I am thankful to Ms. Kavita for having undertaken thorough revision of this book. The last but not the least acknowledgement I owe to Mr. Ankur Chhabra for his contribution to this book in ways more than one.

Comments and suggestions for improving the quality of this volume shall be gratefully acknowledged.

AUTHOR

EXTRACTS FROM THE PREFACE TO THE FIRST EDITION

Indian economy has undergone a phenomenal change particularly after the launching of the New Industrial Policy, 1991. It is in the process of transformation of licensed regime to liberalization and closed economy to globalisation. Industrial licensing has been abolished for all industries except for a short list of 6 industries related to security and social concerns, social reasons, hazardous chemicals and overriding environmental reasons. Most of the industries reserved for the public sector have been opened for the private sector to bring competition in the Indian economy. Inflow of foreign capital and foreign technology agreements have been made easier and several curbs on imports and exports have been withdrawn by the Government. It is expected of every manager to have a thorough understanding of the changes in the economic environment of the country for taking effective business decisions. He should also be well-versed with the principles and techniques of management for the effective and efficient management of the industrial organisation. Keeping this in view, the present volume has been divided into two parts, namely,

Part I : Industrial Economics.

Part II : Principles of Management.

The part I of the book contains 11 chapters covering Nature and Significance of Economics, Role of Engineering and Technology in Economic Development, Concepts of Demand and Supply, Elasticity of Demand and Supply, Marginal Utility Analysis, Indifference Curve Analysis, Value of Money, Causes and Effects of Inflation and Commercial and Central Banking. The part II of the book contains 12 chapters covering Concept, Functions and Significance of Management, Evolution of Management Thought, Contributions of Weber, Taylor and Fayol, Organisational Behaviour, Individual Behaviour and Group Behaviour.

While preparing this introductory volume, I have extensively used the knowledge gained from my great teachers during my Master's Degree Program at the Delhi School of Economics. **Prof. A.B. Ghosh, Prof. L.S. Porwal, Prof. P.K. Ghosh** and **Prof. V.S. Minocha** were always in my mind while preparing the scripts of the present four-in-one volume containing Elements of Economic Theory, Macro Economics, General Management and Human Behaviour. Without the blessings of my respected teachers, this volume would have never been written.

I am deeply indebted to various scholars whose work has been referred

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Chapter 1

Nature and Significance of Economics

The word '*Economics*' is derived from the ancient Greek word *Oikonomia* which means *household management*. It implies that economics is that domain of knowledge which is concerned with the management of wants by households. However, as a result of the writings of many economists during the last three centuries, the focus has now shifted from the management of wants to the management of resources. The definition of Economics has undergone perceptible changes. Broadly speaking, the various definitions of Economics can be categorised under three heads :

(i) Economics as a study of 'wealth',
(ii) Economics as a study of 'welfare', and
(iii) Economics as a study of the problem arising out of the 'scarcity of resources'.

DEFINITIONS OF ECONOMICS

Economics as a Science of Wealth

The roots of the scientific framework of Economics can be traced back to Adam Smith's book entitled *An Inquiry into the Nature and Causes of the Wealth of Nations* published in 1776. As the title of his book suggests, Adam Smith defined economics, **"as the study of the nature and causes of the generation of wealth of a nation."** Goods have both value-in-use (utility) and value-in-exchange (price). Adam Smith defined 'wealth' as all those goods which command value-in-exchange. Economics, according to Adam Smith, seeks to explain and analyse the generation of wealth and also its distribution. He argued that the larger amount of wealth and the betterment of the whole society could be achieved by an efficient allocation of resources through the market mechanism.

J.B. Say has defined economics as the science which deals with wealth. In fact, wealth is the focus of all classical economists including Adam Smith, J.B. Say, J.S. Mill, Walker, etc. But this definition has been criticized on the following grounds :

(i) Adam Smith laid all emphasis on wealth but ignored man and his welfare.

(ii) He gave restricted meaning of wealth as he included in wealth only material goods like tea, biscuits, butter and excluded non-material goods, *i.e.* services like those of doctor, soldier.

(iii) He pre-supposed the existence of an economic man who is to satisfy his own interest having no social interest.

(iv) This definition makes the earning of wealth an end in itself and ignores the propriety of means to achieve it.

Economics as a Science of Material Welfare

The classical economists like Adam Smith and J.S. Mill defined economics as **"the science of wealth"**. But this definition was widely criticised as it gave too much emphasis to 'wealth' and too little to humans. To remove the taint of gross materialism from the definition of economics, Alfred Marshall evolved a better definition which shifted the emphasis from the study of wealth to the welfare of man. According to Marshall, **"Economics is a study of man's actions in the ordinary business of life. It enquires how he gets his income and how he spends it"**. Thus, it is on the one side, a **study of wealth** and on the other and more important side, **"a part of the study of man."**

Marshall's view regarding the definition of economics can be expressed as follows : (1) Economics is a study of man, (2) Economics is concerned only with those activities of man which are related to the acquisition and enjoyment of wealth. The Marshallian definition is certainly an improvement upon the earlier definition of economics. But this definition failed to emphasize the problem of allocation of scarce resources which is the fundamental problem of a modern economy. Robbins criticized Marshall's definition on the following grounds :

(i) Marshall's view of economics is narrow and unscientific.

(ii) Material welfare, which cannot be measured by any scale, cannot be accepted as end of economics.

(iii) Economics is not a social science but a human science. It is rather a pure science like Physics and Chemistry which has universal applicable laws.

(iv) Marshall offered normative view of economics. But economics is neutral between ends and does not give value judgement.

Economics as a Science of Allocation of Scarce Resources

According to Robbins, **"Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses."** This definition is analytical rather than classificatory. Instead of discussing a certain type of human behaviour, it focused its attention on a particular aspect of behaviour *i.e.*, behaviour concerned with the utilisation of scarce resources to achieve unlimited ends.

On analysis, we find that this definition lays down the three fundamental propositions which constitute the basis of the structure of economic science. These include :

(*a*) *Ends.* Ends refer to wants. Human beings have wants which are unlimited in number. This multiplicity of wants calls forth ceaseless effort for their satisfaction and the intending cycle of economic activity moves on.

(*b*) *Means.* Although wants are unlimited, yet the means to satisfy them are strictly limited. No doubt, there are certain free goods which also satisfy human wants. Yet most of the things that we want are scarce.

(*c*) *Alternative Uses.* The third proposition underlying Robins' definition is that the scarce means are capable of alternative uses. If a commodity could be put only to one use and to none else, few economic problems would arise in its connection. After it has met that use, it will become a free good and will have no further economic significance. Actually, however, the uses to which a commodity can be put are numerous, almost unlimited.

Robbins' definition is also lacking. It has been criticised on the following grounds :

(*i*) Robbins' 'ends and means' formulation has been criticised as not being in conformity to human action. It excludes the concept of purpose which is fundamental to human actions. Actually the ends are seldom presented simultaneously with the means.

(*ii*) Robbins regards ends as given, but the means may be equally given. Knight has criticised the attitude that economics is only concerned with means and not ends. Economics should discuss the alternative ends and not only means for a given end.

(*iii*) Robbins has reduced economics merely to valuation theory. Other aspects of the study of economics have been relegated to the background. Further, the theory of economic growth has now become a very important branch of economics. But Robbins' definition does not cover it. Moreover, this definition placed too little importance on human welfare.

(*iv*) Robertson was of the opinion that Robbins' definition of economics is "at the same time too narrow and too wide". It is too narrow as it excludes such important topics as employment policy, relation between capital and labour, etc. And it is too wide because the problem of allocation of scare resources may also arise in certain other fields not generally included within the scope of economics.

Inspite of these drawbacks, Robbins' definition of economics is more scientific and analytical than the older definitions and has good deal of acceptability. It focuses attention on a particular aspect of human behaviour, *i.e.*, behaviour undertaken under the influence of scarcity. For example, a consumer has to choose that combination of goods which yields maximum satisfaction. Similarly, a firm has to choose that size of output which ensures maximum profit. The economy is also to choose a combination of Guns and Butter.

Satisfactory Definition of Economics

Nobel Laureate Prof. Samuelson has spelled out the nature and scope of Economics as follows :

"Economics is the study of how men and society choose, with or without the use of money, to employ scarce productive resources which could have alternative uses, to produce commodities over time, and distribute them for consumption now and in the future among various people and groups of society".

Samuelson remarked, **"Logically, there is nothing fundamental about the traditional boundaries of economic science."** It is not necessary to formulate any strict definition of economics. We may accept any definition of economics if it concerns itself with the following features :

(i) Economics is a social science concerned with the activities of human beings in organised societies.

(ii) Economics is primarily concerned with those activities which are related to wealth-getting and wealth-using. To be more specific, economics deals with human activities relating to production, distribution, consumption and exchange of wealth. Naturally, it is concerned with those activities which can be measured in terms of money.

(iii) Economics is fundamentally a study of scarcity and of the problems to which scarcity gives rise.

(iv) Economics is a study of human welfare. It includes the study of how existing conditions of an economy can be altered for the maximisation of social welfare.

Types

SCOPE OF ECONOMICS

Stonier and Haugue have divided the subject-matter of economics into three categories as discussed below :

(i) **Economic Theory** is a theoretical part of economics. If frames economic theories and forges economic tools. It is divided into static and dynamic economics. It is also known as Economic Analysis.

(ii) **Applied Economics** attempts to apply the results of economics analysis to descriptive economics. Industrial economics, managerial economics and agricultural economics are some of the examples of applied economics.

(iii) **Descriptive Economics.** In descriptive economics relevant facts about a particular economic subject or topic are collected for the purpose of study. The subject Indian economic is the example of descriptive economics.

Business Economics

Importance for Business Manage

The emergence of managerial economics can be traced back to the development of business economics as a specialized branch of economics. **Business Economics deals with the use of economic modes of thought to analyse business situations for the purpose of taking business decisions having economic or financial implications.** Business economics is the applied branch of economics which analyses business situations. Economics has developed some well-known 'principles' or 'modes of thought'. These 'principles' are utilised to solve business problems which can be categorized as economic problems such as cost analysis, pricing, production of alternative products, etc.

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Managerial Economics

Because of application of economic principles to business management, the terms 'business economics' and 'managerial economics' are used interchangeably. However, managerial economics is the preferred term because of its concern with two fundamental aspects of managing. These are :

(i) **Decision-making.** Selecting an alternative course of action from a number of available alternatives.

(ii) **Forward planning.** Making strategic and operational plans for the survival and growth in the market.

In a business, the problem of choice arises because resources at its disposal (land, labour, capital and managerial capacity) are limited and the firm has to make the most profitable use of these resources. The decision-making function is that of the business executive. He takes decisions which will ensure the most efficient means of attaining a desired objective, say profit-maximisation. After taking the decision about the particular goal and the targets to be achieved over a period of time, plans regarding output, pricing, capital, raw-materials and power etc. are prepared. In actual practice, decision-making and forward planning are performed by managers more or loss simultaneously.

In the words of McNair and Meriam, "*Managerial economics consists of the use of economic modes of thought to the analysis of business situations.*"

Thus, managerial economics uses the principles and concepts of economics for a practical purpose, *i.e.*, to analyse business situations being faced by the management of a firm. The managers of every firm have specific goals and they face problems in realising these goals. Managerial economics is the subject which helps in the analysis of business situations so as to facilitate decision-making.

Spencer and Siegelman have defined Managerial Economics as **"the integration of economic theory with business practice for the purpose of facilitating decision-making and forward planning by management."** Thus, managerial economics is the discipline which deals with the application of economic theory to business management. Managerial economics thus lies on the borderline between economics and business management and serves as a bridge between the two disciplines. It helps in integrating economic principles with the business practices. In other words, it is the application of various techniques of economics to managerial decision-making as shown in Table 1.

Table 1 : Techniques of Economics and Managerial Decisions

Framework of Concepts and Techniques	*Managerial Decisions*
• Demand Analysis	• Demand Decisions
• Production and Costs Analysis	• Input-output Decisions
• Market Structure Analysis	• Price-output Decisions
• Firm's Behaviour Analysis	• Profit Maximisation and alternative hypotheses
• Project Appraisal	• Investment Decisions
• Risk and Uncertainty Analysis	• Economic Forecasting and Planning

Thus, managerial economics helps the business executives in taking decisions about costs, prices and profits from time to time as business conditions change. All business situations are not of the same type but there are well known tools of analysis to deal with various situations. These tools and techniques form the core of managerial economics. The analysis of economic situations being faced by business firms is designed to help them in forward planning as well. In other words, managerial economics is concerned with economic forecasting. Firms need forecasts of demand, costs, prices and profits in order to frame their short-term and long-term policies. The managerial economist collects data on costs, prices and demand, tries to project these data into the near future by employing the techniques of forecasting. Top management can use these forecasts for developing corporate level and divisional level plans.

MICRO AND MACRO ECONOMICS

Modern economists have divided economic theory into two main branches, namely (1) micro-economics and (2) macro-economics, so as to facilitate the study of economic analysis. These are discussed below :

Micro-Economics

The term 'micro' is derived from the Greek word *micros* which means small. **Micro-economics (or economic theory) studies the economic behaviour of individual units of an economy and not an economy as a whole.** It concerns itself with the detailed study of individual decision-makers like a household, a firm or individual consumers and producers. How a consumer maximises his satisfaction with his limited income or how a firm maximises its profits or how the wage of a worker is determined are all instances of micro analytical approach.

According to Prof. Boulding **"Micro economics is the study of particular firms, particular households, individual prices, wage incomes, individual industries, particular commodities."** Since its subject matter revolves around determination of prices of individual commodities and factors, micro-economic theory is also called **'Price Theory'**. Micro-economics deals with the central problems of 'what, how and for whom to produce'. Although micro-analysis reflects the activities of individual units, it does not explain the health of economy as a whole. What is true of individual units may not be true of whole industry (or economy). For example, forty-five out of fifty-five firms may be running in losses but the industry may still be making profits. Hence, there is need to study economy as a whole (macro study). Scope of micro-economics includes the following topics :

Scope of Micro-Economics

- *Theory of Demand*
- *Theory of Production*
- *Theory of Distribution (Factor pricing)*
- *Economics of Welfare*

Macro-Economics

The word 'macro' is taken from Greek word '*makros*' which means large. **Macro-economics is the study of economy in its totality or as whole.** *It is concerned with the study of national income and not individual income, national saving and not individual saving aggregate consumption expenditure and not individual consumption expenditure, total production and not production of individual firm, price level and not individual price, etc.* In short, it deals with the economy as a whole. The problem of full employment, aggregate consumption, aggregate

investment, total savings, general level of prices and variations in them are all subject matter of macro-economics. Today every state claims to be a welfare state for which it needs to make policies at the level of whole economy, *i.e.* at the macro-level. Hence study of macro-economics is indispensable.

A few instances will clarify the distinction between the two approaches. When we study the demand of consumers for a particular commodity, our study is micro-analysis, but if we study the problems of production of the whole economy, our study is macro-analysis. Since subject matter of macro-economics revolves around determination of income and employment, therefore, it is also known as **'Theory of Income and Employment'**. In short, macro-economics is the study of aggregates and averages covering the whole economy and examines the inter-relationship among various aggregates. Main tools of its analysis are aggregate demand and aggregate supply. These days, when the study of lakhs of individual units has become almost impossible and when the government participation through monetary and fiscal measures in the economy has increased very much, use of macro analysis has become very essential. In fact, the two types of analyses—micro and macro—are complementary and should be lly made use of. Scope of macro-economics includes the following parts :

Scope of Macro-Economics

- *Theory of National Income*
- *Theory of Employment*
- *Theory of Money*
- *Theory of General Price Level*
- *Theory of Growth*

NATURE OF ECONOMICS

Economics as a Science

Whether economics is to be regarded as a science or not depends upon what we consider a science to be. In simple words, a science is a systematised body of knowledge about a particular branch of the universe **and which contains concepts, theories and principles which are based on cause and effect relationship and are universal in nature.** This implies that a science is a study of a branch of leaning and not of the whole universe. It studies the branch systematically and orderly. Judged by this standard, economics is undoubtedly a science because it is a systematised body of knowledge about economic activities.

"A science is built upon facts as a house is built of stones". Applying this, we find that economics is built upon facts, which are examined and systematised by economists. The economic phenomena are measured by the economists' measuring rod of money. In addition to it, a science is expected to have its own methodological apparatus *i.e.* methods of investigation. Economics as a science has also got the scientific methods of deduction for its study. Economics like other sciences deduces conclusions or generalisations after observing, collecting and examining facts. Thus, it involves (*i*) Observation of facts, (*ii*) Measurement, (*iii*) Explanation and (*iv*) Verification. In short, it formulates economic laws about human behaviour.

Since economics satisfies all the tests of a science, it is regarded as a full-fledged science. But some economists feel that economics cannot be treated as a science because different economists may suggest different solutions to the same problem. It is true that economists do not agree, but this is not a sound reason to disregard economics as a science, as difference of opinions is bound to be there in all growing sciences.

Some people argue that it is difficult to build up a science on economic phenomena because they are complex, variable, unpredictable and provide a slender foundation. But this statement is not true. Economics has been built up as a science in the West with scientific precision. Thus, we can treat economics as a science. But economics is not as exact as physical and natural sciences because economic laws are not as exact and precise as the laws of physics or chemistry. It has been called a **social science** as it deals with the economic decisions taken by human beings.

Economics as an Art

Art is completely different from science. In the words of Cossa "A science teaches us to know; an art teaches to do. In simple words, science explains and expounds; art directs, imposes precepts or proposes rules." In other words, science is theoretical but an art is practical. As J.M. Keynes has put in "An art is system of rules for the attainment of a given end". The object of an art is the formulation of precepts applicable to policy. This implies that art is practical.

Applying this definition of art to economics we can say it is an art. Its several branches like consumption, production and public finance provide practical guidance to solve economic problems. For example, the theory of consumption guides the consumer to obtain maximum satisfaction with his given income (means).

Art is also defined as "a collection or body of rules for the execution of external works." The application of certain rules will result in the attainment of specific results. For example, music is an art because the application of its rules results in sweet music. However, learning of music requires lot of exercise and hard work. In the case of economics also, analytical skills can be learnt through the understanding and applications of economic concepts, principles and tools. Thus, since solution to economic problems requires lot of application of economic skills, economics is treated as an art.

To sum up, **economics is both a science and an art.** In the words of Cossa, "Science requires art and art requires science, each being complementary to the other." Since economics deals with the

It is a science in its methodology and an art in its application

economic behaviour of individuals, it is also treated as a social science. In the words of Samuelson, "Economics is the oldest of the arts, the newest of sciences—indeed the queen of all the social sciences."

POSITIVE AND NORMATIVE SCIENCE

The question whether economics is a positive or normative science has been discussed for a very long time. The conflict here is not so much about the positive aspect but about the normative nature of economics. The classical school advocated economics as a pure positive science. But the historical school maintained the view that economics is a normative science.

In order to understand the full implications of the controversy, it is necessary to know the meaning of both the terms. In the words of J.M. Keynes "A positive science is a body of systematised knowledge concerning *what is* and a normative science or regulative science is a body of systematised knowledge relating to the criteria of *what it ought to be*". In other words, a positive science describes things they are. For this reason, it is also called *descriptive science*. But normative science, on the other hand, explains things not as they are *but as they ought to be*.

J.M. Keynes maintains that "the object of positive science is the establishment of uniformities; of normative science the determination of ideals". The normative science is concerned with ideal while the positive science is concerned with actual. A positive science explains the cause and effect. It is neutral between ends. It does not pass any moral judgements. But normative science prescribes a norm and regulates things in order to achieve that norm. It explains rightness or wrongness of things. 'Ethics' is an example of a normative science and 'Chemistry' is the example of positive science.

Economics as a Positive Science

The classical economists proposed that economics should be concerned only with **"what is"** and not **"what ought to be"**. In other words, they maintained that economics is only a positive science. They said that economics should not explain rightness and wrongness of things and economists should not pass moral judgement. Cairns said that economics should stand neutral as mechanics stand between rival schemes of railway construction. Strigler observed, "Strictly speaking words like 'ought' and 'bad' cannot occur in economic discussions". Lionel Robbins reaffirmed the view that economics is nothing but a positive science. The above stated views are based on the following reasons :

(*i*) If economics is to inquire about the norms or ends of economics, there will arise much confusion regarding the desirability or otherwise of economic ends.

(*ii*) If economics is treated as a normative science, ethical considerations will enter into the realm of economics. This will lead first to difference of opinions and then to perpetual disagreement among economists regarding economic norms. This, in turn, will obstruct the growth of economics.

(*iii*) If economics becomes a normative study, economists will be forced to pass moral judgements. Such judgements based on their moral judgements may prove to be wrong in practical situations.

(*iv*) If economics is concerned with ends, it will become related to ethics.

(*v*) Generally, practical problems are of different kinds like economic, political, moral etc. The economist can well study only economic problems, not others. How can he decide which policy or method is better ? He should not take any side among competing ends, he should be neutral.

