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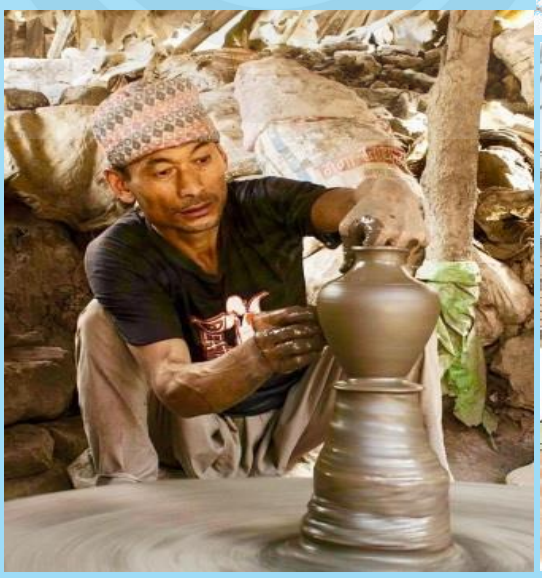
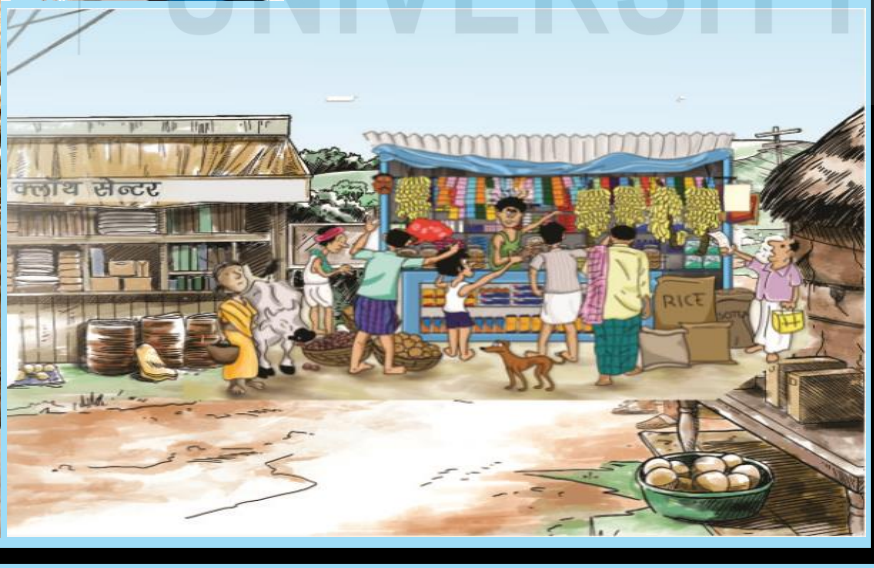
BECC-101

INTRODUCTORY MICROECONOMICS





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INTRODUCTORY MICROECONOMICS

School of Social Sciences
Indira Gandhi National Open University

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COURSE PREPARATION TEAM

Block 1	**Introduction**	
Unit 1	Introduction to Economics and Economy	Shri I.C. Dhingra, Rtd. Associate Professor of Economics Shaheed Bhagat Singh College, Delhi
Unit 2	Demand and Supply Analysis	
Unit 3	Demand and Supply in Practice	
Block 2	**Theory of Consumer Behaviour**	
Unit 4	Consumer Behaviour: Cardinal Approach	Dr. Vijeta Banwari, Asst. Professor in Economics Maharaja Surajmal Institute, Delhi
Unit 5	Consumer Behaviour: Ordinal Approach	
Block 3	**Production And Costs**	
Unit 6	Production with One Variable Input	Dr. V.K. Puri, Associate Professor of Economics, Shyam Lal College, University of Delhi, Delhi
Unit 7	Production with Two and MoreVariable Inputs	
Unit 8	The Cost of Production	
Block 4	**Market Structure**	
Unit 9	Perfect Competition: Firm and Industry Equilibrium	Dr. S.P. Sharma, Associate Professor of Economics, Shyam Lal College, University of Delhi, Delhi
Unit 10	Monopoly: Price and Output Decisions	Ms. Shruti Jain, Assistant Professor of Economics, Mata Sundari College, University of Delhi, Delhi
Unit 11	Monopolistic Competition: Price and Output Decisions	
Unit 12	Oligopoly: Price and Output Decisions	
Block 5	**Factor Market**	
Unit 13	Factor Market and Pricing Decisions	Dr. Nausheen Nizami, Assistant Professor of Economics, Pt. Deen Dayal Upadhyay Petrolium University, Ahemdabad
Unit 14	Labour Market	
Unit 15	Land Market	
Block 6	**Welfare, Market Failure and the Role of Government**	
Unit 16	Welfare: Allocative Efficiency under Perfect Competition	Dr. S.P. Sharma, Associate Professor of Economics, Shyam Lal College, University of Delhi, Delhi
Unit 17	Efficiency of the Market Mechanism: Market Failure and the Role of the State	Dr. Mamta Mehar, Post Doctoral Fellow, Value Chain and Nutrition Programme, World Fish, Malaysia

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Course Contents

INTRODUCTORY MICROECONOMICS

This course is designed to expose the students pursuing BA Hons. Economics Programme to the basic Principles of Microeconomic theory. It aims to provide the conceptual foundation of Microeconomic theory in a manner to enable the students to understand the Intermediate Microeconomics I & II so as to analyse real life situations.

Economics is a live subject and helps the economic agents in their decision making like: Which commodities to produce? How to produce? Which techniques to use? Which factors or resources to use, in which combinations to produce and What quantity of a commodity to produce? How consumers make purchasing decisions and how their choices are affected by changing prices and incomes? How firms decide how many workers to hire and how workers decide where to work and how much work to do? In other words, economics has moved away from financing the activities of state to helping the common man in the street to make many a crucial decisions impinging on their day-to-day life.

We, today incorporate a wide spectrum of activities in the domain of economics. These activities include: (a) consumer's behaviour or choice process; (b) producers' behaviour or how is the production organised and carried on, what is the special role of cost functions? (c) What are the different forms of market organisations; (d) how different individuals co-operate in the process of production to contribute factors owned by them. (e) What are the various types of efficiencies? (f) Under what situations markets fail and how the state can play its role in such situations? The present course on Introductory Micro Economics aims to expose the learners to the issues pertaining to (a) to (f). The course is divided into six blocks.

Introducing the nature of Economics, **Block 1** throws light on the basics of demand and supply and how the demand and supply curves are used to describe market mechanism. The block comprises 3 units. Unit 1 on Introduction to Economics and Economy covers the essential nature of economics and the basic concepts and methodology used in the discipline. Unit 2 deals with the Principles of Demand and Supply, measurement of their elasticities, and determinants. Unit 3 discusses the Market Mechanism by putting the Supply curve and Demand curve together.

Block 2 deals with the theory of consumer behaviour and consists of two units. Unit 4 discusses Cardinal Utility Approach for measurement of utility and how a consumer attains equilibrium with the help of equi-marginal utility. Unit 5 analyse the Consumer Behaviour under Ordinal Approach.

Block 3 covers production function and theory of cost. It consists of three units. Unit 6 throws light on production function with one variable input, Unit 7 deals with the nature of production function with two and more variable inputs. Unit 8 discusses the cost side of production considering different types of costs.

Block 4 throws light on the various forms of market i.e. perfect competition, monopoly, monopolistic competition, and oligopoly. The block comprises 4 units. Unit 9 on Perfect Competition: Firm and Industry Equilibrium provides the characteristics of perfectly competitive market and exposes the learners to equilibrium of Firm and Industry under perfect competition. Unit 10 on Monopoly: Price and Output Decision deals with pricing and output decisions and price discrimination under monopoly condition. The concept of deadweight loss under monopoly has also be discussed in this unit. The equilibrium conditions of monopolistic competition in short-run and long-run period, theory of excess capacity, the comparison of the various market forms have been provided

in Unit 11. Price and Output determination under oligopoly have been covered in Unit 12.

Block 5 discusses the Pricing of the factors of production. It comprises three units. Introducing the Marginal Productivity theory of distribution, Unit 13 provides an overview of how rent and wages are determined. It also provides a bird's eye view on the theories of interest and profit. Unit 14 acquaints the learners of the role of demand and supply mechanisms in determinations of wages under perfectly competitive labour markets and imperfectly competitive labour markets. Unit 15 throws light on features of land as a peculiar factor of production and the various theories of rent.

Block 6 covers the Welfare Market failure and the role of state. This block comprises two units. Unit 16 exposes the learners to the various forms of efficiencies under perfectly competitive market economy and the outcome of departures from the assumptions of perfectly competitive market conditions. Unit 17 highlights the various situations where markets fail and hence the role of state comes into picture.

UNIT 1 INTRODUCTION TO ECONOMICS AND ECONOMY

Structure

*Shri I.C. Dhingra, Rtd, Associate Professor, Shaheed Bhagat Singh College (University of Delhi), Delhi.

1.0 OBJECTIVES

After studying this unit, you will be able to:

- explain the problem of scarcity of resources for satisfying ever-increasing wants of society;
- state the meaning and nature of an economy;
- describe the concept of economic entities;
- discuss the concept of production possibility curve;
- state the issues relating to allocation of resources between investment and consumption, and between private and public goods;
- explain the methods of resource allocation in a market economy in a socialist economy and in a mixed economy;
- clearly describe the basic concepts and methodology of Economics;
- state the nature of economic laws; and
- explain some of the analytical concepts associated with economic reasoning.

1.1 INTRODUCTION

Let us begin with defining the discipline of Economics.

Definition of Economics

Economics has been variously defined. As summarised by Samuelson, some of the definitions seek to explain that economics:

- analyses how a society's institutions and technology affect prices and the allocation of resources among different uses.
- explores the behaviour of the financial markets, including interest rates and stock prices.
- examines the distribution of income and suggests ways that the poor can be helped without harming the performance of the economy.
- studies the business cycle and examines how monetary policy can be used to moderate the swings in unemployment and inflation.
- studies the patterns of trade among nations and analyses the impact of trade barriers.
- looks at growth in developing countries and proposes ways to encourage the efficient use of resources.
- asks how government policies can be used to pursue important goals such as rapid economic growth, efficient use of resources, full employment, price stability, and a fair distribution of income.

A common theme running through all these definitions is that scarcity is a fact of life and that an efficient use of these scarce resources is to be found. That is how we define economics as a science that deals with scarcity.

It explains the behaviour of different economic units, households, firms, government and the economy as a whole, when they are faced with scarcity.

1.2 CONCEPT OF SCARCITY

"Scarcity" lies at the root of all economic activities. The concept of scarcity finds an expression in two basic facts of economic life:

A. Unlimited wants or ends, and

B. Scarce resources or means.

A. Unlimited wants or ends

Every person has some wants. Different persons have generally different wants, and wants of even the same person keep changing with the passage of time, change of place and status.

Human **wants are unlimited and keep on increasing.** Different wants differ in their intensity. Subject to the availability of resources, higher order wants need be satisfied first and if the resources are still available these may be used to satisfy lower order wants.

B. Scarce resources or means

Satisfaction of wants requires resources (or the means to satisfy wants). Availability of resources is limited in relation to requirements.

However, scarce means have alternative uses.

The resources therefore need be allocated among different uses in a systematic coordinated manner. Every individual and economy has to devise a mechanism for this.

Different societies try to solve these issues in different ways and in the process each society creates a set-up called 'an economy'. The term 'economy' or 'economic system' is a comprehensive one. It covers the entire set of institutions and arrangements, (including rules and regulations which facilitate their interactions) for resolving the basic and permanent problem of an imbalance between means and wants.

The human society has evolved several sets of such institutional arrangements each is termed an economic system and they have their own distinguishing features and nomenclatures. These systems try to adopt their own means and methodologies for solving the basic problems.

For example, take the case of a capitalist economy. In this case the means of production are owned and inherited by individuals, and various economic decisions are guided by prices of goods and services in the market. The income of an individual is determined by means of production supplied by him to the market and the price which they are paid for their service. On the other hand, in a strict socialist economy all the means of production are owned by the state. The state takes all the decisions regarding the use of available resources.

However, whatever its nature, every economy has to solve the basic problem of scarcity of means in relation to the ever-increasing and varied wants. The means and wants can be combined in alternative ways. The problem of scarcity exists in every society, irrespective of the levels of its development. Hence it has to address itself to two issues:

1) increasing the availability of means of satisfaction, and

2) laying down the priorities of the wants to be satisfied.

Check Your Progress 1

1) State two important characteristics of wants which make them unlimited in number.

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2) What is an economy?

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3) Pick up the correct option among the following:

Which of the following can be called scarce:

a) Stock of rotten vegetables

b) Useless plants in a jungle

c) Number of flowers in a nursery

d) Water in a dirty pit.

1.3 MEANING OF PRODUCTION

The term **'Production' implies the transformation of various inputs into output thereby increasing the want-satisfying capacity of the inputs.** The process of production transforms the things occurring in nature into goods and services which are capable of satisfying human wants. The things which are so transformed are called inputs while output is nothing but the transformed form of inputs, that is, the goods and services. This involves some human effort, both physical and intellectual. The transformation may be physical (a different appearance which enhances want satisfying capacity), spatial (relocate or transfer the things from one place to another to make them available to the end users) or inter-temporal (saving/preserving things which arise/grow/made today for use at a later date-storage and warehousing). A particular transformation is production if the want-satisfying capacity of the output (also called 'product') is more than that of inputs used. To put it differently production is nothing but the creation of utility.

1.4 CENTRAL PROBLEMS OF AN ECONOMY

Because of the scarcity of resources every economy is faced with certain basic or fundamental problems which it must try to solve within its socio-economic framework. These central problems are:

1.4.1 What to Produce?

An economy does not have enough resources to produce everything required by it. So, it must be selective and decide what to produce and what not to produce. When some goods are not produced, some wants of the society remain unsatisfied. The decisions regarding the wants to be satisfied and the goods and services to be produced are interrelated and are taken in a coordinated manner. This is called allocation of productive resources. If some factors of production are employed in the production of product X, to that extent, these will no longer be available for production of product Y. The problems can be illustrated by Production Possibility Curve which we will introduce shortly.

1.4.2 How to Produce?

This is a problem which covers the details of the allocation of productive resources in the production of various goods and services. More precisely, we can say that when an economy decides to produce X , it has also to work out exactly how much of labour, capital, land, etc., would go into its production. The exact proportion of factor-inputs used in the production of goods needs to be decided, irrespective of the size and nature of an economy. This is called the technique of production of that item. For example, we may think of goods which are produced by using more of labour than capital. In such cases labour intensive techniques of production are said to be in use. On the other hand, if more of capital goes into the production of an item, then we say that it is being produced by a capital-intensive technique.

When an individual producer is to decide about the technique of producing any particular product, he considers the prices and productivities of alternative inputs, say labour and capital, since frequently their relative usage can be varied. He tries to use those inputs in such a combination which costs him the least and will yields him the maximum output.

His decision is based on consideration of following two factors:

i) the relative price of labour and capital, and

ii) the relative efficiency of the two inputs

1.4.3 For Whom to Produce?

A society comprises a large number of individuals and households. All the output of consumption goods and services is ultimately meant for their use. Therefore, all goods and services produced are to be distributed amongst the individuals and households. The share of each individual and household has to be determined and also the quantities of specific goods and services which comprise that share.

We can see that it is possible to propose different principles whereby this distribution may be carried out. In an economic system organised on market

principles, the income shares of individual members of the society are determined in the following manner:

In a market economy, productive resources are privately owned. They are sold, bought and hired like any other goods or services. The price of a productive resource is determined by the market forces of demand and supply. Whenever it is to be employed by a producer, he has to pay its market price to its owner. It is for the owner to supply it to the market or withhold it. The income of each individual under these conditions, is determined by the amounts of different productive resources owned and supplied by him to the market and their respective price.

1.4.4 The Problem of Growth

Every economy seeks to increase its stock of capital to increase its production capacity and thereby generate more income. The generated income in an economy has two alternative uses, viz. consumption expenditure (C) and saving (S). Thus, Y = C + S. Saving is source of finance for investment in an economy. Investment adds to the capital stock of an economy. And therefore, there is a need to reduce the share of consumption expenditure (and thereby increase investment); this helps in capital formation.

1.4.5 Choice between Public and Private Goods

1) **Private Goods:** There are certain goods (the term goods here includes services also) whose availability can be restricted to selected individuals only. For example, a product may be priced in the market and only those who pay its price may be allowed to have it. This characteristic of a product by which some people can be prevented from its use is referred to as the **'principle of exclusion'**. Accordingly, those persons who cannot pay for it or who are not ready to pay, are not allowed to use it. The use of the goods is thus divisible between different persons. **Any goods which can be priced and whose use can be restricted to selected persons is termed** as private goods.

2) **Public Goods:** When it is not possible to restrict the availability of a product to selected individuals, they are termed as public goods or social goods. Such goods cannot be so priced as to deprive some persons from using it. That way, it is indivisible. Defence service is a typical example of a public service. When a country is protected against foreign aggression, every citizen is protected.

With its limited resources, an economy cannot have enough of both public and private goods. It must try to achieve an optimum combination of both.

1.4.6 The Problem of 'Merit Goods' Production

Those goods whose consumption is considered highly desirable for the members of the society are termed as merit goods. The important feature of the merit goods is that their consumption benefits both the user and non-users. For example, if a person is educated and healthy, it not only helps him but also the society as a whole. Health and education, therefore, are called a merit product/service and it is desirable that every member of the society gets education. Consumption of merit goods benefits the society as a whole and raises the level of its efficiency and well-being. Therefore, every society has to decide the extent it can and should produce and consume merit goods.

Check Your Progress 2

1) State the central problems of an economy?

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2) What is capital formation?

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3) What is a technique of production?

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4) What are merit goods?

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5) Differentiate between public and private goods.

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1.5 PRODUCTION POSSIBILITY CURVE

The economy has to choose between alternative combinations of various goods and services. This problem of choice can be illustrated by a simple graph known as **Production Possibility Curve or a Product Transformation Curve.** A typical Production Possibility Curve (PPC) is drawn on the following assumptions:

i) The country has to choose between alternative combinations of only two goods, say. LED (L) and computer monitor (M).

ii) All productive resources of the country are taken as given and so is the state of technology, no changes are made in them.

iii) All productive resources of the economy are fully employed. There is no wastage or under utilisation.

iv) The productive resources are suitable for the production of both goods (L) and (M). They can, therefore, be shifted from the production of one to the other goods. However, such a shift would reduce the production of the first good and increase that of the other.

v) No factor of production is considered to be specific in the production of one good alone and inappropriate for the production of the other.

vi) We consider the productive efficiency of the productive resources only in physical terms, i.e., the units of LED (L) and Computer Monitor which they can produce.

Based upon these assumptions, we can illustrate the set of production possibilities available to a country by a hypothetical example. Look at Table 1.1. The figures in the table show that all the productive resources of the country put together can produce a maximum of either 30 L or 30 M or some other combinations thereof. The production possibilities illustrated in Table 1.1 are also represented in Fig. 1.1 in the form of a production possibility curve (PPC).

