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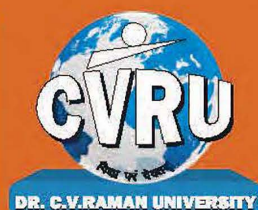
Faculty of Commerce

Micro Economics

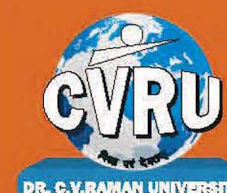
Micro Economics



1BCOM6P



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A STATUTORY UNIVERSITY UNDER SECTION 2(F) OF THE UGC ACT

1BCOM6P

Micro-Economics

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CONTENTS

		Page No.
	BLOCK I	
Unit 1	An Introduction to Microeconomics	3
Unit 2	Method of Economic Analysis	28
	BLOCK II	
Unit 3	Economic Laws	53
Unit 4	Basic Problems of Indian Economy	83
	BLOCK III	
Unit 5	Elasticity of Demand	111
Unit 6	Measuring Elasticity of Demand	130
	BLOCK IV	
Unit 7	Factors of Production	151
Unit 8	Law of Variable Proportion	179
Unit 9	Theories of Population	200

BLOCK I

UNIT

1

AN INTRODUCTION TO MICROECONOMICS

CONTENTS

- 1.0 Aims and Objectives
- 1.1 Introduction
- 1.2 Meaning of Economics
- 1.3 Definitions of Economics
- 1.4 Nature and Branch of Economics
 - 1.4.1 Differences between Microeconomics and Macroeconomics
- 1.5 Understanding Microeconomics
- 1.6 Scope of Microeconomics
- 1.7 Different Assumptions in Microeconomics
 - 1.7.1 Utility
 - 1.7.2 Opportunity Costs
 - 1.7.3 Concept of Ceteris Paribus
 - 1.7.4 Partial and General Equilibrium
- 1.8 Let Us Sum Up
- 1.9 Unit End Activity
- 1.10 Keywords
- 1.11 Questions for Discussion
- 1.12 References & Suggested Readings

1.0 AIMS AND OBJECTIVES

After studying this lesson, you should be able to:

- Understand the meaning and definitions of Economics
- Know about the nature and branches of Economics
- Explain the concept and scope of Microeconomics
- Explain the different Economic problems
- Analyze the different assumptions concerned with Microeconomics

1.1 INTRODUCTION

In our day to day life we use a lot of economic concepts such as goods, market, demand, supply, price, inflation, banking, tax, lending, borrowing, rate of interest, etc. Similarly, we take economic decisions related to the distribution of our income to purchase various goods, make a budget to do some work, take up a job to earn, withdraw money from bank, etc. We also observe and get information on the economic situation of our society or country foreign country and the world.

Every day people make decisions that belong within the realm of economics. What to buy? What to make and sell? How many hours to work? We have all participated in the economy as consumers, many of us as workers, some of us also as producers. We have paid taxes. We have saved our earnings in a bank account. All of these activities and so many more belong to the total realm of economics. Households and firms are the basic units of an economy and are concerned with the economic problem:- How best to satisfy unlimited wants using the limited resources that are available? As such, economics is the study of how society uses its scarce resources. Its aim is to provide an insight into the processes governing the production, distribution and consumption of goods and services in an exchange economy.

Economics is essentially a study of the usage of resources under specific constraints, all bound with a hope that the subject under scrutiny is a rational entity which seeks to improve its overall well-being. Economics as a subject has assumed great importance in the field of social science.

1.2 MEANING OF ECONOMICS

The word 'Economics' originates from the Greek work 'Oikonomikos' which can be divided into two parts:

- (a) 'Oikos', which means 'Home', and
- (b) 'Nomos', which means 'Management'.

In other words, Economics means 'Home Management'. The head of a family faces the problem of managing the unlimited wants of the family members within the limited income of the family. In fact, the same is true for a society also. If we consider the whole society as a 'family', then the society also faces the problem of tackling unlimited wants of the members of the society with the limited resources available in that society. Therefore we can say that economics means the study of the way in which mankind organizes itself to tackle the basic problems of scarcity. All societies have more wants than resources. Hence, a system must be devised to allocate these resources between competing ends.

During the 19th century, social science emerged and separate disciplines were carved out. Economics, psychology, sociology, politics, anthropology and other branches of social science developed as separate fields of study. In the last part of the 19th century, "political economy" became "economics." Since that time, economics has been frequently defined as "the study of how scarce resources are allocated to satisfy unlimited wants." As a professional discipline, economics is often regarded as a decision science that seeks optimal solutions to technical allocation problems.

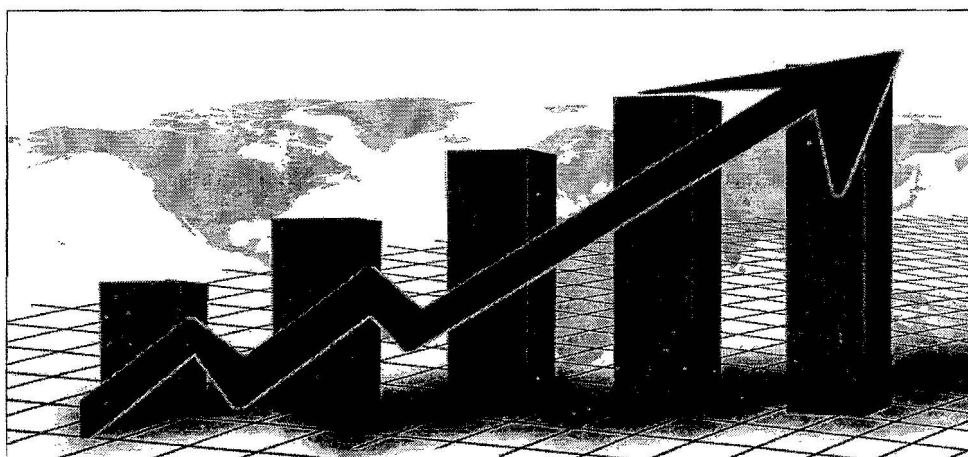


Figure 1.1: Defining Economy

1.3 DEFINITIONS OF ECONOMICS

Economics is a vast subject. So it is not easy to give a precise definition or meaning of economics as its scope and the area which it covers are very large. Ever since, it emerged as a separate branch of study in social science, various scholars and authors have tried to give its meaning and objectives. It should be noted that with development of time and civilization the definition of economics has undergone modification and change.

Economics is the social science that studies economic activities. This definition is, however, too broad. It does not specify the exact manner in which the economic activities are to be studied. Economic activities essentially mean production, exchange and consumption of goods and services. However, with the progress of civilization, the complexity of the production, exchange and consumption processes in society have increased manifold. Economists at different times have emphasized different aspects of economic activities, and have arrived at different definitions of Economics. Many definitions have been given by different writers. The definitions can be classified into four groups:

1. Wealth definitions,
2. Material welfare definitions,
3. Scarcity definitions, and
4. Growth-centered definitions.

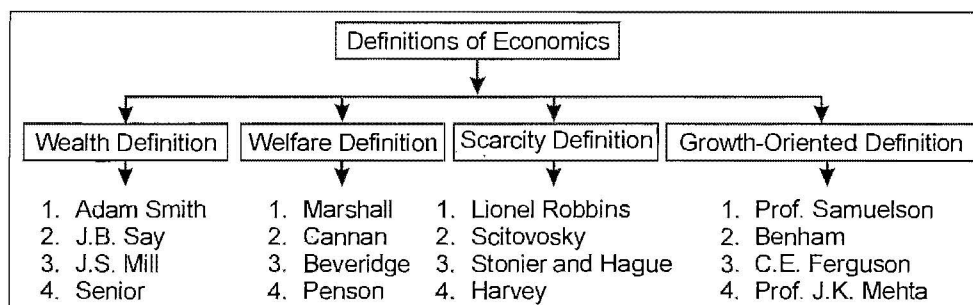


Figure 1.2: Definitions of Economics

Wealth Definition

Adam Smith is considered the founding father of modern Economics, defined Economics “as the study of the nature and causes of nations’ wealth or simply as the study of wealth.”

The central point in **Smith’s** definition is wealth creation. Implicitly, **Smith** identified wealth with welfare. He assumed that, the wealthier a nation becomes the happier are its citizens. Thus, it is important to find out, how a nation can be wealthy. Economics is the subject that tells us how to make a nation wealthy. **Adam Smith’s** definition is a wealth-centered definition of Economics. Many scholars and authors in the late eighteenth and early nineteenth century believed that economics is the science of wealth. These scholars are called the classical thinkers. They viewed that economics deals with the phenomenon of wealth which includes nature and causes of wealth, creation of wealth by individuals and nations, etc.

Another great economist **J.S. Mill** defines economics as the practical science of the production and the distribution of wealth. This definition of **J.S. Mill** was mentioned in the concise Oxford dictionary. **J.B. Say** is a French economist who is a well known classical economist. He defined economics ‘as the science which treats of wealth, that is, economics studies about the wealth’.

