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- The objective of this unit is to acquaint the student with knowledge of producer surplus.
- The knowledge of the producer's surplus will help the learner to understand the producer side market conditions.

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### 8.1. Introduction

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Producer surplus is the difference between how much a person would be willing to accept for a given quantity of a good and 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.

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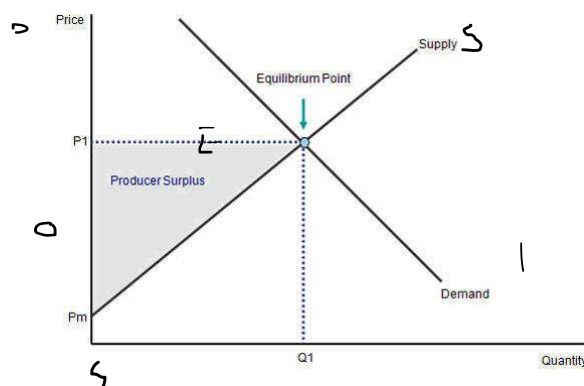
## 8.2. Measure of Producer's Surplus

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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.

The producer surplus is calculated using the same formula using the same example with all the X and Y-axis numbers. 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.



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## 8.3. Practical Usefulness of The Concept

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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

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### **Let Us Sum Up**

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Producer surplus is the difference between how much a person would be willing to accept for a given quantity of a good and how much they can receive by selling the good at the market price. As the price increases, the incentive for producing more goods increases, thereby increasing the producer surplus.

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### **Check Your Progress**

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1. A producer surplus is the difference between the actual or equilibrium price and the\_\_\_\_\_acceptable price a producer is willing to accept in exchange for a product.
2. In most markets, sellers individually or collectively benefit when they sell their product at an actual or equilibrium price that is\_\_\_\_\_than what they would have been willing to receive in exchange for the product
3. Producer surplus and price are\_\_\_\_\_related.

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### **Glossaries**

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**Producers Surplus:** The welfare or benefit enjoyed by producers who sell for a price higher than the price they would have been willing to sell for. Graphically the area above the supply curve and below the price in the market

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### **Answers To Check Your Progress**

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1. Minimum
2. More
3. Positively

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### **Suggested Readings**

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1. Lancaster K. J. (1966) "A New Approach to Consumer Theory"

Journal of Political Economy, 74, pg. 132.157.

2. E. Case Karl and C Fair Ray and E Oster Sharon (2017) Principles of Economics' Pearson.



# Unit-9

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## Types of Utility

### STRUCTURE

Overview

Objectives

9.1 Introduction

9.2 Cardinal Utility Approach

9.3 Ordinal Utility Approach

9.4 Total Utility

9.5 Marginal Utility

9.6 Relationship between TU and MU

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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### Overview

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The unit explains the Utility concept. Utility concepts include the cardinal utility approach, ordinal utility approach, total utility, and marginal utility. This unit also describes the relationship between total utility and marginal utility

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### Objectives

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- To equip with the knowledge of consumer behaviour is the key objective of this chapter. Consumer behaviour refers to how a consumer chooses "what to consume" and "how much to consume" in order to maximize total utility given his or her income and options. There are two types of utility measurements: cardinal and ordinal. The cardinal measure of utility is used to analyse consumer behaviour in this unit.
- The objective of this unit is to recollect that the Marshallian approaches to consumer behaviour analysis are based on cardinal and ordinal utility, respectively.

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## 9.1. Introduction

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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 desires a good or service and 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.

According to him, the goal of the society 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, before Marshall, William Stanley Jevons (1835–82) extended Bentham's utility concept to explain consumer 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 choosing goods for consumption would consider each good's marginal utility. Jevon's pioneering work with Carl Menger, Leon Walras and Alfred Marshall led to the neoclassical revolution and 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

Agricultural commodities like paddy, wheat, oilseeds, pulses are stored for the regular use of consumers throughout the year. 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.

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## 9.2. Cardinal Utility Approach

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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 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 purchasing goods and services, thus making the consumer buy those commodities first, which is a necessity.
3. **Maximize Satisfaction:** Every consumer aims at maximizing his/her satisfaction with 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 a consumer's income level.
7. **Utility is Additive:** The cardinalists believe that not only the utility is measurable, but the utility derived from the consumption of different commodities is 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 to maximise his/her utility or satisfaction for the amount of money he spends on consuming goods and services.

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### **9.3. Ordinal Utility Approach**

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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 and aims to maximise his level of satisfaction for given income and prices of goods and services he wishes 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 that if the consumer prefers commodity X to Y and Y to Z, he must prefer commodity X to Z. In other words, if  $X \succ Y$ ,  $Y \succ Z$ , then he must treat  $X \succ Z$ . The consistency of choice means that if a consumer prefers commodity X to Y at one point, he will not prefer commodity Y to X in another period or even will not consider them 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  $DB/DA$  diminishes if the consumer continues substituting A for B.

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#### **9.4. Total Utility**

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Total Utility According to the cardinal utility approach, measuring and expressing TU and MU in quantitative terms is possible. 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.

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#### **9.5. Marginal Utility**

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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 TU change resulting from one additional unit's consumption. 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.

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#### **9.6. Relationship Between TU and MU**

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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, 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

The marginal utility can be aligned with the commodity's cost from a consumer's perspective. 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.

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### Let Us Sum Up

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**Utility** refers to want satisfying power of a commodity. Utility is classified as form utility, time utility, place utility. There are two approaches in

measuring utility, one is ordinal and another is cardinal. Ordinal utility is where the satisfaction derived from consuming a product cannot be expressed numerically. Cardinal utility is the utility where the satisfaction derived by consuming a product can be expressed numerically. The measuring term for cardinal and Ordinal Utility is utils and ranks respectively. Utils are the unit of utility and ranks determine the preference of a product compared to other products in the market

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### Check Your Progress

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1. The utility may be defined as\_\_\_\_\_
2. The utility of a commodity is\_\_\_\_\_
3. Marginal utility curve of a given consumer is also his\_\_\_\_\_

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### Glossaries

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<b>Utility:</b>	want satisfying power of a commodity
<b>Total Utility:</b>	aggregate utility
<b>Marginal Utility:</b>	additional aggregate utility
<b>Form Utility:</b>	If the physical form of a commodity is changed
<b>Place Utility:</b>	If a commodity is transported from one place to another
<b>Time Utility:</b>	commodity is stored for future usage, its utility may increase

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### Answers To Check Your Progress

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1. The power of a commodity to satisfy wants
2. Its relative scarcity
3. Demand curve

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### Suggested Readings

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1. Luke M. Froeb, Brian T McCann, Mikhael Shor and Michael Robert Ward, Managerial Economics, Cengage Learning Asia Pvt. Limited, 2019.
2. M. Friedman and L.J. Savage (1948), "The Utility Analysis of Choices Involving-Risk", Journal of Political Economy, pg. 279-304

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## Unit-10

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### Law of Diminishing Marginal Utility

## **STRUCTURE**

Overview

Objectives

10.1 Introduction: Law of Diminishing Marginal Utility

10.2 Assumptions of Law of Diminishing Marginal Utility

10.3 Diagrammatic Explanation of Law of DMU

10.4 Importance of the Law

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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### **Overview**

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This unit elaborates on law of diminishing marginal utility. The law is explained along with assumptions in, diagrammatic explanation. Further it explains the importance of the law

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### **Objectives**

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- The unit's objective is to provide insights into consumer behavior by providing a clear explanation of law of diminishing marginal utility.
- 

### **10.1. Introduction: Law of Diminishing Marginal Utility**

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An important tenet of cardinal utility analysis relates to the behaviour of marginal utility. The law of diminishing marginal utility means that the total utility increases at a decreasing rate. 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.

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 factor which the law of diminishing marginal utility is based on 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".

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

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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.