Quantity of M is measured along X-axis and the numbers of L are measured along Y-axis. The respective pairs of the quantities of L and M are plotted and joined with each other to yield a curve which is called the Production Possibility Curve. Thus, the PPC represents all the possible combinations of L and M which can be produced by using all the productive resources of the economy, efficiently. In that sense, each point on the curve represents the maximum possible output and, for that reason, it is also termed as the production frontier of the economy.

Table 1.1: Production Possibilities Available to a Country

Combination	LED (Numbers) (L)	Computer Monitor (M)	Loss of M for each Additional L Produced (Tones)	Loss of L for each Additional M Produced (Numbers)
1	30	0	2.8	
2	25	14	1.2	0.357
3	20	20	0.8	0.833
4	15	24	0.6	1.250
5	10	27	0.4	1.667
6	5	29	0.2	2.500
7	0	30		5.000

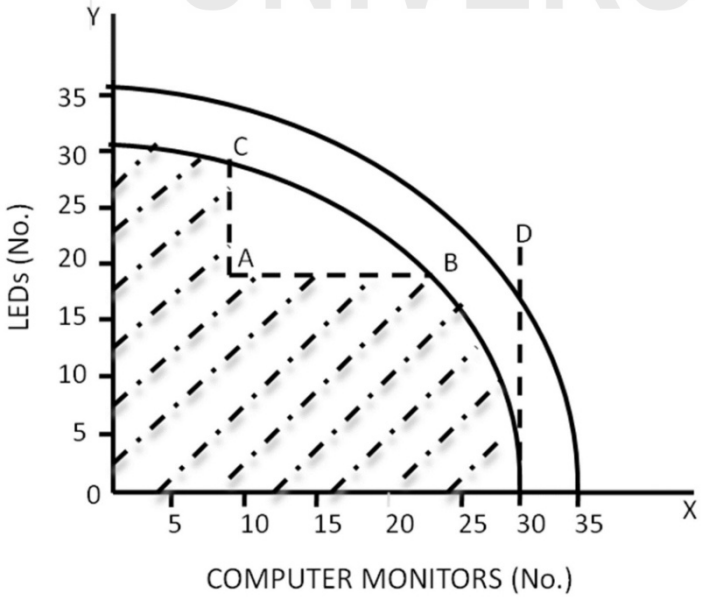

Fig. 1.1

The economy can produce any combination of L and M represented by a point either on the PPC or in the shaded area of the diagram. Production combinations represented by the shaded area imply that the economy can produce either L or M or both. For example, combinations represented by points A, B and C are feasible, as these lie either on the PPC or in the shaded area. But the combination represented by A is feasible but not efficient. Combination represented by points B and C are both feasible and efficient. If it produces at Point A it is not utilising some of its productive resources and let them go waste. Thus consider point A which represents a combination of 10 tonnes of M and 14 L. The PPC, however, shows that with this much of M, the economy can produce 27 L (as shown by point C on PPC). Alternatively, with 14 L, the quantity of M can be increased to 25 tonnes (see point B).

Any point beyond the PPC, which is in the non-shaded area of the diagram, shows a combination of L and M which the economy cannot produce. For example, point D represents a combination of 30 M and 20 L. However, when 30 M is produced, no resources are left for the production of L. On the other hand, if 20 L are produced, then the quantity of M has to be reduced to 20.

Characteristics of PPC

A typical PP curve has two characteristics:

1) **Downward sloping from left to right**

It implies that in order to produce more units of one good, some units of the other good must be sacrificed (because of limited resources).

2) **Concave to the origin**

A concave downward sloping curve has an increasing slope. The slope is the same as MRT. So, concavity implies increasing MRT, an assumption on which the PP curve is based.

Can PP curve be a straight line?

Yes, if we assume that MRT is constant, i.e. slope is constant. When the slope is constant the curve must be a straight line. But when is MRT constant? It is constant if we assume that all the resources are equally efficient in production of all goods.

Note that a typical PP curve is taken to be a concave curve because it is based on a more realistic assumption that all resources are not equally efficient in production of all goods. (Fig. 1.2)

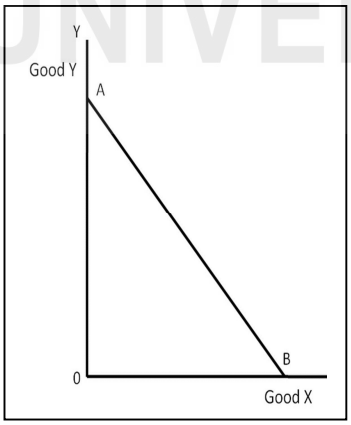

Fig. 1.2

Does production take place only on the PP curve?

Yes and no, both. Yes, if the given resources are fully and efficiently utilised. No, if the resources are under-utilised or inefficiently utilised or both. Refer to the Fig. 1.3.

On point F, and for that matter on any point on the PP curve AB, the resources are fully and efficiently employed. On point U, below the curve or any other

point but below the PP curve, the resources are either under-utilised or inefficiently utilised or both. Any point below the PP curve thus highlights the problem of unemployment and inefficiency in the economy.

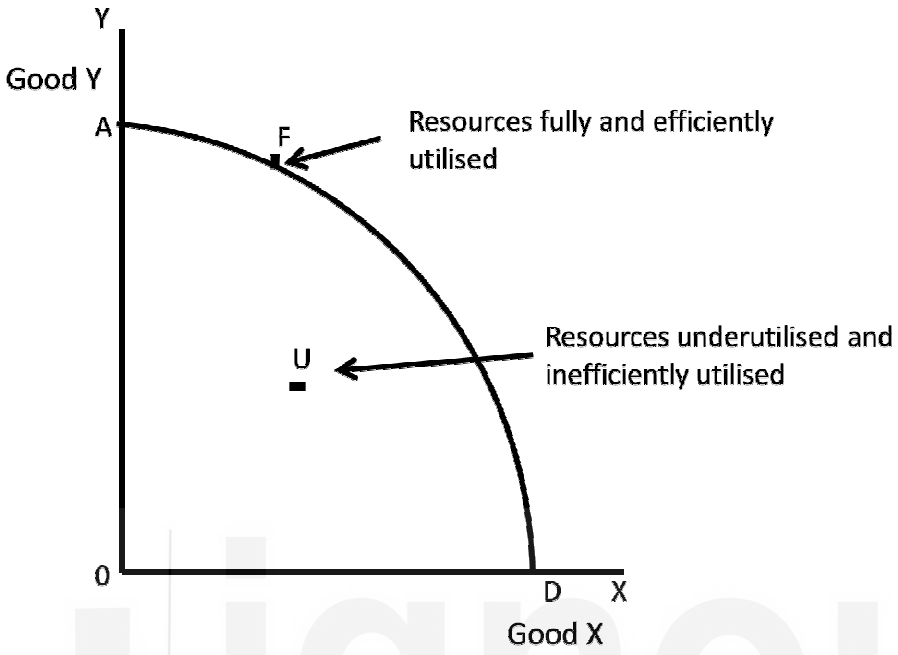

Fig. 1.3

Can the PP curve shift?

Yes, if resources increase. More labour, more capital goods, better technology, all means more production of both the goods. A PP curve is based on the assumption that resources remain unchanged. If resources increase, the assumption breaks down, and the existing PP curve is no longer valid. With increased resources, there is new PP curve to the right of the existing PP curve.

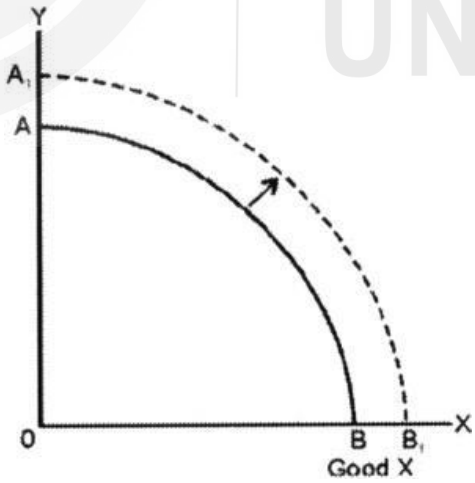

Fig. 1.4

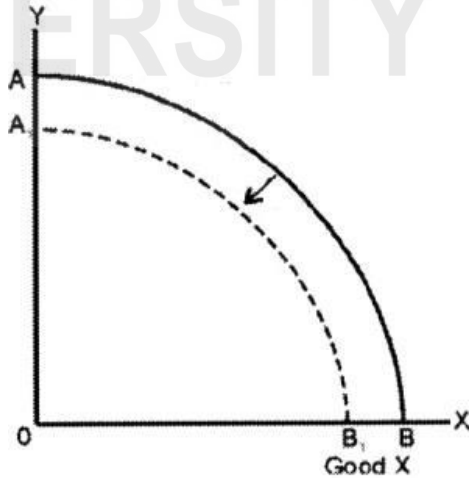

Fig. 1.5

It can also shift to the left, if the resources decrease. It is a rare possibility but sometimes it may happen due to fall in population, and due to destruction of capital stock caused by large scale natural calamities, war, etc.

1.6 ALLOCATION OF RESOURCES: SOLUTION OF CENTRAL PROBLEMS

Theoretically, there are two types of economic systems, viz.. Capitalistic economy and socialistic economy. In practice, all the countries have adopted a system which is broadly identified as mixed economy.

The problem of resources allocation may be tackled in several ways and each economy tries to solve it in line with its own chosen objectives.

1.6.1 Resource Allocation in a Mixed Economy

A mixed economy is one in which some decisions are left to the market forces while others are taken under direct government regulation or even ownership.

Some selected areas of economic activities are reserved for the government sector. The government acquires the necessary productive resources for these activities and employ them in conformity with its priorities. The production pattern of the public sector, the prices of items produced by the public sector and other measures are used to regulate the allocation of resources in private sector as well. These other measures include price controls, licensing, taxation, subsidies and others. Additionally, various labour welfare measures are implemented and enforced by the government. Similar steps are taken to encourage the use of productive resources for encouraging the development of backward areas of the country for removing specific shortages, and for bringing about a balanced development of the economy as a whole.

1.7 ECONOMIC METHODOLOGY AND ECONOMIC LAWS

Economic methodology investigates the nature of economics as a science. It investigates the nature of assumptions, types of reasoning and forms of explanations used in economic science. Various practices such as classification, description, explanation, measurement, prediction, prescription and testing are associated with economic methodology. Economic methodology examines the basis and groups for the explanations. Economists give answer why questions about the economy. For example, economists use the shifting of demand and supply curves to answer the question of why prices change.

Economics being a social science, economic laws are, therefore, a part of social laws. In the words of Alfred Marshall, we should separate that part of behaviour of members of the society where the main motive happens to be an economic one, where the main motive can be expressed in terms of money price. The corresponding activities are then economic activities. However, such a dividing line between economic laws and other social laws is not always clear. Very often an activity happens to be motivated by a combination of both economic and non-economic considerations. As a result, it is often quite difficult to formulate pure economic laws which have full validity also.

1.7.1 Inductive and Deductive Reasoning

Economists have followed two traditions in formulating economic laws. According to one tradition, the causes (also called conditions or assumptions)

are specified and different economic units are expected to behave in a 'rational' manner. The outcome in this case is predictable, provided the assumptions made are satisfied. The assumptions themselves may be totally unrealistic or may be very close to reality but they are stated in a precise manner. In any case, this type of reasoning is called deductive reasoning. In this method, the generalisation or law is stated and the individual activities are expected to conform to it. A typical example of deductive reasoning is the law of demand which states that, other things being equal, the quantity of a product demanded varies inversely with its price. When price falls, demand expands and when price rises, demand contracts.

As against this deductive reasoning, some thinkers try to discover economic laws the other way round. Instead of laying down causes or conditions on a hypothetical basis, they collect the actual information regarding the behaviour of economic units under different conditions. In other words, empirical information is collected and generalisations regarding the behaviour of economic units under different conditions are worked out. This is called the method of inductive reasoning. A well-known example of the use of this method is the Engel's Law. Through a study of family budgets, Engel concluded that as the income of a family increases, the proportion of its expenditure on necessities decreases while that on comforts and luxuries goes up. Most business firms prefer this line of approach.

In economics, both inductive and deductive methods of reasoning are used to supplement our understanding of an economy and its working.

1.7.2 Equilibrium

The concept of equilibrium is an important tool of analysis in economics. It is very frequently used and one should become familiar with it. Usually, an economic variable (such as the price of a commodity) is subject to various forces trying to pull it in different directions. When these forces are in balance, the value of variable stops changing and it is said to be in equilibrium.

Concept of Equilibrium

Equilibrium means a state of rest, the attainment of a position from which there is no incentive nor opportunity to move.

- A consumer is in equilibrium when his expenditure on different goods and services yield maximum satisfaction. No move on his part can increase his satisfaction but, rather, will decrease it.
- A business firm is in equilibrium when its resource purchases and its output are such that it maximises its profits, if profit maximisation is its objective, any change on its part will cause profits to decrease.
- A resource owner is in equilibrium when the resources which he owns are placed in their highest paying employments and the income of the resource owners is maximised. Any transfer of resource units from one employment to another will cause his income to decrease.
- An economy is in equilibrium at the level of income (and employment) where aggregate demand equals aggregate supply.

Equilibrium concepts are important, not because equilibrium is ever in fact attained but because they show us the directions in which economic changes

proceed. Economic units in disequilibrium usually move toward equilibrium positions.

Equilibrium can be analysed in two forms:

1) **Partial:** In partial equilibrium analysis we concentrate on a single market in isolation from the rest of the economy.

2) **General:** In general equilibrium analysis, we analyse simultaneously all the markets in the economy on the basic premise that everything depends on everything else.

1.8 POSITIVE VERSUS NORMATIVE ECONOMICS

The term **positive economics is concerned with only formulating economic laws and describing reality.** The economic laws may be derived from theoretical assumptions or from recorded facts. Either way, they only tell us what exists. They do not pass any judgement as to whether the findings of economic analysis are desirable or need a modification.

As against this, **normative economics realises the fact that an economy is never perfect. The outcome of its working can always be improved upon.** It is quite normal to find an economy faced with many problems requiring immediate attention. Such problems can be related to price changes, employment, scarcity of certain inputs, inequalities of Income and wealth, and so on. In normative economics, the knowledge gained is put to use for improving the working of the economy. Targets of improvement are laid down and policy measures are formulated by which the targets are to be achieved. Thus, normative economics is concerned with what ought to be.

A positive statement:

"An increase in price of petrol leads to a fall in its quantity demanded."

A normative statement:

Government should take steps to cut the consumption of Petrol.

More generally, normative statement uses the verb "should".

1.9 MICROECONOMICS AND MACROECONOMICS

The terms microeconomics and macroeconomics are used in connection with the level of aggregation, that is the extent to which economic units and variables are covered in economic analysis. At one end, the analysis may cover the behaviour and responses of a single economic unit and at the other extreme it may cover the entire economy. These two terms (micro and macro) are derived from Greece words **mikros** and **makros** which mean small and large respectively.

Microeconomics deals with the behaviour of individual elements in an economy such as the determination of the price of a single product or the behaviour of a single consumer or business firm.

As against this, macroeconomics covers large aggregates or collection of economic units which may extend to the entire economy. In the words of Kenneth Boulding, **macroeconomics covers the great aggregates and averages of the economic system rather than individual items.** Here we study collections of variables and economic units (i.e., macro variables) such as national income, employment, level of prices in general, intersectoral flows of goods and services, total savings and investment, and the like. **While the study of an individual firm or an industry lies within the scope of microeconomics, an entire sector falls within the scope of macroeconomics.**

To use a metaphor, macroeconomics studies elephant as one object; microeconomics (like five blind men in a flok tale) studies individual parts of a whole body. Each study leads to different results. Or, to use another metaphor, one enjoys the macro-view of a cricket test match while one enjoys a ball-by-ball description when sitting in before a TV.

1.10 STOCKS AND FLOWS

Economic variables are of two kinds: 1) stocks and 2) flows. **A stock variable is the one which can be measured only with reference to a point of time and not over a period of time. As against this, a flow variable is the one which can be measured only with reference to a period of time and not a point of time.** We come across numerous economic variables which belong to one category or the other. Take the examples of the supply of money and magnitude of wealth. They have reference to point of time. They are, therefore, 'stock' concepts. Correspondingly, examples of flow variables are production, saving, expenditure, income, sales, purchases, etc. All these variables can be measured only over a period of time. A factory can produce so much during, say, a month and not at a given moment of time. A person does not have an income at a point of time. But he has it only for a period of time. A flow concept can assume some value only with the passage of time, not otherwise. One should observe that **stock and flow variables are often used together in economic analysis.**

1.11 STATICS AND DYNAMICS

Economic analysis can be conducted either by using a static framework or a dynamic setting. Static and dynamic modes of analysis can be differentiated in more than one ways. According to one definition, in a static model (theory) the variables (cause effect) are not dated. The demand-supply model of market behaviour is a static model. The model that demand depends on own price, supply depends on own price, with an equilibrium condition that demand must equal supply, time does not enter into the picture at all and the variables are all undated. According to this definition, a dynamic model would be one where the relevant variables are dated. If the demand-supply model is restructured as follows, then the model would become dynamic according to this criterion.

$$D_t = f(P_t)$$

$$S_t = g(P_t)$$

$$D_t = S_t$$

where‘t’ is the relevant time unit.

However, according to some economists, even if the variables are dated the model does not become dynamic. A dynamic model according to this definition would be one where the variables must be dated and a time lag must exist in their relationships. According to this criterion the following would be a dynamic model.

$$D_t = f(P_t)$$

$$S_t = g(P_{t-1})$$

$$D_t = S_t$$

There is **no lag** in the demand relationship. Demand in period ‘t’ depends on own price of the same period. However, in the supply relationship a gestation lag exists which makes the model dynamic. Supply in period ‘t’ depends on price prevailing in the previous period (t–1). The price level in previous period (t–1) would have induced the producers to increase or decrease the supply, full impact of such decisions are visible in time period ‘t’ only. For market to attain equilibrium, demand in period ‘t’ must equal supply in period ‘t’.

Check Your Progress 3

1) State whether the following statements are True or False:

   i) Positive economics is concerned with what ought to be.

   ii) Normative economics requires a system of value judgement for recommending policy steps.

   iii) Every economist prescribes the same remedies for a particular economic problem.

   iv) Positive economies always depict reality.

   v) We can always extend the conclusions of microeconomics to the field of macroeconomics.

   vi) Demand and supply are both stock variables.

   vii) In comparative statics, a comparison of two equilibrium positions is made.

2) Match the item in Column A with those in Column B.