All the above classical economists assign great importance to the wealth as the centre of economic studies. If this definition is taken narrowly, it creates a problem. However if the concept of wealth is defined in broader perspective, it is to take into account scarce goods and services which are used to satisfy wants, etc. In that case, the definition becomes more acceptable. But it appears that these economists have defined wealth in a very narrow sense. Therefore, the definition of economics becomes quite narrow. Such limited definition of economics focusing around the wealth seems to restrict the scope of economics.

Characteristics of Wealth Definitions

1. **Lot of emphasis given on wealth:** These wealth centered definitions gave too much importance to the creation of wealth in an economy. The classical economists like **Adam Smith, J.S. Mill, J.B. Say**, and others believed that economic prosperity of any nation depends only on the accumulation of wealth.
2. **Inquiry into wealth creation:** These definitions show that Economics also deals with an inquiry into the causes behind the creation of wealth. For example, wealth of a nation may be increased through raising the level of production and export.
3. **Study on the nature of wealth:** These definitions have indicated that wealth of a nation includes only material goods (e.g., different manufactured items). Non-material goods were not included. Hence, non-material goods like services of teachers, doctors, engineers, etc., are not considered as 'wealth'.

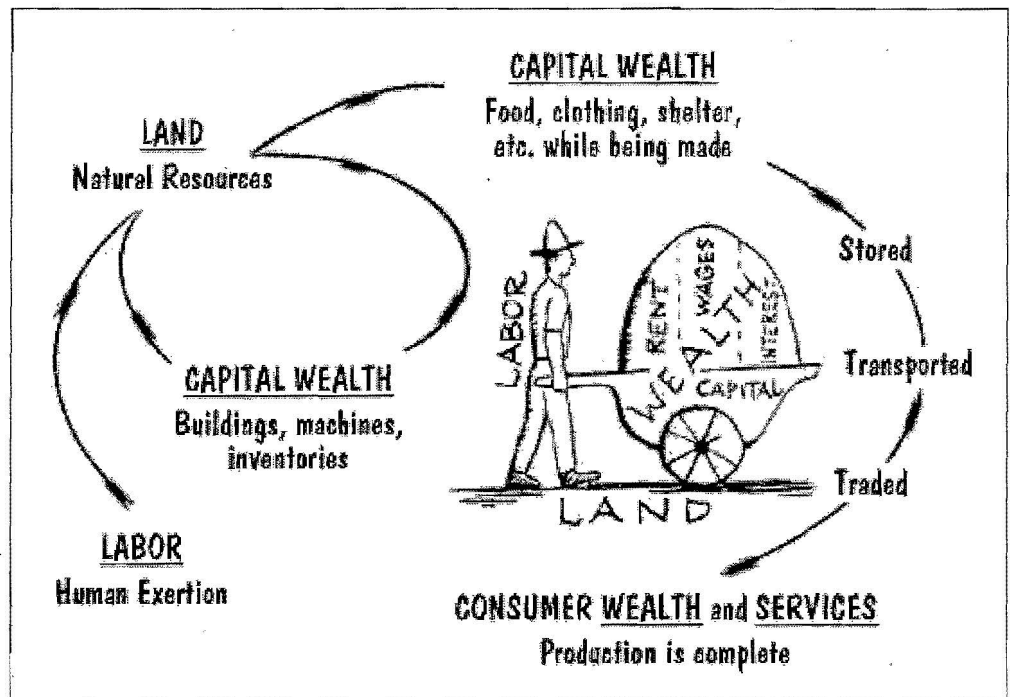


Figure 1.3: Defining Economics

Material Welfare Definitions

Alfred Marshall also stressed the importance of wealth. But he also emphasized the role of the individual in the creation and the use of wealth. He wrote: "Economics is a study of man in the ordinary business of life. It enquires how he gets his income and how he uses it. Thus, it is on the one side, the study of wealth and on the other and more important side, a part of the study of man." **Marshall**, therefore, stressed the supreme importance of man in the economic system. **Marshall's** definition is considered to be material-welfare centered definition of Economics.


The problem with wealth definition was that it did not talk about people who had no wealth. Having wealth and not having wealth divided the society into rich and “not rich” or poor. So many scholars in the early nineteenth century thought that economics should address the issue of “welfare of the society” and not just wealth.

Alfred Marshall published his book, “**Principles of Economics**” in 1890. He shifted emphasis from wealth to material welfare. According to him, wealth acted only as means to attain the ends and the wealth should not be treated as end in itself. According to **Marshall**, “End is the human welfare.” He provided his definition of economics based on such distinction. According to **Marshall**, “Political economy or economics is a study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of well-beings. 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. Thus, this definition focuses on human welfare through wealth.

Like the earlier economist **Marshall** also believed that economics is highly related to politics but he emphasized on political economy. After marginalising the earlier definitions of economics focusing on wealth, it became necessary to come out with more acceptable and wider definition of economics. It is so because more knowledge was accumulated by this time with regard to economics.

Definitions

Marshall's definition: Science of Material Welfare.



Aims:

1. Study of man and his welfare as a member of the organized society.
2. Study causes of material welfare.
3. Separates the science of economics from other social sciences.

Critics:

1. Too narrow and unscientific
2. All material goods can't promote welfare
3. Quantification of welfare is difficult
4. Concept of welfare misleading
5. Neglects basic problems classificatory rather than analytical.

Figure 1.4: Alfred Marshall's Definition on Material Welfare

Another economist **A.C. Pigou** has also defined economics in terms of ‘human welfare’. **A.C. Pigou** defines economics as the range of our enquiry becomes restricted to that part of social welfare that can be brought directly or indirectly into relation with the measuring rod of money.

According to **Edwin Cannan**, “The aim of political economy is explanation of the general causes on which the material welfare of human beings depends.” Thus, a group of economists like **Marshall**, **Cannan**, **Pigou**, etc. put the economic or material welfare of the people at the centre of study, where role of money also becomes important. Such definitions are also subject to criticism.

Robbins criticized welfare definition on the ground that it includes within its purview material things alone. It ignores non-material things. He considers that in real life, the distinction between material and non-material things is quite blurred. Secondly, although the welfare approach emphasizes upon material welfare yet it is curious that

they have adopted non-material definition of productivity. The material welfare approach suffers from many other criticisms.

Accordingly economics was seen as science of welfare. Welfare is both quantitative and qualitative in nature. Consumption of goods and services, increase in per capita income, etc. are quantitative aspects of welfare. Living in peace, enjoying leisure, acquiring knowledge, etc. are qualitative aspects of welfare. As science of welfare, economics was said to be concerned with the quantitative welfare only because it can be measured in terms of money.

The main features of material welfare-centered definitions are as follows:

1. **Study of material requisites of well-being:** These definitions indicate that Economics studies only the material aspects of well-being. Thus, these definitions emphasize the materialistic aspects of economic welfare.
2. **Concentrates on the ordinary business of life:** These definitions show that Economics deals with the study of man in the ordinary business of life. Thus, Economics enquires how an individual gets his income and how he uses it.
3. **A stress on the role of man:** These definitions stressed on the role of man in the creation of wealth or income.

Scarcity Definitions

Prof. Lionel Robbins in his book '**Essays on the Nature and Significance of the Economic Science**', published in 1932, **Robbins** gave a definition which has become one of the most popular definitions of Economics. According to **Robbins**, "Economics is a science which studies human behaviour as a relationship between ends and scarce means which have alternative uses." A long line of economists after **Robbins**, including **Scitovsky** and **Cassel** agreed with this definition and carried on their analysis in line with this definition. It is a scarcity-based definition of Economics.

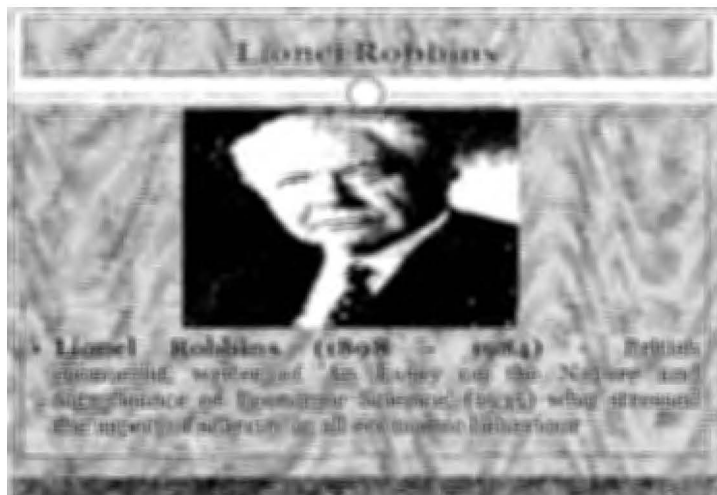


Figure 1.5: Lionel Robbins on Scarcity in Economic Behaviour

The welfare definition of economics explained only the material aspects of welfare. But people want both material goods and non-material services. Since resources available with every individual or society are scarce, people try to achieve their goals by alternative use of these resources which they do by making appropriate choice. Hence economics was treated as science of scarcity and choice.