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### **10.3. Diagrammatic Explanation of Law of Diminishing Marginal Utility (DMU)**

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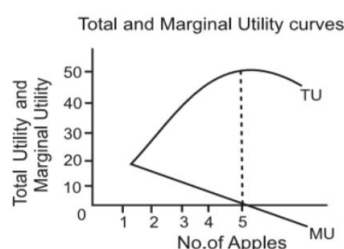
Suppose Mr X is hungry and eats apple one by one. The first apple

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 takes more apples, marginal utility falls to zero and 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

**Figure:3.1**



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 continuously consumes a commodity, the marginal utility declines, reaches zero, and becomes negative.

The total utility (sum of utilities of all the units consumed) goes on increasing and after a certain stage begins to decline. The total utility increases when the marginal utility declines and is greater than zero. 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.

---

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

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**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**

Smith's famous "diamond-water paradox" 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.

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### **Let Us Sum Up**

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- The law of diminishing marginal utility says that the marginal utility from each additional unit declines as consumption increases.<sup>1</sup>
- The marginal utility can decline into negative utility, as consuming another unit of any product may become entirely unfavourable.

- The marginal utility may decrease into negative utility, as consuming another unit of any product may become entirely unfavourable.

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### **Check Your Progress**

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1. The utility is generally related to\_\_\_\_\_
2. When Marginal Utility = 0, Total Utility is\_\_\_\_\_
3. The demand curve slopes downward for a public good because of the law of diminishing marginal \_\_\_\_\_

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### **Glossaries**

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Law of Diminishing Marginal Utility

Marginal Utility

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

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1. Satisfaction
2. Maximum
3. utility

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### **Suggested Readings**

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1. Alfred Stonier W, Douglas Hague C (2008), A Textbook of Economic Theory, Eastern Book Company, 5th Edition.
2. M. Friedman and L.J. Savage (1948), "The Utility Analysis of Choices Involving-Risk", Journal of Political Economy,pg. 279-304

# Unit -11

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## Indifference Curve Theory

### STRUCTURE

Overview

Objectives

11.1 Introduction to Indifference Curves

11.2 Assumptions of Indifference Curve

11.3 Properties of Indifference Curves

11.4 Water Diamond Paradox

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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### Overview

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This unit explains about indifference curve analysis. It includes assumptions of indifference curves and its properties. Further, it also explains about water diamond paradox

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### Objectives

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This unit aims to provide a detailed explanation of consumer behaviour by providing the information about indifference curve analysis.

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### 11.1. Introduction to Indifference Curve

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The indifference curve analysis is a popular theory of consumer's demand which forms the subject-matter of the present unit. A classical economist Edgeworth first invented the technique of indifference curves but 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', somewhat modifying the original paper's version.

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. However, the indifference curve analysis has 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 evolved.

### **Definition**

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

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## **11.2. Assumptions of Indifference Curve**

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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 remain 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 between B and C, it is assumed that he will be indifferent between A and C too. This condition implies that consumers' 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 the consumer will equally accept. The various combinations give equal satisfaction to the consumer. Therefore, he is indifferent between various combinations.

**Indifference Schedule**

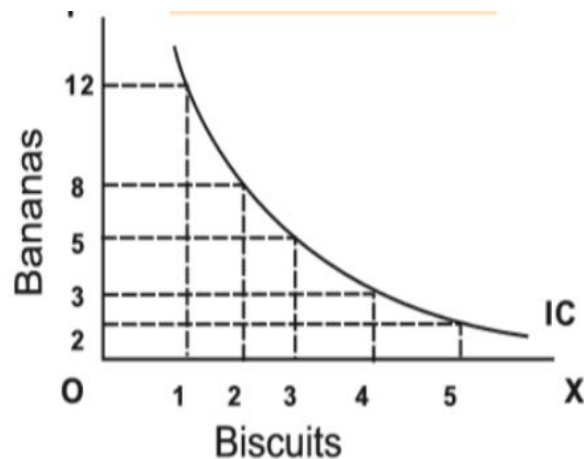
Combination	Biscuits (Good X)	Bananas (Good Y)
A	1	12
B	2	8
C	3	5
D	4	3
E	5	2

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 that provide equal satisfaction to the consumer, it does not indicate exactly how much satisfaction the consumer derives 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.

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### 11.3. Properties of an Indifference Curve

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

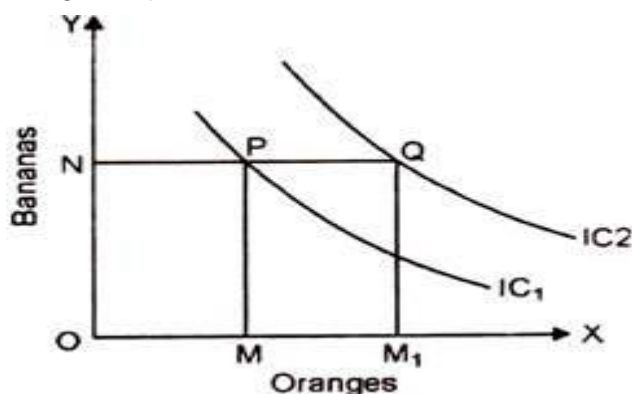
This is an important feature of Indifference Curve. If the total satisfaction is to remain the same, the consumer must part with a diminishing number of bananas as he gets as increasing stock of oranges. The loss of satisfaction to the consumer on account of the downward movement must be made up by the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

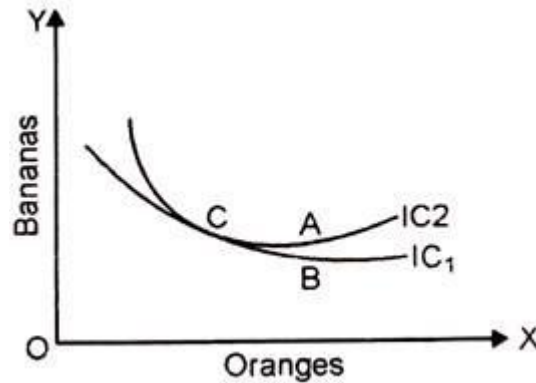
**3. Every Indifference Curve to the right represents Higher Level of Satisfaction than that of the Preceding One:**

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 consumer's total satisfaction 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.

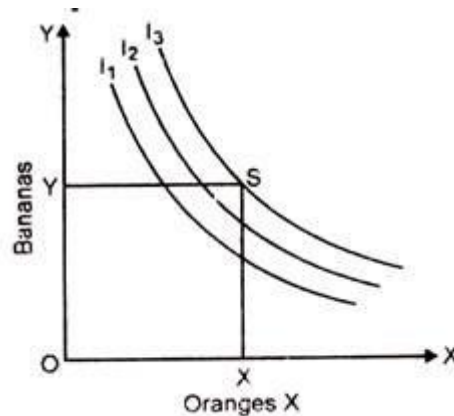


Since point A is an Indifference Curve  $IC_2$ , it represents a higher level of satisfaction to the consumer  $c$  than point B which is located on the lower Indifference  $c$  Curve  $IC_1$ . Point C, however lies on both the curves. This means that two levels of satisfaction, A and B which are unequal,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




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### 11.4. Water Diamond Paradox

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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 we use daily 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.

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### **Let Us Sum Up**

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The indifference curve approach based on ordinal ranking preference was evolved to overcome the criticism of Marshall's demand analysis. An indifference curve is the locus of different combinations of two commodities with the same satisfaction level.

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### **Check Your Progress**

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1. An indifference curve slopes down towards right since more of one commodity and less of another result in\_\_\_\_\_
2. Moving along an indifference curve the\_\_\_\_\_

3. The slope of the indifference curve is equal to which of the following \_\_\_\_\_

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### **Glossaries**

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**Marginal Utility:** Additional units of satisfaction

**Indifference Curve:** The various combinations of the two commodities are plotted and joined to form a curve called indifference curve

An indifference schedule is a statement of various combinations of two commodities that the consumer will equally accept.

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

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1. Same satisfaction
2. Consumers do not prefer one consumption point to another.
3. Marginal rate of substitution

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### **Suggested Readings**

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1. Lancaster K. J. (1966) "A New Approach to Consumer Theory" Journal of Political Economy, 74, pg. 132.157.
2. Paul G. Farnham (2014) Economics for Manager' Pearson publisher.