Economics as a Normative Science

Challenging the views of the classical school, Marshall, Pigou and others put the argument that economics is a normative science. According to Marshall, economics is a normative science because it has a norm, *viz.* welfare. Macifie remarks that "economics is fundamentally a normative science, not merely a positive science like chemistry". Howtrey feels that *economics is a normative science because there is an 'economics ought' as it is in ethics*. Subscribing to this view, other economists have also put up a strong case for normative science. If economics is considered to be a positive science, it will become a mere value theory. Prof. Fraser is of the opinion that "economics is something more than a mere value theory or equilibrium analysis". As it is commonly argued if economics has no light to shed upon practice, it would become barren.

Further if economics does not deal with any norm, economists will be reduced to the position of theorists. As such they may explain and expound but not advocate and condemn. But economists must tell what should be done and what should be avoided. As Fraser remarks "Economist who is only an economist (in the above sense) is poor pretty fish". When economics is neutral between ends, it becomes abstract, complex and unreal. But as a normative science, it is very human and realistic.

Economics is a social science which suggests the modes of promotion of economic welfare with limited means. It can be of great service of mankind as a normative science. It can help a person to get maximum welfare from the limited resources. Normative economics can also be of great help in achieving the national goals of removing poverty, increasing employment and raising the quality of life of the people.

To sum up, the classical and neo-classical economists were preoccupied with the formulation of economic theories in the mould of positive economics. However, a large number of economists are the advocates of normative functions of economics. The vital issues in the areas of economic planning, economic policies, anti-unemployment and poverty alleviation programmes cannot be debated without due consideration to the ethical or normative implications of policies and programmes. In fact, economics is *both a positive science and a normative science.*

Economic Laws

The term 'Law' may be defined as a statement of causal relationship between two sets of phenomena. Accordingly, 'economic law' is a *statement about the cause and effect relationship between two economic phenomena.* However, strictly speaking, economic law is a *statement of tendency* of causal relationship between two economic phenomena. It implies that economic laws unlike physical laws tell us only the likelihood of an economic phenomenon to behave in a particular manner in response to a particular causative factor. The law of demand, for example, establishes cause and effect relationship between the price of a commodity and its demand. But it cannot be said with exactness that if the price of a commodity falls, its demand will *definitely* rise. In fact, there is a *tendency* for the demand to rise in response to fall in the price of a commodity.

The main *characteristics* of economic laws are as follows :

(*i*) **Economic laws are conditional.** Every law of economics is stated with a stipulation 'cetris peribus' (Other things being equal) clause. For example, the law of demand states 'Other things being equal, if the price of a commodity falls, its demand rises and vice versa'.

(*ii*) **Economic laws are statements of tendencies.** It implies that laws of economics are not exact like the physical Law of Gravitation or Newton's Law of Motion.

(*iii*) **Economic laws cannot be subjected to controlled experiment.** The laws of economics deals with human behaviour and not with the physical matter. As a result of this, the verification of economic laws in a laboratory is not possible.

(*iv*) **Economic laws are less universal.** The laws of physical sciences hold good in a capitalist as well as a socialist country. But the laws of economics formulated on the assumption of free market do not hold good in a centrally planned economy.

(*v*) **Economic laws have relatively poor predictability.** Economic policies based on economic laws cannot be predicted accurately to produce the desired results within a stipulated period.

SIGNIFICANCE OF ECONOMICS

Economics is useful not only to individuals but also to business firms and the society as a whole. Economics provides certain tools which can be used for solving various business problems. Knowledge of economics is useful in almost all spheres of life. It helps a businessman in his various decisions with regard to price, quantity, cost, size etc. It helps a policy maker in formulating appropriate policies for the economy and it even helps a housewife in budgeting her finances. However, economics is merely a tool in the hands of users. It does not furnish a body of set principles or readymade solutions to various problems. It only widens and deepens the understanding of functioning of various forces.

Importance for Individuals

Individuals often face the problems of scarcity and choice-making. Knowledge of economics is quite helpful here. An individual can read the market forces and take decision about the time and the rates at which to buy desired products. The concepts of marginal utility, indifference curve, etc. help the individual to maximise his satisfaction with the use of minimum resources.

availability of raw material
transport facilities
power & labour

Importance for Business Firms

Economic laws and theories establish cause and effect relationship which are true under certain assumptions. The laws of production are particularly helpful to business – an optimum factor mix in the use of resources can be achieved through the use of the law of variable proportions.

Production is undertaken in anticipation of demand. Economics helps in forecasting demand. It is based on a number of factors concerning the product and some external forces. It depends on the size of market, the degree of competition, elasticity of demand and the general economic situation. These estimates also help in finding out the likely return on investment.

For making a suitable choice of location for the business, an entrepreneur must know about the availability of raw materials, transport facilities, power and labour. The price situation also influences the demand for the product. The exchange rate has a bearing on the value which will be realised from exports. Indirectly, the general price level and the foreign exchange rate influence the overall economic activity in the country and, therefore, the business prospects of a given product.

Economics helps a business manager to analyse the external environment of business. For example, the Government influences business through its fiscal, monetary and industrial policies. A businessman must be aware of these policies and the implications on his business and what is happening in other countries because, in the modern

era of economic interdependence, business in a country is bound to be affected by conditions in the world as a whole. What is of importance is that businessman should be able to analyse the causes and effects of such forces on his business. For this purpose, the various laws of economics should prove very useful.

However, economics does not furnish a body of set principles or ready-made solutions to various problems which can be applied to a given situation. It only widens and depends on one's understanding of the economic forces. Actual application of the laws will depend on the exigencies of each situation. If the mind is trained in economic logic, finding the solution to various economic problems should not be difficult.

Importance for the Nation

Economics deals with the laws and principles which govern the functioning of an economy and its various parts. An economy exists because of two basic facts. *Firstly*, human wants for goods and services are unlimited, and *secondly*, productive resources with which to produce goods and services are scarce. Therefore, an economy has to decide how to use its scarce resources to obtain the maximum possible satisfaction of the members of the society. It is this basic problem of scarcity which gives rise to many of the economic problems.

The subject-matter of economics has been divided into two parts : micro-economics and macro-economics. Micro-economics deals with the analysis of small individual units of the economy such as individual consumers, firms, industries and markets. On the other hand, macro-economics concerns itself with the analysis of the economy as a whole and its large aggregates such as total national income, output, employment etc.

The problems of scarcity and choice-making can be solved in many ways by an economy. If it gives the whole charge of the economy to private ownership, we get capitalist economy, to public ownership, we get socialist economy and jointly to private and public ownership we get mixed economy. Each type of economic system affects the mode of public welfare and national economic development. With the help of economic principles and laws, the national government can make plans for the effective use of various resources for economic growth of the nation and for raising standard of living of the general public.

CENTRAL PROBLEMS OF AN ECONOMY

An economic system refers to economic relationships which arise in the community from the organisation or mode of production and distribution. In other words, an economy refers to a system in which people organise their activities and form institutions whereby the economic resources, namely, land, minerals, power, raw materials, labour, capital and other inputs of production, are utilized for

satisfying the needs of the people living in the society. The fundamental problem for an economy is to provide answer to the following three fundamental questions :

(*i*) What things will be produced ? This in simple terms means that there must be some method of determining the goods which are to be produced. The economic system must provide for the determination of the goods to be produced.

(*ii*) How will things be produced ? A primary function which an economic system must perform is to determine the methods of production. In particular, to what proportions shall the factors of production be combined ? The choice of techniques of production is extremely important for any economic system.

(*iii*) For whom will things be produced ? Here the basic problem is to determine how to distribute the total product among the population.

These three problems are fundamental and common to all economies and all of them are forever engaged in solving them. Apart from these basic problems, there are three other important problems which have been pointed out by Richard G. Lipsey. These are :

(*i*) How to achieve the level of full employment ?

(*ii*) How to achieve efficiency in utilisation of productive resources and distribution of what has been produced ?

(*iii*) How to achieve maximum possible rate of economic growth ?

The above questions would be decided with reference to the nature of economy as to whether it is a capitalist economy, or a socialist economy or a mixed economy. Each type of economic system, therefore, in trying to provide adequate answer to the above questions, would fix certain goals with reference to the given economic structure and the nature and working of particular factors prevalent in that economic system.

Every economic system is supposed to exist primarily to create such condition as to make it easy for human beings to satisfy their wants. However, the exact manner in which the problems like allocation of resources among various alternative uses, fixation of prices, and direction and determination of input and output will be tackled, would depend upon the particular type of economic system which is adopted by a particular country.

Role of Government/Public Policy

According to Lipsey and Steiner, "Economics develops specific criteria which define the conditions for making the best use of society's resources and employs these criteria as guidelines for formulating and evaluating public policy". The basic problem of a society is the

efficient use of scarce resources so that the maximum possible number of wants are satisfied. Every government has to lay down the criteria for efficient use of resources. To be specific, the government has to take decisions in the following problem areas :

(i) *Determination of goods to be produced.* There must be some method of determining the kinds and quantities of goods to be produced in the economy. The economic system must also provide for the determination of the standard of goods to be produced by the production units.

(ii) *Utilisation of resources.* The resources of any economy are limited. So the basic problem is the maximum possible and efficient use of productive resources for the social welfare of the economy.

(iii) *Choice of techniques of production.* The economic system must determine the techniques of production. What technology should be used to produce a particular product ? Should it be a traditional pairs of bullocks and a plough or a tractor to produce wheat ? In what proportions should the various factors of production be combined ?

(iv) *Distribution of products.* This is an important problem in economies where a section of the society is very poor. The government may distribute essential commodities through fair price shops. It may introduce dual pricing in industries so that goods at low prices are made available to the poor. The government also interferes in the pattern of income distribution. It levies high rates of direct and indirect taxes on the wealthy persons.

(v) *Efficiency of production system.* The efficiency of production system in a particular year is the ratio of output to input. Higher the ratio, higher is the efficiency. This index of different years is compared to know whether the efficiency has increased or decreased.

(vi) *Growth of economy.* The economy should not remain static, it must grow over a period of time if the standard of living of the people is to be raised. The growth of an economy depends upon the exploitation of natural resources, technological advancement and capital formation in the country.

SCIENCE, ENGINEERING, TECHNOLOGY AND ECONOMIC DEVELOPMENT

Meaning and Nature of Science

Science is the systematised body of knowledge pertaining to a particular field of enquiry. Such systematised body of knowledge pertaining to a particular field contains concepts, theories and principles which are universal and true. Science has the following features :

(i) Systematised body of knowledge.
(ii) Scientific methods of observation.
(iii) Tests of validity and predictability.
(iv) Universal application of principles.

Whatever field of enquiry fulfills the above criteria is called a science. The important examples of science are physics, chemistry, biology, zoology, etc. The significant aspects of science which affect human life and economic development include the following :

(i) Science is a social institution.

(ii) There is a method of science which is used to solve problems arising either out of social and economic needs for individual curiosity.

(iii) Science has a cumulative tradition of knowledge. The stock of previous knowledge forms the basis for new knowledge, with the previous knowledge merging into the new knowledge.

(iv) Science has several functions in a given society. It plays a major role in the maintenance and development of production processes.

(v) Science is influenced by the prevailing social thought. And, in turn, radical changes in scientific ideas influence the general attitudes and beliefs in society.

(vi) In science, theory and practice are intimately related. Hence, science progresses rapidly in societies and in conditions, where practitioners and thinkers mix and interact. Theory without practice is as barren as practice without theory.

Meaning and Nature of Engineering

Engineering is an application of scientific knowledge. It is composed of the skills and ingenuity in adapting knowledge to the uses of human race. According to the Engineers' Council for Professional Development : *"Engineering is the profession in which knowledge of the mathematical and natural sciences gained by study, experience and practice is applied with judgement to develop ways to utilize economically the materials and forces of nature for the benefit of mankind".*

The purpose of the scientist is to add to mankind's inventory of systematic knowledge and to discover universal laws. The purpose of

the engineer is to apply his knowledge to particular situations to produce products and services. To the engineer, knowledge is not an end in itself but is the tool from which he fashions structures, machines and processes. Thus, engineering involves the determination of the combination of materials, forces and human factors that will yield a desired result with a reasonable degree of accuracy.

Modern civilization rests to a large extent upon engineering. Most products used to facilitate work, communication and transportation, and to furnish sustenance, shelter and even health care are directly or indirectly a result of engineering activities. Engineering has also been instrumental in providing instruments of entertainment and leisure. Through the development of the printing process, television and rapid transportation, engineering has provided the means for both cultural and economic improvement of the human race. In addition, engineering has become an essential input for national defence. This is evident from the fact that a large number of engineers of different branches are in the employment of armed forces of almost all countries.

Role of Science and Technology in Economic Development

Science and technology have played a vital role in the transformation of human society. They have allowed us to use the resources of the earth, the oceans and the air, and to harness the energy which makes the wheel of production or of transport to move, and communication to take place.

A look into the history of mankind tells us that science was being put to practical use, consciously or unconsciously, through the centuries. But it was not until mid-eighteenth century that the Industrial Revolution in Britain showed what a profound effect advances in technology can have on everyday life. The harnessing of energy gave a boost to industrialisation. The Industrial Revolution in Britain triggered off similar revolutions in various other countries, and the resultant economic progress of these countries has encouraged the remaining ones to take up rapid industrialisation.

The dominating feature of the contemporary world is the intense cultivation of science on a large scale, and its application to meet country's requirements. It is only through the scientific approach and method and the use of scientific knowledge that reasonable material and cultural amenities and services can be provided for every member of the community.

Science and technology have totally transformed life from what it was the beginning of the last century, when there were no cars, buses or aeroplanes, and when medicine and surgery had not advanced to raise human life expectancy to over 50 or 60 years. This has been possible through the growth of scientific knowledge, and related skills, as also by the organisation of the production of numerous goods. As the Scientific

(1) Utilisation of natural resources
(2) Increased efficiency (3) Factor substitution
(4) Overcomy scarcity

Policy Resolution (adopted by the Government in 1958) says, such high levels of production of the basic materials needed for a reasonable standard of living for all, have made it possible to think of a "Welfare State" — which involves management of distribution of goods so that everyone can benefit from them. The Indian Constitution, indeed, speaks of socialism which involves "**distributive justice**" and equality of opportunity to all. Without the help of science and technology, we shall not be able to produce enough goods for our needs. For example, we all know that with the help of a tractor a farmer can plough far more land than he can with the help of an ox. Mechanisation increases the area of ploughed land and thus improves human productivity.

One aspect of the development of science and technology is fuller utilisation of the wealth or resources with which a country has been endowed. Without science and technology, neither could electricity be generated from the water running in our rivers, nor could the oil resources buried deep under land or sea be tapped, nor even could our books and newspapers be printed on the paper obtained from the forests that we have. Science provides the key for unlocking the wealth of our natural resources.

When we study science, we look into the laws of nature which, in turn, indicate the methods of utilising the natural resources of the country for the production of the necessities of life and for their efficient distribution. Mere indication of the methods is, however, not enough. To implement the methods indicated, one has to do work, and here again science comes to our aid. Science provides power, machines and tools for doing the work; devices of all types—those for work involving only muscular effort, for work demanding manipulative skill and, in recent years, even for work requiring brain effort. Without such aids the rate of production would be extremely low and the country would not be able to produce enough to be wealthy by any standards.

Science and Technology for National Self-Reliance

Science and technology are major national resources which can contribute to the goal of achieving self-reliance. With the ideal of self-reliance, what role can science and technology be made to play for national development? As we know, the needs for food, shelter, clothing, health and education for all are still the most pressing needs of our society. A rapid fulfillment of these needs would need new advances in agriculture, food technology, health science and medicine, building materials, clothing, tapping new resources etc. Solution of problems relevant to our own society or economy poses a fundamental challenge before our scientific and technology activity. And in pursuing this challenge, new questions and new answers, new technologies and new areas of scientific work are bound to emerge. To tackle the problems experienced in such an endeavour would need the ingenuity and resources of men, materials and ideas.

In India, we have a great potential of natural resources and intelligent people. We have also a democratic system where ideas can be tested and the best can prevail. The task is to optimise knowledge of all kinds, whether in social science, natural sciences or technology, by making it available to the largest number. It would do our society well to produce at all levels of education, creative and critical thinkers who can use the scientific method of question the social reality on the basis of relevant data and problems. There is a need to re-examine ideas which have been uncritically accepted by the people as well as the political and administrative set-up in our society. The task of getting out of the vicious circle of under-development should not be under-estimated. Science, technology and other kinds of knowledge have played a crucial role in establishing the present structure of societies, their trade, industry and distribution of benefits. Let us hope that they will also be made to play an increasing role in taking our country to the right path of future development.

Technology Policy

Science and technology have assumed greater significance in our country where about 30% of the population is still living under the poverty line. Some of the reasons of large scale poverty in india are as under :

1. Methods of production are out of date by and large. In recent years, however, some remedial measures have been taken.
2. Since 2/3rd of the workforce in agriculture and industry is illiterate, the knowledge and skills are very poor. This factor affects production.
3. In India, where 70% of the people are engaged in agriculture and allied occupations, the use of methods to improve production from the soil and to protect crops is not in keeping with the actual need.
4. In agriculture, the small means at the disposal of farmers and small holdings make it impracticable to use modern technology.
5. In industry, several firms either lack funds or are unwilling to invest in modernising the production processes.
6. In India, because of low levels of skills and poor management of resources, unit cost of production of many items is much higher than in other countries.

To tackle the above problems, it is essential to develop technology suitable for Indian needs and fitting into the pattern of our natural resources and human resources. This was highlighted in the *Technology Policy Statement* issued by the Central Government in 1983. A crucial paragraph produced below neatly summarises several important aspects of the Policy :

"The use and development of technology must relate to the people's aspirations. Our own immediate needs in India are the attainment of

technological self-reliance, a swift and tangible improvement in the conditions of the weakest sections of the population and the speedy development of backward regions. India is known for its diversity. Technology must suit local needs and to make an impact on the lives of ordinary citizens, must give constant thought to even small improvements which could make better and more cost-effective use of existing materials and methods of work. Our development must be based on our own culture and personality. Our future depends on our ability to resist the imposition of technology which is obsolete or unrelated to our specific requirements, and of policies which tie us to systems which serve the purposes of others rather than our own, and on our success in dealing with vested interests in our organizations: governmental, economic, social and even intellectual, which bind us to outmoded systems and institutions."

"Attainment of technological self-reliance" is our immediate need. This refers to the competence of our scientific and technological personnel, who should be well-versed in modern knowledge and "know-how". They should be able to innovate technology according to our need, and develop new technology. For example, they should be able to harness sources of energy, such as solar energy, in which our country abounds, or they should be able to effectively use the raw materials that we possess in plenty.

Technological self-reliance also implies capability of our institutions to support technological development through their infrastructure and skilled manpower. Self-reliance means that we should be able to foresee and forecast our needs so that development work can be undertaken at suitable centres. We should not be helpless watchers of new technology emerging from other countries. If it is decided to import new technology, we should be in a position to develop it further in order to save the country from importing similar technology again after a few years. Self-reliance implies capacity of industry to produce the goods we need. This is achieved through planning, coordination, education and research.

"The basic objectives of the Technology Policy are the development of indigenous technology and efficient absorption and adaptation of imported technology appropriate to national priorities and resources. Its aims are to :

(*a*) attain technological competence and self-reliance by making the maximum use of indigenous resource, to reduce vulnerability, particularly in strategic and critical areas;
(*b*) provide the maximum gainful and satisfying employment to all strata of society, with emphasis on the employment of women and weaker sections of society;
(*c*) use traditional skills and capabilities, making them commercially competitive;
(*d*) ensure maximum development with minimum capital outlay;
(*e*) identify obsolescence of the technology in use and arrange for modernisation of both equipment and technology.

(f) develop technologies which are internationally competitive, particularly those with export potential;

(g) improve production speedily through greater efficiency and fuller utilisation of existing capabilities, and enhance the quality and reliability of performance and output;

(h) reduce demands on energy, particularly energy from non-renewable sources;

(i) ensure harmony with the environment, preserve the ecological balance and improve the quality of the habitat; and

(j) recycle waste materials and make full utilisation of by-products."

Thus, the technology policy stresses attainment of self-reliance in technological development and utilisation of national resources through indigenous technology in order to speed up the process of economic development.

QUESTIONS

1. "Economics is the science of wealth". Is this definition adequate ? Give reasons for your answer.
2. "Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses" (Robbins). Do you agree ?
3. "Economics is the study of man's actions in the ordinary business of life." Explain the statement.
4. Economics is the study of allocation of scarce means to alternate ends. Explain the statement.
5. "Economics is a science of choice". Comment on the statement.
6. Discuss the nature of economics as a science and as an art.
7. "Economics is neutral between ends." How far do you agree with the statement ? Give reasons.
8. Differentiate between Positive Economics and Normative Economics.
9. Explain the significance of economics from the points of view of (a) individuals, (b) business firm, and (c) nation.
10. Briefly explain the usefulness of economics in the day-to-day affairs of an economy.
11. Explain the nature of economics as a positive and a normative science.
12. Examine the role of science, engineering and technology in economic development of a nation.
13. Discuss the nature and inter-relationship of science and engineering.
14. Write brief notes on the following :
    (a) Role of Science and Technology in Development
    (b) Micro and Macro-economics
    (c) Technology Policy
    (d) Managerial economics.