Column A	Column B
i) Study of individual firm and industry	a) Barter
ii) A variable which can be measured at a point of time	b) Macroeconomics
iii) Study of an entire sector of an economy	c) Marginal utility
iv) A variable which can be measured over a period of time	d) Ceteris paribus
v) Want satisfying capacity of a good	e) Flow variable
vi) Satisfaction yielded from consuming one additional unit	f) Microeconomics
vii) Other things being equal	g) Utility
viii) Exchange of apples with eggs	h) Stock variable

3) Which of the following will be the new production possibility frontier, if new technology is developed that enables higher productivity in agricultural (A) only? Industrial output (I) is not impacted.

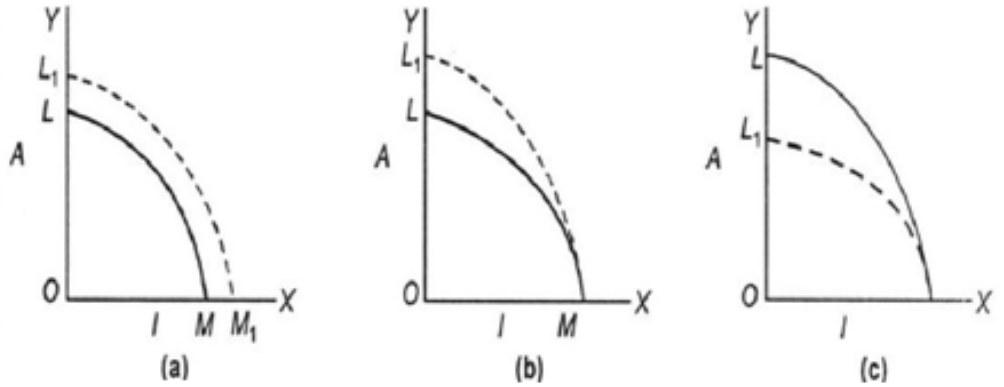

Fig. 1.6

1.12 LET US SUM UP

Economics explains the behaviour of different economic units like consumer, producer, households, firms, governments and the economy as a whole when they are faced with the problem of scarcity. Scarcity is observed in terms of unlimited wants in relation to available scarce resources. Scarcity gives birth to three central problems: What to produce, how to produce and for whom to produce. The other problems aligned with these three problems are the problems growth, choice between public and private goods and the problem of merit goods production. The central problem of an individual as well as for the society is therefore the allocation of scarce means among competing ends. A production possibility curve shows, given scarcity of resources and given technology, the maximum output produced of one good, given the output of other good. It shows how one good can be transformed into another good not physically but via the transfer or shifting of the resources from one line of use to another.

Economic methodology investigates the nature of economics as a science. Economic laws enable us to provide explanation of an event or phenomena in terms of cause and effect relationship. Two types of logics are followed in formulation of economic laws – induction and deduction.

Equilibrium is an important tool of analysis in economics. When the different forces pulling a variable in different directions are in balance, its value stops changing and is said to be in equilibrium.

The term positive economics denotes that part of economic analysis which just describes reality (or theoretical reasoning) without stating the desirability or otherwise of the findings. Normative economics, on the other hand, is concerned with what ought to be. It views reality in the light of chosen goals of society and suggests ways and means of achieving them.

Microeconomics studies the economic activities and responses of individual economic units and their small groups. **Macroeconomics** covers large collections of economic units, their aggregates and averages and macro-variables like national income, employment, and so on.

Economic variables can further be classified into stocks and flows. A **stock variable** is the one which can be measured only with reference to a point of time. A **flow variable**, on the other hand, is measurable only over a period of time.

Static economic or comparative statics is a technique of analysis in which the parameters of the economy are taken to be given. The assumption of ceteris paribus is made and the initial and final equilibrium positions arc compared. In dynamic-economics or dynamic analysis, parameters of the economy are allowed to change.

1.13 REFERENCES

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3) Hal R. Varian, *Intermediate Microeconomics: a Modern Approach, 8th edition*, W.W.Norton and Company/ Affiliated East-West Press (India), 2010.

1.14 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) Unlimited, ever increasing

2) Economy refers to the setup created for meeting the basic and permanent problem of an imbalance between means and wants.

3) c)

Check Your Progress 2

1) The central problems of an economy are (i) what to produce, (ii) how to produce, (iii) for whom to produce, (iv) the problems of growth, (v) choice between public and private goods (vi) the problem of merit goods production.

2) Addition in its stock of capital is capital formation.

3) Technique of production refers to exact proportion of factor inputs used in the production of goods.

4) The goods whose consumption benefits both user and non-users are merit goods.

5) Private goods are the goods whose availability is restricted to selected individuals whereas in case of public goods nobody is excluded in the availability of such goods.

Check Your Progress 3

1) i) False ii) True iii) False iv) False – It will depict reality only if its assumptions are realistic. Otherwise it would have only correct reasoning without applicable conclusions. v) False vi) False vii) True

2) i) f ii) h iii) b iv) e v) g vi) c vii) d viii) a

3) b

1.15 TERMINAL QUESTIONS

1) What is an economic system? Explain the central problems of an economy.

2) What are the main characteristics of human wants?

3) Scarcity lies at the root of every economy. Explain.

4) What do you understand by factors of production? Briefly explain each of the four main factors.

5) Write short notes on the following:

   a) Public goods and private goods

   b) Merit goods

   c) Human wants

6) Explain how the solutions to the fundamental problems of an economy are interlinked with each other.

7) Explain the concept of a production possibility curve. Enumerate its assumptions. Illustrate it with the help of an example.

8) Briefly explain how resource allocation takes place in the following systems:

   a) Market economy

   b) Socialist economy

   c) Mixed economy

9) Giving reasons state which of the following statements are true or false:

   i) All human wants cannot be satisfied. It is a universal truth. Why to make a serious effort to satisfy them?

   ii) Only a resource rich economy like Dubai is not faced with the problem of choice.

   iii) The difference between labour force and work force of an economy indicates the size of unemployed persons.

   iv) National Library at Kolkata is a right example of a public good.

   v) MTNL/BSNL produce a private good.

10) Distinguish between positive and normative economics. Which one should be preferred and why?

11) Write short notes on the following :

    a) Concept of Equilibrium

    b) Limitations of Economic Laws

    c) Ceteris Paribus

    d) Tracing the Path of Change

12) Distinguish between :

    a) Microeconomics and Macroeconomics

    b) Static Economics and Dynamic Economics

13) State the reasons on account of which almost every modern economy is a dynamic one.

14) In what forms opportunity costs manifest themselves for the consumer, the producer, the investor, and a factor of production?

UNIT 2 DEMAND AND SUPPLY ANALYSIS

Structure

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2.0 OBJECTIVES

After studying this unit, you will be able to:

- distinguish between want and demand;
- explain the law of demand with the help of a demand schedule and a demand curve;
- identify the movement along a demand curve and a shift of the demand curve;
- state the concept of supply and its determinants;
- discuss the concept of elasticity of demand and supply and various methods of their measurement; and
- explain the importance and determinants of elasticity of demand and supply.

2.1 INTRODUCTION

Satisfaction of human needs is the basic end and goal of all production activities in an economy. As we have learnt in Unit 1, human wants are unlimited and recurring in nature, whereas means available to satisfy them are limited. Therefore, a rational consumer has to make an optimal use of available resources. The demand and supply analysis provides a framework within which these decisions have to be made. Hence, in this unit we shall discuss the various issues related to the theory of demand and supply analysis.

2.2 THE NATURE OF DEMAND

At first, let us understand the meaning of the terms like desire, want, and demand. Desire is just a wish on the part of the consumer to possess a commodity. If the desire to possess a commodity is backed by the purchasing power and the consumer is also willing to buy that commodity, it becomes want. The demand, on the other hand is the wish of the consumer to get a definite quantity of a commodity **at a given price in the market** backed by a sufficient purchasing power. There are three important points to remember about the quantity demanded:

First, the quantity demanded is the quantity desired to be purchased. It is the desired purchase. The quantity actually bought is referred to as actual purchase.

Secondly, quantity demanded is always considered as a flow measured over a period of time, like if the quantity demanded of oranges is 10, it must be per day or per week, etc.

Thirdly, the quantity demanded will have an economic meaning only at a given price. For example, the demand for oranges equal to 10 units per week at a price of Rs. 100 per dozen is a full and meaningful statement, as used in micro-economic theory.

2.3 DETERMINANTS OF DEMAND

The demand of a product is determined by a number of factors. Let us discuss them in detail.

2.3.1 Determinants of Demand by a Consumer

The demand for commodity or the quantity demanded of a commodity on the part of the consumer is dependent on a number of factors. These are mentioned as follows:

i) Price of the commodity in question

ii) Prices of other related commodities

iii) Income of the consumers, and

iv) Taste of the consumers.

Demand function refers to the rule that shows how the quantity demanded depends upon above factors. A demand function can be shown as:

$$D_x = f(P_x, P_y, P_z, M, T)$$

where, D_x is quantity demanded of X commodity, P_x is the price of X commodity, P_y is the price of substitute commodity, P_z is price of a complement good, M stands for income, T is the taste of the consumer.

If all the factors influencing the demand for a commodity X vary simultaneously, the picture would be highly complicated. Therefore, normally we allow only one of the factors to change, assuming that all other factors remain unchanged ('ceteris paribus' other things remaining equal).

Demand Relationship: Relationship of quantity demanded of a commodity to its various determinants can be stated as follows:

1) **Price of the commodity:** Normally, higher the price of the commodity, the lower the demand of the commodity. This is the law of demand.

2) **Size of the consumer's income:** When the increase in income leads to an increase in the quantity demanded, the commodity is called a 'normal good'. If an increase in income leads to a fall in the quantity demanded, we call that commodity an 'inferior good'.

3) **Prices of other commodities:** A consumer's demand for a commodity may also be influenced by the prices of some other commodities. Some are complementary goods, which are consumed along with the commodity in question while others may be used in place of this commodity. This category is called substitutes.

   Demand bears inverse relationship with prices of complements and direct relationship with prices of substitutes.

   Tea and coffee are substitutes and a car and petrol are example of a pair of complementary goods.

4) **Tastes of consumer:** If a consumer has developed a taste for a particular commodity, he/she will demand more of that commodity. Similarly, if a consumer has changed his taste against a particular commodity, less of it will be demanded at any particular price. This development of tastes may be related to seasons of the year as well. In summer months, you may consume more cold drinks and ice creams, whereas in winters, the preference may shift towards hot or warm drinks like tea and coffee etc.

2.3.2 Determinants of Market Demand

The factors determining the demand for a commodity in a market are the same as those which determine the demand for the commodity on the part of a consumer. Besides that two additional factors are also to be included. These two factors are:

1) **Size of the population:** All other factors remaining unchanged, the greater is the size of the population, more of a commodity will be demanded.

2) **Income distribution:** People in different income groups show marked differences in their preferences. So if larger share out of national income goes to the rich, demand for the luxury goods may rise and a rise in income share of the poor will increase demand for the wage goods.

A correct specification of the demand equation is a must for the estimated function to predict demand accurately.

Check Your Progress 1

1) Distinguish between want and demand of a commodity.

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2) What are the determinants of demand of a commodity by an individual consumer?

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3) Explain the factors influencing the market demand of a commodity.

.....

.....

.....

2.4 THE LAW OF DEMAND

The inverse ralationship between the quantity of a commodity and its price, given all other factors that influence the demand is called 'law of demand'. It gives us a demand curve that slopes downwards to the right. We can explain this idea with help of a demand schedule, a table that records quantities demanded at different prices. This schedule, on being recorded on a two dimensional axes system, gives us a demand curve.

2.4.1 The Demand Schedule

Let us use imaginary figures to show the application of the law of demand. Table 2.1 given below, showing the application of the law of demand, is called the 'Demand Schedule'.

Table 2.1 : The Demand Schedule of a Consumer for Apples

Price of Apple per Kg. (in Rs.)	Quantity Demanded of Apples (in Kg. per week)
100	15
200	12
300	8
400	3

Four combinations of price and quantity demanded are shown in the Table 2.1. We can easily infer that as price of an apple rises quantity demanded by the consumer is falling.

2.4.2 The Demand Curve

The demand curve graphically shows the relationship between the quantity of a good that consumers are willing to buy and the price of the good. Let us understand the demand curve with the help of the Fig. 2.1. In this figure, on the Y-axis, price of an apple in rupees in measured and on the X-axis the quantity demanded of apples per week is measured. The first combination of Table 2.1 is shown by point a where at Rs. 100 per kg 15 units of apples are demanded. Similarly points b, c, d represent combinations of Rs. 200 price – 12 quantity demanded, Rs. 300 price – 8 quantity demanded and Rs. 400 price – 3 quantity demanded, respectively. The joining together of points a, b, c, and d give us the demand curve, DD.

Fig. 2.1

The most important feature of a demand curve is that it slopes downward from left to right. In Fig. 2.1 the demand curve is a straight line. But it can also be in the form of a curve as shown in Fig. 2.2.

Whether a demand curve is a straight line or a curve depends on how much quantity demanded rises with the fall of its price or how much quantity demanded falls with the rise in the price of the commodity. Whether we take Fig. 2.1 or 2.2, in both the cases the law of demand is applicable.

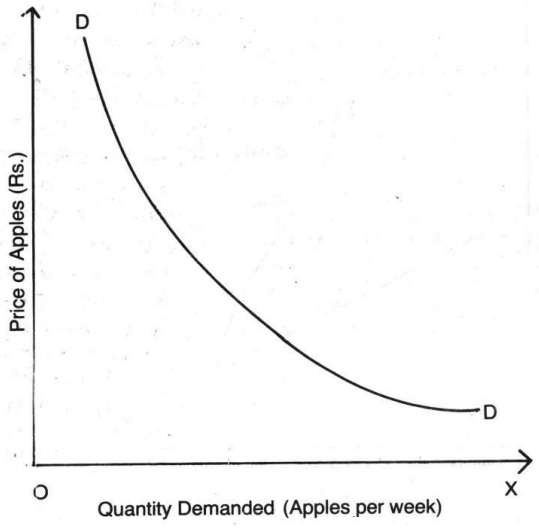

Fig. 2.2

If we record demand schedules of two or more consumers of a commodity on the same axes, we can get a number of demand curves. Horizontal summation of those curves gives us the market demand curve. We are illustrating a two consumer market demand curve for ice cream with help of the following schedule and diagram:

Table 2.2

Price (Rs)	Quantity Demanded by			Market Demand
	Household A		Household B	
3	4	+	5	=9
4	3	+	4	=7
5	2	+	3	=5
6	1	+	2	=3

Market demand curve is a horizontal summation of individual demand curves, as illustrated below.

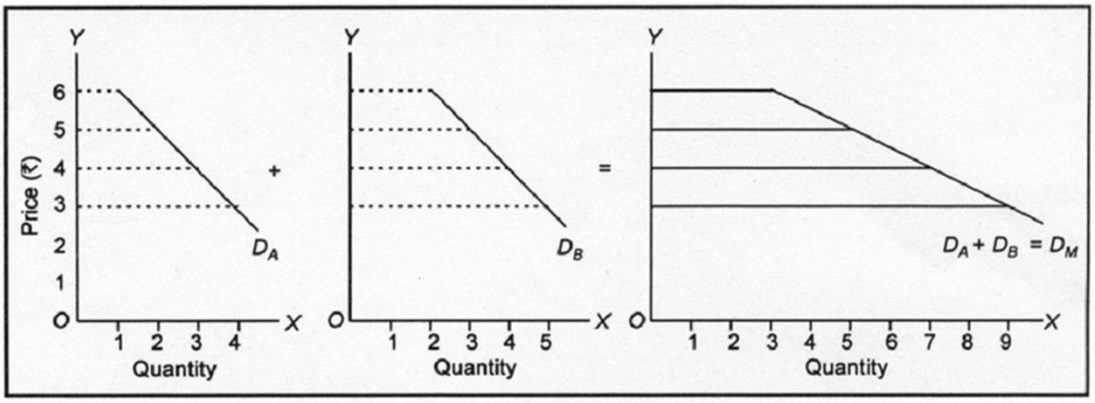

Fig. 2.3

2.4.3 Why does a Demand Curve Slope Downwards?

Law of demand states that there is an inverse relationship between the price of a commodity and its quantity demanded.

1) **Substitution Effect**

Substitution effect results from a change in the relative price of a commodity. Suppose a Pepsi Can and a Coke Can both are priced at Rs. 90 and Rs. 20 each. If the price of Coke is raised to Rs. 25, and the price of Pepsi is not changed, Pepsi will become relatively cheaper to Coke, i.e. although the absolute price of Pepsi has not changed, the relative price of Pepsi has gone down. The change in the relative price of commodity causes substitution effect.

Similarly, if price of mango falls, the rest of the fruits will appear costlier, in comparison with mango.

So in both the cases above, the quantity demanded of relatively costlier items will register a decline.

2) **Income Effect**

This is the effect of a change in total purchasing power of the money income of the consumer. As price of mango falls the purchasing power of the given money income rises, or his real income rises. Thus, he can buy more of the mangoes with the same money income. His demand for any other commodities may also rise. This is called the **'income effect'**. A commodity with positive income effect is called a 'normal good'. It shows a positive or direct relationship between the income and the quantity demanded.

When rise in income leads to a fall in the quantity demanded, we have a case of **negative income effect**. Such goods are called the **'inferior goods'.**

3) **Price Effect**

Price Effect is the sum total of the substitution effect and income effect, i.e.

PE = SE + IE

Where PE = Price Effect.
SE = Substitution Effect
IE = Income Effect

It is important to note that substitution effect and income effect **operate simultaneously** with the change in the price of the commodity. **'Substitution effect',** and **'income effect'** taken together give 'price effect.' We can identify three cases.

1) Substitution effect always operates in a manner such that as price falls, quantity demanded of this commodity increases. If along with substitution effect, we take income effect and if that happens to be positive (a case of normal commodity) the law of demand will necessarily apply.

2) Given substitution effect, if income effect is negative (a case of an 'inferior commodity') the law of demand can still apply provided the substitution effect outweighs or is more powerful than the negative income effect, and

3) Given substitution effect, if income effect is negative and it outweighs or is more powerful than the substitution effect, the law of demand will not hold good.

GIFFEN GOOD

A case where negative income effect outweighs substitution effect is possible when we have 'Giffen good' named after the Robert Giffen who first talked of such paradox. Here a fall in the price of a commodity does not lead to a rise in its demand, it may result in a fall in demand for this commodity.

2.5 CHANGE IN QUANTITY DEMANDED Vs. CHANGE IN DEMAND

When the demand for a commodity changes because of the change in its price, it is called 'change in quantity demanded'. On the other hand, when the change in demand is due to the factors other than its price cause a change it is called 'change in demand'.

Expansion and Contraction in Demand

The change in quantity demanded of a commodity is called the expansion in demand if a fall in the price causes the quantity demanded to rises. Conversely, if with a rise in the price of a commodity, its quantity demand falls, we call it contraction in demand. These can be represented in the form of a movement on a demand curve, as shown in Fig. 2.4.