# Unit-12

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## Indifference Curves – Consumer’s Equilibrium

### STRUCTURE

Overview

Objectives

12.1 Introduction of Consumer's Equilibrium

12.2 Income Effect

12.3 Substitution Effect

12.4 Consumer's Equilibrium with Indifference Curve

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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### Overview

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The unit is about indifference curves with consumers' equilibrium. It explains how consumers' equilibrium will be effected by income effect, substitution effect.

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### Objectives

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- The unit's main objective is to understand How customers discover their equilibrium, or the best combination of two items that maximizes total utility, given their income and the prices of the two commodities.
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### 12.1. Introduction of Consumer’s Equilibrium

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As a consumer has a limited income, he spends it in such a manner to obtain maximum satisfaction. He will attain equilibrium when he gets maximum satisfaction from his expenditure on different goods. Under the utility analysis, a consumer gets maximum satisfaction when marginal utilities from his different purchases are equal.

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### 12.2 . Income Effect

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Normal goods are generally goods whose consumption increases with an increase in consumer income. When consumers' income increases, prices remain constant, their budget line shifts upwards, 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 groceries and a decline of 10% in the price of groceries will increase his free money available to him which he can spend on buying additional groceries or something else of his choice.

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### **12.3. Substitution Effect**

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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 relatively expensive commodities 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 items 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 has a negative slope
- 3 The income effect results from income being freed up whereas substitution effect arises due to relative price changes.
- 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 changes in prices.
- 5 The income effect of a rise in the price of a good is the decrease in discretionary income leading to a decrease in the quantity demanded. As against this, the substitution effect of the increased price of a good is that consumers will buy less costly alternatives.
- 6 The income effect of a fall in prices of a good is that the purchasing power of customers 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.

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#### **12.4. Consumer's Equilibrium with Indifference Curve**

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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 only decide to buy biscuits, in which case he can buy 50.
- (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).

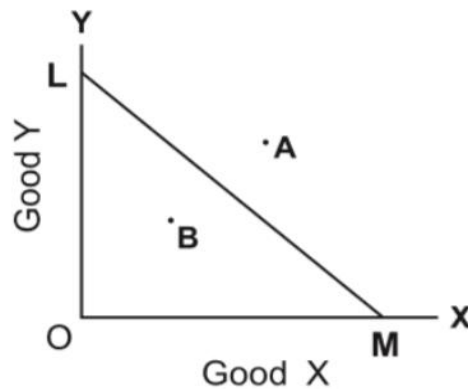
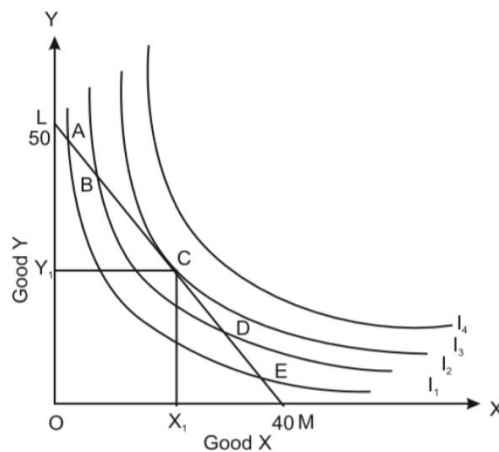


Figure shows the above three possibilities. The line LM represents maximum amount of biscuits (50) and tea (40 cups), which the consumer can buy with his income of Rs.20. The line LM shows that the consumer cannot choose any combination beyond this line because his income does not permit him. Nor would 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 maximum 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 consumers' 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

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### **Let Us Sum Up**

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As a consumer has a limited income, he spends it in such a manner to obtain maximum 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.

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### **Check Your Progress**

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1. The income effect always operates in the opposite direction as the substitution effect. (True / False)
2. An Indifference curve slope down towards right since more of one commodity and less of another result in \_\_\_\_\_
3. An indifference curve is related to \_\_\_\_\_

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### **Glossaries**

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**Consumer Equilibrium:** Maximum satisfaction level

<b>Income effect:</b>	Change in demand due to change in income
<b>Substitution Effect:</b>	Change in demand due to change in the price of related goods
<b>Budget line:</b>	the various amounts the consumer can buy with his income

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### **Answers To Check Your Progress**

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1. False
  2. Same Satisfaction
  3. Choices and preferences of consumer
- 

### **Suggested Readings**

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1. Marshirschey (2008) Fundamentals of Managerial Economics' South Western Publications.
2. Lancaster K.J. (1966) "A New Approach to Consumer Theory" Journal of Political Economy, 74, pg. 132.157.

# Unit-13

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## Factors of Production

### STRUCTURE

Overview

Objectives

13.1 Introduction to Production

13.2 Land

13.3 Labour

13.4 Capital

13.5 Entrepreneurship

13.6 Variable Factors

13.7 Fixed Factors

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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### Overview

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The unit elaborates on production. Production and factors of production i.e., land, labour, capital and entrepreneurship along with variable factors and fixed factors are explained in detail in this unit.

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### Objectives

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- This chapter's aim is to explain the fundamental ideas of production analysis. In this chapter we will move from consumer theory to producer's theory
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### 13.1. Introduction to Production

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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. However, this concept of production is limited to only 'manufacturing'. In an economic sense, the production

process may take various 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 kinds of goods and services require some time for production.
7. 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.

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**13.2. Land**

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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 to acquire other production factors. 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 Production Factor: In any production process, we have to start with land. For example, it helps provide raw materials in industries, and crops are produced on land in agriculture.
- 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.

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### **13.3. Labour**

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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, not the cattle or machine exertion. 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, meaning 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.

#### **13.4. 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. is 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. Capital on its own cannot produce anything until labour works on it. To produce with machines, labour is required. Thus, labour is an active, whereas capital is a passive factor of production.
- iii. Capital is a Produced Means of Production: The composition or supply of capital is not automatic but 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. Capital can be easily transported from one place to another. Land is perfectly immobile. Labour and entrepreneur also lack mobility.
- 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.

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### **13.5. Entrepreneurship**

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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**

1. i. Economic and dynamic activity: Entrepreneurship is an economic activity because it involves creating and operating 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.
2. 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
3. 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.
4. Risk bearing: The essence of entrepreneurship is the 'willingness to assume risk' arising from creating and implementing new ideas. New ideas are always tentative and their results may not be instantaneous and positive.

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### **13.6. Variable Factors**

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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.

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### **13.7. Fixed Factors**

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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.

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

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Production is the process and methods to transform tangible and intangible inputs into goods or services. The inputs are classified and referred to as land, labour, and capital. Collectively the inputs are called factors of production. Factors of production refer to those goods and services which help in the production process.

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### Check Your Progress

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1. Production process is\_\_\_\_\_
2. Factors of production includes\_\_\_\_\_
3. Land is a free gift of \_\_\_\_\_
4. \_\_\_\_\_ is regarded as primary factor of production.

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### Glossaries

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**Production:** transform tangible inputs and intangible inputs into goods and services

**Factors of Production :** Land, Labour, Capital , Entrepreneurship

**Reward for Factors of Production:** Rent, Wages, Interest, Profit

### MODEL QUESTIONS

1. List out the factors of production.
2. What is Capital in Economics?
3. Define the term production.
4. What do you understand by Land in Economics?
5. Give a short note on the term Production
6. Give a short note on Land and Labour as factors of production
7. Write a note on capital as factor of production.
8. Explain various factors of production.

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### Answers to Check Your Progress

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1. Transforming Raw material into finished product
2. Land, Labour capital, entrepreneurship
3. Nature
4. land

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### Suggested Readings

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1. E.Case Karl and C Fair Ray and E Oster Sharon (2017) principles of Economics' Pearson.
2. Maddala, G.S. and Miller, E. (1989), Microeconomics: Theory and Applications, New York, NY: McGraw-Hill Book Co., 2<sup>nd</sup> edition

# Unit-14

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## Production Function

### STRUCTURE

Overview

Objectives

14.1 Introduction: Production Function

14.2 Managerial Uses of Production Function

14.3 Features of Production Function

14.4 Example of Production Function

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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### Overview

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This unit gives you the functional relationship between production and factors of production. The unit explains mathematical relationship between inputs and output. Further it explains managerial uses, features and examples of production function.