□ □ □

Chapter 2

Micro and Macro Economics

There are two major branches of economic theory known as **micro-economics and macro-economics.** The term 'micro' means small and the term 'macro' means large. Micro-economics studies the economic actions of individuals and groups of individuals and firms. In other words, it presents the economic microscopic view of the economy. Micro-economic theories are concerned with the partial equilibrium analysis of firm's price-output determination under different market situations and the allocation of given economic resources to particular uses. But macro economics is concerned with the economic behaviour of the whole nation (or economy) in terms of allocation of productive resources, consumption pattern, distribution of income, etc. In this chapter, we shall study the nature and scope of micro economics and macro economics and also the interrelationship between the two.

MEANING AND NATURE OF MICRO ECONOMICS

According to K.E. Boulding, *"Micro-economics is the study of particular firms, particular households, individual prices, wages, incomes, individual industries, particular commodities."* In micro-economic theory, we study how various units of the economy such as consumers, producers or firms, workers and resource suppliers do their economic activities and reach their equilibrium states. In other words, in micro-economics, we make a **microscopic study of the economy.** But it should be remembered that micro-economics does not study the economy *in its totality*. Instead, in micro-economics, we discuss equilibrium of innumerable units of the economy *piecemeal* and their inter-relationship with each other. For instance, in micro-economic analysis, we study the demand of an individual consumer for a commodity and from there go on to derive the *market demand* for the commodity (that is, demand of a group of individuals consuming a particular commodity). Likewise, micro-economic theory studies the behaviour of the individual firms in regard to the fixation of price and output and their reactions to the changes in the demand and supply conditions.

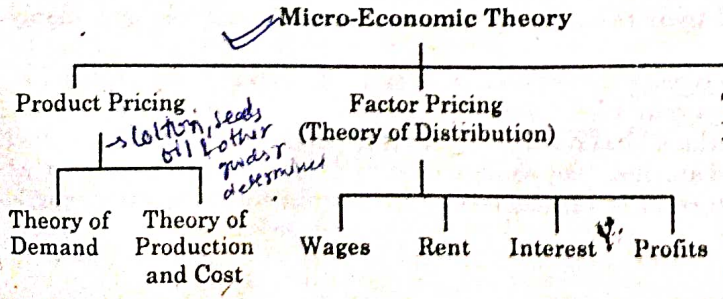
Micro-economic theory takes the total quantity of resources as given and seeks to explain how they are allocated to the production of various goods. It is the allocation of resources that determines what goods shall be produced and how they shall be produced. The allocation of resources to the production of various goods in a free market economy depends

upon the prices of the various goods and the prices of the various resources or factors of production. Therefore, to explain how the allocation of resources is determined, micro-economics proceeds to analyse how the relative prices of goods and factors are determined. Thus, the theory of product pricing and the theory of factor pricing (or the theory of distribution) fall within the domain of micro-economics. The theory of product pricing explains how the relative prices of cotton cloth, foodgrains, jute, kerosene oil, vanaspati ghee and thousands of other goods are determined. The theory of distribution explains how *wages* (price for the use of labour), *rent* (payment for the use of land), *interest* (price for the use of capital) and *profits* (the reward for the entrepreneur) are determined.

Prices of the products depend upon the forces of demand and supply. The demand for goods depends upon the consumers' behaviour pattern, and the supply of goods depends upon the conditions of production and cost and the behaviour pattern of the firms. Thus, the demand and supply sides have to be analysed in order to explain the determination of prices of goods and factors. Thus, the theory of demand and the theory of production are two subdivisions of the theory of pricing.

Besides analysing the pricing of products and factors and the allocation of resources based upon the price mechanism, micro-economics also seeks to explain whether the allocation of resources determined is *efficient*. Efficiency in the allocation of resources is attained when the resources are so allocated that maximises the satisfaction of the people. *Economic efficiency involves three efficiencies, efficiency in production, efficiency in distribution of goods among the people* (also called efficiency in consumption) and *overall economic efficiency*, that is, efficiency in the direction of production. Micro-economic theory shows under what conditions these efficiencies are achieved. The question of economic efficiency is, in fact, the subject-matter of welfare economics.

There are four basic economic questions; namely, (1) what goods shall be produced and in what quantities, (2) how they shall be produced; (3) how the goods and services produced shall be distributed, and (4) whether the production of goods and their distribution for consumption is efficient. All these fall within the domain of micro-economics. The whole content of micro-economic theory is presented in the following chart :



IMPORTANCE OF MICRO ECONOMICS

Micro-economics explains how a free-market economy with its millions of consumers and producers work to decide about the allocation of productive resources among the thousands of goods and services. In the words of D.S. Watson, "Micro-economic theory explains the composition or allocation of total production, why more of some things are produced than of others." He further remarks that micro-economic theory has many uses. The greatest of these is depth in understanding of how a free private enterprise economy operates.

Micro-economics tells us how the goods and services produced are distributed among the various people for consumption, through price or market mechanism. It shows how the relative prices of various products and factors are formed, that is, why the price of bread is what it is and way the wages of an engineer are what they are and so on.

Micro-economic theory *explains the conditions of efficiency in consumption and production* and highlights the factors which are responsible for the departure from the efficiency or economic optimum. On the basis of this, micro-economic theory *suggests suitable policies* to promote economic efficiency and welfare of the people. Thus, not only does micro-economic theory describe the actual operation of the economy, it has also a normative role in that it suggests policies to eradicate "inefficiency" from the economic system so as to maximize the welfare of the people. Micro-economic theory shows that welfare optimum or economic efficiency is achieved when there prevails perfect competition in the product and factor markets. Perfect competition is said to exist when there are so many sellers and buyers in the market that no individual seller or buyer is in a position to influence the price of a product or factor. Departure from perfect competition leads to a lower level of welfare, that is, it involves loss of economic efficiency. It is in this context that a large part of micro-economic theory is concerned with showing the nature of departures from perfect competition and therefore from welfare optimum.

The power of a giant firm or a combination of firms over the output and price of a product constitutes the problem of monopoly. Micro-economics shows how monopoly leads to misallocation of resources and therefore involves loss of economic efficiency or welfare. It also makes important and useful policy recommendations to regulate monopoly so as to attain economic efficiency or maximum welfare. Like monopoly, *monopsony* (that is, when a large buyer or a combination of buyers exercises control over the price) also leads to the loss of welfare and therefore needs to be controlled. Similarly, micro-economics brings out the welfare implications of oligopoly (or oligopsony) whose main characteristic is that individual sellers (or buyers) have to take into account, while deciding upon their course of action, how their rivals

react to their moves regarding changes in price, product design and features and advertising policy.

Micro-economics analysis is applicable to the various applied branches of economics such as Public Finance and International Economics. It is the micro-economic analysis which is used to explain the factors which determine the distribution of the *incidence or burden* of a commodity tax between producers or sellers on the one hand and the consumers on the other. Further, micro-economic analysis is applied to show the damage done to the social welfare or economic efficiency by the imposition of a tax. If it is assumed that resources are optimally allocated or maximum social welfare prevails before the imposition of a tax, then it can be demonstrated by micro-economic analysis that what amount of the damage will be caused to the social welfare.

These days, micro economic analysis is also applied to show the *gain from international trade* and to explain the factors which determine the distribution of this gain among the participant countries. Besides, micro-economics finds application in the various problems of international economics. Whether devaluation will succeed in correcting the disequilibrium in the balance of payments depends upon the elasticities of demand and supply of exports and imports. Furthermore, the determination of the foreign exchange rate of a currency, if it is free to vary, depends upon the demand and supply of that currency.

MEANING AND NATURE OF MACRO ECONOMICS

According to K.E. Boulding, "*Macro-economics deals with aggregates of individual quantities, national income, general price level and the national output*". Macro-economics is concerned with the study of economy-wide aggregates such as total consumption, total investment, total employment and national product. Thus, it furnishes us with the **macroscopic view of the economy**. Macro-economic theories are concerned with the analysis of the levels of total money supply, national product, total employment of nation's resources, etc. Thus, macro-economics is the analysis of the economy-wide or aggregate variables.

Macro-economics analyses the behaviour of the whole economic system in totality. In other words, macro-economics studies the behaviour of the large aggregates such as total employment, the national product or income, the general price level of the economy. Therefore, macro-economics is also known as *aggregative economics*. Macro-economics analyses and establishes the functional relationship between these large aggregates.

Macro-economics concerns itself with those aggregates which relate to the whole economy. Macro-economics also discusses the sub-aggregates of the large aggregates relating to the whole economy. But these sub-aggregates, unlike the aggregates of micro-economics which examines aggregates relating to a particular product, a particular industry or a particular market, cut across various products and industries. For

example, the total production of consumer goods (*i.e.*, total consumption) and the total production of capital goods (*i.e.*, total investment) are two important sub-aggregates dealt with in macro-economics but these aggregates are not confined to a single product or a single industry but instead they refer to all industries producing consumer goods and all industries producing capital goods in the economy. Moreover, the sub-aggregates in macro-economics, add up to an aggregate for the whole economy. For instance, total consumption and total investment, two important sub-aggregates in macro-economics, together constitute the total national product.

IMPORTANCE OF MACRO ECONOMICS

Determination of Income and Employment. The subject-matter of macro-economic analysis is to explain what determines the *level of national income and employment*, and what causes the *fluctuations* in the level of national income, output and employment. Further, it also explains the *growth* of national income over a long period of time. In other words, macro-economics examines the determination of the level, fluctuations (cycles) and trends (growth) in the overall economic activity (*i.e.*, national income, output and employment).

Determination of General Level of Prices. Macro-economics also concerns itself with showing how the general level of prices is determined. Keynes made a significant improvement over the Quantity Theory of Money by showing that the increase in the supply of money does not always bring about the rise in prices. Important topic in this field is to explain the causes of inflation. Keynes showed that before the Second World War involuntary unemployment and depression were due to the deficiency of aggregate demand. But during the war period when prices rose very high, Keynes explained in a booklet entitled "*How to Pay for War*" that just as unemployment and depression were caused by the deficiency of aggregate demand, inflation was due to the *excessive aggregate demand*. Since then Keynes' theory of inflation has been further developed and many types of inflation depending upon various causes have been pointed out. The problem of inflation which is a serious problem faced by many countries is an important concern of macro-economics.

Economic Growth. The theory of growth is an important part of macro-economics. The problem of growth is a long-run problem and Keynes did not deal with it. In fact, Keynes is said to have once remarked that "in the long-run, we are all dead". From this remark of Keynes, it should not be understood that he thought long-run to be quite unimportant. By this remark he simply emphasized the importance of short-run problem of fluctuations in the level of economic activity (involuntary cyclical unemployment, depression, inflation). Later, Harrod and Domar extended the Keynesian analysis to the long-run problem of

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example, the total production of consumer goods (*i.e.*, total consumption) and the total production of capital goods (*i.e.*, total investment) are two important sub-aggregates dealt with in macro-economics but these aggregates are not confined to a single product or a single industry but instead they refer to all industries producing consumer goods and all industries producing capital goods in the economy. Moreover, the sub-aggregates in macro-economics, add up to an aggregate for the whole economy. For instance, total consumption and total investment, two important sub-aggregates in macro-economics, together constitute the total national product.

IMPORTANCE OF MACRO ECONOMICS

Determination of Income and Employment. The subject-matter of macro-economic analysis is to explain what determines the *level of national income and employment*, and what causes the *fluctuations* in the level of national income, output and employment. Further, it also explains the *growth* of national income over a long period of time. In other words, macro-economics examines the determination of the level, fluctuations (cycles) and trends (growth) in the overall economic activity (*i.e.*, national income, output and employment).

Determination of General Level of Prices. Macro-economics also concerns itself with showing how the general level of prices is determined. Keynes made a significant improvement over the Quantity Theory of Money by showing that the increase in the supply of money does not always bring about the rise in prices. Important topic in this field is to explain the causes of inflation. Keynes showed that before the Second World War involuntary unemployment and depression were due to the deficiency of aggregate demand. But during the war period when prices rose very high, Keynes explained in a booklet entitled "*How to Pay for War*" that just as unemployment and depression were caused by the deficiency of aggregate demand, inflation was due to the *excessive aggregate demand*. Since then Keynes' theory of inflation has been further developed and many types of inflation depending upon various causes have been pointed out. The problem of inflation which is a serious problem faced by many countries is an important concern of macro-economics.

Economic Growth. The theory of growth is an important part of macro-economics. The problem of growth is a long-run problem and Keynes did not deal with it. In fact, Keynes is said to have once remarked that "in the long-run, we are all dead". From this remark of Keynes, it should not be understood that he thought long-run to be quite unimportant. By this remark he simply emphasized the importance of short-run problem of fluctuations in the level of economic activity (involuntary cyclical unemployment, depression, inflation). Later, Harrod and Domar extended the Keynesian analysis to the long-run problem of

growth with stability. They pointed out the dual role of investment-*one of income generating*, which Keynes considered, and *the second of increasing capacity* which Keynes ignored because of his preoccupation with the short run. In view of the fact that an investment adds to the production capacity (*i.e.*, capital stock), if growth with stability (without secular stagnation or secular inflation) is to be achieved, income or demand must be increasing at a rate sufficient enough to ensure the full utilization of the increasing production capacity.

The growth of economics has been further developed and extended a good deal. Though a general growth theory applies to both the developed and under-developed economies, special theories which explain the causes of under-development and poverty in under-developed countries and which also suggest strategies for initiating and accelerating growth in them have been propounded. These growth theories relating to under-developed countries are generally known as "*Economics of Development*".

DIFFERENCE BETWEEN MACRO AND MICRO ECONOMICS

In the words of Gardner Ackley, "Macro-economics concerns itself with such variables as *the aggregate volume of the output of an economy, with the extent to which its resources are employed, with the size of the national income, with the general price level.*" Micro-economics, on the other hand, deals with *the division of total output among industries, products and firms and the allocation of resources among competing uses.* Its interest is in relative prices of particular goods and services.

Micro-economics also does deal with some "aggregates" but not of the type with which macro-economics is concerned. Micro-economics examines the behaviour of the industry in regard to the determination of its product-price, output and employment, and the industry is an *aggregate of the various firms* producing the same or similar product. Likewise, micro-economic theory seeks to explain the determination of price of a product through the interaction of the market demand and market supply for a product. Market demand for a product is the aggregate of the individual demands of all consumers wishing to buy the product and the market supply of a product is the aggregate of the productions of many firms producing that product. Similarly, demand for the supply of labour in an industry through which micro-economics explains wage determination are aggregative concepts.

But the aggregates with which macro-economics is concerned are of somewhat different variety. It is concerned with those aggregates which relate to the whole economy such as total investment, total production and total consumption of the whole economy.

Micro-economics helps in explaining the determination of relative prices of products and factors of production and the allocation of resources based upon them. But macro-economics helps to explain what determines the level of national income and employment and what causes the fluctuations in the level of national income, output and employment.

Scope of Micro-Economics. Micro-economics analysis answers such questions as :

(*i*) How is the buying behaviour of a consumer influenced by any given change in the price of a product ?
(*ii*) How does a firm combine the different inputs in order to produce the given goods and services ?
(*iii*) How does a firm under given market conditions determine the output which it will produce and the price at which it will sell it ?

Scope of Macro-Economics. Macro-economics analysis answers such questions as :

(*i*) What commodities are being produced and in what quantities ?
(*ii*) Are the resources of the country fully utilised ?
(*iii*) What determines the level of employment in the economy ?
(*iv*) How efficient are the economy's production and distribution systems ?
(*v*) How is the general price level determined ?

In fact, micro and macro are not two independent approaches to economic analysis but they are complementary to each other. They do not supplant but supplement each other. According to P.A. Samuelson, "*There is really no opposition between micro and macro-economics. Both are absolutely vital. And you are half educated if you understand the one being ignorant of the other*". It is only when we use the two approaches simultaneously that we can have a better understanding of the economic problems.

Comparison between Micro and Macro-Economics

Micro-Economics	*Macro-Economics*
1. It is study of individual economic units.	1. It is study of economy as a whole and its aggregates.
2. It deals with individual income, individual prices and individual output etc.	2. It deals with national income, price level and national output etc.
3. Its central problem is price determination of commodities and factors of production.	3. Its central problem is determination of level of income and employment.
4. Its main tools are demand and supply to particular commodity/factor.	4. Its main tools are aggregate demand and aggregate supply of the economy as a whole.

INTER-RELATIONSHIP BETWEEN MACRO AND MICRO ECONOMICS

Dependence of Macro-Economics on Micro-Economics. Macro-economic theory is dependent on micro economic theory in several

aspects. The theories regarding the behaviour of some macro-economic aggregates (but not all) are derived from theories of individual behaviour. For instance, the theory of investment, which is a part and parcel of the micro-economic theory, is derived from the behaviour of individual entrepreneur. According to this theory, an individual entrepreneur in his investment activity is governed by the expected rate of profit on the one hand and rate of interest on the other. And so is the aggregate investment function. Similarly, the theory of aggregate consumption function is based upon the behaviour patterns of individual consumers. It should be noted that we are able to draw aggregate investment function and aggregate consumption function because the behaviour of the aggregate is in no way different from the behaviour patterns of individual components. But it does not mean that the behaviour of all macro-economic relationships is in conformity with behaviour patterns of individuals unit composing them. For instance, saving-investment relationship, wage-employment relationship for the economic system as a whole are quite different from the corresponding relationships in case of individual parts or units.

Micro-economic theory contributes to macro-economic theory in another way also. The theory of relative prices of products and factors is essential for explanation of the determination of general price level. Even Keynes used micro-economic theory to explain the rise in price as a result of the increase in the money supply of the economy. According to Keynes, when as a result of the increase in money supply and consequently the aggregate demand, more output is produced, the cost of production rises. With the rise in the cost of production, the price rises. According to Keynes, cost of production rises because of (1) the law of diminishing returns operates; and (2) wages and prices of raw materials may rise as the economy approaches full employment. Now the influence of cost of production, diminishing returns, etc., on the determination of prices are the parts of micro-economics.

Dependence of Micro-Economics on Macro-Economics. To some extent, micro-economics also depends upon macro-economics. For instance, determination of the rate of profit and the rate of interest are well-known segments of micro-economic but they greatly depend upon the macro-economic aggregates. In micro-economic theory, the profits are regarded as reward for uncertainty bearing but it fails to show the economic forces which determine the magnitude of profits earned by the entrepreneur and why there are fluctuations in them. The magnitude of profits depends upon the level of aggregate demand, national income and the general price level in the economy. During the times of depression when the levels of aggregate demand, national income and price level are low, the entrepreneurs in the various fields of the economy suffer losses. On the other hand, when aggregate demand, incomes of the people, the general price level go up and conditions of boom prevail, the entrepreneurs earn huge profits.

The theory of rate of interest is now a very much part of macro-economic theory. Partial equilibrium theory of interest which belongs to micro-economic theory would not reveal all the forces which influence the determination of the rate of interest. Keynes showed that the rate of interest is determined by the liquidity preference function and the stock (or supply) of money in the economy. The liquidity preference function and the stock of money in the economy are macro-economic concepts. In the modern theory of interest, the other two forces which are used to explain the determination of interest are saving and investment functions which are also conceived in aggregative or macro terms.

It follows from the above discussion that though micro-economics and macro-economics deal with different subjects, there is great interdependence between them. In the explanation of many economic phenomena, both micro and macro-economic tools and concepts have to be applied. In this context the remarks of Ackley are worth quoting. "The relationship between macro-economics and theory of individual behaviour is a two-way street. On the one hand, micro-economic theory should provide the building blocks for the aggregate theories. But macro-economics may also contribute to micro-economic understanding. If we discover, for example, empirically stable micro-economic generalisations which appear inconsistent with micro-economic theories, or which relate to aspects of behaviour which micro-economics has neglected, macro-economics may permit us to improve our understanding of individual behaviour."

STATIC AND DYNAMIC ANALYSIS

Economic phenomena are often complicated. The large scale production, internal and international trade, planning of the various interdependent sectors of an economy may be cited as some of the complex problems handled in economics. Explanation of these complicated phenomena necessitates analysing the problem into several different frameworks : static, dynamic, historic, etc. This enables us to understand the nature of changes which affect our choices and also equips us for a correct appreciation of the more complicated situations.

Economic Statics

Economic statics is concerned with *economic phenomena independently of the time element*, *i.e.* it excludes the time element. In statics, the relations between the relevant variables relate to the same moment of time, or the same period of time.

When an economic phenomenon is studied under static conditions, it is called static analysis. For static analysis, a static model is used. A static macro-model assumes that there is no change in the size of the economy, national output, prices and employment. In a static economy, the basic forces of change, like stock of capital, technology, population, nature of business organizations, and tastes

and preferences of the people remain unchanged over the reference period. The entire economic process in a static economy reproduces itself year after year at the same level of output and employment. Such an economy is said to be in a state of *static equilibrium*.

A static economy, as described above, is created hypothetically for theoretical purpose. It is an abstraction from reality. A static economy is insulated from the influence of possible changes. This kind of economic analysis is called *static analysis*. An important feature of static analysis is that the variables used in this kind of analysis have no timeframe (past or future) and all the variables belong to the same point of time. Thus, a static model is the construction of a timeless economy. In such a model, the value of the relevant variables and the relationship between them are simultaneously and instantaneously determined. That is, there is no time lag in the adjustment of the dependent variable to the change in the independent variable. *This kind of approach to the study of an economic phenomenon is essentially a theoretical approach*. The primary objective of constructing a static model is to make generalizations or theoretical propositions regarding the relationship between the related variables under static conditions.