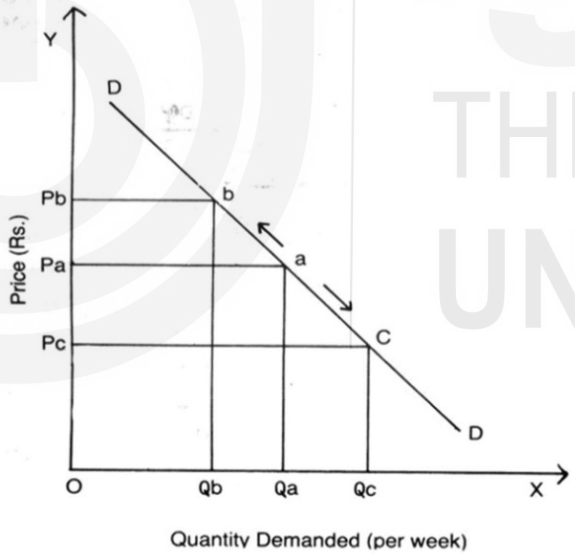

Fig. 2.4

DD is the demand curve. At point 'a' on the demand curve we find that at price OP_a, OQ_a of a commodity is demanded. As price falls to OP_c, demand becomes OQ_c. This movement from point a to point c on the demand curve DD is referred to as 'extension in demand'. Similarly when price of a commodity rises to OP_b, demand falls to OQ_b. Thus, the movement from a to b on the demand curve DD is known as 'contraction in demand'.

Change in Demand

Change in demand takes place when the whole demand scenario undergoes a change. This change occurs due to a change in any determinant of demand

other than the price of that commodity.

Change in demand may take two forms:

i) Increase in demand, and (ii) Decrease in demand

Increase in demand takes place when;

a) at a given price, higher quantity is demanded, or

b) at a higher price, the same quantity is demanded

Decrease in demand takes place when:

a) at a given price, lower quantity is demanded, or

b) at a lower price, the same quantity is demanded

Graphically, increase in demand results in rightward shift of the whole demand curve. Likewise, decrease in demand results in leftward shift of the demand curve. This is shown in the Fig. 2.5.

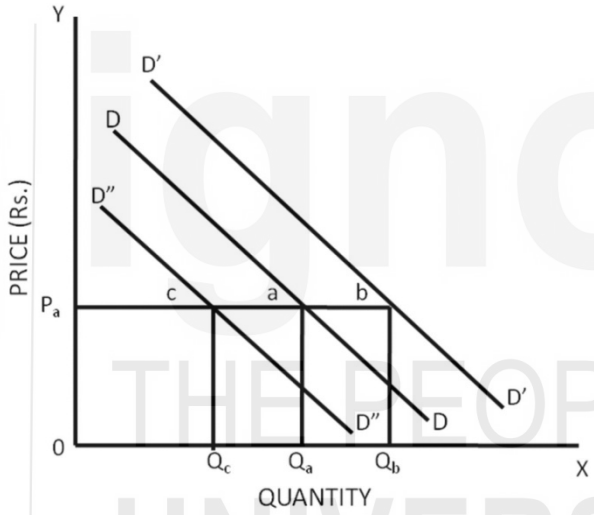

Fig. 2.5

At price P_a, at point 'a' on DD, quantity demanded is OQ_a. At the same price, quantity demanded rises to OQ_b at point b on the demand curve D'D'. This is called 'increase in demand'. Similarly, at price OP_a the quantity demanded comes down to OQ_c on point 'c' of demand curve D"D". This change in quantity demanded is 'decrease in demand'. The shift of the demand curve to the right shows 'increase in demand' and a movement of the demand curve to the left of the initial demand curve is a 'decrease in demand'.

Many factors can shift a demand curve. Some of them are:

1) A rise in income of the consumer can enables him to demand more of a commodity at a given price and a fall in income will generally force him to curtail his demand.

2) A rightward shift in the demand curve can also take place because of increase in price of a substitute. Similarly, a leftward shift in the demand curve can be because of decrease in price of a substitute.

3) If the consumer develops a taste for a commodity, he may demand more of it even if the price remains unchanged, shifting the demand curve to the right. On the other hand, a leftward shift in the demand curve can indicate that our consumer has started disliking the commodity.

Check Your Progress 2

1) Given the demand function

   $q = 90 - 3P$

   i) at what price, no one will be willing to buy any commodity?

   .....

   .....

   ii) what will be the quantity demanded, if the commodity is given free.

   .....

   .....

2) State the law of demand. Does it apply to all the goods?

   .....

   .....

   .....

3) What is substitution effect?

   .....

   .....

   .....

4) Substitution effect + Income effect = Price effect. Is it always true?

   .....

   .....

   .....

5) Does a change in taste leads to a movement along the demand curve?

   .....

   .....

   .....

2.6 THE CONCEPT OF SUPPLY

Supply refers to the quantity of a commodity that producers are willing to sell at different prices per unit of time. Just like demand, the word supply also has some distinguishing features which are given below.

1) The supply of a commodity indicates the offered quantities. In fact, current supply can be different from current production, the difference is accounted for by the changes in the inventories or the stocks.

2) Like the demand, the supply is also with reference to the price at which that quantity is supplied. If the price is not mentioned, our statement would not carry any economic meaning.

3) The supply is a flow. It has a time unit attached therewith. The supply has to be per day/week or month.

Formally, supply of a commodity refers to the quantity that a producer is willing to sell at different prices.

2.6.1 Determinants of Supply

Some of the important determinants of supply are as follows:

1) **Price of the commodity supplied:** The price is most immediate determinant of supply. A person or firm will make quick check whether the costs will be covered by the price. As the price goes up, a firm/person will be willing to sell larger quantity.

2) **The prices of factors of production or cost of production:** These affect the cost of production and possible profits of the firm. A rise in the prices of factors of production discourages the production and supply of the commodity.

3) **Prices of other goods:** As the prices of other commodities rise, they become more attractive to produce for a profit maximising firm. Hence supply of commodity whose price is unchanged will decline.

4) **The state of technology:** The improvement in the knowledge about the means and the methods of production lead to lower costs of production and helps increasing output.

5) **Goals of the producer:** The objective with which the producer undertakes production also influences his production and supply decisions.

A simultaneous change in all the determinants makes analysis difficult. Therefore, we talk of a change in only one of the factors, others remaining unchanged to work out effect of that factor on the quantity of the commodity supplied by a firm.

2.7 THE LAW OF SUPPLY

A producer aims to maximise profits, the difference between total revenue and total cost. Total revenue is the price of the product multiplied by its quantity sold. Total cost is the cost of production.

$$\text{Profit} = TR - TC$$

$$TR = \text{Total Revenue } (q.p)$$

$$TC = \text{Total Cost } (q.AC)$$

where AC is average cost.

A higher price would mean more profits. The producer will supply more at a higher price. Similarly, a producer will supply smaller quantity at a lower price. This is a direct relationship between the price and the quantity supplied of a commodity and is called the 'Law of Supply'.

Here the change in price is the cause and change in supply is the effect. Thus, the supply function is:

$$S = f(P)$$

The supply of a commodity is a function of its price, the price of all other commodities, the prices of factors of production, technology, the objectives of producers and other factors remaining unchanged. So:

$$Q_s = f(P_1, P_2, P_3 ... P_n, F_1 ... F_a, T, G, ...)$$

Where Q_s stands for the quantity of the commodity supplied;

P_1 is the price of that commodity, P_2, $P_3 ... P_a$ are the prices of other commodities;

F_1 …… F_n are the prices of all factors of production;

T is the state of technology;

G is the goal of the producer.

2.7.1 The Supply Schedule

A supply schedule shows quantities of a commodity that a seller is willing to supply, per unit of time, at each price, assuming other factors remaining constant. A supply schedule of a product based on imaginary data is given in Table 2.3 illustrating the relationship between price and quantity supplied as given by the law of supply.

Table 2.3: Supply Schedule of a Pen Producer

Price (in Rs) per Pen	Quantity Supplied (in thousand) per Month
2	25
3	40
4	50
5	60
6	70

The schedule presented in Table 2.3 shows that at Rs. 2 per pen, the producer is willing to supply 25 thousand pens per month. At a higher price of Rs. 3 per pen, he is willing to supply 40 thousand pens per month and so on. This schedule depicts direct relationship between price per pen and quantity supplied of pens per month.

2.7.2 The Supply Curve

Look at Fig. 2.6 where the data from Table 2.3 has been plotted. Here price is plotted on the Y-axis and quantity supplied on X-axis.

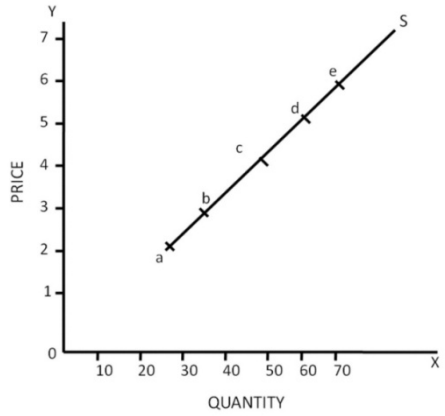

Fig. 2.6 : Supply Curve

Fig. 2.6 shows that point labelled a, for example, gives the same information that is given on the first row of the table; when the price of pens is Rs. 2 per pen, 25,000 pens per month are offered for sale. Similarly, points b, c, d, and e on the graph correspond to row 3rd, 4th, 5th and 6th of Table 2.3 respectively.

The supply curve S is a smooth curve drawn through the five points a, b, c, d and e. This curve shows the quantity of pens offered for sale at each price.

The supply curve (just like a demand curve) can be linear straight line, or in the shape of an upward slopping curve convex downwards.

The upward slope of the supply curve indicates that higher the price, the greater the quantity will be supplied. If the supply curve is extended to the Y-axis, it may or may not pass through O. If it passes through O, it shows that the quantity supplied is zero when the price is zero. If it does not pass through zero, it shows that until the price rises up to a certain point, the quantity supplied will remain zero. Re. 1 can be such a price. The producer will not offer any quantity for sale if price is Re. 1 or less. The upward sloping supply curve is just a diagrammatic representation of the law of supply.

2.7.3 Exceptions to the Law of Supply

Generally speaking, the law of supply indicates a direct relation between the price and the quantity supplied. But there can be some exceptions to the law of supply such as:

Non-maximisation of profits: In some cases the enterprise may not be pursuing the goal of maximisation of profits. In that case, the quantity supplied may increase even when price does not rise. For example, if the firm wants to maximise sales, it may sell larger quantities even when the price remains unchanged.

A multiproduct firm may aim at maximising total profits, rather than profit from each of the line of production. So, the law of supply may not apply for each product.

Factors other than price not remaining constant: We may notice that factors other than the price of the product may not remain constant. For example, the quantity supplied of a commodity may fall at a given price if prices of other commodities show a tendency to rise. The change in technology can also bring about a change in the quantity supplied of a commodity even if the price of that commodity does not undergo a change.

Check Your Progress 3

1) Producers supply more at a higher price. Why?

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2) Why does a supply curve usually slope upwards to the right?

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2.8 CHANGES IN SUPPLY VERSUS CHANGES IN QUANTITY SUPPLIED

2.8.1 Changes in Quantity Supplied

Just as we saw for the demand, there can be changes in the quantity offered for sale due to changes in the price of the commodity only, all other factors remaining constant. This is termed as change in quantity supplied. The change in quantity supplied can be of two types,

1) When the price of a commodity falls and its quantity supplied falls. It is termed as 'contraction of supply'.

2) When the price of a commodity rises and its quantity supplied rises, provided the law of supply applies, it is termed as "extension of supply".

The contraction, and 'extension' of supply has been shown in Fig. 2.7 below.

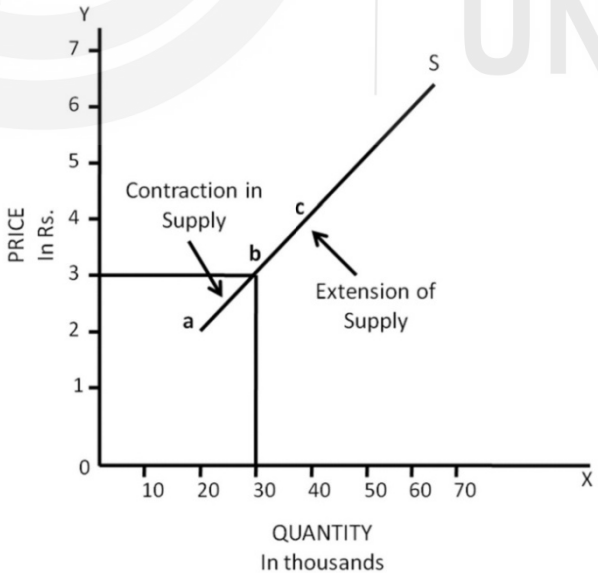

Fig. 2.7 : Supply Curve

Start with point b on the supply curve at which price per pen is Rs. 3 and quantity supplied is 30,000 pens. As price per pen falls to Rs. 2, the quantity supplied falls to 20,000. This is contraction of supply. When price of pen rises to Rs. 4, the quantity supplied rises to 40,000. This is extension of supply.

On the graph it is the movement from b to a on the supply curve which represents 'contraction of supply'. Similarly, the movement from b to c on the curve represents 'extension of supply'.

2.8.2 Change in Supply

If supply of a commodity undergoes a change because of changes in factors other than the price of the commodity, we call this change in supply. It is usually shown by a shift in the position of the supply curve.

Change in supply can be of two types:

A decrease in supply: When the quantity of a commodity supplied declines, at the same price it is referred to as a 'decrease in supply'. It implies a leftward shift of the supply curve.

An increase in supply: When the quantity of a commodity supplied increases, at the same price, it is known as an increase in supply. This is shown by a rightward shift in the supply curve.

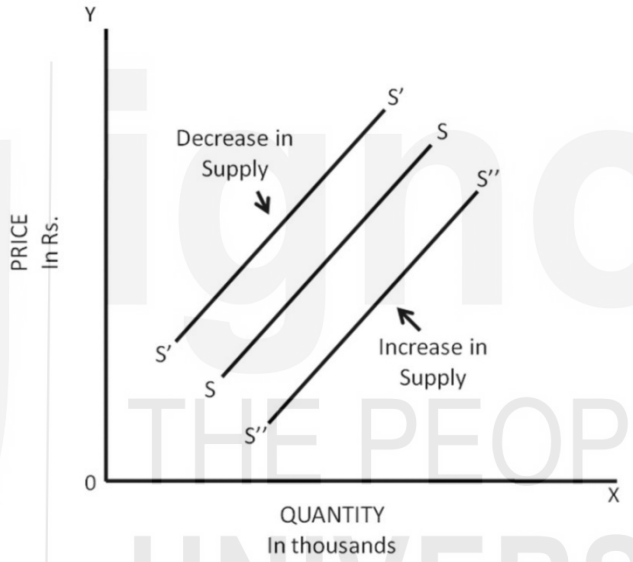

Fig. 2.8: Shifts in Supply Curve

In short, a rise in supply implies a rightward shift of the supply curve showing that producers are willing to supply more at each price. A fall in supply, on the other hand, implies a leftward shift of the supply curve indicating that producers are willing to supply less at each price.

2.8.3 Why the Supply Curve Shifts?

The reasons for the change in supply (both increase and decrease in supply) are:

1) **Change in the prices of other commodities:** A decrease in the prices of other commodities increases the supply of the commodity in question at each price because relative profits from supplying other products fall. An increase in the prices of other commodities decreases the supply of the commodity in question at each price.

2) **Change in the prices of factors of production:** An increase in the prices of factors of production used in producing the commodity tends to reduce the supply of the commodity as the cost of production rises but the price is given. Conversely, a decrease in the price of factors of production used

in making a commodity leads to an increase in supply, at each price.

3) **Change in technology:** An improvement in technology normally leads to a fall in cost of production and given the price of the product, a producer tends to produce more of that commodity, at each price. Conversely, loss in technical knowledge (the chances of which are meager) leads to a fall in supply.

4) **Change or expectation of change in other factors:** Sometimes, supply of a commodity may change because of the change in or expectation of a change in government policies, taxes or rate of interest, fear of war, inequalities of income and wealth which influence the demand pattern. This will affect supply through expectations of the producer about the profits.

Check Your Progress 4

1) How do you interpret a right shift of a supply curve?

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2) Effects of factors other than the own price are shown by a shift of entire supply curve. Why?

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3) Distinguish between an 'increase' in supply and an 'extension' of supply.

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4) How does a contraction of supply differ from a decrease in supply?

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2.9 THE IDEA OF ELASTICITY

In Sections 2.4 to 2.8, we have studied impact of changes in determinant variables on the demand and supply. We examined, in particular, impact of own price, prices of related goods and income of the consumer on demand for a commodity. Likewise, we tried to explore impact of a change in own price, prices of factors of production etc. on the supply of a commodity. The above analysis underlined only one aspect: a change in a determinant leads to a change in the determined variable. We still do not know how strong the impact is. We still cannot say that how much change in, say, demand for oranges (or in

supply of) will be if their price increased by 10 per cent. This situation makes it difficult to talk about the possible effects of the policy changes. In fact, an assessment of relative strength of the impacts of different determinants is also not possible. To this end, we use 'the idea of elasticity'.

The elasticity of a variable X with respect to some other variable Y shows responsiveness or sensitivity of X to changes in Y. the elasticity of X with respect to Y is defined as the ratio of per cent change in X to per cent change in Y. Symbolically:

$$E_{XY} = \frac{\text{Per cent change in X}}{\text{Per cent change in Y}}$$

We can also write it as:

$$E_{XY} = \frac{\Delta X/X}{\Delta Y/Y}$$

So the elasticity of demand for (or supply of) oranges with respect to a change in their price will be:

$$E_{q,p} = \frac{\Delta Q/Q}{\Delta P/P}$$

Where Q represents quantity of oranges and P represents their price.

If we show two commodities by symbols X and Y, their respective quantities and prices by Q_x & Q_y and P_x & P_y we can write down the expression for the cross elasticity of demand for X with respect to a change in the price of commodity Y:

$$E_{X,Y} = \frac{\Delta Q_X/Q_X}{\Delta P_Y/P_Y}$$

Similarly, We can write expression for income elasticity of demand:

$$E_{X,M} = \frac{\Delta Q_X/Q_X}{\Delta M/M}$$

Where M shows the income of the consumer.

2.9.1 Elasticity of Demand

We can use different diagrams to depict the demand curves and their elasticities.

The demand curve with Zero elasticity is depicted in Fig. 2.9. Here a change in price has no impact on the quantity demanded. Such a commodity is, sometimes, called an absolute necessity.