As science of scarcity and choice, economics studies human behaviour as relationship between ends and means which are scarce and have alternative uses. Here "ends"

imply “wants.” “Scarce Means” imply “limited resources.” According to the scarcity definition, limited resources can be used alternatively. Let us take the example of production of two goods – Cloth and Wheat. We cannot produce unlimited amount of cloth and wheat with limited amount of resources. The resources have to be divided to produce these goods. Let demand for one of the goods say wheat increases so it has to be produced in larger quantity for which we need more resources. But given that, resources are limited, we can produce more wheat only by withdrawing some resources from the production of cloth and putting them in production of wheat. As a result, cloth production will fall and wheat production will increase. In this example, we have two alternatives:

- (i) Keep producing the same amount of cloth and wheat.
- (ii) Produce more wheat due to increase in its demand thereby decreasing some amount of cloth.

Since the economy wants more wheat, the study of economics tells us how this problem can be solved with limited resources.

Main Features of the Scarcity Definition

The main features of scarcity definition are as follows:

1. **Human wants are unlimited:** The scarcity definition of Economics states that human wants are unlimited. If one want is satisfied, another want crops up. Thus, different wants appear one after another.
2. **Limited means to satisfy human wants:** Though wants are unlimited, yet the means for satisfying these wants are limited. The resources needed to satisfy these wants are limited. For example, the money income (per month) required for the satisfaction of wants of an individual is limited. Any resource is considered as scarce if its supply is less than its demand.
3. **Alternative uses of scarce resources:** Same resource can be devoted to alternative lines of production. Thus, same resource can be used for the satisfaction of different types of human wants. For example, a piece of land can be used for either cultivation, or building a dwelling place or building a factory shed, etc.
4. **Efficient use of scarce resources:** Since wants are unlimited, so these wants are to be ranked in order of priorities. On the basis of such priorities, the scarce resources are to be used in an efficient manner for the satisfaction of these wants.
5. **Need for choice and optimization:** Since human wants are unlimited, so one has to choose between the most urgent and less urgent wants. Hence, Economics is also called a science of choice. So, scarce resources are to be used for the maximum satisfaction (i.e., optimization) of the most urgent human wants.

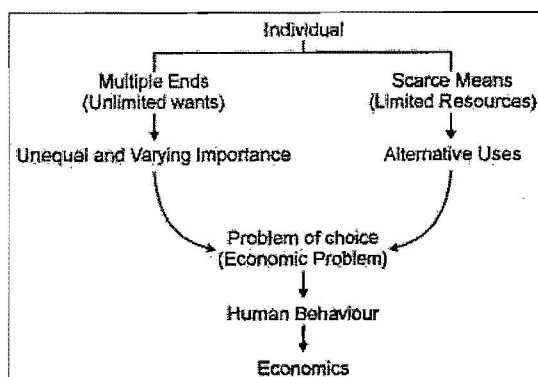


Figure 1.6: Critically Examine the Robbins Definition

Professor Samuelson writes, "Economics is the study of how people and society end up choosing, with or without the use of money, to employ scarce productive resources that could have alternative uses to produce various commodities over time and distributing them for consumption, now or in the future, among various persons or groups in society. It analyses costs and benefits of improving patterns of resource allocation." A large number of modern economists subscribe to this broad definition of Economics.



The economy must allocate its resources among various alternative activities, ensure the efficient use and find ways as to how they would grow for future development of the economy. On this basis, many economies in the world have performed well. For example, the USA, European countries, Japan, etc. are called developed economies because they have achieved higher level of income for their citizens. Our Indian economy is a developing economy because many of its citizens are still poor. A study of economics tells us the state of our economy and guides us to achieve higher level of growth and development.

1. **Growth-orientation:** Economic growth is measured by the change in national output over time. The definition says that, Economics is concerned with

determining the pattern of employment of scarce resources to produce commodities 'over time'. Thus, the dynamic problems of production have been brought within the purview of Economics.

2. **Dynamic allocation of consumption:** Similarly, under this definition, Economics is concerned with the pattern of consumption, not only now but also in the future. Thus, the problem of dividing the use of income between present consumption and future consumption has been brought within the orbit of Economics.
3. **Distribution:** The modern definition also concerns itself with the distribution of consumption among various persons and groups in a society. Thus, while the problem of distribution is implicit in the earlier definitions, the modern definition makes it explicit.
4. **Improvement of resource allocation:** The definition also says that, Economics analyses the costs and benefits of improving the pattern of resource allocation. Improvement of resource allocation and better distributive justice are synonymous with economic development. Thus, issues of development of a less developed economy have also been made subjects of the study of Economics. To put it summarily, the modern definition of Economics is the most comprehensive of all the definitions. All the issues that were highlighted in the earlier definitions are included here. In addition, the issues of development of a backward economy, as well as those of growth in a mature capitalist economy, form part of this definition. Economics as it stands today, is built on the basis of this comprehensive definition.

1.4 NATURE AND BRANCH OF ECONOMICS

The study of economics is divided into two distinct branches. They are:

- (i) Microeconomics
- (ii) Macroeconomics

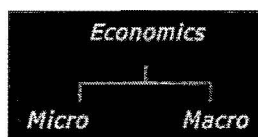


Figure 1.8: Branches of Economics

Microeconomics

Microeconomics is that branch of economics which is concerned with the decision-making of a single unit of an economic system. How does an individual (or a family) decide on how much of various commodities and services to consume? How does a business firm decide how much of its product (or products) to produce? These are the typical questions discussed in microeconomics. Determination of income, employment, etc. in the economic system as a whole is not the concern of microeconomics. Thus, microeconomics can be defined as the study of economic decision-making by micro-units.

Usefulness of Microeconomics

1. **Determination of demand pattern:** The study of microeconomics has several uses. It determines the pattern of demand in the economy, i.e., the amounts of the demand for the different goods and services in the economy, because the total demand for a good or service is the sum total of the demands of all the individuals. Thus, by determining the demand patterns of every individual or family, microeconomics determines the demand pattern in the country as a whole.

2. **Determination of the pattern of supply:** In a similar way, the pattern of supply in the country as a whole can be obtained from the amounts of goods and services produced by the firms in the economy. Microeconomics, therefore, determines the pattern of supply as well.
3. **Pricing:** Probably the most important economic question is the one of price determination. The prices of the various goods and services determine the pattern of resource allocation in the economy. The prices, in turn, are determined by the interaction of the forces of demand and supply of the goods and services. By determining demand and supply, microeconomics helps us in understanding the process of price determination and, hence, the process of determination of resource allocation in a society.
4. **Policies for improvement of resource allocation:** As is well-known, economic development stresses the need for improving the pattern of resource allocation in the country. Development policies, therefore, can be formulated only if we understand how the pattern of resource allocation is determined. For instance, if we want to analyse how a tax or a subsidy will affect the use of the scarce resources in the economy, we have to know how these will affect their prices. By explaining prices and, hence, the pattern of resource allocation, microeconomics helps us to formulate appropriate development policies for an underdeveloped economy.
5. **Solution to the problems of micro-units:** Finally, it goes without saying that, since the study of microeconomics starts with the individual consumers and producers, policies for the correction of any wrong decisions at the micro-level are also facilitated by microeconomics. For example, if a firm has to know exactly what it should do in order to run efficiently, it has to know the optimal quantities of outputs produced and of inputs purchased. Only then can any deviation from these optimal levels be corrected. In this sense, microeconomics helps the formulation of policies at the micro-level.

In every society, the economic problems faced by different economic agents (such as individual consumers, producers, etc.) can be analyzed with the help of microeconomic theories. This shows that economics is a social science which aims at analyzing the economic behaviour of individuals in a social environment.

Limitations of Microeconomics

However, microeconomics has its limitations as well:

1. **Monetary and fiscal policies:** Even though the total demand and total supply in the economy is the sum of individual demands and individual supplies respectively, the total economic picture of the country cannot always be understood in this simplistic way. There are many factors affecting the total economic system, which are outside the scope of microeconomics. For example, the role of monetary and fiscal policies in the determination of the economic variables cannot be analyzed completely without going beyond microeconomics.
2. **Income determination:** Microeconomics also does not tell us anything about how the income of a country - i.e., national income that is determined.
3. **Business cycles:** A related point is that, it does not analyze the causes of fluctuations in national income. The ups-and-downs of national income over time are known as business cycles. Microeconomics does not help us in understanding as to why these cycles occur and what the remedies are.
4. **Unemployment:** One of the main economic problems faced by an economy like India is the problem of unemployment. This, again, is one of the areas on which

microeconomics does not shed much light because, if we are to find a solution to the unemployment problem, we must first understand the causes of this problem. For that, in turn, we must understand how the total employment level in the economy is determined. This is difficult to understand from within the confines of microeconomics.