Comparative Statics

Comparative statics denote a comparative study of economic conditions at two equilibrium positions at two different points of time. In a comparative static analysis, we compare the equilibrium values of the system corresponding to the two equilibrium positions with one another. This sort of comparative analysis of two equilibrium positions may be described as comparative static analysis. A comparative study of this kind assumes a great significance where the objective is to predict the future course of an economy on the basis of the past experience. A comparative analysis has a great predictive power, especially when changes are few and small and the economy treads smoothly from one equilibrium position to another.

In 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 difference between the two being due to the change that was introduced. However, it is important to note that in comparative statics we merely compare the initial (prechange) equilibrium state with the final (post-change) equilibrium state. It does not study the whole path of change, *i.e.*, it does not take into account "how" the new position of equilibrium was reached from the initial position. This is done under dynamic analysis.

Economic Dynamics

Dynamic analysis is used to study *an economic phenomenon under dynamic conditions*. Economic dynamics studies the factors

and forces that set an economy in motion and lead or do not lead it to a new equilibrium. It studies the action of and interaction between the forces of change. The interaction between the forces of change is not instantaneous and simultaneous. It involves a time-lag; that is, the time that a force of change takes to affect the other related factors and the time that other factors take to adjust themselves to the change. Dynamic analysis takes into account the time lag involved in the process of adjustments. It studies the nature and magnitude of changes and finds whether they are oscillatory or dampening—if oscillatory, then whether divergent or convergent. If they are convergent, the economy may reach another equilibrium. If changes are divergent, the economy may not attain another equilibrium position.

The study of "how" the new position of equilibrium is reached, *i.e.* the study of the *paths of change* falls within the domain of economic dynamics. There is no assumption of *ceteris paribus* (*i.e.* 'other things remaining the same') in economic dynamics. Therefore it takes into account all changes, lags, sequences, expectations etc. According to J.R. Hicks, "Economic dynamics refers to that part of economic theory in which all quantities must be dated."

Dynamic analysis traces the time paths of economic variables and involves variables and their lagged values. Since all economic phenomena are "moving" in time, dynamic analysis is the realistic method of studying them. Whether we consider prices and outputs of individual producers; income, consumption or savings of individual households; or the macro economic variables like aggregate income, employment, consumption, savings, investment or general price level, all variables keep changing over time. Most of these variables act and react upon one another with a time lag and this brings out the importance of inter-temporal causal relationships. A dynamic theory shows how in the course of time a condition of the economic system has grown out of its condition in the previous period of time. It is this form of analysis which has central importance for the study of the processes of economic development. On account of this reason, the entire discussion pertaining to the economics of growth and development is carried out in the framework of economic dynamics.

DISTINCTION BETWEEN ECONOMIC STATICS AND DYNAMICS

The distinctive features of static and dynamic analyses are as follows :

(1) In the words of Hicks, "Economic statics are those parts of economic theory where we do not trouble about dating; Economic dynamics are those parts where every quantity must be dated." While to Stigler "static economic analysis is an explanation of equilibrium position in the particular problem on the assumption that the data of that problem do not change." "Dynamic economics", according to him, "is the

study of the path by which a set of economic quantities (*i.e.* prices and quantities) reach equilibrium, within a static framework."

(2) Static Economic Theory deals primarily with the forces of rest, while Dynamic Economic Theory deals primarily with the forces of disturbance or change. The case of disturbed equilibrium, however, falls under both types of studies. If the disturbance is continuous or cumulative, we study its effects under Dynamics; on the other hand, if this disturbance is only casual and accidental so that the system is able to attain a position of equilibrium after a small transitional process of adjustment, we place it under the category of Static.

(3) In static analysis, fundamental economic conditions are assumed to be given and known, but in a dynamic analysis, they continue to change over time.

(4) Economic statics is a timeless analysis, whereas in economic dynamics, time is used as one of the variables because time works as a determinant of other variables. For example, national income of a country in time t depends on its value in time $t - 1$.

(5) Economic statics is an abstraction from reality, whereas economic dynamics is the study of the real world.

(6) All the variables in a static analysis are *undated* while in dynamic analysis, all variables are dated, that is, their movement on time scale is known.

QUESTIONS

1. Discuss the meaning and nature of micro-economics.
2. What is meant by micro-economics ? Explain the importance of micro-economics.
3. Define macro-economics and explain its significance.
4. State the meaning and nature of macro-economics and also discuss its importance.
5. Define micro-economics and differentiate it from macro-economics.
6. What are the central problems of an economy ? Discuss in brief.
7. Examine the inter-relationship between macro-economics and micro-economics.
8. In what respects macro-economics is different from micro-economics ? Discuss.
9. Discuss the role of macro economics in the determination of income and employment and determination of general level of prices.
10. Distinguish between :
    (*a*) Macro and Micro Economics
    (*b*) Static and Dyanmic Economic
11. Write notes on the following :
    (*a*) Scope of micro-economics.
    (*b*) Role of macro-economics in determination of general level of prices.

□ □ □

Concept and Elasticity of Demand

Meaning of Demand

Demand for a commodity refers to the quantity of a commodity which a consumer is willing to buy at a given price in a given period of time. Thus demand involves three essential elements namely : (*i*) *quantity of the commodity,* (*ii*) *price of the commodity; and* (*iii*) *the period of time.* It needs to be noted that demand is not only with reference to the price of the commodity but also to the period of time. Demand is a continuous flow which requires to be expressed in terms of a period of time, *i.e.* whether demand is for a day, a week, a month or for a longer period. It is so because over different periods, different quantities of a commodity may be demanded even at the same price. Thus any statement about demand for a commodity will not be correct if it does not convey its three elements mentioned above. For instance, statement like a household's demand for milk is 2 litres @ Rs. 17 per lit., is not correct and complete. The meaningful statement would be that @ Rs. 17 per lit. a household's demand for milk is 2 lit. *today* because it contains all the three essential elements of demand.

In this context, Benhem's following definition deserves special mention. "*The demand for any thing at a given price is the amount of it which will be bought per unit of time at that price*". Demand for a commodity depends upon a number of factors which are enumerated below. Needless to remind that " a *commodity is any good produced for sale in the market*".

Types of Demand

Broadly speaking demand for a commodity depends upon (*i*) price of the commodity, (*ii*) income of the consumer, (*iii*) prices of related goods and (*iv*) tastes and preference of consumer. The last determinant, *i.e.* taste of the consumer cannot be measured since it is influenced by many factors such as social, political, religious, geographical etc. Thus on the basis of the remaining three factors, demand is classified into three kinds of groups, (*i*) *Price demand,* (*ii*) *Income demand, and* (*iii*) *Cross demand.* Each kind of demand is explained below.

(*i*) Price Demand. It refers to various quantities of a commodity that an individual household is willing to buy at a given market price in a given period of time. Factors other than the price affecting demand for

commodity are presumed to remain unchanged. *The relationship between price and the demand for commodity is generally inverse, i.e.* when price rises, demand falls and when price falls, demand rises.

(ii) Income Demand. It refers to various quantities of a commodity demanded by a consumer at various levels of his income, other things being equal. It indicates the functional relationship between income of the consumer and quantity of commodity demanded.

The relationship between the income and the demand for the commodity is generally positive, i.e. when income of consumer rises, demand also rises and when income falls, demand also falls. Effect of change in income on the demand for commodity depends upon the nature of the commodity *i.e.* whether the commodity is superior (normal) or inferior. Thus normal (superior) goods and inferior goods are defined in relation to the effect of change in income on demand. For instance, when rise in income results in rise in demand for a good, the good is said to be a normal good. On the contrary, when rise in income leads to fall in demand for a good, the good is called as inferior good.

(iii) Cross Demand. It refers to various quantities of commodity that a consumer is willing to buy when price of other related commodity (*i.e.* substitute or complementary) changes. In other words, it indicates functional relationship between demand for a particular commodity and the prices of other related commodities.

Factors Affecting Demand / Determinants

There are many economic, social and political factors or determinants which greatly influence the demand for commodity. Some of these factors are discussed below :

1. Price of Commodity. The most significant factor which influences the demand is the price of the commodity. As the price of a commodity changes, it causes an inverse change in the demand for commodity. In other words, the demand or a commodity rises when its price falls and vice versa, other things remaining unchanged.

2. Price of Related Commodities. Related goods are of two types, namely, substitute goods and complementary goods. How do their prices affect the demand is shown below.

(a) ***Substitute goods.*** *Substitute goods are those goods which can be used (substituted) in place of one another, e.g.* tea and coffee, car and scooter, Coca Cola and Pepsi. For example, a fall in price of coffee (substitute good) will reduce the demand for tea because the consumers will substitute coffee for tea. This is called direct (or positive) relationship between the demand for a commodity and the price of its substitute good. Substitute goods are also called competitive goods. Thus we can say that *a fall in the*

price of substitute good (say, coffee) reduces the consumer's demand for particular good (say, tea).

(b) ***Complementary Goods.*** *Complementary goods are those which are used together to satisfy a given want.* In such cases, utility of a good depends upon the availability of an other related good. They are complementary to each other and are jointly demanded, *e.g.* scooter and petrol, torch and cells. What is the relationship between the household demand for a commodity (say, scooter) and price of its complementary good (say, petrol) ? It is *inverse relationship* because a fall in the price of petrol will *increase* the demand for scooters. In other words, the demand of one commodity is negatively related to the price of other.

3. Level of Income. Other things being equal, the demand for a commodity depends upon the income of the household. In most cases, the larger the average income of the household, the larger is the quantity demanded of a particular good. However, there are certain commodities for which quantities demanded decrease with an increase in income. These goods are called *inferior goods*. Even in the case of other goods, the response of quantities demanded to changes in their prices is not of same proportions. If goods are such that they satisfy the basic necessities (food, clothing, shelter) of life, a change in their prices although will cause an increase in demand for these necessities this increase will be less than proportionate to the increase in income. This is because as people become richer, there is a relative decline in importance of food and other non durable goods in the over all consumption pattern and a rise in importance of durable goods such as a TV, car, house etc.

4. Tastes and Preferences of Consumers. The demand for a commodity also depends upon tastes and preferences of consumers and changes in them over a period of time. Goods which are more in fashion command higher demand than goods which are out of fashion. Consumers may even discard a good even before it is fully utilised and prefer another good which is in fashion. For example, there is a greater demand for colour television and more and more people are discarding their black and white television even though they could have still used it for some more years.

Demonstration effect plays an important role in affecting the demand for a product. An individual's demand for colour television may be affected by his seeing one in neighbour's or friend's house, either because he likes what he sees or because he figures out that if his neighbour or friend can afford it, he too can. A person may develop a taste or preference for wine after tasting some, but he may also develop it after discovering that serving it enhances his prestige. In any case, people have tastes and preferences and these change, sometimes due to exogenous and sometimes due to endogenous causes.

5. Distribution of Wealth. The quantity demanded of a commodity is also influenced by the distribution of wealth in the society. If there is an equal distribution of income in the society, the demand will be higher and in case of inequality demand will be less.

6. Government Policy. Government policy is also responsible to influence the demand for commodity. If the Government imposes additional taxes on various commodities, it would lead to an increase in the price of the commodities. This would bring down the demand for such commodities.

7. Miscellaneous Factors. Apart from the above factors, the demand for a commodity depends upon the following factors :

(a) *Size of Population.* Generally, larger the size of population of a country or a region, greater is the demand for commodities in general.

(b) *Composition of Population.* If there are more old people in a region, the demand for spectacles, walking sticks, etc. will be high. Similarly, if the population consists of more of children, demand for toys, books, stationery, etc. will be more.

Demand Function

It explains *the relationship between the demand for a commodity and the factors determining demand*. The above analysis is presented as demand function in the form of the following equation :

$$D_x = f(P_x, P_R, Y, T)$$

The equation shows that Demand for commodity X (D_x) is the function (f) of Price of commodity X (P_x); Price of Related goods (P_R); Income of consumer (Y) and Tastes of consumer (T).

LAW OF DEMAND

The law of demand explains the relationship between price and quantity demanded. It may be stated as follows : "*Other things being equal, if the price of a commodity falls, the quantity demanded of it will rise and if the price of a commodity rises, its quantity demanded will decline.*" Thus, there is an inverse relationship between price and quantity demanded, other things being same. The other things which are assumed to be equal or constant are the prices of related commodities, income of consumers, tastes and preferences of consumers, and such other factors which influence demand. If these factors which determine demand also undergo a change, then the inverse price-demand relationship may not hold good. For example, if incomes of consumers increase, an increase in the price of a commodity, may not result in a decrease in the quantity demanded of it. Thus, the constancy of these other factors is an important assumption of the law of demand.

Assumptions of the Law of Demand

According to Samuelson, 'Law of demand states that people will buy more at lower prices and buy less at higher prices, ceteris paribus." However, this law is based on the following assumptions :

1. There should be no change in the income of the consumers.
2. There should be no change in the tastes and preferences of the consumers because the law of demand applies only when the tastes and preferences of the consumers remain constant.
3. Price of the related commodities should remain unchanged.
4. The commodity in question should be a normal one.
5. There should be no change in the size of population.
6. The distribution of income and wealth should be equal.
7. There should be continuous demand except in case of indivisible commodities.
8. There should be perfect competition in the market.

Demand Schedule

A demand schedule is a tabular statement which shows different quantities of a product demanded at various prices. It thus illustrates the relation between quantity of a commodity demanded and its price as shown in Table 1.

Table 1. Demand Schedule of a Household

	Price per Unit (Rs.)	*Quantity Demanded (Units)*
A	5	10
B	4	15
C	3	20
D	2	35
E	1	60

When price of the commodity is Rs. 5 per unit, a household purchases 10 units of the commodity. When the price falls to Rs. 4, it purchases 15 units of the commodity. Similarly, when the price further falls, quantity demanded by the family goes on rising until at price Re. 1, the quantity demanded by the family rises to 60 units. The above table depicts an inverse relationship between price and quantity demanded as the price of the commodity X goes on rising, its demand goes on falling.

Demand Curve

A demand curve reflects graphically the *relationship between the quantity demanded of a commodity and its price*. Alternatively *a demand curve relates quantity demanded of a commodity to its price*. It shows the information graphically whereas the demand schedule shows the same information arithmetically. The above imaginary demand schedule has been reflected as a demand curve in Figure 1. The points A, B, C, D and E on the demand curve show the quantity of the commodity demanded at various prices as shown in Table 1. Point A, shows the same information as the first row of Table 1, that at Rs. 5 per unit, only 10 units of *X* will be demanded. Point E shows the same information as does the last row of the table, when the price is Re. 1, the quantity demanded will be 60 units.

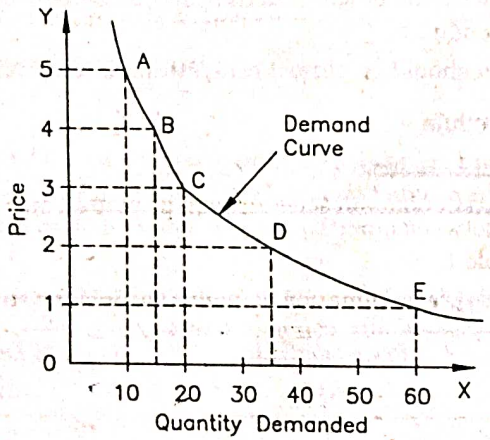

Fig. 1. Demand Curve of a Commodity.

The curve shows the quantity of the commodity that a consumer would like to buy at each price, its downward slope indicates that the quantity demanded increases as its price falls. Thus, the downward sloping demand curve is in accordance with the law of demand which, as stated above, describes an inverse price-demand relationship.

Market Demand Schedule

By adding up horizontally, the demand schedule of all households, we will arrive at the *market demand schedule*. This is also known as the *industry demand schedule*. An increase in price leads to decrease in demand and vice versa, if other things remain constant. This phenomenon explains why the demand curve shapes downward.

Suppose there are three buyers of the commodity, namely, A, B and C in the market and have different patterns of demand at different prices as shown in Table 2.

Table 2. Market Demand Schedule

Price (Rs.)	*Quantity Demanded by* A	B	C	*Total Market Demand (Units)*
5	10	8	12	30
4	15	12	18	45
3	20	17	23	60
2	35	25	40	100
1	60	35	45	140

By adding the quantities demanded by A, B and C at different prices, we get the total demand in the market. At Rs. 5 per unit, the market demand is 30 units (*i.e.*, 10 + 8 + 12) and at Re. 1 per unit, the market demand is 140 units.

Market Demand Curve

The market demand schedule can be plotted on a graph to get the market demand curve as shown in Fig. 2. The market demand curve, like individual demand curve, slopes downwards to the right because it is nothing but lateral summation of individual demand curves. Besides, as the price of the good falls, it is very likely that new buyers will enter the market which will further raise the quantity demanded of the goods.

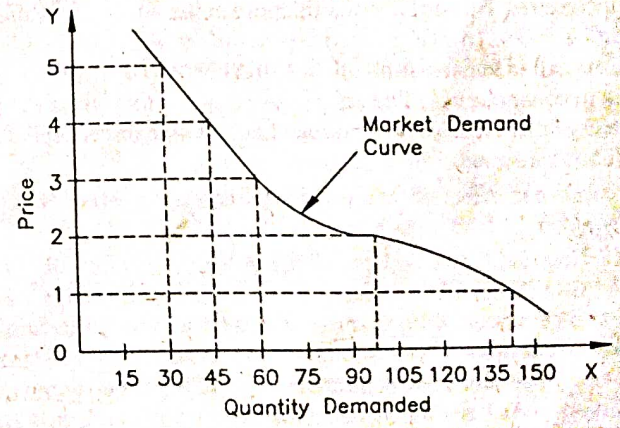

Fig. 2. Market Demand Curve

RATIONALE FOR THE LAW OF DEMAND

Reasons of Demand Curve Sloping Downward

The demand curve of a commodity slopes downward to the right because of the following reasons :

1. Law of Dimnishing Marginal Utility. A consumer achieves equilibrium when his marginal utility of a product is equal to its price. If his marginal utility is less than the price, he will stop further buying. Marginal utility of a product decreases with increase in its consumption. If the price decreases, the equality between marginal utility and cost is attained when the demand is more than it was originally and vice versa.

2. Income Effect. *A change in quantity demanded as a result of change in real income caused by change in price of a commodity is called income effect.* Any change in the price of a commodity affects the purchasing power or real income of the consumer although his money income remains the same. When price of a commodity falls, less has to be spent on purchase of same quantity of the commodity in question. This is called income effect. In short, a fall in price increases the real income (purchasing power) of a consumer with the result that he buys more quantity with the same money income. Similarly, a rise in price virtually amounts to fall in real income of the consumer leading to contraction of his demand. This is called income effect. Mind, income effect is related to change in income caused due to change in price and not due to change in money income.

3. Substitution Effect. *It refers to substitution of one commodity in place of other commodity when it becomes relatively cheaper.* A rise in the price of a commodity, say coffee, also means that price of its substitute, say tea, has fallen in relation to that of coffee even though price of tea remains unchanged. So people will buy more of tea and less of coffee when price of coffee rises. In other words, consumers will substitute tea for coffee. This is called substitution effect. Alternatively demand for cheaper goods rises in consequence. The effect operates reverse when the price of the commodity falls. Clearly substitution effect is based on concept of relative prices of substitute goods.

The combined effect of income effect and substitution effect is also called *price effect.*

4. Additional Consumers. When price of a commodity falls, two effects are quite discernible. Firstly, new (additional) buyers enter the market, *i.e.* consumers, who could not afford to buy that commodity previously, start demanding it at a reduced price. Secondly, old consumers or buyers purchase more of the same commodity by spending the same amount of money. As a result, old and new buyers push up the demand for a commodity, when price falls.

5. Different Uses of Commodity. A commodity having different uses is generally used at a large scale. For instance, milk is used for drinking, for preparing tea, curd, cheese, sweets etc. If price of milk goes up, its consumption is restricted to its very essential uses, say for baby's food or tea. Consequently, total demand for milk will fall which proves that with rise in price, demand falls.

Exceptions to the Law of Demand

In the following situations, people do not increase or decrease their demands as envisaged in the law of demand :

(i) *Conspicuous Necessities.* A commodity may be a necessity for one household and may be luxury for another. Fridge, T.V. and VCR are the examples in this regard. For middle class families, these products have become necessities as they convey a certain level of standard of living. Their demand is increasing even though their prices are also increasing.

(ii) *Inferior or Giffin Goods.* When the prices of giffin goods such as Jowar and Bajra fall, their demand also goes down. This is because of the fact that with the fall in the prices of giffin goods, the real income of households increase and they tend to substitute giffin goods by superior goods (say wheat). This is because the consumers divert their extra purchasing power caused by fall in price of giffin goods to purchase superior goods. As a result, demand for such inferior goods whose price has fallen, also falls. *All inferior goods are not exception to the law of demand.* Law of demand fails to operate in only Giffen goods, *i.e.*, those inferior goods whose *positive substitution effect is lesser than negative income effect.* Otherwise the law does operate in other inferior goods whose substitution effect is greater than income effect.