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### Objectives

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- This unit objective is to give knowledge on the production function and introduce the learner on how to work out production function.
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### 14.1. Introduction: Production Function

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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. It presents the quantitative relationships between inputs and output in its specific form.

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 output (Q) level 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 the case of ‘raw materials’, it has been observed that ‘this input bears a constant relation to output at all production levels’. For example, cloth bears a constant relation to the number of ready-made garments. Similarly, for a given house size, the quantity of bricks, cement, steel and so on remains constant, irrespective of the number of houses constructed. In car manufacturing of a particular brand or size, the quantity of steel, engine number, and 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.

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## **14.2. Managerial Uses Of Production Function**

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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 clearly understand alternative plans and the right costs involved in them.
8. To have clarity about the various cost concepts.
9. To decide and determine a firm's very existence 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 reclassifying elements, reprising of input factors, etc., to fit the relevant costs into management planning, choice, etc.

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### **14.3. Features of Production Function**

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The following are the main features of production function:

1. **Substitutability:** The factors of production or inputs are substitutes of one another, making 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. The substitutability of the factors of production 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 principle of returns to scale is another manifestation of complementarity of inputs as it reveals that the quantity of all inputs must be increased simultaneously 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.

#### **14.4. Examples of Production Function**

Let us now look at an example. 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.

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 =  $\min(\text{burger ingredients, } 12 \times \text{no of cookers, } 30 \times \text{no.of. employees})$

This formula calculates the output achieved when all variables are considered 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 are only enough ingredients for one burger, then only one 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.

---

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

Production function refers to the functional relationship between the quantity of a good produced (output) and factors of production (inputs). Production function is used to find the firm's most profitable operation rate.

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#### **Check Your Progress**

1. Production function shows the \_\_\_\_\_ relationship between physical inputs and physical output

2. Production function is used to find \_\_\_\_\_ of the firm
  3. Production is a function of \_\_\_\_\_
- 

### **Glossaries**

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**Production Function** : Functional relationship between input and output

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### **Answers To Check Your Progress**

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1. Technical
  2. Rate of operation
  3. Factors of production
- 

### **Suggested Readings**

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1. Pindyck, R.S. and Rubinfeld, D.L. (2001), Microeconomics- New York, NY: Prentice Hall, 5th edition.,
2. Koutsoyiannis, A. (1978), Modern Microeconomics, London: Macmillan, 2nd edition

# Unit-15

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## Law of Production Function

### STRUCTURE

Overview

Objectives

- 15.1 Introduction of Law of Production
- 15.2 Assumptions of Law of Variable Proportions
- 15.3 Explanation of Law of Variable Proportions
- 15.4 Statement of Law of returns to scale
- 15.5 Assumptions of Law of Returns to scale
- 15.6 Explanation of Law of Returns to scale
- 15.7 Producer's Equilibrium

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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### Overview

This unit provides information regarding various laws of production function. Economics gives short term and long term laws of production. Laws are explained with assumptions and diagrammatic explanations. Further it also explains producer's equilibrium

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### Objectives

- This unit aims to explain in detail various laws of production and their clear description to the learners.

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### 15.1. Introduction of Law Of Production

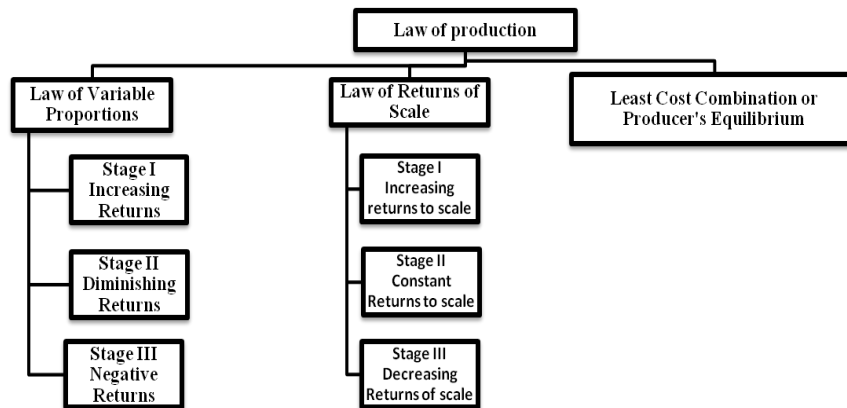
Production function helps in making long-run as well as short run decisions. By definition, short run refers to the period during which supply of capital is inelastic and long run is the period during which supply of both labour and capital is elastic. Therefore, the firm can increase coal production in the short run 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.

Law of production can be studied under three headings:



### 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)

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## 15.2. Assumptions Of Law Of Variable Proportions

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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.

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### 15.3. Explanation Of Law Of Variable Proportions

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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, are used to produce.

Table: Law of variable proportions

Units of Land (Fixed factor)	Units of Labour (Variable Factor)	Total production	Average production	Marginal production	Description of Stages
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 - $MP < 0$

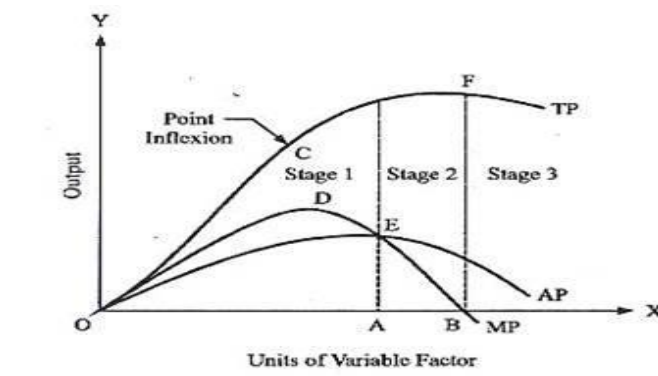
**Stage I: Increasing Returns :** From the table it is clear that there are three stages of the law of variable proportion. In the first stage, average production increases as more and more doses of labour and capital are employed with fixed factors (land). We see that total product, average product,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

marginal product increase 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>
Stage	Increasing returns of the factor	Starts from origin increases at an increasing rate and then increases 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	Variable factors in the initial stage give increasing returns. The fixed factor is more intensively and effectively utilized. It becomes possible to introduce specialization or division of labour, resulting in higher productivity.
Stage 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.
Stage 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.

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#### **15.4. Statement of Law of Returns to Scale**

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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 analyses the effects of scale on the output level. 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".

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#### **15.5. Assumptions F Law of Returns to Scale**

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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.

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#### **15.6. Explanation of Law of Returns to Scale**

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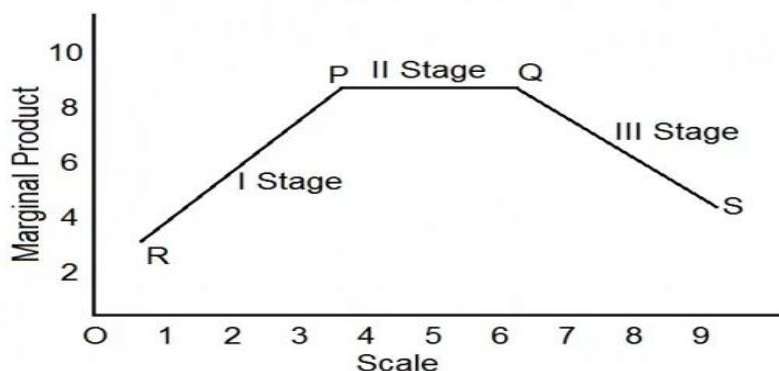
There are three phases of returns in the long-run which may be separately described as (1) the law of increasing returns (2) the law of constant returns and (3) the law of decreasing returns.

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, managerial, 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. The emergence of diseconomies is a natural process when a firm expands beyond certain stages. 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.

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### **15.7. Producer's Equilibrium**

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The producers are always faced with the problem of deciding about a combination of inputs to produce a commodity. A given level of output can be produced by employing various combinations 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".