Macroeconomics

Macroeconomics is that branch of economics which is concerned with the economic magnitudes relating to the economic system as a whole, rather than to the microeconomic units like individuals or firms. It has, therefore, been called 'aggregative economics'. In the picturesque language of **Kenneth Boulding**, "Macroeconomics deals ... not with individual income but with national income, not with individual prices but with the price level, not with individual outputs but with national output."

Importance of Macroeconomics

We need to understand the importance of macroeconomics. In short, we can say that, macroeconomics deals with some of the questions untouched by microeconomics. The study of economics is, therefore, left incomplete, if we do not study macroeconomics. Some of the important issues involved in macroeconomics are as following:

1. **Income and employment determination:** To determine the national income and total employment in the country are important subjects of macroeconomics. Since the volume of unemployment is simply population minus the number of people employed, unemployment is determined as soon as the employment level is known.
2. **Price level:** The determination of the general price level is discussed in macroeconomic theories. Upward movement of the general price level is known as inflation. Thus, if we want to understand the process of inflation and find ways of controlling it, we must resort to the study of macroeconomics.
3. **Business cycles:** The economic booms and depressions in the levels of income and employment follow one another in a cyclical fashion. While income rises and employment expands during boom periods, they shrink during depressions. Since depressions bring business failures and unemployment in their wake, economists have sought remedies to depressions. The scope of macroeconomics involves discussion of business cycles in general and anti-depression policies.
4. **Balance of payments:** The balance of payments theory is also a part of macroeconomics. The difference between the total inflow and the total outflow of foreign exchange is known as the balance of payments of a country. When this balance is negative i.e., outflow exceeds inflow, the country faces a lot of economic hardships. The causes and remedies of such balance of payments problems are discussed in macroeconomics.
5. **Government policies:** The effects of various government policies on the economic variables like national income or the general price level are also studied in macroeconomics. It should be noted that, we are talking of the macroeconomic effects of government policies. The effects of these policies on the micro-units (for instance, the effects of taxes on the output of an individual firm), are the subject-matter of microeconomics. Since, the Government occupies an important position in any modern economic system the analysis of these effects is of importance.
6. **Interrelations between markets:** Probably, the most important contribution of macroeconomic theories is to show that different markets of the economic system -

for example, the commodity market, the labour market, the bond market, the money market, etc. are interrelated. Any disturbance in one of these markets affects all the others. It should be noted that, it is the interrelation between the macroeconomic markets that we are talking about here. The relationship between the markets of the individual commodities is the subject matter of 'general equilibrium theory', which is a part of microeconomics.

Thus, we see that the study of microeconomics and that of macroeconomics are complementary to each other. The limitations of microeconomics are covered by macroeconomics. On the other hand, macroeconomics does not make a detailed study of the individual consumer or producer. This is taken care of by microeconomics. One can hope to form a comprehensive notion of what economics is all about only when one is acquainted with both microeconomics and macroeconomics.

1.4.1 Differences between Microeconomics and Macroeconomics

We can now indicate some of the important differences between Microeconomics and Macroeconomics.

Table 1.1: Differences between Microeconomics and Macroeconomics

Microeconomics	Macroeconomics
1. It is that branch of economics which deals with the economic decision-making of individual economic agents such as the producer, the consumer, etc.	It is that branch of economics which deals with aggregates and averages of the entire economy, e.g., aggregate output, national income, aggregate savings and investment, etc.
2. It takes into account small components of the whole economy.	It takes into consideration the economy of any country as a whole.
3. It deals with the process of price determination in case of individual products and factors of production.	It deals with general price-level in any economy.
4. It is known as price theory (since it explains the process of allocation of economic resources along alternative lines of production on the basis of relative prices of various goods and services).	It is also known as the income theory (since it explains the changing levels of national income in any economy during any particular time period).
5. It is concerned with the optimization goals of individual consumers and producers (e.g., individual consumers are utility-maximizes, while individual producers are profit maximizes).	It is concerned with the optimization of the growth process of the entire economy.
6. It studies the flow of economic resources or factors of production from any individual owner of such resources to any individual user of these resources, etc.	It studies the circular flow of income and expenditure between different sectors of the economy (say, between the firm sector and the household sector).
7. Microeconomic theories help us in formulating appropriate policies for resource allocation at the firm level.	Macroeconomic theories help us in formulating appropriate policies for controlling inflation (i.e., rising price-level), unemployment, etc.
8. It takes into account the aggregates over homogeneous or similar products (e.g., the supply of steel in an economy).	It takes into account the aggregates over heterogeneous or dissimilar products (say, the Gross Domestic Product of any country during any year.)

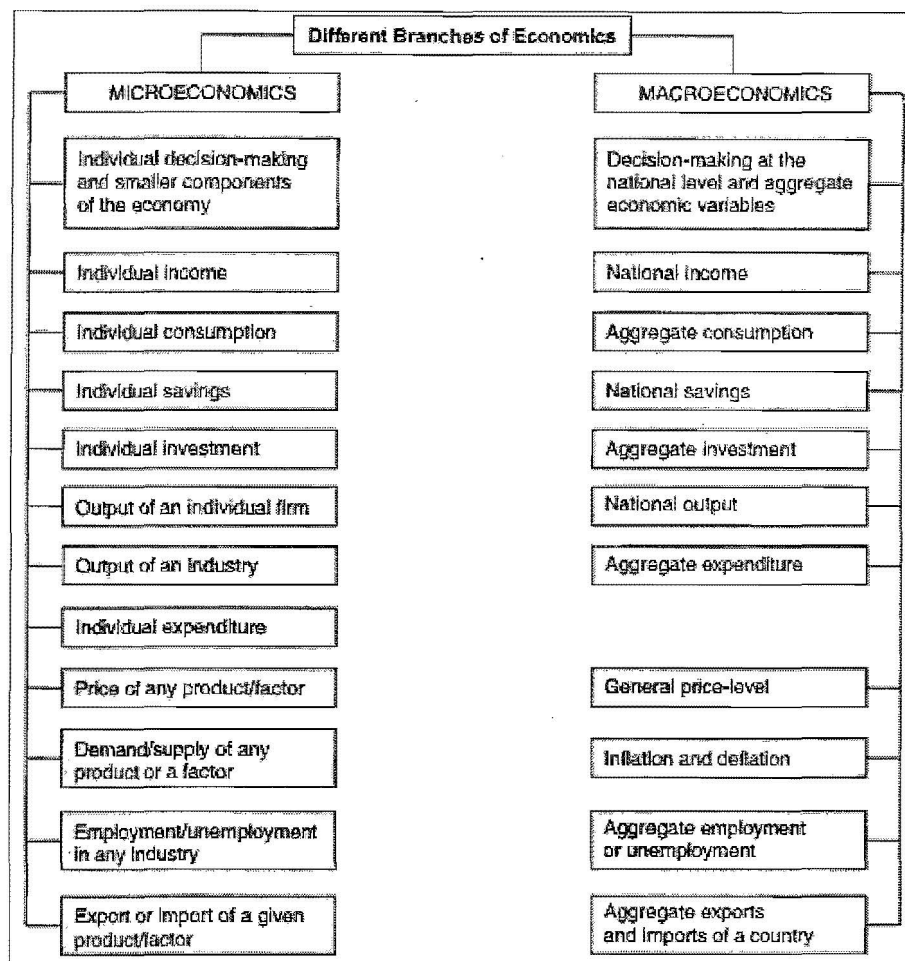


Figure 1.9: Defining the Different Branches of Economics

1.5 UNDERSTANDING MICROECONOMICS

Microeconomics is a word from the Greek prefix “mikro”—meaning “small” and economics. It is a branch of economics that studies the behaviour of individual households and firms in making decisions on the allocation of limited resources - scarcity. Typically, it applies to markets where goods or services are bought and sold. Microeconomics examines how these decisions and behaviours affect the supply and demand for goods and services, which determines prices, and how prices, in turn, determine the quantity supplied and quantity demanded of goods and services. This is in contrast to macroeconomics, which involves the “sum total of economic activity, dealing with the issues of growth, inflation and unemployment.” Microeconomics also deals with the effects of national economic policies such as changing taxation levels on the above mentioned aspects of the economy. Particularly in the wake of the Lucas critique, much of modern macroeconomic theory has been built upon ‘micro foundations’—i.e., based upon basic assumptions about micro-level behaviour. One of the goals of microeconomics is to analyze market mechanisms that establish relative prices amongst goods and services and allocation of limited resources amongst many alternative uses.

Microeconomics analyzes market failure, where markets fail to produce efficient results, and describes the theoretical conditions needed for perfect competition. Significant fields of study in microeconomics include general equilibrium, markets under asymmetric information, choice under uncertainty and economic applications of game theory. Also considered is the elasticity of products within the market system.