(iii) *Future Expectations.* Decision about one's willingness and ability to pay for a product is often made on the basis of future expectations. Expectations of rising prices in the future can increase present demand; so can expectations of shortages. When people fear that incomes will drop and that unemployment will spread, they become less willing to buy.

(iv) *Change in Fashion and Tastes.* When the fashion changes, people do not like to buy the old fashioned goods (such as ready made garments and shoes) even at throw away prices. When there is a change in tastes in favour of a commodity, more of this commodity will be demanded even if its price increases and that of its substitutes does not increase.

(v) *Status Symbol.* Some goods are purchased not because of their intrinsic value but because of status or prestige value. The same jewellery when sold at low price sells poorly but offered at five times the price, sells quite well. Similarly, demand for colour T.V. set, video tape recorders has been rising because of their status symbols in spite of the fact that their prices have also been rising continuously.

(vi) *Lack of Information.* Lack of information or ignorance about the market trends may induce a customer to purchase more of a particular product at a higher price. Some people also suffer from the phobia that a high priced product is better in quality than its lower-price substitute. Such people buy a higher quantity of a high priced product.

(vii) *Emergent Situation.* The law of demand does not operate during emergencies like famine, flood, war and internal disturbance. People buy their necessities in larger quantities even at high prices to make provision for increasing future.

Giffin Paradox

The law of demand says that when the price falls, the quantity demanded increases and with a rise in price, the quantity demanded decreases, *certrus paribus*. But in certain cases, with the increase in price, quantity demanded also increases and with the fall in price, quantity demanded falls. In such a case, demand curve slopes upward from left to right. It is called the positive slope as shown in Fig. 3. Robbert Giffin is the first person to expose this rare occasion, which is known as, 'Giffin's Paradox'

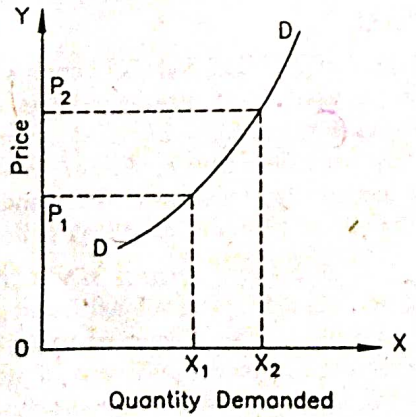

Fig. 3. Giffin Paradox (Upward Sloping Demand Curve).

In Fig. 3, DD is the positive sloping demand curve (upward slope) when the price is OP_1, the quantity demanded is OX_1. As the price rises to OP_2 quantity demanded also rise to OX_2. Therefore, *the positive sloping demand curve shows the direct relationship between price and demand.*

Impact of Rise in Income on Normal Goods and Inferior Goods

Normal Goods. *When rise in income leads to rise in demand for a good, that good is called a normal good. Alternatively goods whose income effect is positive are generally called normal goods.* Positive income effect means that when income of consumers rises, demand for normal goods also rises and when income falls, demand for such goods also falls. This has been shown in Fig. 4. In this figure, when income is OI, demand is OQ and when income of the consumer goes up form OI to OI', quantity demanded of commodity also goes up from OQ to OQ'. *Thus, price effect for normal goods is negative* which means when price rises, demand falls and when price falls, demand for normal goods rises as explained in law of demand.

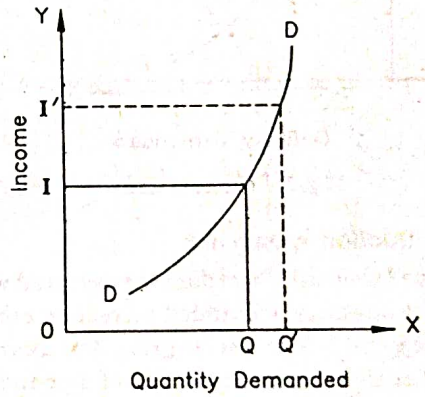

Fig. 4. Normal Goods.

Inferior Goods. *When rise in income leads to fall in demand for a good, that good is called an inferior good.* Alternatively *goods whose income effect is negative are called inferior goods.* Negative income effect means when income of the consumer rises, demand for inferior goods falls and when income falls, demand for such goods rises. In other words, *there is inverse relationship between income of the consumer and demand for inferior goods.* Suppose the price of 'Jowar' which is staple food of poor Indian labourers falls. Now they will have to spend less income to get the same amount of jowar; this means they will have more income for superior

foodgrains like wheat. As a result the labourers may demand less of inferior goods like jowar and more of wheat which is considered superior or normal good. This is shown in Fig. 5. At income level of OI, demand is OQ. With rise in income from OI to OI′, demand has fallen from OQ to OQ′.

In short, *goods the demand for which varies directly with the income are called normal goods. As against it, goods the demand for which varies inversely with income are termed as inferior goods. Demand* curve for normal goods is upward sloping as in Fig. 4 whereas for inferior goods is downward sloping as in Fig. 5.

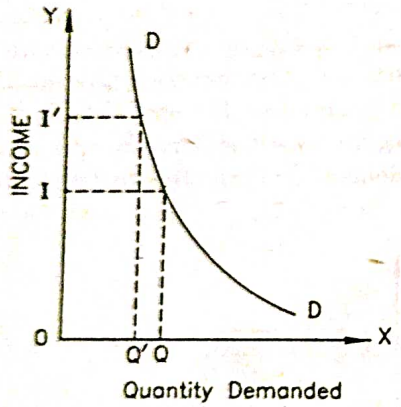

Fig. 5. Inferior Goods.

Expansion and Contraction in Demand

We have observed that the law of demand says that when the price of a commodity falls, its quantity demanded increases, other things being equal. When as a result of decrease in price, the quantity demanded increases, we say that there is an expansion of demand and when as a result of increase in price, quantity demanded decreases we say that there is contraction of demand. For example, suppose the price of apples at any time is Rs. 20 per kilogram and a consumer buys one kilogram at that price. Now, if other things such as income, prices of other goods and tastes of the consumers remain same, the price of apples falls to Rs. 16 per kilogram and the consumer now buys two kilograms of apples, we say that there is a change in quantity demanded or there is an expansion of demand. On the contrary, if the price of apples rises to Rs. 30 per kilogram and consumer buys only half a kilogram, we say that there is a contraction of demand.

Expansion and contraction in demand take place as a result of changes in the price while all other determinants of price viz. income, tastes, propensity to consume and price of related goods remain constant. These other factors remaining constant means that the position of the demand curve remains the same and the consumer moves downwards or upwards on it.

The phenomena of expansion and contraction in demand are shown in Fig. 6. The figure shows that when price is OP, quantity demanded is OM, given other things equal. If as a result of increase in price (OP_2), the quantity demanded falls to OL, we say there is a fall in quantity demanded or 'contraction of demand' or 'an upward movement along the same curve'. Similarly, as a result of fall in price to OP, the quantity demanded rises to ON, we say that there is 'expansion of demand' or ' a rise in quantity demanded' or 'downward movement on the same demand curve.

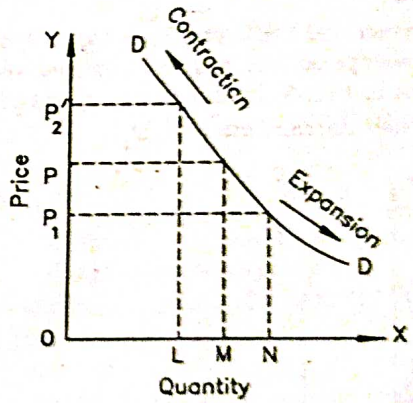

Fig. 6. Expansion and Contraction in Demand.

Increase in Demand

Increase in demand refers to a situation *when there is more demand at the same price or the same demand at a higher price.* In such a case, there will be a shift in demand curve in the upward direction as shown in Fig. 7. DD is the original demand curve. At price OP_1, the consumer's demand is OX_1. But due to change in any factor(s) other than price, the demand curve shifts to D_1D_1. At the same price OP_1, demand is increased from OX_1 to OX_2. In the same manner, the demand curve signifies that as price increases to OP_2, the demand remains the same.

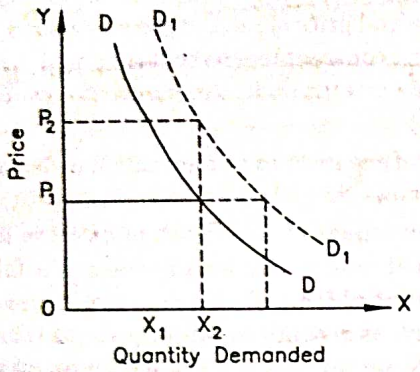

Fig. 7. Increase in Demand.

Decrease in Demand

It means fall in demand due to change in factor(s) other than price or same demand at a lower price. As a result demand curve shifts leftward or downward as shown in Fig. 8. In this figure, demand curve DD shifts leftward to create a new demand curve D_1D_1.

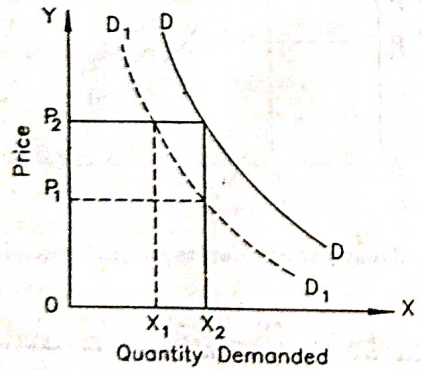

Fig. 8. Decrease in Demand.

Originally, at price OP_2, the demand for the commodity is OX_2. But when the demand curve shifts leftward due to factors other than price, the demand at OP_2 gets reduced to OX_1 on the curve D_1D_1.

Decrease in Demand and Contraction of Demand. Both indicate fall in quantity demanded but the reasons are different. (*i*) Decrease in demand is at the same price due to change in factors other than the price (*e.g.* price of related goods, income and taste of the consumer etc.) whereas contraction of demand is due to change (rise) in

the price of the commodity. (*ii*) In case of decrease in demand, demand curve shifts leftward whereas in case of contraction of demand, we move up along the demand curve.

Increase in Demand and Expansion of Demand. Both reflect rise in quantity demanded but the causes are different. (*i*) Increase in demand is at the same price due to change in factors other than the price of the commodity (*e.g.* price of related goods, income and taste of consumer etc.) whereas expansion of demand is due to change (fall) in price of the commodity. (*ii*) In expansion of demand, we move down along the demand curve.

Movements along Demand Curve vs. Shift of Demand Curve

It is important to make a distinction between a movement along a demand curve and a shift of the whole demand curve. A movement along the demand curve indicates changes in the quantity demanded because of price changes, other factors remaining constant. A shift of the demand curve indicates that there is a change in demand at each possible price because one or more other factors, such as incomes, tastes or the price of some other goods, have changed.

When an economist speaks of an increase or a decrease in demand, he refers to a shift of the whole curve because one or more of the factors which were assumed to remain constant earlier have changed. When an economist speaks of change in quantity demanded, he means movement along the same curve (*i.e.* expansion or contraction of demand) which has happened due to fall or rise in price of the commodity.

In short, 'change in demand' represents shift of the demand curve to right or left resulting from changes in factors such as income, tastes, prices of other goods etc. and 'change in quantity demanded' represents movement upwards or downwards on the same demand curve resulting from a change in price of the commodity.

Income Effect

A change in quantity of a commodity demanded as a result of change in real income caused by change in price is called income effect. Alternatively effect on demand for a commodity as a result of change in real income due to change in price is termed as income effect. When the price of a commodity falls, less has to be spent on purchase of the same quantity of that commodity. With money thus saved, a consumer can purchase more quantity of the said commodity. In other words, fall in price increases purchasing power (or real income) of a consumer which enables him to purchase more quantity with the same income. Suppose a household buys 2 litre of milk when its price is Rs. 15 per litre. If price of milk falls to Rs. 12 per litre, it can afford to buy 2.5 litre by spending the same amount of money (i.e. Rs. 30). This consequent rise in its demand

for milk is due to fall in price of milk. This is called income effect. On the other hand, when price of a commodity rises, more has to be spent on the same quantity of the commodity, *i.e.* real income of the consumer falls leading to fall in demand. Thus, effect on demand for a commodity due to change in real income caused by change in price is known as income effect. It should be noted that *income effect is related to change in real income caused by change in price and not related to change in money income.*

Substitution Effect

Substitute goods are those goods which can be used in place of each other to satisfy a given want *e.g.*, coffee and tea or ghee and oil. They are also called competitive goods. *Between substitute goods, use of one in place of other when the former becomes relatively cheaper is called substitution effect.*

We can illustrate substitution effect with the help of an example of coffee and tea as substitutes. When price of a tea falls, it also means that relative price of its substitute, *i.e.*, coffee, has risen even though in reality price of coffee remains unchanged. Suppose price per cup of tea falls from Rs. 3 to Rs. 2 whereas that of coffee selling @ Rs. 5 per cup does not change. As a result, consumers may substitute tea in place of coffee. This is called substitution effect. In other words, when price of a commodity falls, demand for it rises because of substitution effect. Reverse happens when price of a commodity rises, demand for it falls because of substitution effect. In short, *substitution effect refers to substitution of one commodity in place of other commodity when the former is relatively cheaper.*

Price Effect

Price effect denotes changes in demand of a commodity caused by change in its price. It is the combined effect of income effect and substitution effect. Thus,

Price effect = Income effect + Substitution effect.

When the price of a commodity falls, real income of the consumer goes up leading to rise in demand (Income effect). When price of a commodity falls, it becomes relatively cheaper than its substitute goods leading to rise in demand (Substitution effect). Clearly, rise in demand due to fall in price is the result of income effect and substitution effect. Thus, *change in demand of a commodity caused by change in its price is known as price effect.*

ELASTICITY OF DEMAND

Elasticity of demand is defined as the responsiveness of the quantity demanded of a good to changes in one of the variables on which demand depends. *In other words, it is the percentage change in quantity demanded divided by the percentage in one of the variables on which demand*

depends. These variables are price of the commodity, prices of the related commodities, income of the consumers and other various factors on which demand depends. Thus we have *price elasticity, cross elasticity, elasticity of substitution and income elasticity.* It is to be noted that when we talk of elasticity of demand, unless and until otherwise mentioned, we talk of price elasticity of demand. In other words, it is price elasticity of demand which is usually referred to as elasticity of demand.

Price Elasticity of Demand. Price elasticity of demand measures the response of quantity demanded of a good to a change in its price, given the consumer's income, his tastes and prices of all other goods. In other words, it is measured as percentage change in quantity demanded dividing by the percentage change in price, other things remaining equal. That is

$$\text{Price Elasticity } (E_p) = \frac{\text{\% change in quantity demanded}}{\text{\% change in price}}$$

This can be explained further with a few examples. Demand for goods like fruits and costly cloth is very sensitive to change in price so that even a small change in price leads to large change in demand. On the other hand, there are goods like wheat, milk, coarse cloth etc., the demand for which is not so sensitive to price changes so that even large change in price results in very small change in demand. Suppose in a city, daily demand for wheat @ Rs. 800 per quintal is 1000 quintals. Further suppose 'that price of wheat goes upto Rs. 880 per quintal and the demand contracts to 980 quintals a day. What elasticity of demand does it show ?

$$\text{Rise in price of wheat} = \frac{\text{Rs. } 80}{\text{Rs. } 800} \times 100 = 10\% \quad \ldots (a)$$

$$\text{Consequent fall in demand for wheat} = \frac{20}{1000} \times 100 = 2\% \quad \ldots (b)$$

$$\text{Thus, Price Elasticity } (E_p) = \frac{b}{a} = \frac{2}{10} = \frac{1}{5}$$

Since wheat is an essential item of food, its demand is less elastic as shown in the above example. Change in demand for wheat in the city is 2% in response to 10% change in price of wheat.

Degrees or Types of Elasticity of Demand

The elasticity of demand of a product may vary between zero and infinity as discussed below.

(1) Elasticity is zero, if there is no change at all in quantity demanded when price changes *i.e.* when quantity demanded does not respond to a price change. It is called perfectly inelastic.

(2) Elasticity is more than zero and less than one when the percentage change in quantity demanded is less than the percentage change in price. In such a case demand is said to be inelastic.

(3) Elasticity is one, or unit elasticity if the percentage change in quantity demanded is equal to the percentage change in price.

(4) Elasticity is greater than one when the percentage change in quantity demanded is greater than the percentage change in price. In such a case, demand is said to be elastic.

(5) Elasticity is infinite, when some 'small price reduction raises the demand from zero to infinity.' In such a case, demand is said to be perfectly elastic.

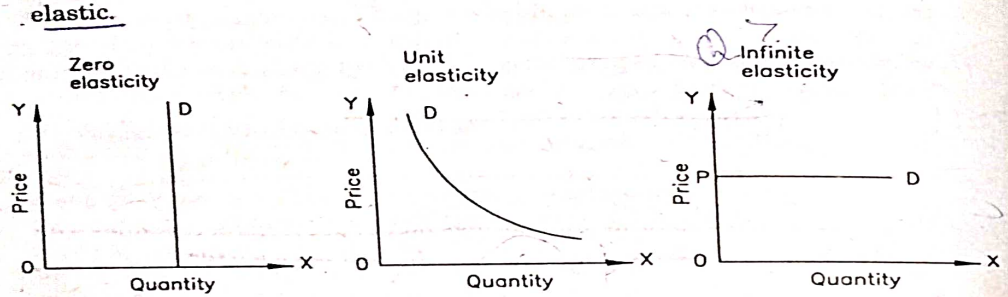

Fig. 9. Demand Curves of zero, unitary, and infinite elasticity.

Table 4. Elasticity Measures and their Implications

Measure of Elasticity	*Type of Elasticity*	*Verbal Description*
1. Zero	Perfectly inelastic	Quantity demanded does not change as price changes.
2. Greater than zero but less than one	Inelastic	Quantity demanded changes by a smaller percentage than does price.
3. One	Unit elasticity	Quantity demanded changes by exactly the same percentage as does price.
4. Greater than one, but less than infinity	Elastic	Quantity demanded changes by a larger percentage than does price.
5. Infinity	Perfectly (or infinitely) elastic	Purchasers are prepared to buy all they can obtain at some price and none at all at an even slightly higher price.

Uses of Elasticity of Demand

Usefulness to a Monopolist. A monopolist usually fixes the price himself and leaves the supply to be determine by the demand of the consumers. If the demand for his product is very elastic, he will keep the price low to maximum monopoly profit. On the other hand, if demand is *inelastic*, be fixes a higher price and sells a slightly smaller quantity. Thus, the concept of elasticity of demand is of great practical significance to a monopolist.

Useful in Factor Pricing. The concept helps in explaining relative reward of factors of production in the production process. The factors which have inelastic demand for them are able to get a higher price than factor having elastic demand.

Usefulness to the Government. The concept is equally important to the government in its policy of taxation. While levying taxes, the Finance Minister takes into consideration the elasticity of demand for the commodities on which taxes are being imposed. High rates of taxation on goods with inelastic demand brings higher amounts of revenues whereas the same on goods having elastic demand may not fetch the desired revenues of the government.

Useful in International Trade. The knowledge of elasticity of demand has importance in many spheres of international trade. India, for example, can obtain better and higher prices for tea from its exports to U.K. if the latter's demand for Indian tea is inelastic. Thus terms of international trade are determined by elasticity of demand for each other's product.

Explanation of the Paradox of Poverty of Farmers. It is generally said that a good harvest, instead of bringing riches, fetches poverty to the farmers. This is known as paradox of poverty which is explained by the concept of elasticity of demand. For instance, a rich harvest of an agricultural product, say wheat whose demand is inelastic, may ultimately fetch less price due to the simple reason that the increased production of wheat has led to fall in market price.

Determinants of Price Elasticity of Demand

The price elasticity of demand of a commodity is affected by the following factors :

1. **Nature of Goods.** Necessities of life have inelastic demand, since they are to be purchased even though their prices go up, *e.g.* demand for foodgrains, sugar, ghee, etc. As against this, demand for luxuries is elastic, *e.g.* demand for T.V. set, V.C.R., etc.

2. **Availability of Substitutes.** Demand for a commodity which has a large number of its substitutes is usually elastic, *e.g.* demand for cold drinks, tooth pastes. Demand for salt is inelastic since it has no good substitutes.

3. **Various Uses of a Commodity.** Demand for a commodity which has many uses is generally elastic, *e.g.* demand for electricity, milk, petrol etc. On the other hand if commodity has a few uses (like butter), its demand is likely to be inelastic.

4. **Share in Total Expenditure.** Demand fora commodity is inelastic if proportion of total expenditure incurred on that commodity is very small, *e.g.* demand for needle, matchbox etc. On the other hand if expenditure on a commodity in a consumer's budget is high, its elasticity is likely to be high.

5. **Level of Prices.** Demand for inexpensive or *low priced* articles like matchbox, pencils, combs etc., is inelastic. On the contrary, demand for *high priced goods* like cars, V.C.R. etc. is usually elastic.

6. **Level of Income.** If income level of consumer is high, change in price will not affect the quantity demanded of most of the commodities. But if income level is low, elasticity of demand for most of the commodities will by very high.

7. **Tastes, Preferences and Habits of consumers.** These also determine change in their demand for commodities. For example, a chain smoker will not restrict his smoking even at a higher price.