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### **Let Us Sum Up**

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Production function helps in making long-run as well as short run decisions. There are three laws of production: Law of variable proportions, Law of returns to scale, and Production Equilibrium. 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. The law of returns to scale operates in the long period. It explains the production behaviour 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.

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### **Check Your Progress**

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1. Production theory with one variable input is called\_\_\_\_\_
2. Point of inflexion means\_\_\_\_\_
3. In the third stage of law of variable proportion\_\_\_\_\_
4. Production theory with two variable inputs is called\_\_\_\_\_
5. The law of return to scale expressed in\_\_\_\_\_

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### **Glossaries**

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**Law of variable proportions:** Short run production function

**Law of returns of scale:** Long run production function  
Producer's equilibrium

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### **Answers To Check Your Progress**

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1. Law of variable proportions
2. Output changes from increasing rate to decreasing rate
3. Marginal product is negative
4. Law of returns to scale
5. Increasing, decreasing, constant

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### **Suggested Readings**

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1. Alfred Stonier W, Douglas Hague C (2008), A Textbook of Economic Theory, Eastern Book Company, 5th Edition.
2. Christopher T Thomas (2017), Managerial Economics 12th Edition, Publisher Richard. Irwin



# Unit-16

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## ISO-Quant Approach

### STRUCTURE

Overview

Objectives

16.1 Introduction: The ISO -quant Curve

16.2 The Derivation of ISO -quant curve

16.3 Assumptions of ISO -quant Curve

16.4 Properties of ISO-quant Curve

16.5 ISO-quant Map

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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### Overview

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This unit is about ISO- Quant curve. Iso-quant explains different combinations of production with a hypothetical example. In addition to this properties of iso-quant curves were also explained in detailed.

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### Objectives

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- This unit's main objective is to introduce a new production analysis tool known as isoquant.
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### 16.1. Introduction: The ISO-Quant Curve

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

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 shows all the combinations of inputs that yield the same output level. '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."

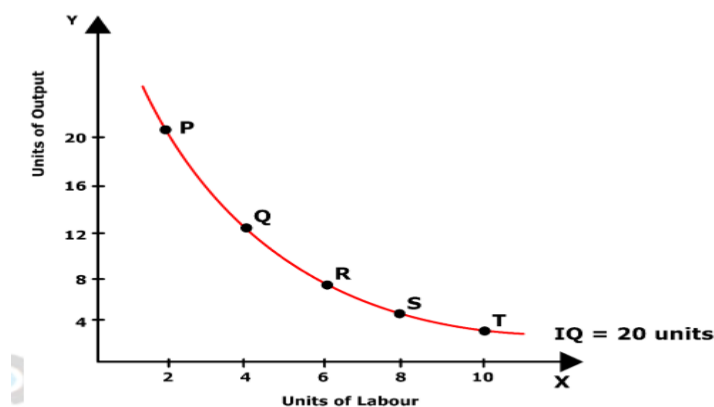
## 16.2. The Derivation of ISO-Quant Curve

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

Let us suppose a firm producing 20 units of a product using different combinations 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 22 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 combinations of factors such P, Q, R, Sand T can produce 20 units of output.

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### 16.3. Assumptions of ISO-Quant Curve

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An isoquant is based on the following assumptions:

1. Employment of two factors Labour (L) and Capital (K)
2. Given state of technology
3. Continuous production function

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### 16.4. Properties of ISO-Quant Curve

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The following are the main properties of isoquants:

- i. **Isoquants are downward sloping from left to right:** Isoquants 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. Thus, if the amount of one factor increases, the amount of other factor has to be decreased to produce the same output level. 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.
- 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) a firm is willing to sacrifice for an additional labour (L) to keep the same output level.

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

The MRTs goes on declining as we move down on the isoquant showing that the quantity of capital needed to be sacrificed by employing more units of labour declines to maintain the same output level. Along 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.

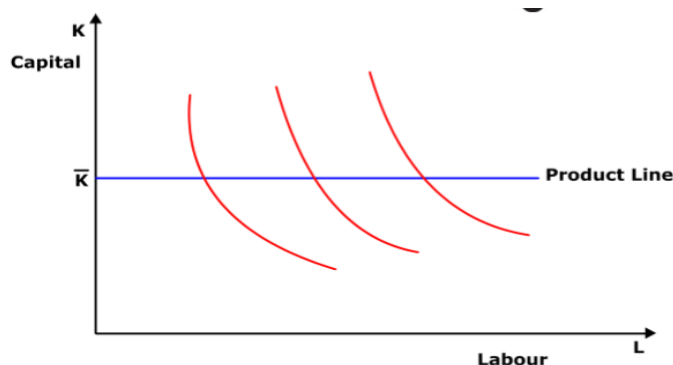
- iii. **Two Isoquants never intersect or touch each other:** it is not possible that one combination of factors can produce two different level of output. This is illogical and absurd. Thus, isoquants never intersect each other.

- iv. **Higher isoquant represents a higher level of output:** Higher Iso-quant indicates higher output level and lower Iso-quant indicates lower output level. In other words, Iso-quants lying to the right represent a larger output than those lying to the left, which indicate lower output.

### 16.5. 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 lines 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 output levels are known as isoquant maps.



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 levels of output of 30 units and 40 units respectively. Higher isoquant represents higher level of output than the lower one.4.

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### Let Us Sum Up

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

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### Check Your Progress

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1. Iso-quant curve is also known as \_\_\_\_\_
2. \_\_\_\_\_ shows the overall output generated at a given level of input.
3. An Isoquant is \_\_\_\_\_ to an iso cost line at equilibrium point.

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### Glossaries

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**Iso- quant :** all possible combinations of labour & capital that can be employed to produce a given level of output.

**Isoquant Map:** A number of isoquants depicting different output levels are known as isoquant maps.

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### Answers To Check Your Progress

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1. Production indifference curve
2. Production Function
3. Tangent

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### Suggested Readings

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1. Pindyck, R.S. and Rubinfeld, D.L. (2001), Microeconomics- New York, NY: Prentice Hall, 5th edition
2. Leontief, Wassily. [1966] Input-Output Economics. New York, NY: Oxford University Press

# Unit-17

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## Market Structures

### STRUCTURE

Overview

Objectives

17.1 Introduction to Market

17.2 Characteristics of Market

17.3 Market Structure

17.4 Forms of Market Structure

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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### Overview

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This unit describes market from an economics perspective. Market from an economic perspective is explained with the help of characteristics. In addition, market structure and various forms of market structure are explained in detail.

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### Objectives

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- This unit aims to provide a clear understanding of market concepts in economic perspective to the learner and also to give knowledge regarding market structure
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### 17.1. Introduction to Market

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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.

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## **17.2. Characteristics of Market**

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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 commodity market, we need 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 economists 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:**

A market must have 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:**

The presence of speculators is essential just to supply business information and prices prevalent in the market.

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**17.3. Market Structure**

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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

Cross-examining the above features against each other can establish similar traits. 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.

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#### 17.4. Forms of Market Structure

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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 an individual firm faces.

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

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 an individual firm faces.

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### Let Us Sum Up

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A market is a set up where two or more parties exchange goods, services and information. The two parties involved in a transaction are called seller and buyer. The seller sells goods and services to the buyer in exchange for money. There has to be more than one buyer and seller for the market to be competitive. 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.

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### Check Your Progress

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1. In economics when we refer to market we mean \_\_\_ market.
2. Market structure is broadly classified into \_\_\_ types
3. Market structure shows the relationship between \_\_\_ and \_\_\_

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### Glossaries

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**Market :** Place of business activity.

**Market Structure:** different industries are classified and differentiated based on their degree and nature of competition

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**Answers to Check Your Progress**

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1. Commodity market
2. Perfect competition and Imperfect competition
3. Buyer and seller

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**Suggested Readings**

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1. Alfred Stonier W, Douglas Hague C (2008), A Textbook of Economic Theory, Eastern Book Company, 5th Edition.
2. K.W. Rothschild(1947), Price Theory and Oligopoly, Economic Journal, Vol. 57.Pg.157.