Since the word “micro” means very small, microeconomics implies study of economics at a very small level. Let us now understand the meaning of this statement. In a society comprising of many individuals collectively every single individual makes just a small part. So the economic decisions taken by a single individual become the subject matter of microeconomics. The next part is the kind of economic decisions an individual takes. We can cite some examples in this regard. They are as follows:

- (a) In order to satisfy various wants an individual buys goods and services. To buy goods and services the individual has to pay some price from his limited amount of income. So the individual has to make a decision with regard to quantity of the good to be purchased at given price. He/she has to also decide the combination of different goods to buy given his/her income so that he/she can get maximum satisfaction as a buyer.
- (b) An individual also sells goods and services as a seller. Here he has to take decision regarding the quantity of good to be supplied at a given price so that he/she can earn some profit.
- (c) All of us pay price to buy a good? How does this price get determined in the market? Microeconomics provides answer to this question.
- (d) In order to produce a good an individual producer has to take decision as to how to combine the various factors of production so that maximum output can be produced at minimum cost. All these are some important areas of study under microeconomics.

1.6 SCOPE OF MICROECONOMICS

The scope of economics entails the identification of basic economic problems before any society and find out different possible ways to solve those problems. Economics is the study of those activities of human beings, which are concerned, with the satisfaction of unlimited wants by using the limited resources. Micro means the millionth part. Since we are aware that micro has been taken from the Greek word ‘mikros’ meaning small. Under microeconomics we study the individual units like a consumer, a firm, an industry, price determination of a particular commodity, etc. In short the microeconomics deals with the study of the economic problems of a single unit like a firm or small economic units or resource owners. The main objective of microeconomics is to study the principles, policies and the problems relating to the optimum allocation of resources. From the theoretical point of view it tells us the functioning of a free enterprise economy. It explains us how through the market mechanism goods and services produced in the economy are distributed.

On an individual level microeconomics theory deals with four important issues:

- What should be produced?
- How much of it should be produced?
- How can one make the best use of given resources while producing goods and services in order to maximize the efficiency of production and consumption or to maximize the returns for an individual (firm, industry, household, etc)?
- How the goods and services can be distributed for maximum well being?

The scope and subject matter of microeconomics covers the three aspects:

- **Theory of Firm and Product Pricing:** In brief, the theory of Firm and Product pricing discusses demand and supply environment encountered by individual firms, industries, etc. It discusses how given resources can be allocated for production in order to ensure maximization of profit or minimization of cost for a

firm. It also discusses various market situations possible and determination of product pricing under various market situations. It deals with the following:

- ❖ Theory of Demand and Supply
- ❖ Theory of Production
- ❖ Theory of Cost
- ❖ Theory of Markets - Perfect market and Imperfect markets like Monopoly, Duopoly, Oligopoly, Monopolistic competition
- ❖ Theory of Product Pricing in various market situations
- **Theory of Factor Pricing:** As per economic theory, there are four factors of Production – Land, Labour, Capital and Organization.

In brief, the Factor pricing theory discusses how the reward or return for the various factors of production (Land, Labour, Capital and Organization) can be decided when they are contributing to the production activities. It deals with the following:

- ❖ Labour theory and theory of Wage
- ❖ Theory of Rent
- ❖ Theory of Interest
- ❖ Theory of Profit
- **Welfare Economics:** In brief, the welfare theory involves the discussion and understanding of the criteria of 'Social Welfare' for any economy and how the same can be achieved in the economy. It also discusses the determination of welfare maximizing output-mix, commodity distribution and resource allocation. It consists of the following:
 - ❖ Criteria of Social Welfare
 - ❖ Maximization of Social Welfare
 - ❖ Determination of welfare optimizing output mix, commodity distribution and resource allocation

The term 'Micro' and 'Macro' economics have been coined by **Prof. Ragnar Frisch of Oslo University** during 1920's. Microeconomics deals with a small part of the whole economy. For example, if we study the price of a particular commodity instead of studying the general price level in the economy, we actually are studying microeconomics. In the same way, microeconomics studies the behaviour of individual units of an economy such as consumers, firms and industry, etc. Therefore, it is the study of a particular unit rather than all units combined together.

Microeconomics is called price theory, which explains the composition, or allocation of total production. In short, microeconomics is the study of the economic behaviour of individual consumers, firms and industries, and the distribution of production and income among them. It considers individuals both as suppliers of labour and capital and as the ultimate consumers of the final product. On the other hand, it analyses firms both as suppliers of products and as consumers of labour and capital.

1.7 DIFFERENT ASSUMPTIONS IN MICROECONOMICS

The decision-making process of the individual consumer is critically important in the study of microeconomics because consumer spending accounts for about 70% of the economy.

Consumers also save money, invest it, stash it away for the future in banks, stocks, bonds, money market or mutual funds, or other forms of savings. Microeconomics also studies the decision making processes that determine how much a household may save, where it is saved, for how long and why. But because consumer spending is the engine that drives the economy, businesses continually pursue knowledge of how the consumer decision-making process works to better serve their markets with the most desired of products and services at usually, but not always, competitive prices.

A basic assumption of microeconomics is that because a consumer does not have an unlimited budget, his or her available cash for spending must be judiciously allocated for maximum benefit. Microeconomics also supposes that individual consumers make their buying decisions in an effort to obtain the most happiness at the least cost - in other words, maximizing happiness or benefit.

Happiness, of course, cannot be quantified. But there are methods and assumptions in the microeconomics tool box for calculating a reasonable approximation of this elusive concept. In microeconomics, happiness is measured by a concept called utility.

The standard unit of measurement, that microeconomics uses to measure utility is called the util.

1.7.1 Utility

It's the want satisfying power of a commodity.

1. Utility is subjective. It depends upon the human wants.
2. Utility keeps on changing with time and place.
3. It need not be always useful.
4. Utility has nothing to do with the morality.

Measurement of Utility

It can be measured both in terms of money as well as in terms of units. If two persons pay different sum of money for the same amount of commodity then it is the measurement in terms of money.

Marshall, Jevons and Menger and others have tried to measure it in terms of cardinal numbers.

Pareto, Allen, Hicks and others measured it in ordinal an term that is indifference curve approach.

Utility has three concepts:

1. Initial utility
2. Marginal utility
3. Total utility

Marginal utility can further be divided into

Positive Marginal Utility or Zero Marginal Utility or Negative Marginal Utility

1.7.2 Opportunity Costs

Opportunity cost of an activity (or goods) is equal to the best next alternative uses/foregone. Although opportunity cost can be hard to quantify, the effect of opportunity cost is universal and very real on the individual level. In fact, this principle applies to all decisions, not just economic ones.

Opportunity cost is one way to measure the cost of something. Rather than merely identifying and adding the costs of a project, one may also identify the next best alternative way to spend the same amount of money. The forgone profit of this next best alternative is the opportunity cost of the original choice. A common example is a farmer that chooses to farm their land rather than rent it to neighbours, wherein the opportunity cost is the forgone profit from renting. In this case, the farmer may expect to generate more profit alone.

This kind of reasoning is a very important part for the calculation of discount rates in discounted cash flow investment valuation methodologies. Similarly, the opportunity cost of attending university is the lost wages a student could have earned in the workforce, rather than the cost of tuition, books, and other requisite items (whose sum makes up the total cost of attendance).

Note that opportunity cost is not the sum of the available alternatives, but rather the benefit of the single, best alternative. Possible opportunity costs of a city's decision to build a hospital on its vacant land are the loss of the land for a sporting center, or the inability to use the land for a parking lot, or the money that could have been made from selling the land, or the loss of any of the various other possible uses — but not all of these in aggregate. The true opportunity cost would be the forgone profit of the most lucrative of those listed.

Marginal and Incremental Costs

It is the change in total costs due to the production of one more or one less unit of a factor of production.

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

Incremental costs refer to the total additional costs associated with the decisions to expand output or to add a new variety of product, etc. In the long run when firms expand their production they hire more of men, machinery and equipments. These expenditures are included in the incremental costs. These costs also arise due to change in the product lines, addition or introduction of a new product, replacement of worn out plant and machinery, replacement of old techniques of production with a new one, etc.

Sunk costs are those costs, which cannot be increased or decreased by varying the rate of output. Example once it is decided to make incremental investment expenditure and the funds are allocated, all the preceding costs are considered to be the sunk costs as these costs cannot be recovered when there is a change in the market decisions.

1.7.3 Concept of Ceteris Paribus

Ceteris Paribus is a Latin phrase, literally translated as “with other things the same” or “all other things being equal or held constant.” It is commonly rendered in English as “all other things being equal.” A prediction, or a statement about causal or logical connections between two states of affairs, is qualified by ceteris paribus in order to acknowledge, and to rule out, the possibility of other factors that could override the relationship between the antecedent and the consequent.

A ceteris paribus assumption is often fundamental to the predictive purpose of scientific inquiry. In order to formulate scientific laws, it is usually necessary to rule out factors which interfere with examining a specific causal relationship. Under scientific experiments, the ceteris paribus assumption is realised when a scientist controls for all of the independent variables other than the one under study, so that the effect of a single independent variable on the dependent variable can be isolated. By holding all the other relevant factors constant, a scientist is able to focus on the unique effects of a given factor in a complex causal situation.