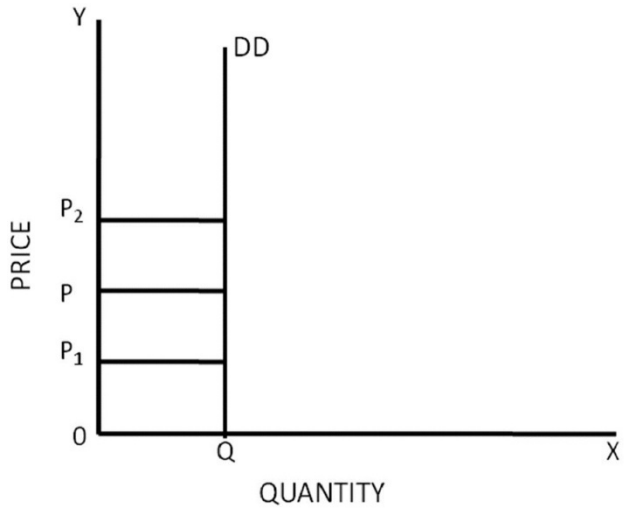

Fig. 2.9: Demand curve with zero elasticity

The Fig. 2.10 shows a demand curve which is infinitely elastic. In such a situation, a very small fall in price can lead to an extremely large increase in quantity demanded.

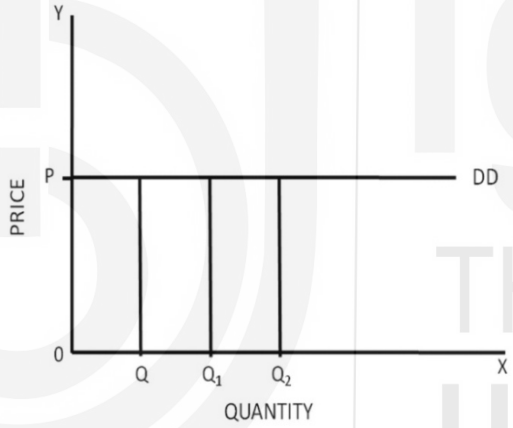

Fig. 2.10 : Infinite Elasticity of Demand

For a straight line demand curve falling to the right, elasticity of demand at any point on the curve is given by the ratio of the lower segment to the upper segment. Fig. 2.11, the elasticity will be:

$$E = (-) BE/EA$$

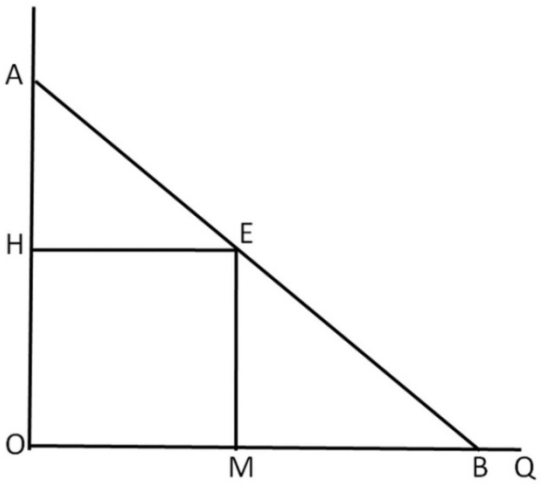

Fig. 2.11

A Proof: Initial price was OH and quantity demanded was OM. The price rises to OA. At this price, the consumer does not demand any quantity of the good. So, new demand is zero. Using this information in the formula for elasticity we get:

E = (Change in quantity/ original quantity)/(change in price/ original price)

= (OM/OM) / {(OA – OH) / OH} = 1/ (HA/OH) = OH/HA.

Now consider right angled triangle AOB. Line HE is parallel to base OB. Therefore it divides perpendicular and the hypotenuse in equal proportions. Therefore:

OH/HA = BE /EA

That means elasticity at point E on the demand curve AB equals ratio of lower segment BE to the upper segment EA.

We can depict a special type of demand curve which has elasticity equal to unity at every point. Such a demand function is shown using a rectangular hyperbola, a curve which shows constant area under the curve at every point on the curve. The Fig. 2.12 is such a demand curve.

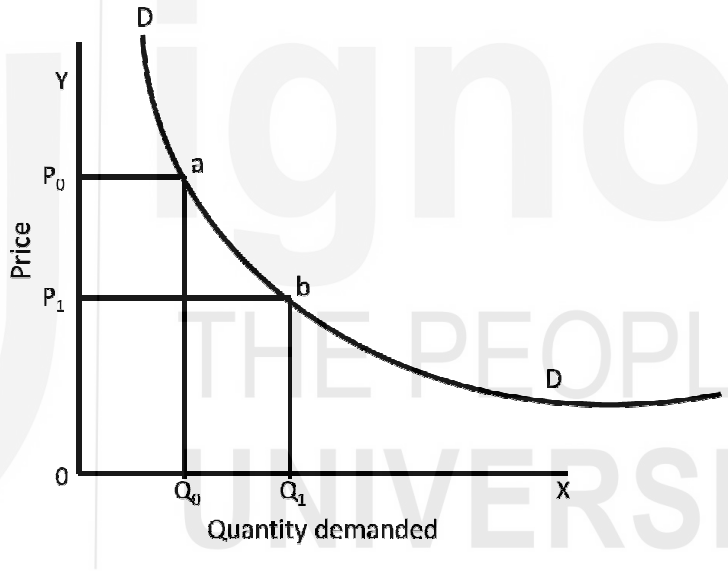

Fig. 2.12: Demand curve with unitary elasticity

We can, likewise, show supply curves with zero, unitary, infinite and variable elasticity.

2.9.2 Elasticity of Supply

A supply curve with zero elasticity is a vertical straight line, just like the perfectly inelastic demand curve.

A straight line supply curve passing through the origin will have unitary elasticity throughout.

A straight line supply curve running parallel to the quantity axis will have infinite elasticity. This too is similar to the case of demand curve.

A straight line supply curve that intersects price axis will have elasticity greater than one at all points in the 1st quadrant.

A straight line demand curve that intersects quantity axis in 1st quadrant has elasticity less than one.

We can make a general observation about the supply curves involving the above characteristics. For a straight line supply function shown in Fig. 2.13, elasticity of supply at a point E can be determined in this manner: drop a perpendicular EM from E to the quantity axis. Extend the supply line to meet the quantity axis in point K. Then:

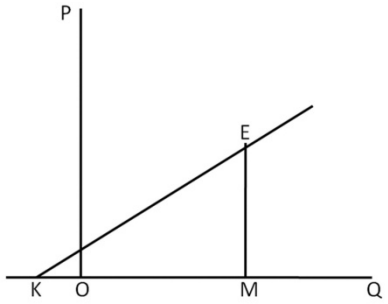

Fig. 2.13: Elasticity of supply at point E

$E_s = KM/OM$

If supply line passes through origin, point K will coincide with O. Therefore, the ratio KM/OM will be equal to unity (KM = OM). If the supply line intersects quantity axis in the 1st quadrant, elasticity will be less than one as KM < OM. In the Fig. 2.13, the supply line cuts quantity axis in 2nd quadrant. Therefore, KM> OM. Hence elasticity is greater than one.

2.10 MEASUREMENT OF PRICE ELASTICITY OF DEMAND

There are a number of methods to measure price elasticity of demand. Some of the important methods are as follows:

1) **Point Method:** Also known as the percentage method (as discussed above), the main point to remember about this method is that it is employed only when the changes in price and quantity demanded are very small.

2) **Total Expenditure Method:** This total outlay method to measure price elasticity of demand is used whenever the changes in price and demand are not small. But it only helps us to distinguish three situations (i) whether the price elasticity of demand is one or unity, (ii) whether the price elasticity of demand is more than one, and (iii) whether the price elasticity of demand is less than one. Here the elasticity is measured by ratio P_1Q_1/P_0Q_0.

$E = (P_1Q_1) / (P_0Q_0)$

Where initial and after change price and quantity are indicated by subscript 0 and 1 respectively

3) **Geometrical Method:** According to this method, elasticity of demand is different at different points on a given demand curve, and is measured as follows on any point of a straight line curve.

$$E_p = \frac{\text{Lower segment of the demand curve}}{\text{Upper segment of the demand curve}}$$

2.11 DETERMINANTS OF PRICE ELASTICITY OF DEMAND

The price elasticity of demand for a commodity depends on these important factors:

1) **Nature of the Commodity:** The commodities are divided into three categories (i) necessities, (ii) comforts, and (iii) luxuries. Price elasticity of demand will be less for the necessities. We know a rise in the price of salt will not be able to force people to reduce their consumption. As luxuries are purchased by people with high income their demand also does not change much with change in price.

2) **Number of Substitutes:** If a good's substitutes are easily available, price elasticity of demand will be high.

3) **Number of uses of a commodity:** The greater the number of possible uses of a commodity, the greater its price elasticity of demand will be.

4) **Price level of a commodity:** The level of price will also have an impact on price elasticity of demand. A commodity priced high will have higher elasticity of demand and a low priced commodity will have lower elasticity (This idea becomes clearer when you revisit Fig. 3.12).

Importance of Elasticity of Demand

The price elasticity of demand is very important in a number of policy decisions regarding individual commodity markets. Some of the important fields where price elasticity of demand is important are:

1) **Price fixation by a monopolist:** The monopolist is always interested in charging a higher price. If he comes to know that the price elasticity for a commodity is low, he would fix up a higher price for that commodity. He would not be able to charge a very high price for a commodity whose price elasticity of demand is relatively higher.

2) **Price support programme of the government:** A good harvest, because of better monsoon can lead to a big fall in agricultural prices as elasticity of demand is rather low. To protect the farmer's interests, the government announces a price support programme and the price of the commodity is not allowed to fall below a particular level. Obviously, this creates a situation of excess supply and the government has to lift the excess supply from the market.

Similarly, a poor harvest can raise the price. Here to protect the interest of the consumer, the government can announce a 'price ceiling' and releases stock from its own warehouses or imports to meet the excess demand in the market.

Check Your Progress 5

1) Income elasticity is positive for normal goods only. Explain.

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2) Do you agree with the statement that 'The sign of coefficient of cross elasticity depends on whether the commodity is a complement or a substitute'. Give reasons.

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2.12 DETERMINANTS OF ELASTICITY OF SUPPLY

Elasticity of supply depends on a number of factors and all these factors are to be taken together before one can comment on the elasticity of supply of a commodity. Some of the important determinants of elasticity of supply are given as follows:

1) **Behaviour of costs as output varies:** As output of a commodity rises total cost do rise, normally, at a falling rate in the beginning, then at a constant rate and finally at a rising rate. If cost of production rises rapidly as output rises, then a rise in price will not induce a big rise in supplies.

2) **Nature of the commodity:** Perishable products cannot be stored for long and thus, their supply does not respond very much to the price changes. Durable products can be stored and their supply responds to the price changes.

3) **Time:** In the short-run, supply of a commodity is less elastic, but in the long run, the size of the plant can be changed supply responds to the price changes. Hence, supply can be more elastic.

4) **Price expectations:** If the producers expect that prices in the future will be maintained above particular level, they may produce more. If they expect prices to rise in the future, they may hold more stocks and may supply lesser quantities in the market. Supply in such a case will be inelastic. If the prices are expected to fall in the future, supply will be more elastic.

2.13 LET US SUM UP

The demand refers to the wish on the part of the consumer to buy a commodity in the market at a given price backed by the sufficient purchasing power. The price of the commodity in question, prices of other related commodities, income and taste of the consumers determine the demand for consumer.

Supply refers to the quantity a firm is willing to sell at a given price in every time period. In addition to the own price, supply of a commodity depends on prices of related goods and the factors of production as well. State of technology is another important determinant of supply.

Elasticity is the responsiveness of quantity demanded (supplied) to given changes in own price or prices of other related goods. In case of demand, it can be with respect to income as well. Elasticity can be measured by way of point

method, outlay method or geometrical method. Nature of the commodity, number of substitutes, number of uses of a commodity and price level of the commodity are among important determinants of price elasticity. Elasticities of demand and supply play an important role in price fixation by a monopolist, price support programme of the government and in determination of incidence of indirect tax.

2.14 REFERENCES

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2) Stiglitz, J.E. and Carl E. Walsh, *Economics, viva Books*, New Delhi, 2014.

3) Hal R. Varian, *Intermediate Microeconomics: a Modern Approach, 8th edition*, W.W.Norton and Company/ Affiliated East-West Press (India), 2010.

2.15 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) See Section 2.2

2) See Sub-section 2.3.1

3) Size of the population, Income distribution.

Check Your Progress 2

1) i) Rs. 30

   ii) q = 90

2) See Section 2.4

3) See Section 2.4

4) Yes

5) No

Check Your Progress 3

1) See Section 2.6

2) See Sub-section 2.7.2

Check Your Progress 4

1) See Sub-section 2.8.2

2) See Sub-section 2.8.3

3) See Section 2.8

4) See Sub-section 2.8.1 & 2.8.2

Check Your Progress 5

1) See Section 2.9

2) See Section 2.9

2.16 TERMINAL QUESTIONS

1) Explain the main determinants of demand for a commodity in the market.

2) Explain the law of demand with the help of a demand schedule and a demand curve.

3) Explain the exceptions to the Law of demand using the distinction between substitution and income effects.

4) Distinguish between an inferior good and a Giffen good.

5) What uses can be made by the government of the law of demand in deciding about the price policy and tax cum subsidy policy.

6) What is law of supply? Explain with help of a suitable example.

7) Explain the circumstances where the law of supply may not hold.

UNIT 3 DEMAND AND SUPPLY IN PRACTICE

Structure

3.0 OBJECTIVES

After going through this unit, you will be able to :

- appreciate how market price and quantity are determined;
- evaluate the impact of price controls, minimum wages, price support and arbitrage on price and quantity;
- determine how the taxes and subsidies affect consumers and producers; and
- appreciate the usefulness of economic theory in our day to day life.

3.1 INTRODUCTION

Demand and supply curves are used to describe the market mechanisms. These two market forces by way of equilibrium determine both the market price of a good and the total quantity produced/supplied. The level of price and the quantity depend on the particular characteristics of Demand and Supply. Variations in price and quantity over time depend on the ways in which supply and demand respond to other economic variables.

In this unit we will try to acquaint you with the usefulness of this analysis.

*Shri I.C. Dhingra, Rtd, Associate Professor, Shaheed Bhagat Singh College (University of Delhi), Delhi.

3.2 DETERMINATION OF EQUILIBRIUM

Equilibrium price is defined as the price at which the quantity demanded and quantity supplied are equal. Quantity demanded is an inverse function of price, while quantity supplied is a direct function of price. The two functions can be stated as follows:

$$q^d = 10 - 1P$$

and

$$q^s = 1P$$

Equilibrium price is the one at which the quantity demanded equals quantity supplied, i.e.,

$$q^d = q^s$$

or

$$10 - 1P = 1P$$

$$\therefore \quad P = 5$$

Equilibrium price is Rs. 5. At this price $q^d = q^s$ and $q^d = 5$ units. Thus, 5 units would be sold and purchased in the market at price Rs. 5.

Similarly, if we graphically represent these two functions as in Fig. 3.1, we find that the downward sloping demand curve intersects the upward sloping supply curve at E, forming what is known as the **Marshallian cross.**

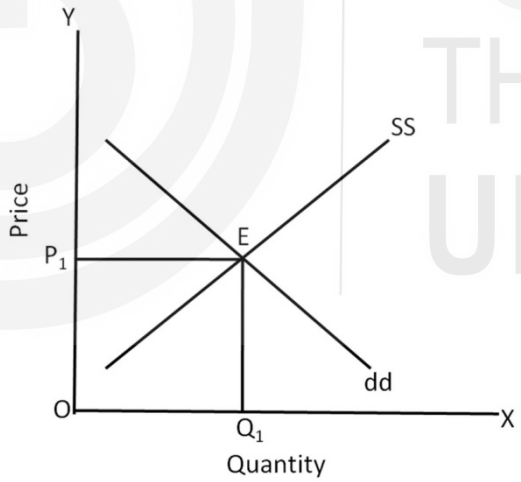

Fig. 3.1

In the equilibrium, OQ_1 quantity is sold and purchased at OP_1 price.

If, for any reason, the market price were to be less than the equilibrium price, say at OP_1, quantity demanded will be more than the quantity supplied, resulting in excess demand in the market, TW in Fig. 3.2. This will push the market price upwards, till the market price equals the equilibrium price.

Similarly, if the market price is more than the equilibrium price, the resultant excess supply, RS, will push the price downwards to OP_2. In short, we reach the following conclusions:

- All demand curves have negative slopes throughout their entire range.

- All supply curves have positive slopes throughout their entire range.
- Prices change if and only if, there is excess demand or excess supply.
- Prices rise, if there is excess demand and fall if there is excess supply.

In short, market price has a tendency to be equal to the equilibrium price. This is called **stable equilibrium.**

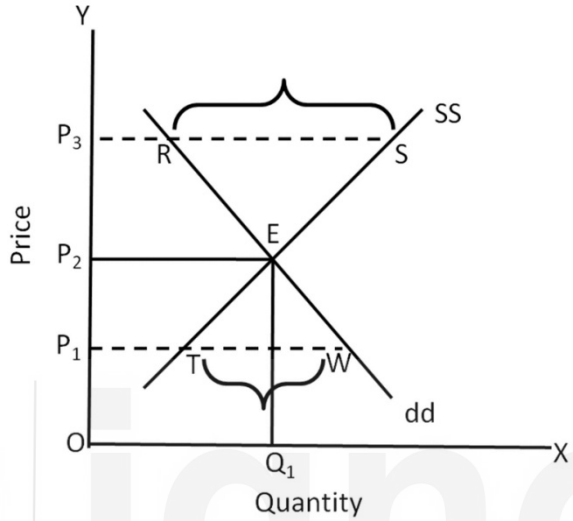

Fig. 3.2

The essential condition for stable equilibrium is that the demand curve should have a negative slope and the supply curve a positive slope. Otherwise, it will not be a stable equilibrium, this would be what can be called **unstable equilibrium.**

Let us illustrate the situation of unstable equilibrium with the help of Fig. 3.3.

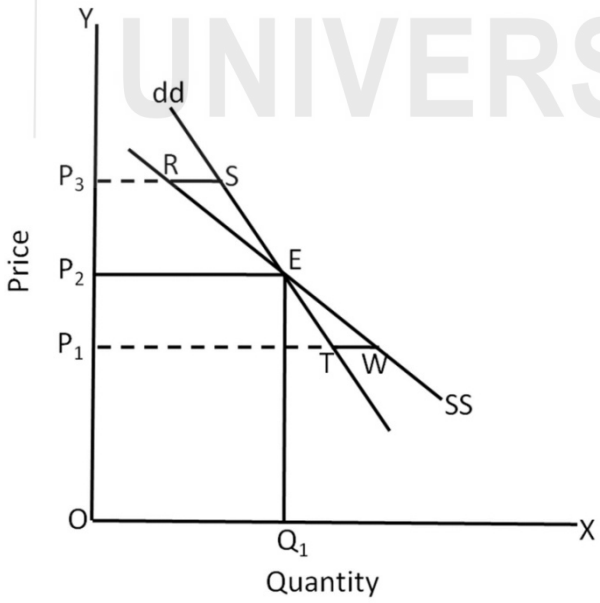

Fig. 3.3

We have plotted a negatively sloped demand curve and a negatively sloped supply curve. Equilibrium is determined at point E. If the market price were to fall to Op_1 quantity supplied > quantity demanded, and therefore the market price should fall further (rather than rise).