8. **Miscellaneous.** Class of consumers (rich or poor), nature of use of a commodity (coal for cooking or heating of room), jointly demanded goods, possibility of postponement etc. are some of the other factors that affect elasticity of demand.

Percentage Method of Measuring Elasticity of Demand

According to this method, elasticity of demand is measured by taking *ratio of percentage change in demand to the percentage change in price* as shown below :

$$\text{Elasticity of Demand } (E_p) = \frac{\text{\% change in demand}}{\text{\% change in price}}$$

$$E_p = \frac{\dfrac{\text{change in demand}}{\text{original demand}} \times 100}{\dfrac{\text{change in price}}{\text{original price}} \times 100}$$

$$E_p = \frac{\text{change in demand}}{\text{change in price}} \times \frac{\text{original price}}{\text{original demand}}$$

$$E_p = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

where (Δ pronounced as delta)

Δq = change in quantity demanded

Δp = change in price

p = original price

q = original demand.

When E_p is 1, demand is elastic. When E_p is more than 1, demand is more elastic and when it is less than 1, demand is less elastic.

Total Outlay Method of Measuring Elasticity of Demand

In the outlay or total expenditure method, change in total expenditure before and after the change in the price of commodity is taken into account. (*i*) If a fall in price leads to increase in total expenditure or a rise in price reduces this total (i.e. direct relationship), elasticity of demand is more than unity ($E_p > 1$). (*ii*) When a fall in price reduces total expenditure or a rise in price increase it (*i.e.* direct relationship), elasticity of demand is less than unity ($E_p < 1$). (*iii*) If a fall or rise in price leaves the total expenditure unaffected, elasticity of demand is unity ($E_p = 1$). Direct relationship means that both variables (price and total expenditure) move in the same direction whereas inverse relationship shows that both variables move in the opposite directions. The three positions are clarified in the following schedule :

Table 5. Total Outlay and Price Elasticity of Demand

Price per unit Rs.	*Demand (Units)*	*Total Expenditure (Rs.)*	*Comments*
7	6	42	Position before change in price
6	10	60	$E_p > 1$ (Inverse relationship)
6	5	30	$E_p < 1$ (Direct relationship)
6	7	42	$E_p = 1$ (No change in expenditure)

Income Elasticity of Demand

It is a measure of the responsiveness of the demand to changes in income. Income elasticity of demand may be defined as the percentage change in the quantity demanded of a commodity divided by the percentage change in income. Thus,

$$\text{Income Elasticity} = \frac{\text{Percentage change in purchase of a commodity}}{\text{Percentage change in income of consumer}}$$

Symbolically, $$E_i = \frac{\Delta q}{q} \div \frac{\Delta Y}{Y}$$

where E_i stands for income elasticity
q stands for quantity demanded
Y stands for income
Δ stands for a very small change

$$E_i = \frac{\Delta q}{q} \times \frac{Y}{\Delta Y}$$

or

$$E_i = \frac{\Delta q}{\Delta q} \times \frac{Y}{q}$$

If 5 per cent increase in income of a consumer results in 6 per cent increase in the quantity of milk consumed, then the income elasticity of milk is 1.2. (i.e. 6/5).

Since expenditure made on a commodity is equal to the quantity of the commodity purchased multiplied by the price of the commodity; we can also express the income elasticity in terms of changes in expenditure made on the commodity rather than the change in quantity purchased of the commodity. Thus, we can express income elasticity as percentage change in expenditure on a commodity divided by percentage change in income of the consumer. Thus, if 5 per cent change in income of the household leads to 10 per cent change in expenditure on entertainment, then income elasticity of entertainment is 2 (*i.e.* 10/5).

There is a useful relationship between income elasticity for a commodity and proportion of income spent on it. Three important propositions emerge from this relationship which are as under :

(*i*) If the proportion of income spent on a commodity remains the same as income increases, then income elasticity for the good is equal to one.

(*ii*) If the proportion of income spent on a commodity increases as the income increases, then the income elasticity for the good is greater than one.

(iii) If the proportion of income spent on a commodity decreases as the income increases, then income elasticity for the good is less than one.

The goods having income elasticity more than one and which therefore occupy a greater percentage of consumer's income as he becomes richer are called *luxury goods*. On the other hand, goods having income elasticity lesser than one and which therefore occupy a lower percentage of consumer's income as he becomes richer are called *necessities*.

Income elasticity of demand being zero means that the commodity in question is quite unresponsive to changes in income. It implies that a given increase in income does not at all lead to any increase in quantity demanded of the commodity or in expenditure on it. But, when the income

elasticity is less than zero (or negative), it means that an increase in income causes a fall in the quantity demanded of the good. Goods having negative income elasticity are called *inferior goods*. On the other hand, when the income elasticity is more than zero (or positive), it implies that an increase in income causes an increase in the consumption of the particular commodity. This happens in the case of most of the goods and these goods are called *normal goods*.

The following examples will make the above concepts clear :

(*a*) The income of a household increases by 5%, the demand for 'food in a five star hotel rises by 10%.

(*b*) The income of a household increases by 5%, the demand for rice rises by3%

(*c*) The income of a household increases by 5%, the demand for coarse grians falls by 2%.

(*d*) The income of a household increases by 5%, the demand for beauty aids increases by 5%.

(*e*) The income of a household increases by 5%, the demand for common salt remains the same.

We can calculate income elasticity by using the following formula :

$$E_i = \frac{\text{Percentage change in demand}}{\text{Percentage change in income}}$$

The income elasticity in each of the above case has been shown in Table 6.

Table 6. Income Elasticity of Demand

No.	*Commodity*	*Income Elasticity*	*Remarks about the nature of Commodity*
(*a*)	Food in a five star hotel	$\frac{10\%}{5\%} = 2$	Luxury
(*b*)	Rice	$\frac{3\%}{5\%} = .60$	Normal
(*c*)	Coarse grains	$\frac{-2\%}{5\%} = -.40$	Inferior
(*d*)	Beauty aids	$\frac{5\%}{5\%} = 1$	Unit income elasticity
(*e*)	Common salt	$\frac{0\%}{5\%} = 0$	Zero income elasticity

Cross Elasticity of Demand

It is the ratio of proportionate change in the quantity demanded of Y to a given proportionate change in the price of the related commodity X. It is a measure of relative change in the quantity demanded of a commodity due to a change in the price of its substitute complement. It can be expressed as

$$E_c = \frac{\text{Proportionate change in the quantity demand of Y}}{\text{Proportionate change in the price of X}}$$

Cross elasticity may be infinite or zero if the slightest change in the price of X causes a substantial change in the quantity demanded of Y, cross elasticity is infinite. It is always the case with goods which have perfect substitutes for one another.

Cross elasticity is zero if a change in the price of one commodity will not affect the quantity demanded of the other, in the case of goods which are not related to each other, cross elasticity of demand is zero. Therefore, it depends upon substitutability of goods. If substitutability is perfect, cross elasticity is infinite; if on the other hand, substitutability does not exist, cross elasticity is zero. In the case of complementary goods like jointly demanded goods cross elasticity is negative. A rise in the price of one commodity X will mean not only decrease in the quantity of X but also decrease in the quantity demanded of Y because both are demanded together.

Elasticity of Substitution

Elasticity of substitution measures the ease with which one good can be substituted for another. It is the relative measure of the substitution effect

$$E_s = \frac{\Delta\left(\frac{qx}{qy}\right)}{\frac{qx}{qy}} \div \frac{\Delta\left(\frac{\Delta y}{\Delta x}\right)}{\frac{\Delta y}{\Delta x}}$$

where E_s stands for

$\frac{qx}{qy}$ stands for the original proportion between the quantities of goods X and Y.

$\Delta\left(\frac{qx}{qy}\right)$ stands for the small change in the proportion of goods X and Y.

$\frac{\Delta y}{\Delta x}$ stands for the original marginal rate of substitution of goods X and Y.

$\Delta\left(\frac{\Delta y}{\Delta x}\right)$ stands for the change in the marginal rate of substitution of goods X and Y.

Elasticity of substitution may be of three types :

(*i*) If two goods are perfect substitutes, elasticity of substitution will be infinite.

(*ii*) If two goods are to be used in fixed proportion, elasticity of substitution will be zero.

(*iii*) In between these extreme situations, we have elasticity of substitution lying between zero and infinity. When it is difficult to substitute one good for another, then a small change in the proportion of the goods will bring about a large change in the marginal rate of substitution between the two goods. When the substitution is easy (*e.g.* tea and coffee), then a small change in the proportion of two goods will bring about a small change in the marginal rate of substitution between the goods.

QUESTIONS

1. What do you mean by demand ? Explain the law of demand with an illustration.
2. State the law of demand. Give circumstance under which it is not operative.
3. What factors determine the demand of a commodity ? Explain.
4. Explain demand schedule and demand curve of an individual with the help of an illustration.
5. Explain the reasons of demand curve sloping downward.
6. Explain law of demand and discuss the rationale for this law.
7. What are the exceptions to the law of demand ? Discuss.
8. Describe the impact of rise in income on normal goods and inferior goods.
9. What do you mean by expansion and contraction in demand ? Explain with the help of a diagram.
10. Briefly discuss the impact of increase and decrease in demand on the demand curve.
11. Explain income effect and substitution effect on the demand of a commodity.

12. State and explain the meaning and degrees of elasticity of demand.
13. Discuss the determinants of price elasticity of demand of a commodity.
14. Briefly explain percentage method determining price elasticity of demand.
15. Answer the following :
    (a) State the law of demand.
    (b) What are related goods ?
    (c) Why is elasticity of demand for salt is almost zero ?
    (d) What is price elasticity of demand ?
    (e) What are giffin goods ?
    (f) State the meaning of substitution effect.
    (g) What is meant by contraction of demand ?

□ □ □

Chapter 4

Concept and Elasticity of Supply

Supply is one of the forces that determine the price in the market. The study of supply therefore is as important as the study of demand. In simple words, supply means the quanity of a commodity offered for sale in the market. Just as demand for a product is always at a price, supply of a product is also at a price. The supply of a product varies with the change in price. The supply also depends upon time. Thus supply means the quantity of a commodity offered for sales at a particular price during a given period of time.

Definition of Supply

Supply of a commodity means quantity of a commodity that a seller (firm) is willing to sell in the market at a given price in a given period of time. Just as demand for a commodity refers to the quantity that a consumer is willing to buy at a given price in a given period of time, supply of a commodity means the quantity of a commodity that a seller is willing to sell in the market at a given price in a given period of time. Thus supply has three elements, namely (*i*) price, (*ii*) quantity supplied and (*iii*) period of time.

Distinction between Supply and Stock

In a ordinary way, the term supply and stock are confusing. Supply of a commodity is the part of stock or production which is offered for sale in the market. While stock is the total quantity produced during a period, supply denotes the quantity offered for sale in the market. For instance, an agriculturist has produced 120 quintals of wheat. This is stock of wheat with him. He may be willing to offer for sale 10 quintals @ Rs. 500 per quintal; 20 quintals @ Rs. 600 per quintal; 50 quintals @ Rs. 700 per quintal and so on. In this case, stock is 100 quintals, but the supply of wheat is different at different prices. So, the term 'stock' (or production) should not be confused with the term supply. *Supply is that part of stock of a commodity which is offered for sale at a particular price and time.* Thus, supply is a flow concept.

Factors Affecting Supply

The factors that determine the supply of a commodity are discussed below :

(*i*) **Price of the Commodity.** Other things being equal, the higher the relative price of a good the greater the quantity of it that will be supplied. This is because goods and services are produced by the firm in order to earn profits and, ceteris paribus, profits of the seller rise if the price of its product rises.

(*ii*) **Price of Other Goods.** An increase in the price of other goods induces the firms to produce more of other goods leading to reduction in supply of the goods whose price has remained unchanged.

(*iii*) **Price of Factors of Production.** This constitutes the cost of production of a commodity. An increase in the price of a factor of production (*e.g.* rent, wage etc.) increases to reduce supply if the price of the commodity remains constant. On the contrary, a producer may supply more of a commodity at a given price if price of factors falls.

(*iv*) **State of Technology.** The supply of a particular product depends upon the state of technology also. Inventions and innovations tend to make it possible to produce more or better goods with the same resources, and thus they tend to increase the quantity suplied of some products and to reduce the quantity supplied of products that are displaced.

(*v*) **Objectives of the Firm.** Sometimes, a firm may increase the supply of commodity not because it gives more profit but because its supply is a source of status and prestinge in the market. At other times a firm may increase supply keeping in view the goal of maximum sales or even to keep away competitors.

(*vi*) **Government Policy.** The production of a good may be subject to the imposition of commodity taxes such as excise duty, sales tax and import duties. These raise the cost of production and so the quantity supplied of a good would increase only when its price in the market rises. Subsidies, on the other hand, reduce the cost of production and thus provides an incentive to the firm to increase supply.

(*vii*) **Miscellaneous Factors.** Other factors influnencing supply might include change in season, future expectation of rise in prices, agreement among producers, natural factors, means of transport and communication etc.

Supply Function

Supply function explains the relationship between the supply and the factors determining supply of the commodity. In other words, supply

determinants of supply such as price of the commodity, price of other goods, price of factors of production (rent, interest, wages, profit), goals or objectives of the firm, state of technology, etc.

$$S_n = f(P_N P_R F, T, G)$$

where S_n = Supply of a commodity

P_N = Price of a commodity

P_R = Price of the related commodity

F = Price of factors of production

T = Technical know-how

G = Goals of the producer.

Law of Supply

The law of supply states : *"Other things being equal, quantity supplied of a commodity is directly related to the price of commodity."* In other words, other things remaining the same, when price of a commodity rise, the quantity supplied also rises and when price falls, quantity supplied also falls (*i.e.* both the variables—price and quantity supplied—move in the same direction). The producer of the seller behaves this way because higher the price, larger is the profit and greater is incentive to produce (or sell) more of commodity.

Like the law of demand which shows the relationship between the price and demand, law of supply also shows the *relationship between the price and supply*. In case of demand relationship is inverse (when price rises, demand falls), whereas in case of supply relationship is direct (when price rises, supply also rises and vice-versa)

Supply Schedule

A supply schedule is a tabular statement which shows different quantities of a commodity offered for sale at different prices. The supply of commodity '*A*' by the producer at different prices is shown in the following hypothetical supply schedule :

Table 1. Supply Schedule of commodity '*A*' of a Supplier

Price (Rs.) (per unit)	*Quantity Supplied (units)*
1	5
2	35
3	45
4	55
5	65

At the price of Re 1 pet unit, the quantity supplied is 5 units whereas at Rs. 5 per unit, the supply is increased to 65 units. This supply schedule has been shown graphically in Fig. 1.

Supply Curve

A supply curve reflects graphically the relationship between the quantity supplied of a commodity and price. In other words, the supply curve shows graphically the information which the supply schedule shows arithmetically. Fig. 1 depicts the above hypothetical supply schedule in the form of a supply curve. The curve SS clearly shows a *positive relationship* between the price and supply to the right.

Normally a supply curve has a positive slope, *i.e.* more quantity is supplied at a higher price and less of it at a lower price. Thus, ***supply curve moves upward from left to the right with rise in price of the commodity*** as shown in Fig. 1.

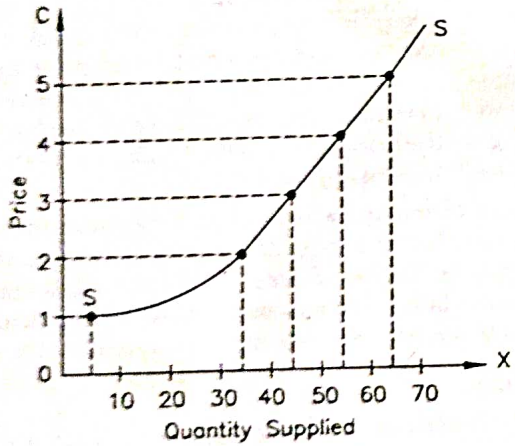

Fig. 1. Supply Curve of a Commodity.

The law of supply is based on 'other things remaining constant'. In other words, it is based on the assumption that there would be no change in : (*i*) price of other goods, (*ii*) price of factors of production, (*iii*) state of technology and (*iv*) objectives of the firm. Thus law of supply shows relationship between price of the commodity and the quantity supplied of the commodity while assuming all other factors constant.

Expansion and Contraction of Supply

Rise in supply due to rise in price of the commodity, other things being equal, is called expansion of supply. It results in upward movement along a supply curve. *Fall in supply due to fall in price, other things being equal, is called contraction of supply.* This results in downward movement along a supply curve. Thus expansion and contraction of

supply occur due to change in price of the commodity. It denotes movement along the supply curvew as an Fig. 1. The movement upward along the supply curve is a case of expansion and movement downward is a case of contraction of supply.

Increase and Decrease in Supply (Shift in Supply Curve)

Rise in supply due to change in factors other than the price of the commodity is called increase in supply. Increase in supply results in rightward shift of supply curve as shown in Fig. 2 in which supply curve SS shifts rightward from its original position to new supply curve S_1S_1. *Fall in supply due to change in factors other than the price of commodity is called decrease in supply.* Decrease in supply results in leftward (or upward) shift of supply curve as shown in Fig. 3 in which supply curve SS shifts leftward from its original position to new supply curve S_2S_2.

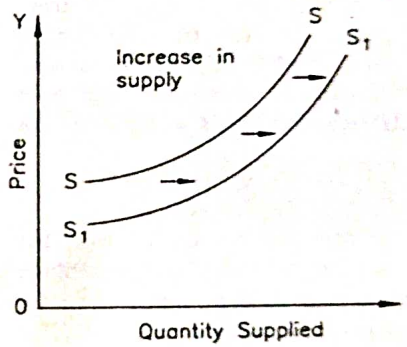

Fig. 2. Increase in Supply.

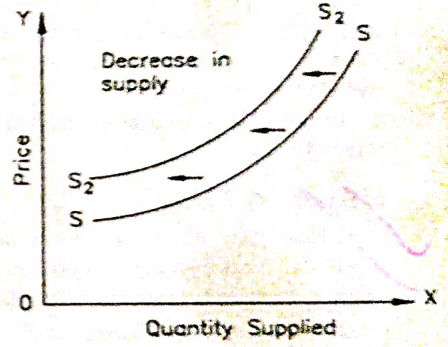

Fig. 3. Decrease in Supply.

Causes of Increase in Supply (or *downword shift of supply curve*) include : (*i*) Fall in prices of other commodities, (*ii*) Fall in prices of factors of production, (*iii*) Improvement in technology and (*iv*) Changes in goals of producers.

Causes of Decrease in Supply (or *upward shift of supply curve*) include : (*i*) Rise in prices of other commodities (making their production more profitable), (*ii*) Rise in price of factors of production (resulting in an inverse in cost of production), (*iii*) Technology becoming outdated and deteriorated and (*iv*) Changes in goals of producers (inducing them to decrease supply at the same price).

Difference between Decrease and Contraction in Supply. Both reflect fall in the quantity supplied but reasons are different. (*i*) Contraction in supply is the consequence of change (fall) in price whereas decrease in supply is at the same price due to change in factors other

than price. (*ii*) In case of contraction of supply, we move down along the supply curve but in case of decrease in supply, supply curve shifts leftward.

Difference between Increase and Expansion in Supply. Both indicate rise in supply but reasons are different. (*i*) Expansion in supply is due to change (rise) in price whereas increase in supply is at the same price due to change in factors other than price of the commodity. (*ii*) In case of expansion of supply, we move up along the supply curve but in case of increase in suply, supply curve shifts rightward.

Individual vs. Market Supply Schedule

An individual supply schedule indicates different quantities offered for sale by an individual firm at different prices. As against it, *a market supply schedule reflects total of various quantities of the commodity offered for sale by all the individual firms at different prices.* Thus, market supply is obtained by aggregating the supplies of all the firms selling that commodity at alternate prices. In short, by summing up individual supplies, we get aggregate or market supply. Let us assume there are three firms, namely *A*, *B* and *C* in the wheat market. Aggregate of supply of all the three firms at different price levels will give us the market schedule.

Elasticity of Supply

Elasticity of supply describes *the degree of responsivenes of the supply for a commodity to a change in its price.* It is the ratio of percentage change in quantity supplied to the percentage change in price. We use E_S to denote the coefficient of the elasticity of supply.

$$E_S = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

$$= \frac{\dfrac{\text{Change in quantity supplied}}{\text{Quantity supplied}}}{\dfrac{\text{Change in price}}{\text{Price}}}$$

or

$$\frac{\dfrac{\Delta q}{q}}{\dfrac{\Delta p}{p}} = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

where q denotes original quantity supplied.

Δq denotes change in quantity supplied.

p denotes original price.

Δp denotes change in price.

The concept of elasticity of supply explains the degree of change in supply. It reflects how sensitive the supply of a commodity is to the change in its price. The greater the response, the greater will be elasticity; the lesser the response, the smaller will be elasticity.

Suppose at the rate of Rs. 16 per kg, the supply of sugar is 100 kg but when the price falls to Rs. 12 per kg, its supply contracts to 50 kg. In this case, supply of sugar is vary elastic for its supply has fallen by 50% in response to fall in price by 25%.