Such assumptions are also relevant to the descriptive purpose of modelling a theory. In such circumstances, analysts such as physicists, economists and behavioural psychologists apply simplifying assumptions in order to devise or explain an analytical framework that does not necessarily prove cause and effect but is still useful for describing fundamental concepts within a realm of inquiry.

One of the disciplines in which *ceteris paribus* clauses are most widely used is economics, in which they are employed to simplify the formulation and description of economic outcomes. When using *ceteris paribus* in economics, assume all other variables except those under immediate consideration are held constant. For example, it can be predicted that if the price of beef increases – *ceteris paribus* – the quantity of beef demanded by buyers will decrease. In this example, the clause is used to operationally describe everything surrounding the relationship between both the price and the quantity demanded of an ordinary good.

This operational description intentionally ignores both known and unknown factors that may also influence the relationship between price and quantity demanded, and thus to assume *ceteris paribus* is to assume away any interference with the given example. Such factors that would be intentionally ignored include: the relative change in price of substitute goods i.e., the price of beef vs. pork or lamb; the level of risk aversion among buyers i.e., fear of mad cow disease; and the level of overall demand for a good regardless of its current price level i.e., a societal shift toward vegetarianism. The clause is often loosely translated as “holding all else constant.”

In the real world, it is very hard to isolate only one factor. For example, if we look at exchange rates, we would expect higher interest rates (*ceteris paribus*) to cause an appreciation in the currency. But, in the real world, there will be many other factors affecting exchange rates. However, by isolating the other factors we can consider how higher interest rates are likely to have an effect.

1.7.4 Partial and General Equilibrium

The concept of equilibrium, which forms the basis of various theories in different economic activities, is borrowed from Physics. Unlike its meaning in Physics i.e., an absence of activity, and in economic sense it implies absence of tendency or urge to change. It thus means a state of balance.

“Equilibrium is a position from which there is no tendency to move.” –*Prof. Stigler*

“Equilibrium denotes absence of change in the movement and not the absence of movement itself.” –*Prof. J.K. Mehta*

“A market or an economy or any other group of persons and firms is in equilibrium, when none of its members feels impelled to change his behaviour.” –*Scitovsky*

All the above definitions bring home the point that equilibrium in economic sense implies a position of rest. It does not imply absence of movement but suggests absence of change in the movement. Number of examples of equilibrium can be mentioned e.g., a firm is in equilibrium when it is maximizing its profits; the consumer is in equilibrium when he maximizes his level of satisfaction, within given constraints of his income and prices.

Types of Equilibrium

1. Stable — Unstable - Neutral Equilibrium
2. Static and Dynamic - Equilibrium
3. Single and Multiple - Equilibrium
4. Short Term and Long Term Equilibrium
5. Partial and General Equilibrium

All these varieties are important in their own ways. However, the concepts of Partial and General Equilibrium are of particular significance. Hence, we shall concentrate on them here.

Partial Equilibrium

Partial Equilibrium analyses the position of rest i.e., equilibrium of an individual unit such as a consumer, a firm, an industry, etc. It is thus a microeconomic concept. In order to analyze the position of equilibrium of an individual unit, it becomes necessary to assume that all other variables are constant. Thus, if we intend to establish the conditions of equilibrium of an individual consumer, we have to ignore (assume to be constant) other forces that affect the behaviour of the said individual. Hence, we ignore the changes in tastes and preferences of consumers, prices of other goods, etc. while discussing the individual equilibrium.

“A partial equilibrium is one which is based on only restricted range of data, a standard example is price of a single product; the prices of all other products being held fixed during the analysis”. It assumes ‘Ceteris Paribus’.

—Prof. Stigler

In short Partial Equilibrium implies:

- Equilibrium of an individual or a single unit.
- It isolates an individual unit from others.
- It ignores the independence and hence is based on independence of individual units.
- It excludes other variables and relies on a restricted data.
- It assumes, ‘Other things remaining the same’.

As mentioned above partial equilibrium explains how an individual consumption or production unit attains the position of equilibrium. Naturally, it deals with issues such as the following:

Equilibrium of Consumer: On the basis of income, prices and preferences of individual it determines the manner in which a consumer derives maximum satisfaction i.e., equilibrium.

Equilibrium of a firm: This implies determination of level of output that yields maximum profit.

It reached equilibrium when $MR = MC$.

The position is arrived at on the basis of cost behaviour, prices, technique of production, etc.

Industry Equilibrium: It occurs when the number of firms in the industry remains constant i.e., there is neither entry nor exit of firms. This happens when all firms enjoy only normal profit i.e., $AR = AC$.

Factor Market: An individual factor reaches the position of equilibrium when it receives highest possible reward. Since the alternative reward is less he sticks to that employment.

Assumptions of Partial Equilibrium

The partial equilibrium isolates an individual unit from other influences. It has to make a variety of assumptions many of which may be quite unrealistic. Following are assumed to exist.

1. Constancy of price of the product and income, habits, etc. of consumer.
2. Prices of other goods are constant. For a firm prices and availability of resources is given and constant.

3. Perfect factor mobility.
4. Existence of perfect competition, etc.

Limitations of Partial Equilibrium

- Narrow approach.
- Limited applicability due to restrictive assumptions.
- Neglect of interdependence among unit.
- Inadequate.
- Inability to explain interdependence among units.

Significance of Partial Equilibrium

Even though partial equilibrium approach is exposed to a number of limitations, it has a considerable practical and theoretical significance.

- Explanation of determination in product and factor prices.
- Analysis of change in individual unit.
- Explanation of consequences of change in behaviour of single unit.
- Description of effect of policy changes.
- Helps in solving economic problem.
- Simplification of important issues.
- Foundation of understanding interdependence.
- Assistance in general equilibrium analysis.

General Equilibrium

“Theory of general equilibrium is the theory of inter relationship among all parts of economy.”
–Prof. Stigler

Above definition is self explanatory and fully reveals the meaning and nature of general equilibrium. It is obvious that this approach concentrates on the entire economy i.e., whole as against partial equilibrium analysis which deals with ‘a part’ or an individual unit. It is a macro approach undertaking extensive and comprehensive study of the different variables, their interrelations and inter-dependence, etc. It primarily tries to arrive at equilibrium of the entire system. A general equilibrium occurs when every individual unit attains equilibrium simultaneously. Thus what general equilibrium does is to bring out the link between different individual units in a system.

Since general equilibrium deals with the whole economy it has to explain how total demand and total supply are brought into equality both in the factor and product markets. This implies an in-depth study of the factors forming total demand (buyers) and total supply (sellers) in both product as well as factor markets. The state of general equilibrium will be reached when the decisions of buyers and sellers regarding demand and supply in product and factor markets are in harmony. Taking into account all these facts we can mention the subject matter of general equilibrium in the following manner:

Total Demand for Product: Tastes, preferences, prices of complimentary and substitute products income i.e., rewards in factor market, etc.

Total Supply of Product: Cost of different products, upon the reward of factors and their quantity prices of commodities in the product market, of production, etc.

Total Demand for Factor: Input productivity, the rewards of factors, quality and quantity of different factors of production, etc.

Total Supply of Factor: Rewards, availability, willingness to work, size and composition of population policy implications, etc.

It is obvious that since general equilibrium approach deals with entire system in the context of equilibrium in product and factor markets, it has to properly analyze the interdependence among all the four aspects mentioned above. Study of consequences of change in one of the constituents on the different macro variables is also to be made.

It can be observed that in any market the general equilibrium occurs at equality between total demand and total supply. In the product market, the consumers are on demand side and the firms on the supply. In the factor market, these roles are reversed. Two sets of conditions have to be fulfilled to achieve general equilibrium.

1. **Subjective factors:** Maximisation of gains (satisfaction/profits) by each individual unit.
2. **Objective factors:** Demand — Supply equality in all markets.

Walras points out that “General equilibrium occurs through the mutual interdependence between different markets and their constituents.” In his opinion, the trade in perfectly competitive market is similar to auction. The prices are raised when demand exceeds supply and lowered in the opposite situation. Raising and lowering continues till demand and supply become equal when we have the position of equilibrium.

Assumptions of General Equilibrium

Following are the basic assumptions of general equilibrium analysis:

- Existence of perfect competition in product and factor markets.
- Perfect factor mobility.
- Identical cost conditions for all firms.
- Homogeneity of productive resources.
- Given and constant state of technology.
- Full employment of resources.
- Constant returns to scale. Not all assumptions are true but are essential as they provide the framework for general equilibrium analysis.

Limitations of General Equilibrium

1. **Unrealistic Assumptions** of this approach weaken its importance. The assumptions like perfect competition, full employment, perfect mobility, etc. can hardly be experienced in practice.
2. **Neglect of changing conditions** is yet another defect of this approach. It assumes the constancy of most of the variables which in reality are frequently changing. Such a static model cannot effectively analyze the real dynamic scene. It is aptly remarked, “since the given **Walrasian** conditions are continuously changing, the movement towards general equilibrium is ever thwarted and its attainment has ever remained wishful ideal’.
3. **Limited Validity** is the fate of **Walrasian** general equilibrium model. They are applicable only when conditions are fulfilled i.e., assumptions are valid. This is true only in restricted situations. The validity depends upon proper solutions to various simultaneous equations.