Similarly, if market price were to be Op_3, quantity supplied < quantity demanded, and hence the price should still rise further (rather than fall to back to equilibrium).

Thus, in this situation there is unstable equilibrium. The condition for stable equilibrium is that above the equilibrium point surplus must exist ($Q^s > Q^d$) and below the equilibrium point shortage must exist (Q^d, > Q^s). In case this condition is not fulfilled, we get unstable equilibrium.

Can there be a stable equilibrium when supply curve is downward sloping?

Yes, there can be a stable equilibrium even if supply curve is downward sloping. This is illustrated with the help of Fig. 3.4. At price Op_2, which is more than the equilibrium price Op_1 there exists surplus to the extent of SR, which creates competition among sellers, as such price falls to Op_1.

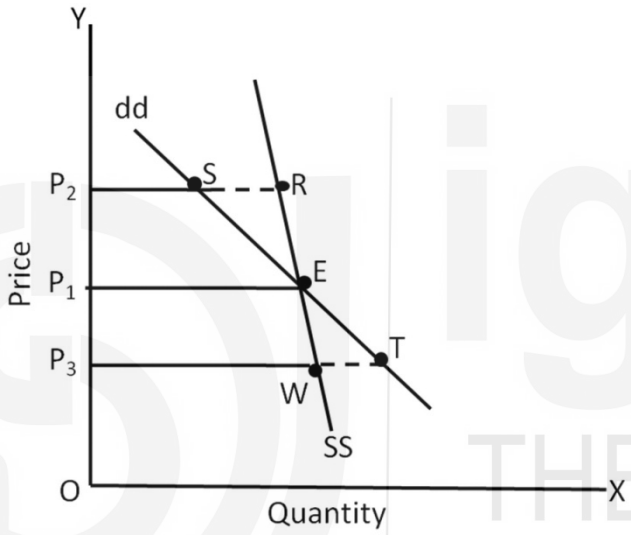

Fig. 3.4

At price Op_3, which is less than equilibrium price Op_1 there exists shortage to the tune of WT, which creates competition among buyers, this causes the price to increase to Op_1 Thus, we get stable equilibrium.

This is also known as the **Walrasian Equilibrium.** The Walrasian stability condition can be stated as follows:

Above the equilibrium price, the supply curve must be to the right of the demand curve; and below the equilibrium price, the supply curve must be to the left of the demand curve.

It would be seen that whereas the Marshallian adjustment process works through a change in quantities, the Walrasian adjustment process works through a change in price.

3.3 EFFECTS OF SHIFT IN DEMAND AND SUPPLY ON EQUILIBRIUM

In the method of comparative statics we start from a position of equilibrium and then introduce the change to be studied. The new equilibrium position is determined and compared with the original one. The differences between the

two positions of equilibrium must result from the change that was introduced, by keeping everything else as constant.

1) **Shift in Demand Curve**

A shift in demand curve (the supply curve remaining unchanged) will affect the equilibrium price and equilibrium quantity, as shown in Fig. 3.5.

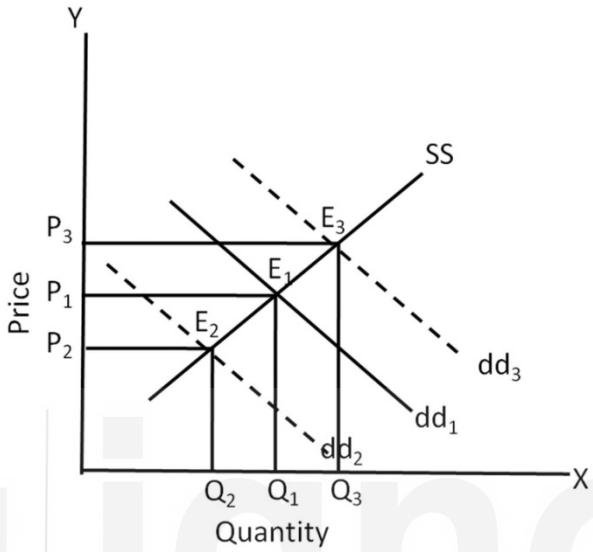

Fig. 3.5

An increase in demand would result in:

- an increase in the equilibrium price
- an increase in the equilibrium quantity.

Conversely, a decrease in demand would result in:

- a decrease in the equilibrium price
- a decrease in the equilibrium quantity.

2) **Shift in Supply Curve**

A shift in supply curve (the demand curve remaining unchanged) will also affect both, the equilibrium price and equilibrium quantity, as shown in Fig. 3.6.

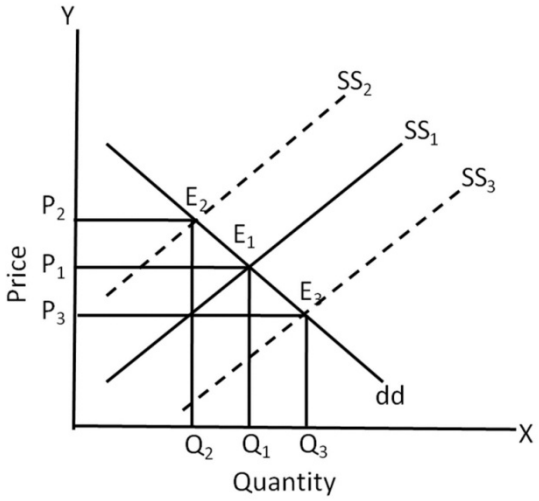

Fig. 3.6

An increase in supply would result in:

- a fall in the equilibrium price
- an increase in the equilibrium quantity.

A decrease in supply would result in:

- a rise in the equilibrium price
- a fall in the equilibrium quantity.

3) **Simultaneous Shift**

We may also examine if both demand and supply curves shift simultaneously. The combined result would be determined as we have analysed above.

The net result would depend upon the relative change in demand and supply.

The various results can be briefly summarised as follows:

When one of the demand or supply curves shifts, the effect on both the price (P) and quantity (Q) can be determined:

- An increase in demand (a shift rightward in the demand curve) raises P and increases Q.
- A decrease in demand (a shift leftward in the demand curve) lowers P and decreases Q.
- An increase in supply (a shift rightward in the supply curve) lowers P and increases Q.

When both the demand and supply curves shift the effect on the price or the quantity can be determined but without information about the relativity of the shifts, the effect on the other variable is ambiguous.

- If both the demand and supply curves increase (shift rightward), the quantity increases but the price may rise, fall or remain the same.
- If the demand decreases (shifts leftward) and the supply increases (shifts rightward) the price falls but the quantity may increase, decrease, or not change.

3.3.1 Determination of Equilibrium: A Mathematical Presentation

We begin with a simple numerical example:

$$q^d = 100 - 2p \quad (1)$$

$$q^s = 3p \quad (2)$$

$$q^d = q^s \quad (3)$$

We solve the system by substituting (1) and (2) into (3):

$$100 - 2p = 3p = 100 = 3P + 2P$$

or $5p = 100$

or $p = 20$

by putting P value in equation (1) we get,

$$q^d = 100 - 2(20)$$

$$q^d = 60$$

and $q^s = q^d = 60$

If we let the demand curve shift to the right so that 60 more units are bought at each price, (I) becomes

$$q^d = 160 - 2p \quad (1')$$

Substituting (1') and (2) into (3) yields $p = 32$ and $q^d = q^s = 96$.

In this manner we could solve the equations every time.

Algebra allows us, however, to find the solution to any linear demand supply system. To do this, we substitute letters, called **parameters**, for the numbers in the above system:

$$q^d = a + bp,\ a > 0,\ b < 0 \quad (4)$$

$$q^s = c + dp,\ c < a,\ d > 0 \quad (5)$$

$$q^d = q^s \quad (6)$$

The restrictions on the parameters ensure that a positive amount is demanded at a zero price ($a > 0$), that the demand curve has a negative slope ($b < 0$), and the supply curve has a positive slope ($d > 0$). The restriction on c is a little more complex. If c is less than zero a positive price is required to call forth any supply. If c exceeds zero, some amount is supplied at a zero price. In that case, we need less to be supplied than demanded at a zero price ($a > c$) if we are to get a positive equilibrium price. If $c > a$, supply exceeds demand at a zero price and the linear model solves for a negative price.

To avoid this, we need the added condition that $p = 0$ whenever $c > a$.

Once again, we solve by substituting the equations (4) and (5) into (6). This gives

$$a + bp = c + dp$$

Simple manipulation produces

$$p = \frac{a-c}{d-b} \quad (7)$$

Now, whenever we encounter a numerical example, we can substitute the numbers directly into (7) and obtain the answer.

3.3.2 Uniqueness of Equilibrium and Multiple Equilibria

So far, we have examined the situations in which a unique equilibrium is established, i.e., a single price (or single quantity) corresponding to a single quantity (or single price).

We can also conceive of a situation in which there is no such unique price or unique quantity. This is illustrated with the help of Fig. 3.7 and Fig. 3.8.

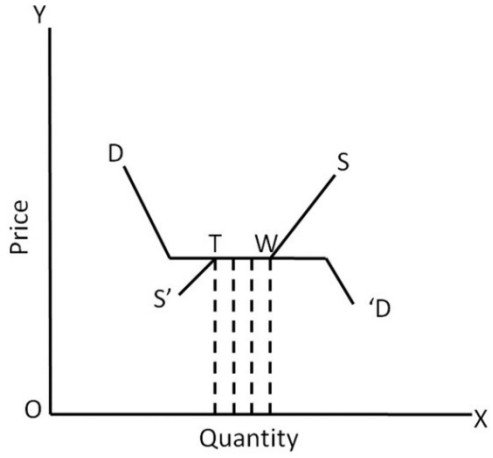

Fig. 3.7

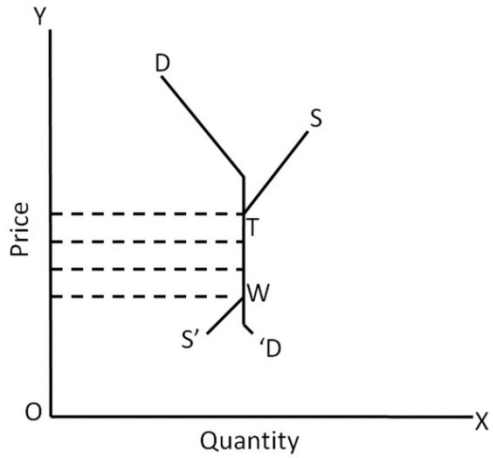

Fig. 3.8

In Fig. 3.7, both the demand curve and the supply curve have horizontal segments.

As a result of this, though the equilibrium price is uniquely determined, there is no unique quantity. It lies in the range TW.

In Fig. 3.8 similarly, both the demand curve and the supply curve have vertical segments. Though a unique quantity is determined, there is no unique price. The equilibrium price lies in the range TW.

This is also known as **multiple equilibria.**

Check Your Progress 1

1) Given the following demand and supply functions, find the equilibrium price and quantity in the market

$$q^s = -5 + 3P,\ q^d = 10 - 2P$$

2) From the following equation find the equilibrium price and output $q^d = 6 - P$, $q^s = 3P - 2$

3) State whether following statements are true or false:

   i) All demand curves have positive slopes

   ii) Prices change if and only if there is excess demand or excess supply

   iii) Prices fall if there is excess demand

   iv) The Walrasian equilibrium adjustment process works through change in quantity

   v) The quantity increases in case of both demand and supply curve shift rightwards.

4) There are 1000 identical individuals in the market for commodity X given the individual demand function $q^d = 12 - 2P$ and 100 identical producers of commodity given the individual producer supply function $q^s = 20P$. Find the equilibrium price and quantity.

3.4 APPLICATIONS

3.4.1 Rationing and the Allocation of Scarce Goods

Rationing implies fixation of price controls. Price control means that a ceiling has been imposed on the prices of such commodities as are covered under the price-control measures. Fixation of ceiling on prices means that the free operation of the forces of demand and supply is not being permitted.

Let us see what will happen in such a situation. This can be illustrated with the help of Fig. 3.9. DD and SS are the original demand and supply curves respectively for a commodity. R is the equilibrium point, corresponding to which OQ quantity is being demanded and supplied at the price OP per unit. Suppose the Government decides to interfere with the free operation of the market forces, i.e., it decides to impose price controls. Price controls, as already stated, take the form of ceiling on prices. Ceiling could be fixed at a price (a) higher than the equilibrium price, say at OK, (b) equal to the equilibrium price, i.e., OP, and (c) less than the equilibrium price, say at OH.

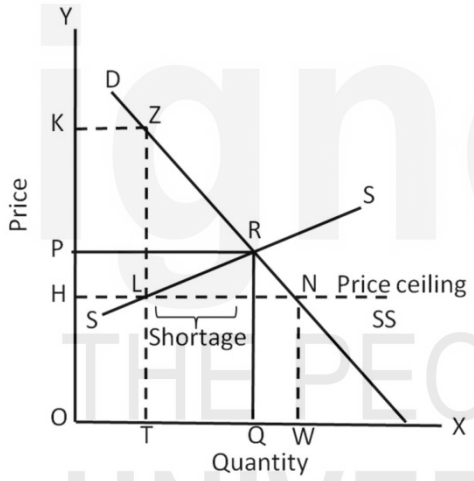

Fig. 3.9

- Ceiling price more than the equilibrium price will have no effect on the market. At a higher price say OK, OT quantity of the commodity will be demanded. The suppliers, on the other hand, would be waiting in their wings to supply more than the quantity being presently demanded. There will be a tendency for the price to fall down to the equilibrium level.

- If ceiling price equals the equilibrium price, OP, it will leave the market unaffected.

- If ceiling price is less than the equilibrium price, it will create conditions which need our further attention. Suppose, in Fig. 3.9, the Government imposes ceiling at OH per unit. The equilibrium price, OP, would no longer be legally obtainable. Prices must be reduced from OP to OH. At the lower price, OH, quantity demanded will expand to HN or OW. But at this reduced price, suppliers will be ready to supply only HL or OT quantity of goods. As a result, a shortage of this commodity (equal to quantity demanded minus quantity supplied) will emerge. This shortage is being represented by the line segment LN.

We reach the following conclusion about the effect of price control in free market: The setting of minimum prices will either have no effect (maximum price set at or below the equilibrium) or it will cause a shortage of the commodity and reduce both the price and the quantity actually bought and sold below their equilibrium values.

Consequences of Price Controls (ceiling below the equilibrium price). Imposition of ceiling below the equilibrium price will have the following major implications:

1) **Shortages:** The quantity actually sold and bought in the market will shrink. As a result, a large chunk of consumer's demand will go unsatisfied. The situation, as it arises, has been explained in Fig. 3.9.

2) **Problem of allocation of limited supplies among large number of consumers:** As already observed, shortage of a commodity means that all those consumers who demand the commodity at the ruling price cannot be satisfied. In other words, a large number of potential consumers of the commodity will be denied its use.

Here question arises how to allocate the limited supplies among large numbers of consumers?

One general way is that it is left at the retail shops to arrange for the distribution of the scarce product. For example, in our country, we have often witnessed such products as kerosene, edible oils, sugar, onions, etc., going scarce in the market. More generally, the consumer is left at the mercy of the local retailer, who more often than not chooses I: serve his regular customers in preference to others.

Among all others, the scarce product may be distributed on the basis of first-come-first-served. The latter situation often develops in the formation of long unmanageable queues at the retail centres, so that the persons lining up at the tail of the queue have only a little chance of getting the desired good. To avoid these problems which may often arise from the free marketing of the scarce product, Governments generally couple price controls with distribution controls. The most effective form of distribution control is rationing.

Rationing implies that a ceiling is imposed on the quantity which can be bought and consumed by a consumer. A consumer with less utility may choose not to purchase the rationed product. But those consumers for whom the rationed product has fairly large marginal utility are assured of some quantity at least, which possibly might not have been available to them in free marketing conditions. Rationing thus will increase the aggregate utility derived by the community from the consumption of the commodity. In such a situation, in all probabilities, rationing will replace first-come-first-served method of distribution.

We reach the conclusion:

Where there is a feeling against allocation on the basis of first-come-first-served and seller's preferences, effective price ceiling will give rise to strong pressure for a central (administered) system of rationing.

3) **Black Marketing:** It is a direct consequence of price controls. Black marketing implies a situation in which the controlled commodity is sold unlawfully, below the desk, at a price higher than the lawfully enforced ceiling price.

This situation arises largely because of the fact that (i) the number of potential consumers of the commodity is more than what can be served by the available supplies of the commodity, and, (ii) there are consumers who are willing to pay more than the ceiling price. This latter phenomenon is more important in creating black market and sustaining it.

In Fig. 3.9, OH is the ceiling price. At this price only OT quantity is being supplied and therefore actually bought in the market. We can see from DD curve in Fig. 3.9 that OT quantity would be demanded even at the price TZ or OK, which is substantially higher than the ceiling and the equilibrium price. Those buyers, who are willing to pay more than the ceiling price, will prefer to indulge in underhand transactions rather than go without the commodity since none of the free market methods of distribution can assure these consumers that the desired supplies would be coming.

Thus, we reach the interesting conclusion:

Black marketing in a commodity whose price has been controlled by the authorities will invariably arise since there are consumers who are willing to pay more than the controlled price.

3.4.2 Price Support Measures

Price support means a floor has been fixed on the prices of such commodities as are covered under the price-support measures.

Producers of these commodities need not sell at prices lower than the floor prices (i.e., the minimum prices) fixed by the Government. Fixation of floor on prices means that the free operation of the forces of demand and supply is being interfered with. Let us see what will happen in such a situation.

In Fig. 3.10; R is the equilibrium point determined by the intersection of demand and supply curves, OQ quantity is being supplied and demanded at OP price. Suppose, the Government decides to impose price supports. Price supports mean that the Government imposes a floor on prices. Floors could be fixed at a price (a) lower than the equilibrium price, say at OH; (b) equal to the equilibrium price, OP; and (c) more than the equilibrium price, say at OK.

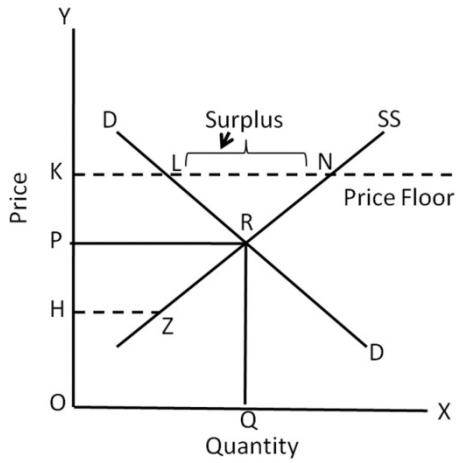

Fig. 3.10

Floor Price Lower than the Equilibrium Price: If floor price is less than the equilibrium, it will have no effect on the market. At a lower price, say OH, HZ quantity will be supplied. The consumers, on the other hand, would be willing to pay a higher price. The price will move upwards towards the equilibrium level.