Kinds of Elasticity of Supply

(*i*) **Perfectly Inelastic Supply ($E_S = 0$).** Elasticity of supply is zero or perfectly inelastic when supply a commodity does not change at all in response to any change in price. In Fig. 4, the supply curve SS is perpedicular to the *X*-axis as it is perfect inelastic. There is no change in the supply despite changes in the price from OP_1 to OP_2.

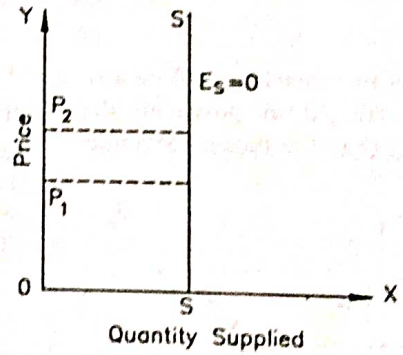

Fig. 4. Perfectly Inelastic Supply Curve.

(*ii*) **Less than Unit Elastic Supply ($E_S < 1$).** When percentage (proportionate) change in quantity supplied is less than the percentage (proportionate) change in price, supply is said to be less than unit elastic as shown below :

Price per kg. (Rs.)	*Qty. Supplied (kg.)*
20	40
30	50

Here supply has increased by 25% as a result of rise in price by 50%. Fig. 5 shows a straight line positively sloped supply curve.

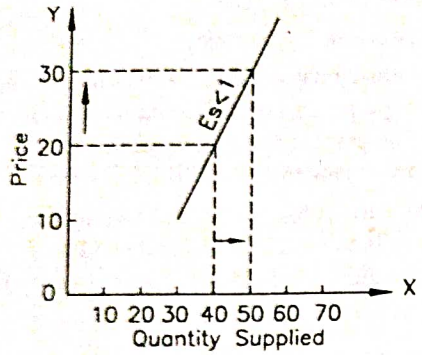

Fig. 5. Less than Unit Elastic Supply Curve.

(iii) Unit Elastic Supply ($E_S = 1$). Supply for a commodity is said to be unit elastic if percentage change in supply equals the percentage change in price as shown below.

Price per kg. (Rs.)	*Qty. Supplied (kg.)*
20	40
30	60

Here supply has increased by 50% as a result of 50% increase in price. Fig. 6 shows a straight line positively sloped supply curve which passes through origin *O* and makes a 45° angle.

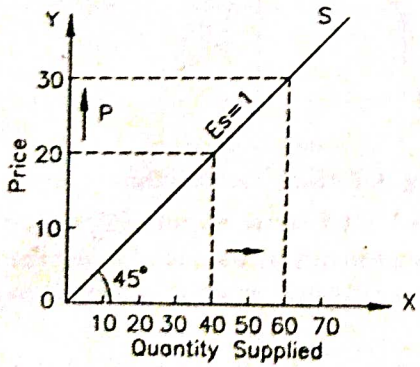

Fig. 6. Unitary Elastic Supply Curve.

(iv) More than Unit Elastic Supply (Relatively higher elasticity or $E_S > 1$). When percentage change in supply is more than the percentage change in price supply is said to be more than unit elastic as shown below :

Price per kg. (Rs.)	*Qty. Supplied (kg.)*
20	35
30	70

Here supply has increased by 100% due to 50% increase in price. Fig. 7 shows a straight line positively sloped supply curve which meets *X*-axis above the origin *O*.

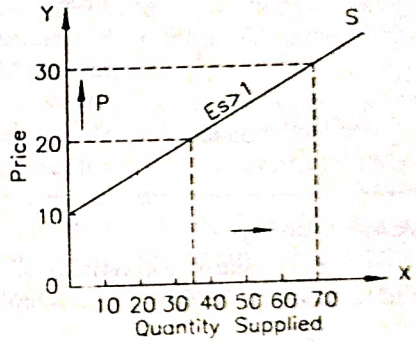

Fig. 7. More than Unit Elastic Supply Curve.

(v) Perfectly Elastic Supply [$E_S = \infty$]. The supply elasticity is infinite when nothing is supplied at a lower price but a small increase in price causes supply to rise from zero to an indefinitely large amount. This indicates that producers will supply any quantity demanded the higher price as shown is Fig. 8.

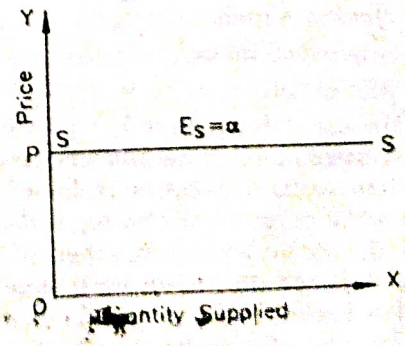

Fig. 8. Infinite Elastic Supply Curve.

Table 2. Types of Elasticity of Supply

Measure of Es	*Type of Elasticity*	*Verbal Description*
$Es = 0$	Perfectly inelastic	Quantity supplied does not change with change in price.
$Es < 1$	Inelastic	% change in supply is less than that in price.
$Es = 1$	Unit elasticity	% change in supply is equal to that in price.
$Es > 1$	Elastic	% change in supply is more than that in price.
$Es = \infty$	Perfectly elastic	Supply changes infinitely.

Measurement of Elasticity of Supply

Like the method used in measuring elasticity of demand, the following method is used for measuring elasticity of supply :

$$\text{Elasticity of Supply} = \frac{\text{\% change in quantity supplied}}{\text{\% change in price}}$$

or

$$Es = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

where Es = elasticity of supply

Δq = change in quantity supplied

Δp = change in price

q = original quantity

p = original price

If the result of the above equation is 1, supply is elastic. If it is more than 1, supply is called more elastic and when result is less than 1, supply is said to be less elastic. This can be explained with the help of an example. Suppose when price of a plastic toy is Rs. 2, its supply is 1000. But when price rises to Rs. 3 per unit, supply of plastic toys also goes upto 2000 units. Here the supply of the toy is more than one. To be exact, it is 2 as calculated below :

Δp = Rs. 3 – Rs. 2 = Re. 1

Δq = 2000 units – 1000 units = 1000 units

$$Es = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

$$= \frac{1000}{1} \times \frac{2}{1000} = 2$$

(v) No of i/ps used
(vi) Risk Taking

Factors Affecting Elasticity of Supply

The important factors which influence the elasticity of supply are as follows :

(i) *Nature of Commodity.* Commodities which are perishable in nature have inelastic supply this is because their supply cannot be increased substantially as a result of a change in their prices. Durable goods on the other hand, generally, have elastic supply.

(ii) *Time-Factor.* Longer the time period involved in the production of a commodity more is the time available for changing the size of plant and making other cost adjustments and hence more elastic is the supply of the commodity. On the other hand, shorter the time period involved in production, more inelastic the supply of a commodity would be.

(iii) *Technique of Production.* Supply of commodities involving simple production techniques have elastic supply and commodities having complex techniques of production have inelastic supply.

(iv) *Future Expectations.* If the prices are expected to rise in future producers will withhold the supply and hence elasticity will be inelastic. On the contrary, if the prices are expected to fall in future, the supply will be elastic.

Uses of Elasticity of Supply

The concept of elasticity of supply has the following uses :

(i) *To assess the effect of price.* The elasticity of supply is useful to assess the effect of price when the demand of a commodity increases. The more elastic is supply, the smaller the rise in price. Needs to include sellers to offer more of the commodity for sale.

(ii) *To understand the quasi-rent which one enjoys.* Elasticity of supply helps to make a difference between short-run elasticity of supply and long-run elasticity of supply.

(iii) *To improve economic planning.* A knowledge of elasticity of supply is useful to improve economic planning specially in less developed countries.

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or

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If the result of the above equation is 1, supply is elastic. If it is more than 1, supply is called more elastic and when result is less than 1, supply is said to be less elastic. This can be explained with the help of an example. Suppose when price of a plastic toy is Rs. 2, its supply is 1000. But when price rises to Rs. 3 per unit, supply of plastic toys also goes upto 2000 units. Here the supply of the toy is more than one. To be exact, it is 2 as calculated below :

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(v) No of i/ps used
(vi) Risk Taking

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The important factors which influence the elasticity of supply are as follows :

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(iii) *To improve economic planning.* A knowledge of elasticity of supply is useful to improve economic planning specially in less developed countries.

QUESTIONS

1. What do you mean by supply ? What are the reasons for the change in supply ?
2. Explain the concept of supply. Distinguish between supply and stock.
3. What is meant by supply ? Explain the law of supply with the help of supply schedule and curve.
4. Define the term elasticity of supply. Explain its measurement with an illustration.
5. What factors determine the supply ? Explain with examples.
6. Describe elasticity of supply. Discuss its main types.
7. Explain the concept of elasticity of supply and describe the factors that affect elasticity of supply.
8. Explain the law of supply with the help of a supply schedule and supply curve.
9. How is elasticity of supply measured ? What are the various determinants of supply elasticity ?
10. State the law of supply and describe the shape of supply curve.
11. Explain the situations when the elasticity of supply is more than one and less than one.
12. Briefly answer the following :
    (*a*) Define the concepts of supply and stock.
    (*b*) Explain elasticity of supply.
    (*c*) State the law of supply.
    (*d*) Enumerate the determinants of elasticity of supply.
    (*e*) What is the shape of supply curve ?
    (*f*) Explain contraction and expansion of supply.

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Chapter 5

Theory of Consumer Behaviour : Utility Analysis

We have already studied the law of demand which states that people demand larger quantity of goods at lower prices and vice-versa provided other things remain the same. But the law of demand does not explain why demand and price are inversely related. Here the question arises : Why does the consumer behave in this manner ? The answer to this question is provided by the following approaches :

(*i*) Marshall's Utility Analysis.

(*ii*) Hicks and Allen's Indifference Curve Analysis.

(*iii*) Samuelson's Revealed Preference theory of Demand.

MARSHALL'S UTILITY ANALYSIS

Marshall derived the law of demand from the law of diminishing marginal utility. He sought to explain how a consumer spends his income on different goods to attain maximum satisfaction. We shall now explain the concepts of utility, total utility and marginal utility and the law of diminishing marginal utility.

Meaning of Utility

Utility hypothesis forms the basis of the Theory of Consumer's Behaviour. The term 'utility' means *the want satisfying power of a commodity*. It is a subjective entity and varies from person to person. It should be noted that utility is not the same thing as usefulness. Even harmful things like liquor, may be said to have utility from the economic stand point because people want them. Thus, in economics, the concept of utility is ethically neutral. It is free from value judgments.

The utility of a commodity depends upon :

(*i*) the attributes or benefits which the commodity possesses.

(*ii*) the attributes or benefits which the consumer (*i.e.* his mental make-up) with respect to the intensity of the need and the extent to which the commodity can satisfy the need.

(*iii*) the particular point of time.

"*Utility*" *is different from satisfaction*. Utility is what the consumer expects to get from the commodity and satisfaction is what he actually gets. Utility is thus "expected satisfaction" and satisfaction is "realised

satisfaction" from consuming that commodity. Therefore "satisfaction" can only be got only after consumption of the commodity. Actual consumption of the commodity is not necessary to determine the utility of the commodity.

Utility is a *subjective concept*. It varies from individual to individual and even for the same individual, the utility may vary at different points of time, for the same commodity. The "utility" of the commodity exists in the mind of the consumer. For a non-smoker, a cigarette has no utility or even dis-utility.

Total Utility

Total utility is the sum of utility derived from the consumption of various units of a commodity. In other words, it is the total utility derived by a person from consumption of all units of a commodity.

Marginal Utility

Marginal utility is the addition to a person's total utility brought through the consumption of an additional unit of the commodity. In other words, marginal utility is the utility that a consumer gets from consumption of an additional unit of a commodity.

Assumptions of Marginal Utility Analysis

Marshall's utility analysis is based on the following assumptions :

(*i*) *The Cardinal Measurability of Utility*. According to this theory, utility is a cardinal concept *i.e.* utility is a measurable and quantifiable entity. Thus a person can say that he derives utility equal to 10 units from the consumption of 1 unit of commodity *A* and 5 from the consumption of 1 unit of commodity *B*. Since, he can express his satisfaction quantitatively, he can easily compare different commodities and express which commodity gives better utility or satisfaction and by how much.

It should be noted that measuring rod of utility is money. The amount of money which a person is prepared to pay for a unit of a good rather than go without it is a measure of the utility which he derives from the good.

(*ii*) *Constancy of the Marginal Utility of Money*. The marginal utility of money remains constant throughout when the individual is spending money on a good. This assumption although not realistic, has been made in order to facilitate the measurement of utility of commodities in terms of money.

(*iii*) *The Hypothesis of Independent Utility*. The total utility which a person gets from the whole collection of goods purchased by him is simply the sum total of the separate utilities of the goods. The theory ignores complementarity between goods.

(*iv*) *Rationality of Behaviour*. Every consumer is rational. He seeks to maximise satisfaction by the maximisation of his total utility subject to the constraint imposed by his given income.

The Law of Diminishing Utility

This law is based on two important facts :

(*i*) Human wants are unlimited. There is no end to human wants.

(*ii*) Each particular human want is satiable. As a consumer consumes more and more units of a thing, the intensity of his want for the thing goes on decreasing and a point is reached where the consumer no longer wants it.

Marshall stated the law of diminishing utility as follows :

"The additional benefit which a person derives from a given increase in stock of a thing diminishes with every increase in the stock that he already has."

In the words of Kenneth E. Boulding, *"As a consumer increases the consumption of any one commodity, keeping constant the consumption of all other commodities, the marginal utility of the variable commodity must eventually decline."* In other words, as a person increases the consumption of a commodity, its marginal or additional utility goes on progressively diminishing. For instance, if a person is very thirsty, he gets the maximum utility when he drinks the first glass of cold drink . This is because intensity of thirst was the highest. The second glass of cold drink which he consumes will give him less utility as intensity of thirst is reduced. The utility from the third glass will be still less. The utility goes on decreasing with the consumption of every additional of glass cold drink till the thirst is fully satiated. Any further additional helping may cause the utility to change to disutility. This tendency on part of utility to diminish with increased consumption of a commodity is called the Law of Diminishing Marginal Utility. Since the law of diminishing marginal utility is derived from the "satiable" characteristic of a particular want, it is also called the "*Law of Satiable Wants*".

We can illustrate the law of diminishing utility with the help of a hypothetical total and marginal utility schedule. Suppose the consumer gets a total utility of 40 units by consuming the first glass of cold drink, and 70 units of total utility by consuming two glasses of cold drink. It is obvious that the marginal utility of the second glass is 30 units as compared to 40 units of first glass. Similarly, the marginal utility from the 3rd, 4th and 5th glass is 20, 10 and zero respectively. Though total utility has been increasing, but marginal utility has been declining as shown in Table 1. The reason for diminishing utility is that the intensity of want diminishes with the consumption of each additional glass of cold drink. After the

thirst is satisfied, total utility is maximum and marginal utility is zero. However, with the consumption of the sixth glass of cold drink, marginal utility is negative as the consumer may feel stomach discomfort or any other problem.

Table 1. Total and Marginal Utility Schedule

Glass of cold drink consumed	*Total utility (in units)*	*Marginal Utility (in units)*
1	40	40
2	70	30
3	90	20
4	100	10
5	100	0
6	90	–10

The law of diminishing marginal utility is graphically illustrated in Figure 1. The total utility (TU) curve and marginal utility (MU) curve of commodity *X* (cold drink in the above example) are obtained by plotting the data given in Table 1. The following observations are worth-noting :

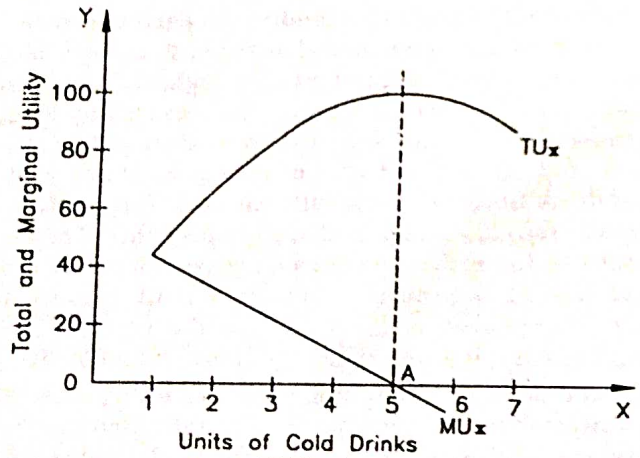

Fig. 1. Utility Curves.

(*a*) The TU_X curve increases but at a decreasing rate and after a point it decreases in absolute terms.

(*b*) Point "*A*" is the point of satiety, where the MU_X curve intersects the *X*-axis, MU_X is zero and total utility is maximum.

(*c*) Consumption of units beyond the point of satiety, "*A*" causes MU_X to become negative.

(*d*) The MU_X curve is downward sloping to the right.

(*e*) When 4 glasses of cold drinks have been consumed, the total utility is 100 units, which is the sum of marginal utilities till that 4th pack i.e. (40 + 30 + 20 + 10).

Limitations of the law of Diminishing Utility

The law of diminishing utility is subject to the following assumptions or qualifications :

(*i*) The different units consumed should be identical in all respects. The habit, taste, treatment and income of the consumer also remain unchanged.

(*ii*) The different units consumed should consist of standard units. If a thirsty man is given water by successive spoonfuls, the utility of second spoonful may conceivably be greater than the utility of the first.

(*iii*) There should be no time gap or interval between the consumption of one unit and another unit *i.e.* there should be continuous consumption.

(*iv*) The law may not apply to articles like gold, cash where a greater quantity may increase the lust for it.

(*v*) The shape of the utility curve may be affected by the presence or absence of articles which are substitutes or complements. The utility obtained from tea may be seriously affected if no sugar is available.

THE LAW OF EQUI-MARGINAL UTILITY: CONSUMER'S EQUILIBRIUM

The law of equi-marginal utility occupies an important place in marginal utility analysis because it is through this law that consumer's equilibrium is explained. In actual life, a consumer has a given money income which he has to spend on various goods he wants. Now the question is how he would allocate his money income among various goods, so that he maximises his satisfaction and attains the position of equilibrium.

Let us suppose that there are only two commodities *X* and *Y* and the consumer has to spend his money income on them. His behaviour will be guided by two factors: (*i*) marginal utilities of the goods and (*ii*) prices of the goods. According to the law of equi-marginal utility the consumer will be maximising his utility when he spends his money income between the

goods X and Y in such a way that the utility derived from the last rupee spent on each good is equal.

i.e. $$\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$$

$\frac{MU_x}{P_x}$ denotes the marginal utility of the last rupee spent on 'x'.

$\frac{MU_y}{P_y}$ denotes the marginal utility of the last rupee spent on 'y'.

But the equality achieved is not only at one level but at various different levels of expenditure. The problem is how far the consumer will go on spending his money income. The consumer will go on spending till the marginal utility of expenditure on each good becomes equal to the marginal utility of money (MU_m). Thus, for X and Y, the consumer will be in equilibrium when :

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = MU_m$$

or $$\frac{MU_x}{MU_y} = \frac{P_x}{P_y}$$

Thus, a consumer is in equilibrium when he equalises the ratio of marginal utilities of goods with the ratio of corresponding prices for goods consumed.

Limitations of the Law of Equi-Marginal Utility

The law of equi-marginal utility lays down that the consumer will be attaining maximum utility or satisfaction from his money income when he spends it in such a manner the marginal utility of a rupee spent on each commodity bought is equal. But in practice, many people may not follow the law fully, but act in haste and thus don't derive maximum utility. This is because of the following limitations of the above law :

(*i*) The consumer may make an improper distribution of his expenditure because of ignorance. It is not always possible to make an exact estimate of marginal utilities.

(*ii*) Goods are sometimes purchased on an impulse. The consumer may not always behave in a rational way.

(*iii*) Commodities are not always divisible to the extent necessary for the equalisation of marginal utilities.

CONSUMER'S SURPLUS

The concept of consumer's surplus was evolved by Alfred Marshall. It occupies an important place in economic theory and also in economic policies of government and decision-making of monopolists.

Sometimes consumers are ready to pay more for the goods than they actually pay for them. This extra satisfaction which consumers get from the purchase of goods is called *consumer's surplus. Marshall* defined the concept of consumer's surplus as "*excess of the price which a consumer would be willing to pay rather than go without a thing over that which he actually does pay*". It is the economic measure of this surplus satisfaction.

or Consumer's surplus = What a consumer is ready to pay – What he actually pays.

The concept of consumer's surplus is derived from the law of diminishing marginal utility which says that the more of a thing we have, the lesser marginal utility it has. In other words, as we purchase more of a good, its marginal utility goes on diminishing. *The consumer is in equilibrium when marginal utility is equal to given price i.e.* he purchases that many number of units of a good at which marginal utility is equal to price (It is assumed that perfect competition prevails in the market). Since the price is fixed for all the units of the good he purchases except for the one at margin, he gets extra utility; this extra utility or extra surplus for the consumer is called consumer's surplus.

Let us suppose, the price of a commodity is Rs. 20 per unit irrespective of the number of units purchased and the total utility of the Ist unit is 30. But marginal utility of each successive unit is reduced by 2, i.e., it is 28 for 2nd unit, 26 for 3rd unit and so on as shown in Table 2.