Significance of General Equilibrium

The general equilibrium model of Walras has great utility in enhancing our understanding of the functioning of the whole system and in solving various problems faced by the entire economy. It rightly reveals the fact of inter-dependence between individual units and highlights the dangers in isolating them. The practical importance of this approach can be explained with reference to following:

1. It provides a wide and comprehensive explanation of the inevitable mutual interdependence in a free enterprise economy.
2. This approach provides a thorough explanation of the functioning of the entire economy.
3. General equilibrium analysis simplifies the market complexities by revealing the inter-relations between individual units.
4. The approach clearly explains the role and functions of the market mechanism and reveals how economic decisions are arrived at.
5. The Input-Output analysis of Prof. Leontif is developed on the basis of general equilibrium analysis.
6. The Walrasian model provides the starting point for almost all economic theories. In almost every field of economic enquiry such as money, trade, welfare, etc. the approach proves very useful.

In brief, General Equilibrium model of Prof. Walras is useful in understanding the real issues of the economy as a whole.

Thus Partial Equilibrium approach is based on the assumption, 'other things remaining the same.' i.e., 'ceteris paribus': whereas the General Equilibrium approach assumes 'everything depends on everything else.' Both the approaches, as we have seen, have their respective limitations and significance.

Check Your Progress

Fill in the blanks:

1. _____ is essentially a study of the usage of resources under specific constraints, all bound with a hope that the subject under scrutiny is a rational entity which seeks to improve its overall _____.
2. Microeconomics is that branch of economics which is concerned with the _____ of a single unit of an economic system.
3. Microeconomics analyzes market failure, where markets fail to produce efficient results, and describes the _____ conditions needed for perfect competition.
4. The _____ definition of Economics states that human wants are unlimited. If one want is satisfied, another want crops up.
5. The concept of equilibrium, which forms the basis of various theories in different economic activities, is borrowed from _____.

1.8 LET US SUM UP

- Economics is essentially a study of the usage of resources under specific constraints, all bound with a hope that the subject under scrutiny is a rational entity which seeks to improve its overall well-being. Economics as a subject has assumed great importance in the field of social science.

- In other words, Economics means 'Home Management'. The head of a family faces the problem of managing the unlimited wants of the family members within the limited income of the family. In fact, the same is true for a society also. If we consider the whole society as a 'family', then the society also faces the problem of tackling unlimited wants of the members of the society with the limited resources available in that society.
- **Adam Smith** is considered the founding father of modern Economics, defined Economics "as the study of the nature and causes of nations' wealth or simply as the study of wealth."
- **Alfred Marshall** also stressed the importance of wealth. But he also emphasized the role of the individual in the creation and the use of wealth. He wrote: "Economics is a study of man in the ordinary business of life." It enquires how he gets his income and how he uses it. Thus, it is on the one side, the study of wealth and on the other and more important side, a part of the study of man.
- **Prof. Lionel Robbins** in his book 'Essays on the Nature and Significance of the Economic Science', published in 1932, **Robbins** gave a definition which has become one of the most popular definitions of Economics.
- **Professor Samuelson** writes, "Economics is the study of how people and society end up choosing, with or without the use of money, to employ scarce productive resources that could have alternative uses to produce various commodities over time and distributing them for consumption, now or in the future, among various persons or groups in society. It analyses costs and benefits of improving patterns of resource allocation
- The study of Economics is divided into two distinct branches. They are (i) microeconomics and (ii) Macroeconomics
- Microeconomics is a word from the Greek prefix "mikro"- meaning "small" and economics. It is a branch of economics that studies the behaviour of individual households and firms in making decisions on the allocation of limited resources.
- The scope of economics entails the identification of basic economic problems before any society and find out different possible ways to solve those problems. Economics is the study of those activities of human beings, which are concerned, with the satisfaction of unlimited wants by using the limited resources. Micro means the millionth part.
- *Ceteris Paribus* is a Latin phrase, literally translated as "with other things the same" or "all other things being equal or held constant." It is commonly rendered in English as "all other things being equal."
- "Theory of general equilibrium is the theory of inter relationship among all parts of economy" –**Prof. Stigler**. This definition is self explanatory and fully reveals the meaning and nature of general equilibrium.

1.9 UNIT END ACTIVITY

There are so many varied definitions of economics. Economists at different times have emphasized different aspects of economic activities, and have arrived at different definitions of Economics. Many definitions have been given by different writers. Prepare a report emphasizing which should be the appropriate definition for economics. Prepare a report stating the correct definition and give a presentation about it.

1.10 KEYWORDS

Economics: The branch of knowledge concerned with the production, consumption, and transfer of wealth.

Microeconomics: The part of economics concerned with single factors and the effects of individual decisions is concerned with decision-making by individual economic agents such as firms and consumers.

Macroeconomics: The branch of economics concerned with large-scale or general economic factors, such as interest rates and national productivity. It is concerned with the aggregate performance of the entire economic system.

Economic Theory: A theory of commercial activities concerned with and relies upon principles to analyze behaviour of economic agents.

Ceteris Paribus: It means all other things equal or held constant.

Capital: These are the physical assets used in production i.e., plant and equipment.

Opportunity Cost: The next best alternative that must be foregone as a result of a particular decision.

Resource Allocation: It is a plan for using available resources, for example human resources, especially in the near term, to achieve goals for the future. It is the process of allocating scarce resources among the various projects or business units.

Scarcity: The state of being scarce or in short supply; shortage.

Equilibrium: A state in which opposing forces or influences are balanced.

1.11 QUESTIONS FOR DISCUSSION

1. "Economics is the study of the nature and causes of nations' wealth or simply as the study of wealth." Who said this and explain the statement?
2. Which are the branches of economics? Explain them with their merits and demerits.
3. Explain the concept and meaning of Microeconomics.
4. Explain the concept of 'Ceteris Paribus' in detail. Mention its assumption and importance in economics.
5. Explain the concept of General Equilibrium. Discuss its assumptions and limitations.

Check Your Progress: Model Answer

1. Economics, Well-being
2. Decision-making
3. Theoretical
4. Scarcity
5. Physics

1.12 REFERENCES & SUGGESTED READINGS

Agarwal, M. (2021). *Principles of Microeconomics*. Vikas Publishing House.

Bhaduri, A. (2020). *Microeconomics: Theory and Applications*. Oxford

University Press

- Choudhury, B. (2021). *Essentials of Microeconomics*. Wiley India Pvt. Ltd.
- Dutt, R., & Sundaram, K. P. M. (2021). *Indian Economy (71st ed.)*. S. Chand Publishing.
- Ghosh, A. (2020). *Microeconomics: Theory and Applications*. Oxford University Press.
- Gordon, R. J. (2019). *Microeconomics (13th ed.)*. Pearson.

UNIT

2

METHOD OF ECONOMIC ANALYSIS

CONTENTS

- 2.0 Aims and Objectives
- 2.1 Introduction
- 2.2 Different Concepts of Economics
- 2.3 Nature of Economics: Economics as a Science and an Art
 - 2.3.1 Economics as a Science
 - 2.3.2 Economics and Positive Science
 - 2.3.3 Economics and Normative Science
 - 2.3.4 Economics – A Social Science
 - 2.3.5 Economics as an Art
- 2.4 Method of Economic Analysis
 - 2.4.1 Deductive Method
 - 2.4.2 Inductive Method
 - 2.4.3 Differences in Deductive and Inductive Methods
- 2.5 Let Us Sum Up
- 2.6 Unit End Activity
- 2.7 Keywords
- 2.8 Questions for Discussion
- 2.9 References & Suggested Readings

2.0 AIMS AND OBJECTIVES

After studying this lesson, you should be able to:

- Analyse the different concept of Economics in regards to their definitions
- Know whether Economics is a Science or an Art
- Know about the Positive and Normative Analysis
- Understand the concept of Positive and Normative Economics
- Explain the Induction and Deduction methods

2.1 INTRODUCTION

Microeconomics is the study of economic behaviour of an individual, firm or industry in the national economy. It is a study of a particular unit rather than all the units combined. Microeconomics is the branch of economics based on the economic behaviour of small economic units which involves consumers, workers, savers, business managers, firms, individual industries and markets. Microeconomics,

however, is not limited to small issues. Instead, many bigger issues can best be understood using microeconomics by recognising that they are composed of numerous smaller parts.

Microeconomics involves the study in regards to the following aspects of economy:

- Product pricing;
- Consumer behaviour;
- Factor pricing;
- Economic conditions of a section of the people;
- Study of firms; and
- Location of the industry.

According to K.E. Boulding, "Microeconomics is the study of particular firms, particular households, individual prices, wages, incomes, individual industries, particular commodities". Thus, it deals with the analysis of small individual units of the economy such as individual consumers, firms and small groups of individual units such as various industries and markets; it is a microscopic study of the economy.