Floor Price Equal to the Equilibrium Price: If floor price equals the equilibrium price, OP, it will leave the market unaffected.

Floor Price Higher than the Equilibrium Price: If floor price is more than the equilibrium price, it will need our further attention. Suppose, in Fig. 3.10, the Government imposes the price floor at OK per unit. The equilibrium price OP would no longer be legally obtainable. Price must be raised to OK. At the higher price, OK, quantity demanded will contract to KL. But at this price suppliers will be ready to supply KN quantity. As a result, a surplus will emerge; surplus is shown by the line segment LN.

We reach the following conclusion about the effect of price support in a free market:

The setting of minimum prices will either have no effect (minimum price set below the equilibrium) or it will cause surplus of the commodity to develop with the actual price being above its equilibrium level but the actual quantity bought and sold being below its equilibrium level.

Consequences of Price Support (Floor above equilibrium price): Imposition of floor prices above equilibrium price will have the following major implications:

1) **Surpluses:** The quantity actually bought and supplied will shrink as a direct consequence of price support. As a result, large chunk of producer's stocks will remain unutilised. The situation, as it arises, has been explained in Fig. 3.10 where the surplus has been shown equal to LN.

2) **Buffer Stocks:** In order to maintain the support price, the Government would have to design some such programme as to enable producers to dispose of their surplus stocks. One such programme can take the form of buffer stocks. The Government purchases the surplus stocks available with the producers, these stocks are released if and when the production of the supported commodity suffers. The buffer stock operations benefit the producers as a group. But who bears this cost? First, consumer who has to pay higher prices for the product. Second, the people in general who have to pay taxes to support this programme.

3) **Subsidies:** To offset the loss to the consumers, the Government may undertake to subsidise the product. By subsidy we mean that the Government purchases the product at the support price and sells the product to consumers below its cost of procurement. The difference between cost and price is borne by the Government.

Before we leave this discussion of price floors and ceilings, the reader should note that such terms as surplus and shortage are defined with reference to a specific price.

3.4.3 Minimum Wage Legislation

Minimum wage legislation is similar to fixing of floor prices. Governments, at times, are known to have interfered in the factor markets also. Legislation may be enacted whereby in the market, employers may be prohibited from paying less than the minimum wage fixed by the Government. The effect of fixing the minimum wage would be the same as that of fixing the minimum price of a commodity. Let us illustrate this effect diagrammatically, as in Fig. 3.11.

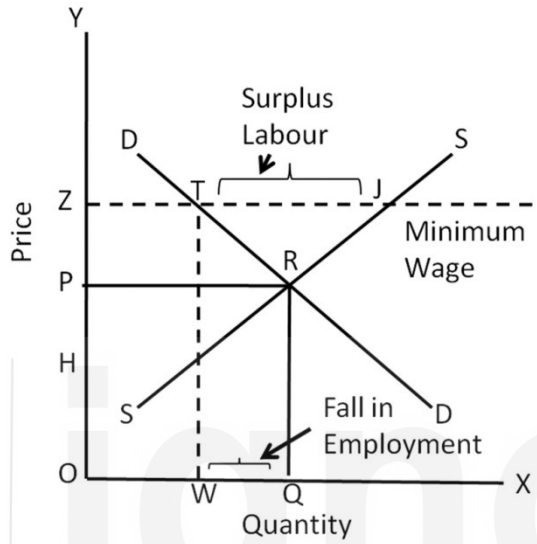

Fig. 3.11

In Fig. 3.11, OQ quantity of labour is being demanded and supplied at the equilibrium wage rate OP. If the wage rate is fixed at OZ by Government legislation, or by trade union agreement, the following consequences will follow:

1) Where the law or the agreement is effective, it will raise the wages of that labour which remains in employment, from OP to OZ.

2) Minimum wage will lower the actual amount of employment; at the new minimum wage rate only ZT or OW labour would be demanded, whereas at the equilibrium wage OQ labour was being supplied and demanded. Employment will fall by WQ.

3) Minimum wage will create a surplus of labour which would like to work, but cannot find a job. The surplus labour would equal TJ.

4) Some of the unemployed workers may be tempted or forced to offer themselves for work at the wage rate below the floor rate. Some sort of clandestine transaction in the labour market will begin to take place.

3.4.4 Arbitrage

Arbitrage is an operation involving simultaneous purchase and sale of a commodity in two or more markets between which there are price differentials or discrepancies. The arbitrageur aims to profit from the price difference; the effect of his action is to lessen or eliminate it.

Suppose fresh mushrooms are being sold in New Delhi and Noida. Geographically separate markets are illustrated in Fig. 3.12.

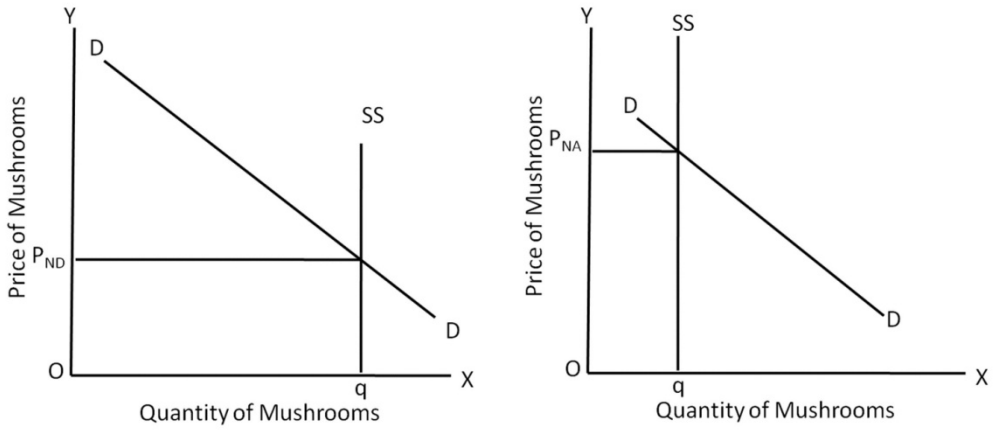

Fig. 3.12

New Delhi (ND) and Noida (NA) are separate markets with separate demand curves. The vertical supply curve in each city represents the quantity of mushrooms now available in each place. The equilibrium price in New Delhi is labelled P_{ND} and in Noida, P_{NA}.

If the equilibrium price in New Delhi is much less than that in Noida, a trucker might buy a load in New Delhi and sell them in Noida. As long as the price differential is greater than the cost of transporting the mushrooms, it will pay truckers to buy and sell in this way. As mushrooms are bought in New Delhi for sale in Noida, the price in New Delhi will increase, while that in Noida will fall. Thus the transport of mushrooms from New Delhi to Noida tends to narrow the price gap between the two cities. This process is called arbitrage.

Arbitrage will stop when the price differential becomes equal to or less than the cost of transportation between the two points. If transportation costs are small relative to the price of the good, the price differentials between cities will remain small.

Arbitrage narrows the dispersion of prices. If commodities are easily transported, geographic variations in price are small. If a commodity is easily stored, seasonal variations in price are insignificant. When markets are well-organised, with information about prices in different places and times readily available, arbitrage works easily. Any dealer can act as an arbitrageur by deciding when and where to buy. If, however, information about prices in different times and places is expensive to get, the dispersion of prices will then be greater.

Case Study

A few years ago The New York Times carried a dramatic front page picture of the President of Kenya setting fire to a large pile of elephant tusks that had been confiscated from poachers. The accompanying statement explained that the burning was intended as a symbolic act to persuade the world to halt the ivory trade. One may well doubt whether the burning really touched the hearts of criminal poachers. However, one economic effect was clear. By reducing the supply of ivory in the world markets, the burning of tusks forced up the price of ivory which raised the illicit rewards reaped by those who slaughter elephants. They could only encourage more poaching – precisely the opposite of what the Kenyan government sought to accomplish!

3.4.5 Sharing of Tax Burden

Who bears the tax burden under following situations:

a) When demand is perfectly elastic and supply is of normal shape.

b) When demand is perfectly inelastic and supply is of normal shape.

c) When supply is perfectly elastic and demand is of normal shape.

d) When supply is perfectly inelastic and demand is of normal shape.

a) When demand is perfectly elastic, the whole tax burden is borne by the producer himself as is illustrated in the Fig. 3.13. Before imposition of tax, equilibrium point is E which gives equilibrium price as OP. After the imposition of per unit tax, the equilibrium point shifts to giving equilibrium price as OP which is same as before the imposition of tax. Hence the whole tax burden is borne by the producer.

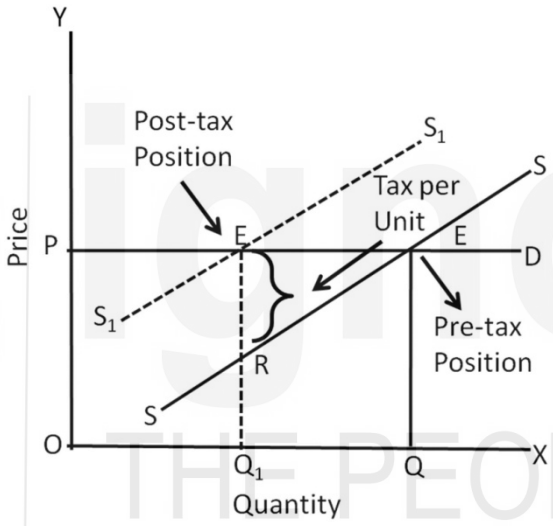

Fig. 3.13

b) When demand is perfectly inelastic, the whole tax burden is borne by the consumer because in this case the price rises by the full amount of tax as shown in the Fig. 3.14. The equilibrium point before imposition of tax is E which gives the equilibrium price as OP. After the imposition of tax per unit, the equilibrium point shifts to E_1 which gives equilibrium price as OP_1 Thus, price rises by the full amount of tax.

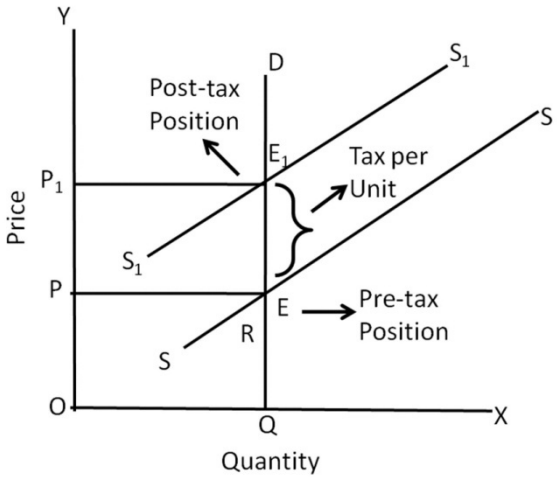

Fig. 3.14

c) When supply is perfectly elastic, the whole tax burden is borne by the consumer as illustrated in the Fig. 3.15. Before imposition of tax, the equilibrium point is E giving equilibrium price as OP. After the imposition of tax, the equilibrium point shifts to E_1 showing equilibrium price as OP_1. Thus the whole tax burden is borne by the consumer.

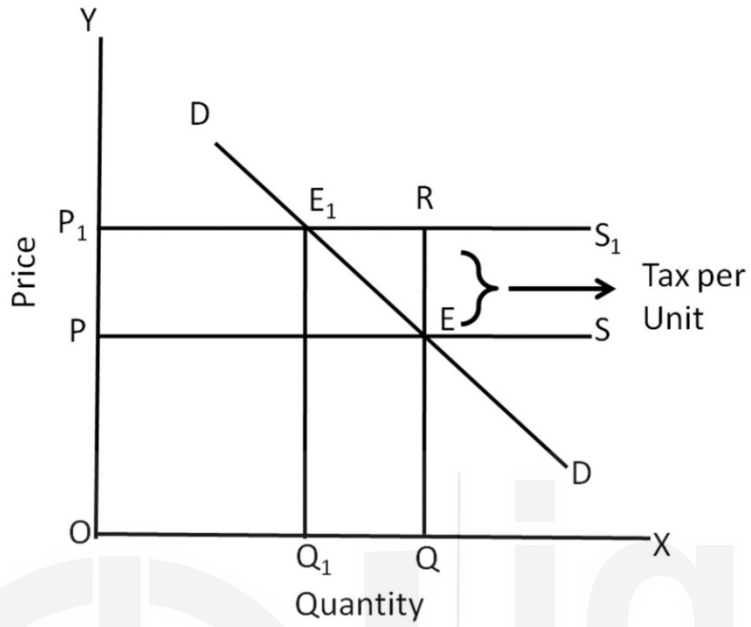

Fig. 3.15

d) When supply is perfectly inelastic, the whole tax burden is borne by the seller as the pre-tax equilibrium position and post-tax equilibrium remains unchanged, as shown in Fig. 6.16. Since supply is perfectly inelastic, with the imposition of tax the supply curve remains unchanged as such equilibrium price remains unchanged. So the tax burden falls on producer.

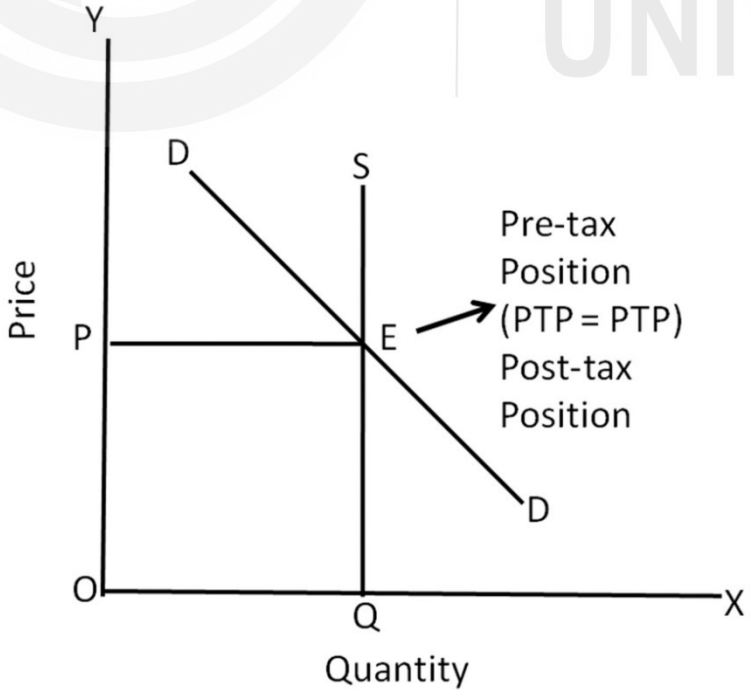

Fig. 3.16

- Show that as the demand curve becomes steep (arid hence inelastic) as greater amount of the tax is passed on to the consumer.

We take three different demand curves with different elasticities as shown in Fig. 3.17.

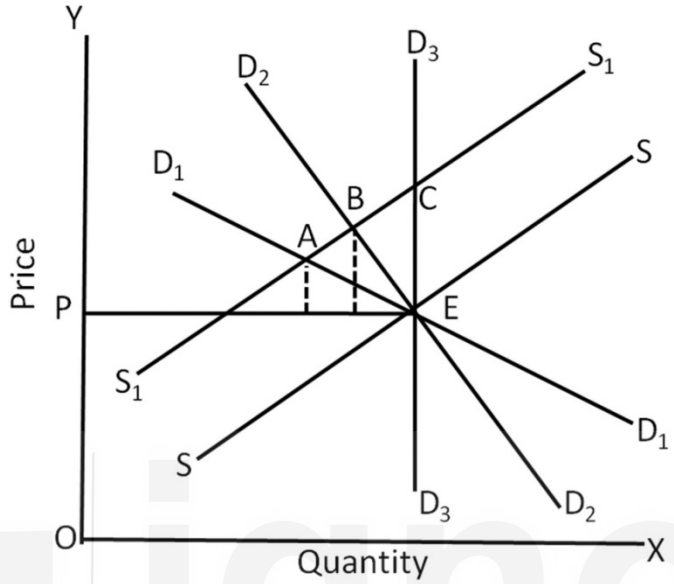

Fig. 3.17

All the three curves are drawn through the point E in order to facilitate comparison. Let the imposition of tax shift the supply curve to S_1S_1. The post-tax equilibrium position is shown by three points, A, B or C depending upon whether the relevant demand curve is D_1D_1, D_2D_2 or D_3D_3 respectively. The length of vertical line segment from points A, B or C to the line PE shows the amount of increase in the consumer price that will occur, given the respective demand curves. Examining the relationship between the amount of the price increase and the slope of the demand curve, we note that as the demand curve becomes steep (and hence elastic) a greater amount of the tax is passed onward to the consumer.

Check Your Progress 2

1) The price of a personal computer has continued to fall in the face of increasing demand. Explain.

2) New cars are normal goods. Suppose that the economy enters a period of strong economic expansion so that people's incomes increase substantially. Determine what happens to the equilibrium price and quantity of new cars.

3) State whether following statements are true or false:

   i) If ceiling price equals the equilibrium price, it will affect the market.

   ii) The minimum wage Act lowers the actual employment of workers.

   iii) Arbitrage widens the dispersion of prices.

   iv) When the demand is perfectly elastic, the whole burden is born by the consumer.

4) Suppose that the policy makers decide that the price of a pizza is too high and that not enough people can afford to buy pizza. As a result, they impose a price ceiling on pizza that is below the current equilibrium price. Are consumers able to buy more pizza: before the price ceiling or after?

5) Suppose that demand for a good is subject to unpredictable fluctuations. Explain how speculators help reduce the price variability of the good.

3.5 LET US SUM UP

Basics of demand and supply enables us to appreciate the relevance of economics in day to day life. Market price is determined at a point where quantity demanded is equal to quantity supplied. The characteristics of demand and supply may differ from one situation to another and from one market to another. These market forces influence the prices and quantity over a period of time. Marshalian equilibrium is attained through the process of change in quantity whereas Walrasian adjustment process works through a change in price.

Imposition of ceiling below the equilibrium price have implications of shortage of supply, black marketing and hence the need for central administered system of rationing. The imposition of floor prices may cause the surpluses of the commodity, hence need for buffer stocks and selling of the product to the consumers at subsidised prices.

The impact of minimum wage legislative is similar to fixing of floor prices.

The Arbitrage narrows the dispersion of prices.

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3.7 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) $P = 3$, $q^d = 4$

2) $p = 2$, $q = 4$

3) (i) False (ii) True (iii) False (iv) false (v) True

4) $P = 3$, $q = 6000$

Check Your Progress 2

1) Personal computers have fallen in price although the demand for them has increased because the supply has increased more rapidly.

2) Because new cars are a normal good, an increase in income increases the demand for them. Hence the demand curve shifts rightward. As a result, the equilibrium price rises and the equilibrium quantity also rises.

3) (i) False (ii) True (iii) False (iv) False

4) As a result of a price ceiling, the sellers would offer less quantity for sale in the market. The consumers would end up consuming less of the pizzas. There would be a large unmet demand.

5) Speculators buy the product to exploit any potential profit opportunities. In particular, speculator- aim to sell the good from their inventories if the current price is higher than the expected future price and they strive to buy the good to be added to their inventories if the current price is below the expected future price.