Table 2. Measurement of Consumer's Surplus

No. of Units	*Marginal Utility*	*Price (Rs.)*	*Consumer's Surplus*
1	30	20	10
2	28	20	8
3	26	20	6
4	24	20	4
5	22	20	2
6	20	20	0
7	18	20	–
			Total surplus 30

Since marginal utility for a unit of good indicates the price the consumer is willing to pay for that unit, and since price is assumed to be fixed at Rs. 20, the consumer enjoys a surplus at every unit of purchase above 6 units. Thus, when the consumer is purchasing 1 unit of the commodity, the marginal utility is worth Rs. 30 and price fixed is Rs. 20, thus he is deriving a surplus of Rs. 10. Similarly, when he purchases 2 units, he enjoys a surplus of Rs. 8 [Rs. 28 – Rs. 20]. This continues and he enjoys consumer's surplus equal to Rs. 6, 4, 2 respectively from 3rd, 4th and 5th unit. When he buys the 6th units, he is in equilibrium because here his marginal utility is equal to the market price i.e., he is willing to pay a sum equal to the actual market price. Here he enjoys no surplus. Thus, given the price of Rs. 20 per unit, the total surplus the consumer will get from the purchase of 6 units is 30 (i.e., 10 + 8 + 6 + 4 + 2 + 0).

We can also show the concept of consumer's surplus graphically as shown is Fig. 2. The quantity of commodity is measured along *X*-axis and price and utility along *Y*-axis. The marginal utility curve MU slopes downwards, indicating that as the consumer buys more units of the commodity, its marginal utility falls. Marginal utility shows the price which a person is willing to pay for the different units rather than go without them. If *OP* is the price that prevails in the market, then consumer will be in equilibrium when he buys *OQ* units of the commodity, since at *OQ* units, marginal utility is equal to the given price *OP*. The last unit, *i.e.*, *Q*th unit does not yield any consumer's surplus because here price paid is equal to the marginal utility of the *Q*th unit. But for units before *Q*th unit, marginal utility is greater than the price and thus these units fetch consumer's surplus to the consumer.

In the above figure total utility is denoted by the area *ODRQ*. But given the price of *OP* per unit, the consumer actually pays *OPRQ*. Thus, he derives extra utility or consumer's surplus of *DPR* shown by shaded area.

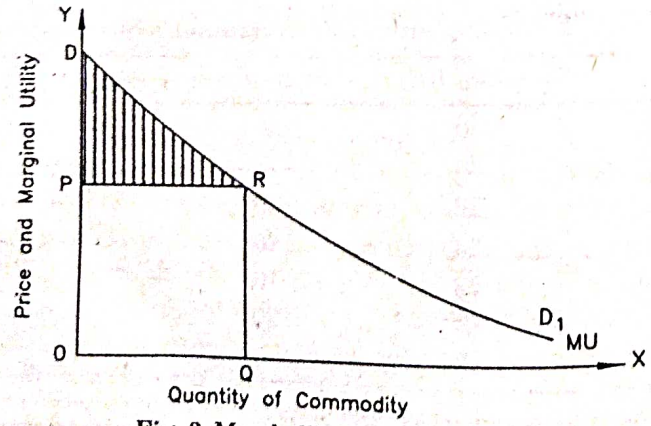

Fig. 2. Marshall's Consumer's Surplus.

Usefulness of Consumer's Surplus

The concept of Consumer's surplus is useful under the following situations :

(*i*) It draws attention to the fact that the total utility derived from the consumption of a thing is usually greater than the price paid for it. In other words, it reveals the difference of value-in-use and value-in-exchange.

(*ii*) Consumer's surplus indicates the benefit a person derives from the economic environment in which he lives. We can compare different localities by estimating and comparing the consumer's surplus obtained in each locality.

(*iii*) The concept is useful to the government in imposing taxes on various goods. Taxes on commodities raise their prices and the consumer's surplus will come down. But they will also result in increasing revenues of the government. The loss to the consumers should be matched against the gains to the government, the tax is not proper; on the other hand, if the gain to the government is greater than loss of satisfaction to the consumers, the tax is proper. Thus, the concept of consumer's surplus is useful in analysing the effects of taxes.

(*iv*) The concept is also an important tool in the hands of a monopolist. While fixing prices, he has to see the amount of consumer's surplus which buyers are deriving from the commodity. He will try to charge the prices in such a manner that he leaves little or no consumer's surplus for his customers.

(*v*) The concept of consumer's surplus is relevant to understand the implications of international trade. A country can continue to import goods at given prices so long as there is consumer's surplus *i.e.*, imported goods are available at a price lower than the consumer's are willing to pay.

Limitations of Consumer's Surplus

The shortcomings of the concept of consumer's surplus are as under :

(*i*) It is argued that consumer's surplus cannot be measured precisely—because it is difficult to measure the marginal utilities of different units of a commodity consumed by a person.

(*ii*) In the case of necessaries, the marginal utilities of the earlier units are infinitely large. In such a case, the consumer's surplus is always infinite.

(*iii*) Consumer's surplus derived from a commodity is affected by the availability of substitutes. But Marshall assumed lack of interdependence between goods.

(iv) When a consumer goes to the market, he accepts the price prevailing and pays it. It is very difficult for him to tell how much he would be willing to pay rather than go without it.

(v) Consumer's surplus cannot be measured in terms of money because the marginal utility of money changes as purchases are made and the consumer's stock of money gets diminished. But Marshall assumed the marginal utility of money to be constant. However, this assumption is unrealistic.

QUESTIONS

1. Define the terms 'utility', 'total utility' and 'marginal utility'. What are the assumptions of Marginal utility analysis ?
2. State and illustrate the law of diminishing marginal utility with the help of a suitable example.
3. Explain the law of diminishing marginal utility and discuss its limitations.
4. How does consumer obtain equilibrium under the law of equi-marginal utility ? Discuss.
5. What is meant by consumer's surplus ? How can consumer's surplus be measured ?
6. Explain graphically the concept of consumer's surplus.
7. Define consumer's surplus and discuss the applications of the concept of consumer's surplus.
8. Explain the meaning and limitations of consumer's surplus.
9. State the essence of law of diminishing marginal utility. Show in a tabular form, how is marginal utility measured ?
10. Answer the following :
    (a) What is marginal utility ?
    (b) Why does marginal utility show a diminishing trend ?
    (c) Define consumer's surplus.
    (d) State the limitations of consumer's surplus.
    (e) What is the difference between utility and satisfaction ?

□ □ □

We can explain the above concept with the help of an example of a consumer who has one apple and 12 banana. To derive the same level of satisfaction, he is prepared to give up 6 banana to get an additional apple. In this way, we have four combinations of apple and banana that give the same amount of satisfaction to the consumer as shown in Table 1. Each combination (*A, B, C, D, E*) gives equal amount of satisfaction.

Table 1. Indifference Schedule

Combination	*Apple*	*Banana*
A	1	12
B	2	6
C	3	4
D	4	3
E	5	2

The data in the above table has been plotted graphically in Fig. 1. All the five combinations *A, B, C, D* and *E* have been plotted on an indifference curve *IC*. The quantity of apple is represented along *X*-axis and that of banana along *Y*-axis. As in indifference schedule, combinations lying on an indifference curve will give the consumer the same level of satisfaction.

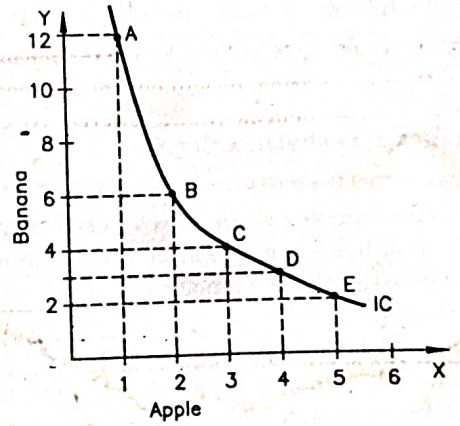

Fig. 1. Consumer's Indifference Curve.

Indifference Map

An indifference map depicts a complete picture of consumer's scale of preference for two goods. In Fig. 2, an indifference map of a consumer is shown which consists of three indifference curves. In other words, a family of indifference curves is called an indifference map. Each indifference curve reflects a different level of total utility. A higher indifference curve shows a greater amount of satisfaction.

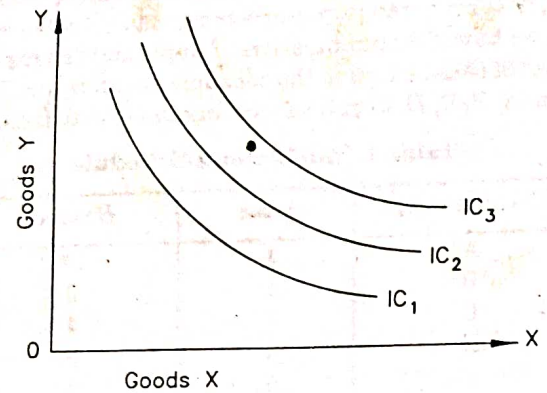

Fig. 2. An Indifference Map.

While the consumer is indifferent among the combinations lying on the same indifference curve, he certainly prefers the combinations on the higher indifference curve to the combinations lying on a lower indifference curve because a higher indifference curve signifies a higher level of satisfaction. Thus while all combinations of IC_1 give same satisfaction all combinations lying on IC_2 give greater satisfaction than those lying on IC_1.

Features/Properties of Indifference Curve

Indifference curves possess the following properties :

1. Indifference curves slope downwards from left to right. An indifference curve has a negative slope which implies that it slopes downward from left to right. The reason underlying this property is that if the consumer has to stay at the same level of satisfaction, the quantity of one commodity must decrease when the quantity of the other commodity increases. Fig. 1 clearly explains this point. When the quantity of apple increases from 1 to 2, the quantity of banana decreases from 12 to 6. When further the quantity of apple increases from 2 to 3, the quantity of banana decreases from 6 to 4 and so on. At each combination, the level of satisfaction remains the same.

Downward slope of an indifference curve is based on the assumption that both the goods give the consumer positive satisfaction *i.e.*, he wants to consume more and more of the commodity. This assumption is called *monotonicity of preferences.*

Table

The downward slope of indifference curve can also be proved by contradiction as shown in Fig. 3.

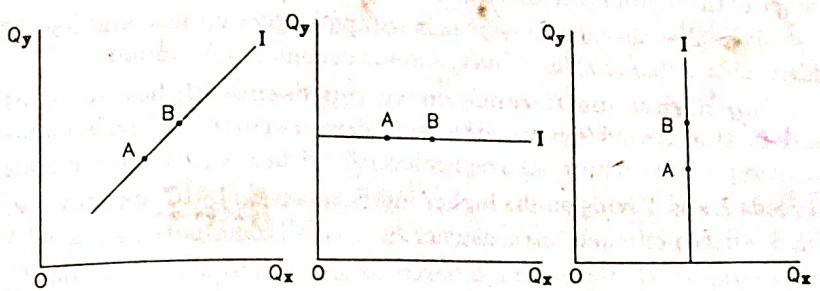

Fig. 3. The Downward Slope of an Indifference Curve by contradiction.

In this figure, the consumer has to choose combinations of two goods namely Q_x and Q_y. In all the three sub-figures, point B is preferred to point A as point B has more of both the commodities. Hence, the relation of indifference cannot exist between A and B. In other words, an indifference cannot be upward sloping, horizontal or vertical—it has to be downward sloping.

(*ii*) **Indifference curves are always convex to the origin.** As has been shown in Fig. 4, as more and more of one commodity *i.e.*, apple is substituted for another banana, the consumer is willing to part with less and less of the commodity being substituted *i.e.*, banana. This is called **diminishing marginal rate of substitution (MRS).** This happens

MRS

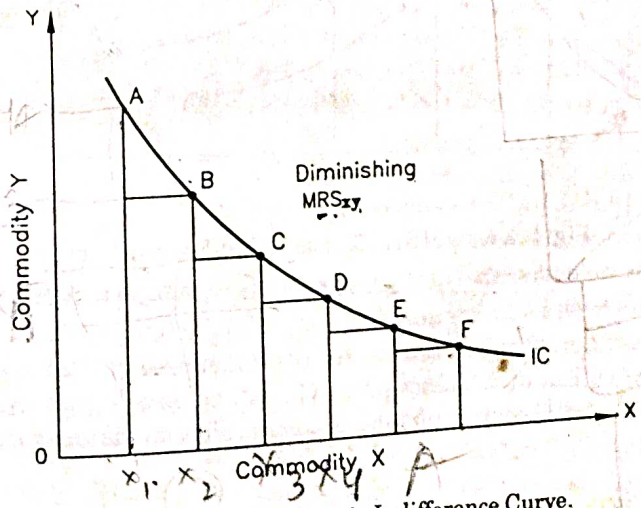

Fig. 4. Convex to the Origin Indifference Curve.

mainly because want for a particular good is satiable and as a person has more and more of a good, his intensity of want for that good goes on diminishing; This diminishing marginal rate of substitution gives convex shape to the indifference curve as shown in Fig. 4.

It implies that the consumer is willing to give up less and less of commodity Y (banana) for an increment in commodity X (apple).

(*iii*) **Higher indifference curve represents higher level of satisfaction.** An indifference curve lying above and to the right of another indifference curve represents a higher level of satisfaction. All combinations of goods X and Y lying on the higher indifference curve IC_2 as shown in Fig. 5, will be preferable to a consumer vis-a-vis all combinations of good X and Y lying on IC_1, the lower indifference curve. All combinations on IC_2 contain a large quantity of either X or Y or both X and Y, than all combinations on IC_1. For example, point 'L' lying on IC_1, represents OX_1 units of X and OY_1 units of Y $(OX_1 + OY_2)$. Point 'M' lying on IC_2 represents the same amount of Y as point E, but a larger amount of X, *i.e.* OX_2. In the figure, OX_2 is greater than OX_1.

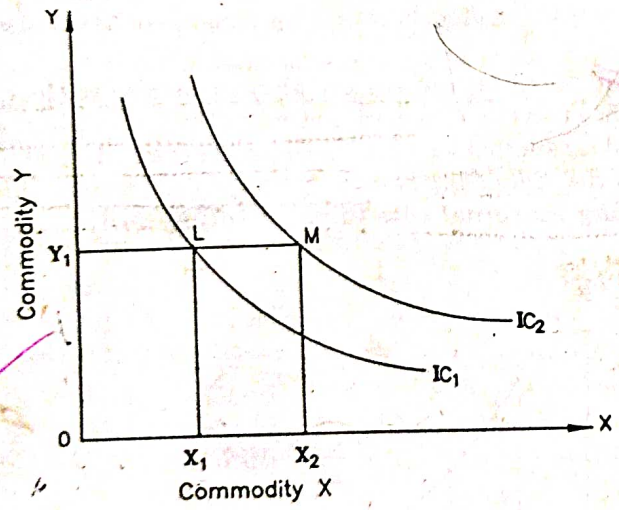

Fig. 5. Levels of Satisfaction by Indifference Curves.

The consumer shall get greater satisfaction from a larger amount of good than from a smaller amount $[(OX_2 + OY_1) > (OX_1 + OY_1)]$. According to the assumption of non-satiety, the consumer prefers a large amount of a good than less of it. Hence point M shall be on a higher indifference curve, and shall be more preferable to point L, lying on the lower indifference curve-IC_1.

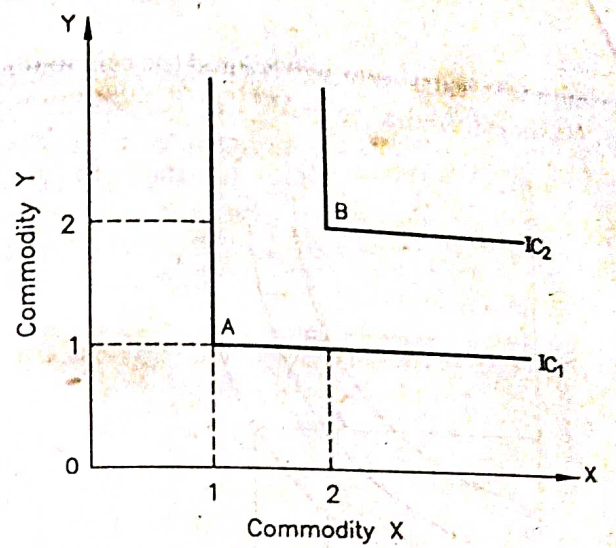

Fig. 8. Indifference Curve in the case of Perfect Complements.

If 2 left shoes and 2 right shoes are given to the consumer, he reaches a higher indifference curve IC_2. This curve will again be a L-shaped curve. It is important to remember that the requirement of perfect complements is that the consumer prefers to consume the goods in fixed proportions. It is not necessary that the proportion is one-to-one, it could be any proportion but fixed. For example, a consumer may take two teaspoons of sugar in a cup of tea, *i.e.*, 2 : 1.

(3) Bad Goods

A bad thing is a commodity that is not liked by a consumer. In Fig. 9, consumer's income is shown on Y-axis and pollution is depicted on the X-axis. Obviously income is a "good" commodity while pollution is "bad". Let us consider the bundles of commodities income and pollution given by point A on the indifference curve IC_1. If a person inhales more toxic fumes, to keep him on the same indifference curve, his income will have to be increased, *i.e.*, the consumer will have to be "compensated" for the additional pollution. Thus if pollution increases, income will also have to increase for the consumer to remain on the same indifference curve. As a result, *indifference curve will slope upwards from left to right*. Moreover, greater levels of well-being are shown by indifference curves above and to the northwest, *i.e*, IC_2 is preferred to IC_1. This is due to the fact that more income combined with the same level of pollution as on point A in IC_1 would give a higher level of satisfaction than A (see point B on IC_2). On similar reasoning, IC_3 will depict a lower level of satisfaction as compared with IC_1. For example, if income remains the same as at A but pollution

increases, the level of satisfaction will fall and the consumer will shift to point C on a lower indifference curve IC_3.

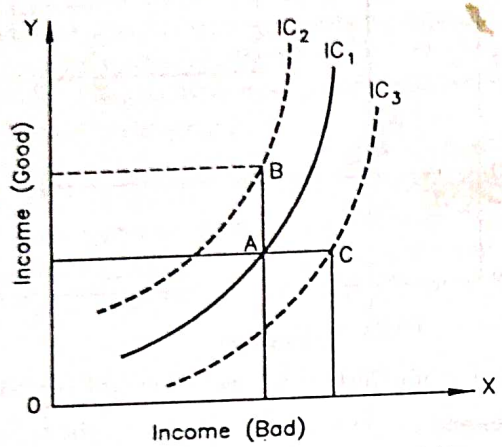

Fig. 9. Indifference Curve in case of a Bad Commodity.

(4) Neutral Goods

If a consumer does not care one way or the other for a particular commodity, then that commodity is a 'neutral' commodity. If a 'good' commodity is depicted on X-axis and a 'neutral' commodity on Y-axis, the *indifference curve would be a vertical straight line*. On the other hand, if a 'good' commodity is depicted on Y-axis and a 'neutral' commodity on X-axis, the *indifference curve would be a horizontal straight line.*

Point of Bliss

A 'point of bliss' is defined as a point most preferred by the consumer. All other points in the indifference map lie on lower indifference curves and hence indicate a lower level of satisfaction as compared to the point of bliss.

Budget Line (or Price Line)

A higher indifference curve shows a higher level of satisfaction than a lower one. Therefore, a consumer in his attempt to maximise satisfaction will try to reach the highest possible indifference curve. But in his pursuit of buying more and more goods and thus obtaining more and more satisfaction he has to work under two constraints. *Firstly*, he has to pay the prices for the goods and, *secondly*, he has a limited money income with which to purchase the goods.

These constraints are explained by budget line or price line as shown in Fig. 10. In simple words, a budget line shows all those combinations of

two goods which the consumer can buy spending his given money income on the two goods at their given prices. All those combinations which are within the reach of the consumer assuming that he spends all his money income will lie on the budget line. The points L and M in the figure fall outside the price line. The combination L shows underspending by the consumer and combination M would be beyond the reach of the consumer because of money constraint.

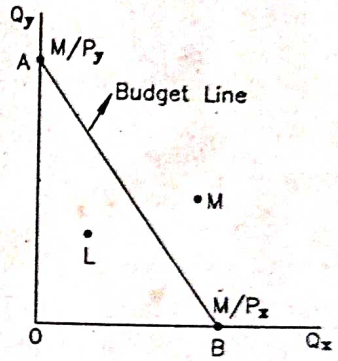

Fig. 10. Consumer's Budget Line.

Slope of the Budget Line

The consumer's fixed income is a constraint to his maximising behaviour. In the simple case, in which only two goods X and Y are being considered, the budget constraint can be written mathematically as :

$$M = P_X Q_X + P_Y Q_Y$$

where M = Total income of the consumer.

$P_X Q_X$ = Expenditure on good X.

$P_Y Q_Y$ = Expenditure on good Y.

The budget constraint shows all the possible combinations (Fig. 10) of the two goods that can be bought by a consumer, given income and prices of goods. It is obtained by solving for Q_Y *i.e.*,

$$Q_Y = \frac{M}{P_Y} - \frac{P_X Q_X}{P_Y}$$

if $Q_X = 0$, then $Q_Y = \frac{M}{P_Y}$ (shown by point A)

if $Q_Y = 0$, then $Q_X = \frac{M}{P_X}$ (shown by point B)