## Unit-18

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### Equilibrium of Firm and Industry Under Perfect Competition

#### STRUCTURE

Overview

Objectives

18.1 Introduction to Perfect Competition

18.2 Features of Perfect Competition

18.3 Perfect Competition and Pure Competition

18.4 Equilibrium of Firm under Perfect competition

18.5 Equilibrium of Industry Under Perfect Competition

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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#### Overview

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This unit gives detailed insights into market structure. In particular, this unit elaborates on perfect competition, its features, how it is different from pure competition and its equilibrium at firm and industry levels.

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#### Objectives

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- The objective of the unit is to apprehend the concept of perfect competition and its features, equilibrium etc.,

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#### 18.1. Introduction to Perfect Competition

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A perfectly competitive market is one in which there are many buyers and sellers of a homogeneous product and neither a seller nor a buyer has any control on the product's price. 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. Therefore, this kind of a notional market is created by assumption for theoretical purposes. A perfectly competitive market is assumed to have the following characteristics:

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## **18.2. Features of Perfect Competition**

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### **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 perfect competitive market sellers 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 existing firms earn super-normal profits, new firms enter 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 production 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.

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### **18.3. Perfect Competition and Pure Competition**

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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 exit. 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.

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## 18.4. Equilibrium of Firm Under Perfect Competition

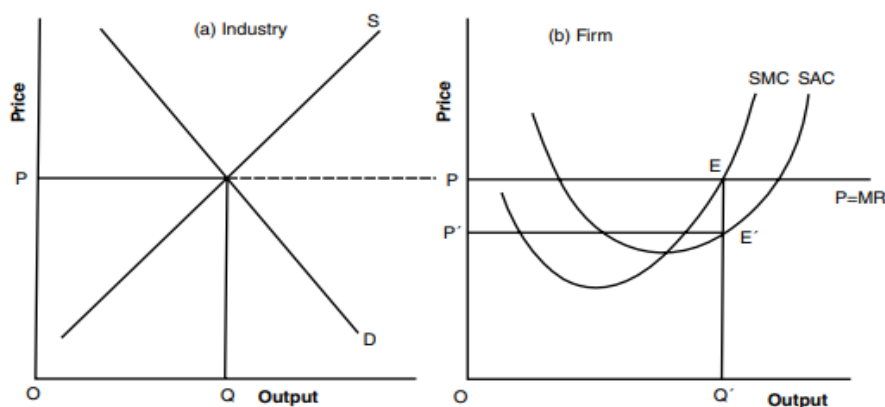
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As explained earlier, in the traditional theory of firm, the equilibrium of a firm is determined in the following conditions: (i) profit maximization is assumed to be the basic objective of a business firm and (ii) profit is maximized at the level 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 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.,  $AR = MR$ .  $SAC$  and  $SMC$ , respectively, show the firm's short-run average and marginal cost curves. The firm's equilibrium in the short run is illustrated in above Figure.

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. The area shows firm's maximum pure profit PEE'P' which equals  $PP' \times OQ (=PE)$  where PP' is the per unit super normal profit at output OQ.

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### 18.5. Equilibrium of Industry Under Perfect Competition

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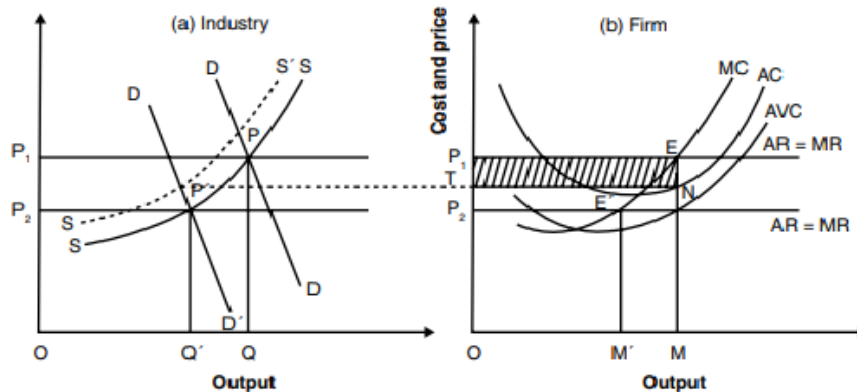
The short-run equilibrium of the firm and industry have been analysed separately in the previous sections. However, a link exists between a firm's and industry's equilibrium. In a perfectly competitive market, change in the equilibrium of an individual firm does not affect the industry's equilibrium, 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 alters an individual firm's equilibrium. 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 below figure. 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 shaded area, P1 ENT, shows the firm's total pure profit.

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. Firms 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.




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### Let Us Sum Up

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Perfect competition is a market situation where there are infinite numbers of sellers that no one is big enough to have any appreciable influence over market price. Under perfect competition, the market price is determined by the market forces namely the demand for and the supply of the products. Hence there is a uniform price in the market and all the output units are sold at the same price. As a result, the average revenue is perfectly elastic. The average revenue curve is horizontally parallel to X-axis. Since the Average Revenue is constant, Marginal Revenue is also constant and coincides with Average Revenue. AR curve of a firm represents the demand curve for the product produced by that firm.

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### Check Your Progress

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1. The market type which is known as perfect competition is \_\_\_\_\_.
2. In the long run equilibrium, a perfect competitive firms earns\_\_\_\_\_
3. One of the essential conditions of perfect competition is\_\_\_\_\_

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## **Glossaries**

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**Perfect competition:** market situation where there are infinite numbers of sellers

**Firm :** Individual firm

**Industry :** Group of Firms

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## **Answers to Check Your Progress**

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1. the firms produce goods that are identical in all aspects, but under monopolistic competition, the goods are not identical
  2. Normal profit
  3. Free entry and exit
- 

## **Suggested Readings**

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1. Keat Paul, K Young Philip and C Dickinson (2017) Managerial Economics' Pearson.
2. Nicholas Kaldor(1938), The Equilibrium of the Firm, Economic Journal, Vol. 44, reprinted in Readings in Price Theory (A.E.A.).pg. 412

## Unit-19

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### Pricing Under Perfect Competition in Short Run

#### STRUCTURE

Overview

Objectives

19.1 Introduction

19.2 Equilibrium price under Perfect Competition in Short run - Super Normal Profit

19.3 Equilibrium price under Perfect Competition in Short run - Loss

19.4 Equilibrium price under Perfect Competition in Short run - Shut down point

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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#### Overview

This unit is extension of perfect competition concept. It includes equilibrium price estimation under perfect competition both in short run and long run conditions. It also explains various conditions like super normal profit, normal profit, loss, shutdown condition of a perfectly competitive firm.

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#### Objectives

- This unit aims to give more clear information regarding the equilibrium conditions of the firm in a perfect competitive market. This unit will help the learner to understand various phases faced by a firm in perfect competition.

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#### 19.1. Introduction

Perfect competition is a market setting in which there are a large number of sellers of a homogeneous product. Each seller supplies a very small fraction of the total supply. No single seller is powerful enough to

influence the market price. Nor can a single buyer influence the market price. Market price in a perfectly competitive market is determined by the market forces—market demand and market supply. Market demand refers to the demand for the industry as a whole: it is the sum of the quantity demanded by each individual consumer or user at different prices.

Similarly, market supply is the sum of quantity supplied by the individual firms in the industry. Therefore, the market price is determined for the industry, and is given for each firm and buyer. Thus, a seller in a perfectly competitive market is a 'price-taker, not a 'price-maker'. In a perfectly competitive market, therefore, the main problem for a profit maximizing firm is not to determine the price of its product but to adjust its output to the market price so that profit is maximum.