The first profit opportunity – selling when the current price is higher than the expected future price – reduces the current price. The second profit opportunity – buying when the current price is lower than the expected future price – raises the current price.

Selling, if the price is higher than, or buying, if the price is lower than the expected future price, means that the price will not deviate much from the expected future price.

Thus, speculators help reduce price fluctuations and make the price less variable.

3.8 TERMINAL QUESTIONS

1) Given the following supply and demand equations

$$Q^u - 100 - 5P$$

$$Q^s - 10 + 5P$$

a) Determine the equilibrium price and quantity.

b) If the government sets a minimum price of Rs. 10 per unit, how many units would be supplied and how many would be demanded?

c) If the government sets a maximum price of Rs. 5 per unit, how many units would be supplied and how many would be demanded?

d) If demand increases to

$$Q^{dl} = 200 - 5P$$

determine the new equilibrium price and quantity.

2) Discuss the likely effects of the following:

a) Rent ceilings on the market for apartments.

b) Floors under wheat prices on the market for wheat.

Use supply-demand diagrams to show what may happen in each case.

3) The demand and supply curves for T-shirts in the tourist town, Bengaluru, are given by the following equations:

$$Q^d = 24{,}000 - 500\ P$$

$$Q^s = 6{,}000 + 1{,}000\ P$$

a) Find the equilibrium price and quantity algebraically.

b) If tourists decide they do not really like T-shirts that much, which of the following might be then demand curve?

$$Q^d = 21{,}000 - 500\ P$$

$$Q^d = 27{,}000 - 500\ P$$

Find the equilibrium price and quantity after the shift of the demand curve.

c) If, instead, two more new stores that sell T-shirts open up in town, which of the following might be the new supply curve?

$$Q^s = 3{,}000 + 1{,}000\ P$$

$$Q = 9{,}000 + 1{,}000\ P$$

Find the equilibrium price and quantity after the shift of the supply curve.

4) Under which condition will a shift in the demand curve result mainly in a change in quantity? In price?

5) Under which condition will a shift in the supply curve result mainly in a change in price? In quantity?

6) Suppose the market demand for pizza is given by $Q^d = 300 - 20\ P$ and the market supply for pizza is given by $Q^s = 20\ P - 100$, where P = price (per pizza).

a) Graph the supply and demand schedules for pizza using Rs. 5 through Rs. 15 as the value of P.

b) In equilibrium, how many pizzas would be sold and at what price?

c) What would happen if suppliers set the price of pizza at Rs 15? Explain the market adjustment process.

d) Suppose the price of hamburgers, a substitute for pizza, doubles. This leads to a doubling of the demand for pizza (at each price consumers demand twice as much pizza as before). Write the equation for the new market demand for pizza.

e) Find the new equilibrium price and quantity of pizza.

GLOSSARY

Average Product : Total product divided by the number of units of the input used is average product

Accounting Cost : Accounting cost refers to actual expenses of the firm plus depreciation charges for capital equipment.

Allocative Efficiency : Producing goods and services demanded by consumers at a price that reflect the marginal cost of supply.

Abnormal Profit : Profit in excess of normal profit - also known as supernormal profit or monopoly profit. Abnormal profits may be maintained in a monopolistic market in the long run because of barriers to entry.

Adverse Selection : When one party to a deal is making suboptimal choice because of asymmetry in information.

Barter : Exchange of goods/services against other goods/services.

Budget Line : The Budget Line, also called as Budget Constraint shows all the combinations of two commodities that a consumer can afford at given market prices and within the particular income level.

Comforts : Goods which are used for increasing our productive capacity and for making our lives more comfortable.

Consumption : Using up of Utility of goods in the satisfaction of a want.

Change in Demand : Shift of the entire demand of curve.

Change in Quantity Demanded : Movement on a demand curve itself caused by a changes in the price of the commodity in question.

Contraction in Supply : The decrease in quantity supplied because of a fall in the price of the commodity.

Curvilinear Supply Curve : The supply curve which is not a straight line.

Cardinal Utility : 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.

Consumer Equilibrium : The point at which a consumer reaches optimum utility, or satisfaction, from the goods and services purchased, given the constraints of income and prices.

Constant Returns to Scale : Constant returns to scale implies that when all inputs are increased in a given proportion, output increases in the same proportion.

Complementary Commodity : It is the commodity whose demand is directly related to the demand of the commodity in question.

Collusive Behaviour : In collusive oligopoly industry contains few producers wherein producers agree among one another as to pricing of output and allocation of output among themselves. Cartels, such as OPEC, are collusive oligopolies.

Cournot Model : The Cournot model of oligopoly assumes that rival firms produce a homogenous product, and each attempts to maximise profits by choosing how much to produce. All firms choose output (quantity) simultaneously.

Cartel : An association of manufacturers or suppliers with the purpose of maintaining prices at a high level and restricting competition.

Common Resources : These are resources where there are many users but no owner.

Demand : The amount of goods which the buyers are ready to buy, per period of time, at a given price per unit.

Dependent Variable : A variable which changes only with the change in the independent variable.

Decrease in Supply : The decrease in quantity supplied at a given price of the commodity.

Diminishing Returns to Scale : Diminishing returns to scale refers to the case when output grows proportionally less than input.

Derived Demand : Refers to demand for factors of production as their demand is derived from the demand for goods and services.

Economic Laws : Statements of tendencies. They depict the standardised or generalised response of economic units to different forces and stimuli.

Exchange Value : The price which an item commands in the market.

Elasticity of Demand : It quantifies the strength relationship between the quantity demanded of commodity and the price of the commodity or income of the consumer or price of another commodity which is related to the commodity in question.

Elasticity of Supply : The responsiveness of quantity supplied to a given percentage change in the price of the commodity.

Extension in Supply : The rise in quantity supplied due to a rise in the price of the commodity.

External Economies : When a firm enters production, it obtains a number of economies for which the firm's own strategies/policies are not responsible. These are economies external to the firm.

External Diseconomies : When the scale of operations is expanded, many such diseconomies accrue that have no particular ill-effect on the firm itself but their burden falls on the other firms. These are known as external diseconomies.

Explicit cost : Explicit costs arise from transaction between the firm and other parties in which the former purchases inputs or services for carrying out production.

Economic Profit : A firm's revenues less its economic cost.

Economic Cost : The economic cost includes the accounting cost and the opportunity cost of the factor of production in its next best alternative use.

Excess Capacity : **Excess capacity** is a situation in which actual production is less than what is achievable or optimal for a firm. This often means that the demand for the product is below what the business could potentially supply to the market.

Economic Rent : Refers to payment for the use of something which is fixed in supply.

Externalities : Externalities occur in an economy when the production or consumption of a specific good impacts a third party that is not directly related to the production or consumption.

Efficient Allocation of Resources : That combination of inputs, outputs and distribution of inputs, outputs such that any change in the economy can make someone better off (as measured by indifference curve map) only by making someone worse off (Pareto efficiency).

Flow Variable : A variable which can be measured only with reference to a period of time.

Free Rider : It means one person is using the benefits of a good without paying anything for it.

Goods : Items which have a utility or can be used for the production of other goods or services

Giffen Good : A commodity in which there is a direct relationship between the price of a commodity and its quantity demanded.

Historical Cost : Historical cost is the cost that was actually incurred at the time of purchase of an asset.

Inductive Reasoning : The technique of analysis in which factual information is used to discover the behaviour pattern of different economic units in response to various forces and stimuli.

Inferior Commodity (Good) : A commodity in which there is an inverse relationship between the income of the consumer and quantity demanded of a commodity.

Income Effect : It shows the effect of a change in income of the consumer on the quantity demanded of a commodity.

Income Elasticity of Demand : It is the responsiveness of demand to a given proportional change in the income of the consumer.

Inequalities of Income : The distribution of income among different income groups of an economy.

Increase in Supply : The rise in quantity supplied at a given price of the commodity.

Income effect : A change in the demand of a good or service, induced by a change in the consumers' real income.

Any increase or decrease in price correspondingly decreases or increases consumers' real income which, in turn, causes a lower or higher demand for the same or some other good or service.

Isocost Line : An isocost line represents various combinations of inputs that may be purchased for a given amount of expenditure.

Isoquant : An isoquant is the of all the combination of two factrors of production that yield the same level of output.

Increasing Returns to Scale : Increasing returns to scale refer to the case when output grows proportionally more than inputs.

Internal Economies : Those economies that accrue to a firm on expansion of its own size are known as internal economies.

Internal Diseconomies : When the scale of production is continuously expanded, a point is reached where the increase in production becomes less than proportionate to the increase in the factors of production. As this point, internal diseconomies set in.

Implicit Cost : Implicit costs are the costs associated with the use of firm's own resources. Since these resources will bring returns if employed elsewhere, their imputed values constitute the implicit costs.

Incremental Cost : An incremental cost is the increase in total costs resulting from an increase in production or other activity.

Interest : Refers to payment for the use of capital. Interest is paid for man-made goods which are used for production of goods and services.

Imperfect Information : Imperfect information is a situation in which the parties to a transaction have different information, as when the seller of a used car has more information about its quality than the buyer. In other words, a situation when information about the goods and services available to buyers' and sellers are not symmetric.

Indifference Curve or Utility Frontier : An indifference curve represents a series of combinations between two different economic goods, between which an individual would be theoretically indifferent regardless of which combination he received.

Isoquants : The isoquant curve is a graph that charts all input combinations that produce a specified level of output.

Imperfect Competition : Imperfect competition exists whenever a market, hypothetical or real, violates the abstract tenets of neoclassical pure or perfect competition

Law of Supply : It shows the direct relationship between the price of a commodity and its quantity supplied, other factors influencing supply (except price of the commodity) remaining constant.

Law of Diminishing Returns : As more units of an input are used per unit of time with fixed amounts of another input, the marginal product of the variable input declines after a point.

Linear Homogeneous Production Function : When output increases in the same proportion in which inputs are increased, the production function is linear homogeneous. For example, if labour and capital are increased λ by times and, as a result, output also increases by λ times, the production function is linear homogeneous.

Long Run : The time period when all inputs including plant capacity are variable.

Labour Union : A recognised organisation of workers that seeks protection of their rights.

Merit Goods : The goods whose consumption is believed to be desirable for the benefit of the society and the consuming individuals.

Macroeconomics : Branch of economic analysis that focuses on the workings of the whole economy or large sectors of it.

Margin : The value of the variable under consideration related to the last unit of an item.

Marginal Utility : The additional or extra satisfaction yielded from consuming one additional unit of a commodity.

Microeconomics : Branch of economic analysis that focuses on individual economic units or their small groups and micro-variables like individual prices of individual commodities, etc.

Money Exchange : Sale of goods/services against money.

Monopolist : A producer who controls the whole supply of a commodity.

Marginal utility : Marginal utility is the additional satisfaction a consumer gains from consuming one more unit of a good or service. Marginal utility is an important economic concept because economists use it to determine how much of an item a consumer will buy.

Marginal Product : Marginal product of an input is defined as the change in total output due to a unit change in the amount of an input while quantities of other inputs are held constant.

Marginal Rate of Technical Subsitution ($MRTS_{L,K}$) : Marginal rate of technical substitution of factor L for factor K ($MRTS_{L,K}$) is the quantity of K that is to be reduced on increasing the quantity of L by one unit for keeping the output level unchanged.

Monopoly : A firm that is the sole seller of a product without close substitutes.

Monopolistic Competition	:	There are a large number of firms that produce differentiated products which are close substitutes to each other. In other words, large sellers sell the products that are similar, but not identical and compete with each other on other factors besides price.
MRP	:	Marginal revenue product i.e. Marginal revenue times the marginal product of factor.
Marginal Physical Product	:	Change in quantity produced as one additional unit of the variable factor keeping all other factors constant.
Marginal Revenue Product	:	Marginal physical product multiplied by marginal revenue.
Minimum Wage Act	:	Government law which fixes the minimum level of wages payable.
Marginal Rate of Substitution	:	The marginal rate of substitution is the amount of a good that a consumer is willing to give up for another good, as long as the new combination of the two goods is equally satisfying. It's used in indifference theory to analyse consumer behaviour.
Marginal Rate of Technical Substitution	:	The marginal rate of transformation or technical substitution is the rate at which one good must be sacrificed in order to produce a single extra unit (or marginal unit) of another good, assuming that both goods require the same scarce inputs. The marginal rate of transformation is tied to the production possibilities frontier (PPF), which displays the output potential for two goods using the same resources.
Market Imperfection	:	Conditions in market which are not conclusive to perfect competition.
Moral Hazard	:	Deliberate concealment of some information from the other party.
Market Failure	:	It refers to failure of market mechanism to achieve efficient allocation of resources in the economy.
Necessities	:	Goods which are used for satisfying basic of existence.
Normative Economics	:	That part of economic analysis which is concerned with what ought to be, and the way it can be achieved by changing the existing situation.
Normal Profits	:	Normal Profit is an economic condition occurring when the difference between a firm's total revenue and total cost is equal to zero.

Simply, normal profit is the minimum level of profit needed for a company to remain competitive in the market.

Non Collusive Behaviour : Oligopoly is best defined by the actual conduct (or behaviour) of firms within a market. The concentration ratio measures the extent to which a market or industry is dominated by a few leading firms. When these firms agree to behave in a particular manner it is said to be collusive behaviour of oligopoly market.

Non-exclusion : It means that we cannot exclude non-payers from consuming it.

Non-rival : It means that when person consume a good, it will not diminish other person's share.

Ordinal Utility : The Ordinal Utility approach is based on the fact that the utility of a commodity cannot be measured in absolute quantity. However, it will be possible for a consumer to tell subjectively whether the commodity gives more or less or equal satisfaction when compared to another.

Optimality : The point where maximum possible output is being achieved given the use of different factors of production.

Oligopoly A state of limited competition, in which a market is shared by a small number of big producers or sellers.

Optimal Output Mix : The optimal mix of output is known in economics as the most desirable combination of output attainable with available resources, technology, and social values.

Private Goods : Goods whose availability can be restricted to selected users. It is divisible in that sense.

Production Possibility Curve : A graphic representation of the combinations of maximum amounts of goods X and Y which can be produced with the given productive resources of the economy and under certain other simplifying assumptions.

Public Goods : Goods or services whose availability cannot be restricted to selected users only. The benefits of the goods are indivisible and people cannot be excluded.

Positive Economics : That part of economic reasoning which covers what is, without going into its desirability or otherwise, and without suggesting ways for changing the existing state of affairs.

Price Effect : The impact that a change in its price has on the consumer demand for a product or service in the market. The price effect can also refer to the impact that an event has on something's price. The price effect is a resultant effect of the substitution effect and the income effect.

Point of Inflexion : The point where total product stops increasing at an increasing rate and begins increasing at a decreasing rate is called the point of inflexion.

Production Function : The technical law which expresses the relationship between factor inputs and output is termed production function.

Perfectly Competitive Market : A market is perfectly competitive if it consists of many consumers and firms, none of whom have any appreciable market share, all firms produce identical products, and there are no barriers to entry or exit, and consumers have perfect information about prices.

Price Discrimination : When a firm charges different prices to different groups of consumers for an identical good or service, for reasons not associated with costs, it is termed as price discrimination.

Product Differentiation : The marketing of generally similar products with minor variations that are used by consumers while making a choice.

Prisoner's Dilemma : A situation in which two players each have two options whose outcome depends crucially on the simultaneous choice made by the other, often formulated in terms of two prisoners separately deciding whether to confess to a crime.

Profits : Are returns to entrepreneurs for use of their organisation and management skills in the production process, as well as bearing risks.

Productive Efficiency : Production efficiency is an economic level at which the economy can no longer produce additional amounts of a good without lowering the production level of another product. This happens when an economy is operating along its production possibility frontier.

Production Possibility Curve : A graphical representation of the alternative combinations of the amounts of two goods or services that an economy can produce by transferring resources from one good or service to the other. This curve helps in determining what quantity of a nonessential good or a service an economy can afford to produce without jeopardising the required production of an essential good or service.

Public Goods : A public good is a product that one individual can consume without reducing its availability to another individual, and from which no one is excluded. Economists refer to public goods as "non-rivalrous" and "non-excludable."

Price Ratio or Relative Price : Price of a commodity as it compares to another. The relative price is usually presented as a ratio between the two prices.

Public Interventions : Actions of the government in the markets for goods, services and factors.

Public Provision : Direct supply of certain socially desirable services /goods by the government authorities/ agencies to the end users.

Price Ceiling : It occurs when the government puts a legal limit on how high the price of a product can be.

Quasi-Rent : Return to a factor of production over and above its average cost; it is a short-run concept.

Rectangular Hyperbola : It is a curve in which every rectangle drawn with one corner on the curve has the same area.

Ridge Lines : The lines forming the boundaries of the economic region of production are known as the ridge lines.

Replacement Cost : Replacement cost is the cost that will have to be incurred now to replace that asset (i.e., the replacement cost is the current cost of the new asset of the same type).

Rent : Refers to payment for the use of land. Land refers to all natural resources available for the purpose of production.

Stock Variable : A variable which can be measured only with reference to a point of time.

Supply : The quantity of goods which the sellers are ready to sell, per unit of time, at a given price per unit.

Substitution Effect : It shows how with a change in the price of a commodity, prices of other commodities remaining unchanged, a consumer substitutes one commodity for the other.

Substitute Commodity : It is the commodity whose demand is inversely related to the demand of the commodity in question.

Supply Schedule : A table having two columns, one showing different prices of the commodity and the other showing quantities supplied during a given period at each of these prices.

Supply Curve : A curve showing the relationship between price of a commodity and its quantity supplied during a given period, other factors influencing supply remaining unchanged.

Substitution Effect : An effect caused by a rise in price that induces a consumer (whose income has remained the same) to buy more of a relatively lower-priced good and less of a higher-priced one.

Sub-optimality : It is a point where optimality has not been achieved, i.e. output is less than the possible maximum given the use of the resources.

Sunk Cost : Sunk cost is a cost that has already been incurred and can't be recovered.

Short Run : The time period when at least one of the inputs (size of the plant) is fixed.

Supernormal Profit : A firm earns supernormal profit when its profit is above that required to keep its resources in their present use in the long run i.e. when price > average cost.

Stackelberg Model : The Stackelberg leadership model is a strategic game in economics in which the leader firm moves first and then the follower firms move sequentially. ... There are some further constraints upon the sustaining of a Stackelberg equilibrium.

Technology : The method employed to produce a commodity or service.

Total Utility : The total satisfaction derived from all the units of an item.

Transfer Earnings : Minimum payment to be made to a factor of production to retain it in present employment. It refers to the earnings in the next best employment.

Use Value : Utility of goods

Utility : The want satisfying capacity of goods. It is the service or satisfaction an item yields to the consumer

VMP : Value of Marginal Product, i.e. price times the marginal product of factor.

Wages : Refers to payment for the use of labour which refers to the human effort made for production of goods and services through technical expertise or manual labour.

SOME USEFUL BOOKS

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