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## 19.2. Equilibrium Price Under Perfect Competition in Short Run - Super Normal Profit

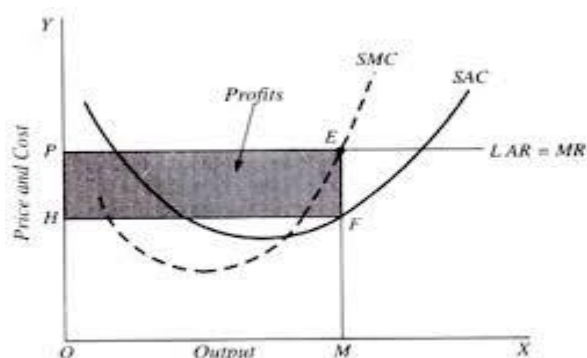
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The aim of any producer is to maximize his profit. Since a firm in the perfectly competitive market is a price-taker, it has to adjust its level of output to maximize its profit. The short run is a period in which the number and plant size of the firms 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 or normal profit or incur loss in the short term.

### Super-normal Profit

When the firm's average revenue is greater than its average cost, it is earning super-normal profit.

### Short-run equilibrium with super-normal profits



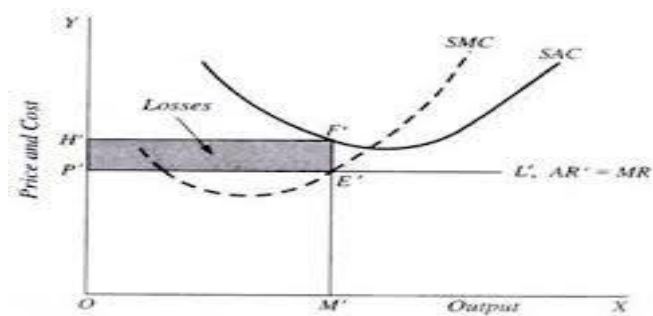
In figure output is measured along the x-axis and price, revenue and cost along the y-axis.  $OP$  is the prevailing price in the market.  $PL$  is the demand curve or average and the marginal revenue curve.  $SAC$  and

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.

### 19.3. 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 figure below where the ruling price is  $OP'$  which the firm takes.



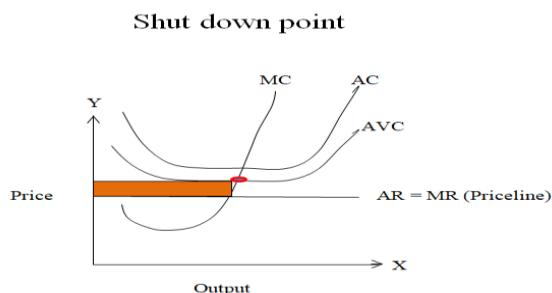
$P' L'$  is the price line that lies below AC curve at all output levels. The firm will be in equilibrium at point E, where marginal cost is equal to price (or marginal revenue) and the marginal cost curve is rising. Firm would be producing  $OM'$  output but would be making losses, since average revenue (or price) equal to  $ME'$  is less than average cost equal to MF. The loss per unit of output is equal to  $E'F'$  and total loss will be equal to  $P'E'F'$  'FT 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 firms will tend to leave it through they cannot do so in the short period.

### 19.4. Equilibrium Price Under Perfect Competition In Short

## Run - Shut Down Point

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In analysing a firm's decision to continue operating or shut down in the short run, the difference between variable 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.



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 the price level is fixed at that level. 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.

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## Let Us Sum Up

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Perfect competition is a market in which there are large numbers 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 completion cannot be seen. The firm in the perfect competition are called price takers as there is a uniform price exists. Under perfect competition, the profit position of the firm can be expressed under four categories viz.,

1. Normal Profit
2. Abnormal profit
3. Minimum loss

#### 4. Shut down point

Under this market, the prices are uniform as products are homogeneous. The position of Average Revenue (AR) curve and the Average Cost (AC) curve decides the profit position of the firm. Due to price uniformity, the AR curve is a straight line parallel to output axis and equal to Marginal Revenue (MR)

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#### Check Your Progress

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1.  $MR = MC$  is condition of \_\_\_\_\_
2.  $MR > MC$  is condition of \_\_\_\_\_
3.  $MR < MC$  is condition of \_\_\_\_\_

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#### Glossaries

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<b>Normal profit position:</b>	Average cost = Average Revenue
<b>Abnormal profit position:</b>	Average cost < Average Revenue
<b>Minimum Loss position:</b>	Average cost > Average Revenue
<b>Shut down point:</b>	Average variable cost > Average Revenue

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#### Answers to Check Your Progress

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1. Equilibrium / Normal Profit
2. Super normal profit
3. loss

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#### Suggested Readings

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1. Marshirschey (2008) Fundamentals of Managerial Economics 'South Western Publications.
2. Nicholas Kaldor (1986), The Equilibrium of the Firm, Economic Journal, Vol. 44, reprinted in Readings in Price Theory (A.E.A.).Pg.302

## Unit-20

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### Pricing Under Perfect Competition in Long Run

#### STRUCTURE

Overview

Objectives

20.1 Introduction: Cost Curves in Long run under Perfect Competition

20.2 Revenue curves in Long run under Perfect Competition

20.3 Equilibrium price under Perfect Competition in Long run

20.4 Equilibrium of the Firm and Industry

Let Us Sum Up

Check Your Progress

Glossaries

Answers to Check Your Progress

Suggested Readings

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#### Overview

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This unit explains the nature of cost and revenue curves under perfect competition both in the long run and short run. In addition, it elaborates the equilibrium conditions of firms and industries under perfect competition.

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#### Objectives

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- The core aim of the unit is to give clear and deep information about a firm in the perfect competitive market in long-run. This will help the learner to know the market conditions of a firm in perfect competitive market in long run.
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#### 20.1. Introduction: Cost Curves in Long Run Under Perfect Competition

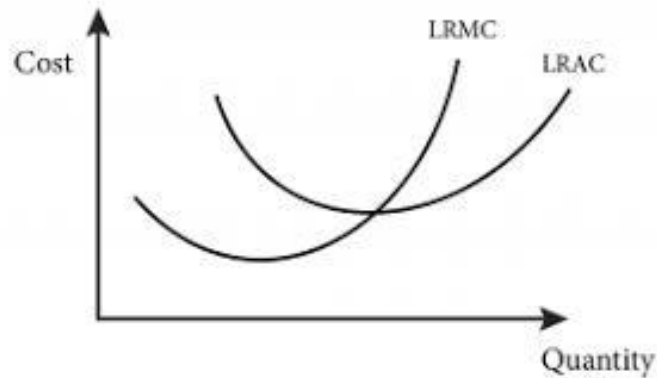
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Long-term is the period in which the firm can vary all of its inputs. There are no fixed costs; therefore, the AFC or Average Fixed Cost curve vanishes. Also, the Average Cost (AC) curve represents the Average Total Cost (ATC) curve. Further, since 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




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## **20.2. Revenue Curves in Long Run Under Perfect Competition**

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The relationship between total, average and marginal concepts is highly useful in the 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, the product's price is beyond the firm's control, 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.

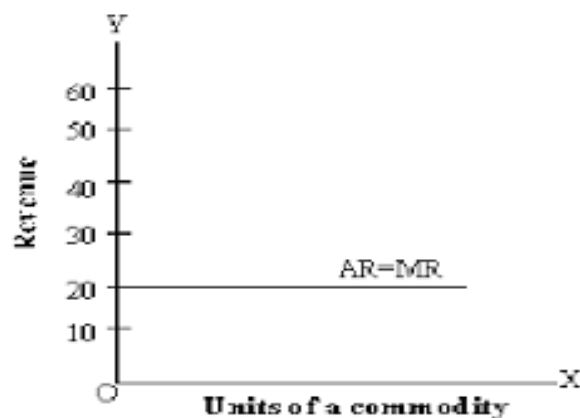
Hence, it means that the average revenue or the price would remain constant for the firm. Furthermore, constant AR implies constant MR. Thus, it means that under perfect competition,  $AR=MR=Price$ . It can be well explained with the help of tabular and graphical representation:

### Tabular Representation:

The following schedule illustrates the behaviour of AR, MR and TR in a perfectly competitive market:

Output/Sales (in units) Q	Average Revenue $AR = TR/Q$ =Price (In Rs.)	Total Revenue $TR = AR \cdot Q$ (In Rs)	Marginal Revenue $MR = TR_n - TR_{n-1}$ (In Rs.)
1	20	$1 \cdot 20 = 20$	20
2	20	$2 \cdot 20 = 40$	20
3	20	$3 \cdot 20 = 60$	20
4	20	$4 \cdot 20 = 80$	20
5	20	$5 \cdot 20 = 100$	20

The above table clearly shows 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.

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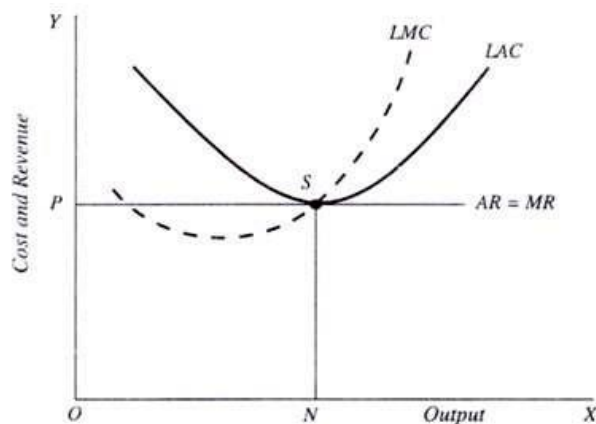
### 20.3. Equilibrium Price Under Perfect Competition In Long Run – Normal Profit

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Long run equilibrium, price and output determination In the long run, all factors are variable. The firms can increase their output by increasing their number and plant size. 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 an increase in the factors' prices.

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 profits 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.

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## **20.4. Equilibrium of The Firm and Industry**

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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 many 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.

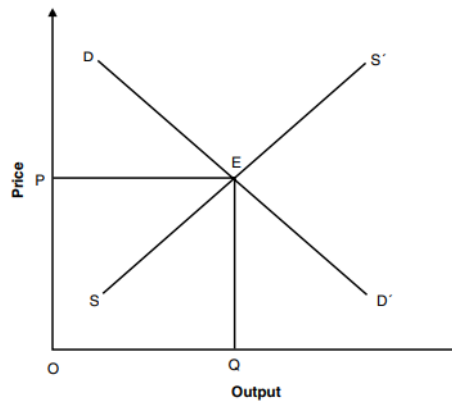
### **ii. A Firm is a Price-Taker.**

Under perfect competition, an individual firm does not determine the price of its own product. The market demand and market supply for the industry as a whole determine price for its product.

### **iii. No Control over Cost.**

Because of its small purchase of inputs (labour and capital), a firm has no control over input prices under perfect competition. 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 markets except for 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 equilibrium, there is no tendency to expand or 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 not continue in the long run.



The short-run equilibrium of the firm and industry have been analysed separately in the previous sections. However, a link exists 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 alters an individual firm's equilibrium. 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, lets 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. Long run permits improvement in production technology and a larger employment of 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, supply curve shifts downward and 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

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### Let Us Sum Up

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In the long run, all factors are variable. The firms can increase their output by increasing their number and plant size. Moreover, new firms can enter the industry and the existing firms can leave the industry. 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. As a result, all the existing firms will earn only normal profit in the long run.

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### Check Your Progress

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1. Marginal cost curves cut average revenue curve from \_\_\_\_ at \_\_\_\_ point
2. Normal profit condition of a perfectly competitive firm is \_\_\_\_
3. Firms in a perfectly competitive firm derives its price from \_\_\_\_

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### Glossaries

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<b>Average Cost Curve:</b>	U shaped
<b>Marginal Cost Curve:</b>	Cuts AC Curve from below
<b>Equilibrium condition:</b>	$AR = MR$
<b>Normal Profit:</b>	Average cost = Average Revenue

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### Answers To Check Your Progress

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1. Below, minimum
2.  $MR = MC$
3. Industry

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### Suggested Readings

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1. Nicholas Kaldor(1938), The Equilibrium of the Firm, Economic Journal, Vol. 44, reprinted in Readings in Price Theory (A.E.A.).pg. 412
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## **WEB LINKS**
















1. [https://onlinecourses.nptel.ac.in/noc21\\_hs52/preview](https://onlinecourses.nptel.ac.in/noc21_hs52/preview)
2. <https://nptel.ac.in/courses/110104093>
3. [https://onlinecourses.swayam2.ac.in/cec20\\_hs37/preview](https://onlinecourses.swayam2.ac.in/cec20_hs37/preview)
4. [https://onlinecourses.swayam2.ac.in/cec21\\_hs04/preview](https://onlinecourses.swayam2.ac.in/cec21_hs04/preview)
5. <https://www.swayamprabha.gov.in/index.php/program/archive/16>



## Document Information

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## Sources included in the report

<b>W</b>	URL: <a href="http://www.worldcolleges.info/sites/default/files/schoolbooks/Std12-Economics-EM.pdf">http://www.worldcolleges.info/sites/default/files/schoolbooks/Std12-Economics-EM.pdf</a> Fetched: 2021-11-15 06:00:27	 <b>6</b>
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<b>W</b>	URL: <a href="https://slideplayer.com/slide/9418396/">https://slideplayer.com/slide/9418396/</a> Fetched: 2022-07-06 12:37:09	 <b>1</b>
<b>W</b>	URL: <a href="https://pdfcoffee.com/introductory-economics-12th-class-cbse-pdf-free.html">https://pdfcoffee.com/introductory-economics-12th-class-cbse-pdf-free.html</a> Fetched: 2021-10-21 14:14:57	 <b>7</b>
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<b>W</b>	URL: <a href="https://www.msuniv.ac.in/Download/Pdf/d20c3272e8a1407">https://www.msuniv.ac.in/Download/Pdf/d20c3272e8a1407</a> Fetched: 2021-08-02 23:47:01	 <b>25</b>
<b>W</b>	URL: <a href="https://moam.info/economic-theory_599b8cda1723dd0f406edbaf.html">https://moam.info/economic-theory_599b8cda1723dd0f406edbaf.html</a> Fetched: 2022-01-31 17:17:17	 <b>45</b>
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<b>W</b>	URL: <a href="https://opentextbc.ca/principlesofeconomics/chapter/5-1-price-elasticity-of-demand-and-price-elasticity-of-supply/">https://opentextbc.ca/principlesofeconomics/chapter/5-1-price-elasticity-of-demand-and-price-elasticity-of-supply/</a> Fetched: 2019-09-26 11:29:22	 <b>2</b>
<b>W</b>	URL: <a href="https://www.economicdiscussion.net/essays/economics/law-of-demand-meaning-reasons-and-exceptions-to-the-law-of-demand-with-diagram/916">https://www.economicdiscussion.net/essays/economics/law-of-demand-meaning-reasons-and-exceptions-to-the-law-of-demand-with-diagram/916</a> Fetched: 2020-11-30 05:05:16	 <b>4</b>
<b>W</b>	URL: <a href="https://www.wallstreetmojo.com/price-elasticity-of-demand-formula/">https://www.wallstreetmojo.com/price-elasticity-of-demand-formula/</a> Fetched: 2019-09-25 13:35:04	 <b>2</b>
<b>W</b>	URL: <a href="https://dornsife.usc.edu/assets/sites/1277/docs/Week2.pdf">https://dornsife.usc.edu/assets/sites/1277/docs/Week2.pdf</a> Fetched: 2020-01-17 09:23:13	 <b>1</b>
<b>W</b>	URL: <a href="https://www.distanceeducationju.in/pdf/EC-101%20Economics.pdf">https://www.distanceeducationju.in/pdf/EC-101%20Economics.pdf</a> Fetched: 2021-11-06 23:12:18	 <b>11</b>
<b>W</b>	URL: <a href="https://www.yourarticlelibrary.com/economics/elasticity-as-demand/elasticity-of-demand-concept-of-demand-elasticity-explained-with-diagram/39032">https://www.yourarticlelibrary.com/economics/elasticity-as-demand/elasticity-of-demand-concept-of-demand-elasticity-explained-with-diagram/39032</a> Fetched: 2020-11-25 19:56:24	 <b>11</b>