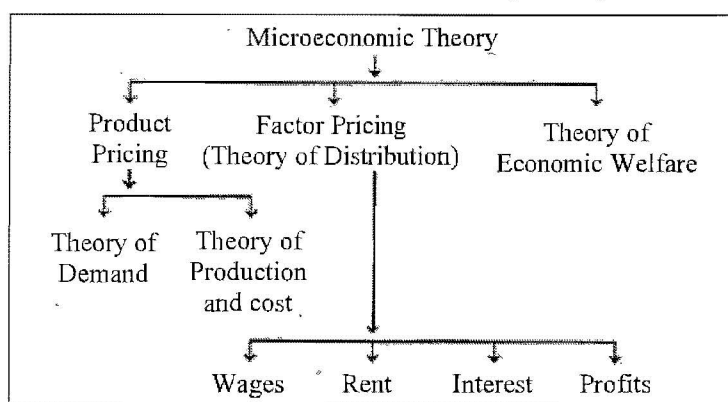


Figure 2.1: Microeconomic Theory

Microeconomics studies how choices are made at the individual level under conditions of scarcity. If there is no scarcity, there would be no need to make choices. Choice must be made from among alternatives. If there are no alternatives available, then the freedom to choose has little meaning. Microeconomics encompasses the factors that influence the decisions made by millions of individuals and the way these innumerable decisions merge to determine the workings of the entire economy. Consumers decide how much of various goods to purchase, workers decide what jobs to take, and firms decide how much output to produce.

Microeconomics examines the allocation decisions of individual consumers and firms. Consumers and firms are guided by the objective of maximization of satisfaction and profits respectively. Since markets are important in the maximization efforts of both consumers and firms, microeconomics studies the markets in detail. The understanding of individual behaviour provides the basis for understanding markets, since a market is comprised of many individual agents.

To quote **Prof. Mc. Connel**, "Microeconomics is concerned with specific economic units and a detailed consideration of the behavior of these individual units. In Microeconomics, we examine the trees, not the forest. Microeconomics is useful in achieving a worm's-eye view of some very specific component of our economic system".

Microeconomic theory is capable of dealing with some of the most important social issues of the day. The important among them are environmental pollution, poverty and welfare programs, monopolies and consumer well-being, labour unions and real wages, rising medical expenditure, discrimination in employment, energy problems, taxation and work incentives.

2.2 DIFFERENT CONCEPTS OF ECONOMICS

The word economics comes from the ancient Greek word 'oikonomia' which means management of a household. Previously, Economics was known as Political Economy. At present Economics is a social science that deals with human wants and their satisfaction. It is mainly concerned with the allocation of resources for the maximization of welfare of the people. In other words, Economics is a social science that studies about production, distribution and consumption of goods and services. The existence of human wants is the starting point of all economic activity. We cannot get all we want by sitting idle. We have to work hard for getting goods and services to satisfy our wants. Hence, due to the existence of human wants, people engage in economic activities or they make efforts to satisfy their wants. Hence, wants, efforts, satisfaction constitute the circle of economics.

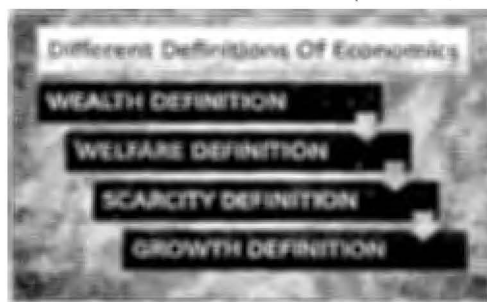


Figure 2.2: Different Definitions of Economics

The concept of Economics has been changing during different stages of developing economics as subject. Some of the stages are mentioned below:

- **Wealth Concept:** During the eighteenth and the early part of nineteenth century, classical economists, such as **Adam Smith, J.B. Say and Walkar** defined Economics as the science of wealth. **Adam Smith** systematized the concept in the form the book which was entitled as “an enquiry into the nature and cause of the wealth of nations”. These economists stated that Economics is related to and concerned with wealth. Excessive emphasis on wealth enabled the businessmen and industrialists to amass wealth by any means, whether fair or foul. Social reformers like **Thomas, Carlyle, John Ruskin, Charles Dickens and William Morris** reacted sharply to the wealth concept of Economics. They branded Economics as a dismal science, gospel of Mammon and science of bread and butter, etc. Wealth concept of Economics was bitterly criticised, because it assumed wealth as an end of human activities. If it is accepted in life, there will be no place for love, affection, sympathy and patriotism. Absence of these values will make our real life a hell.
- **Welfare Concept:** According to this concept, Economics is not the science of wealth but it is concerned with human welfare. It studies and emphasizes wealth as a means of satisfying human wants, not as an end of human activities. **Marshall** was the pioneer of welfare thought. According to him, “Political Economy or Economics is the study of mankind in the ordinary business of life. 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.” The important features of this welfare concept are as under:

- ❖ Economics is the science of human welfare.
- ❖ Economics is the study of mankind in the ordinary business of life.
- ❖ Economics is a social science.
- ❖ Economics is the study of only economic activities.

Welfare concept was also criticised by the pioneers of ‘Scarcity Concept’. According to these economists, it will be an injustice to the subject, if it is restricted to ordinary business of life, concerned with economic activities and related to human welfare only.

- **Scarcity Concept:** The founder of this concept was ‘**Lionel Robbins**’. According to him, “Economics is the science, which studies human behaviours as a relationship between ends and scarce means which have alternative uses”. The important features of this concept are:
 - ❖ Economics is a positive science.
 - ❖ Economics is the study of human behaviour.
 - ❖ Our wants are unlimited.
 - ❖ Our resources are limited/scarce.
 - ❖ Resources can be put to alternative uses.

According to this approach certain universal truth are regarded as the basis of economic problems. Every individual and economy has unlimited wants and scarce means to satisfy these wants. Inability to satisfy unlimited wants with limited resources creates the problems of choice making i.e., fixing priority of wants to be satisfied. As resources can be put to alternative uses, we will have to take decision as to which specific want should be satisfied with particular means. In this way, choice making or decision making is the means of tackling all these economic problems.

- **Development Concept:** Scarcity concept explains the presence of economic problems. It is concerned with the positive aspect of the subject. Modern economists feel that economist should also suggest how the scarce means should be further increased to satisfy more wants and attain good living. The founder of this concept is **Professor Samuelson**, who presented the growth-oriented definition of Economics. According to him, “Economics is the study of how man and society choose, with or without the use of money to employ scarce productive resources, which could have alternative uses, to produce various commodities over time and distribute them for consumption now and in the future among various people and groups of society”.

The important features of this concept may be summarised as under:

- ❖ Problem of choice making arises due to unlimited wants and scarce means. We have to decide which wants are to be satisfied and which of them are to be deferred.
- ❖ Wants have tendency to increase in the modern dynamic economic system, so the available resources should be judiciously used. Best possible efforts should also be made to increase the resources, so that increasing wants can be satisfied.
- ❖ Economics is not concerned with the identification of economic problems but it should also suggest ways and means to solve the problems of unemployment, production, inflation, etc.

- ❖ Economists should also suggest how the resources of the economy should be distributed among various individuals and groups.
- ❖ Economists should also point out the plus and minus points of different economic systems.

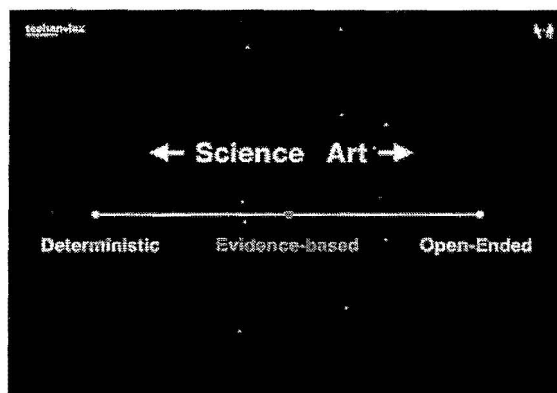


Figure 2.3: Economics as Science or Art

2.3 NATURE OF ECONOMICS: ECONOMICS AS A SCIENCE AND AN ART

There is a great controversy among the economists regarding the nature of economics, whether the subject 'economics' is considered as science or an art.

If it is a science, then it could be either positive science or normative science.

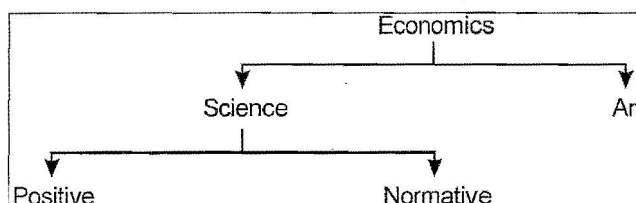


Figure 2.4: Economics is a Science and an Art

2.3.1 Economics as a Science

Before we start discussing whether economics is science or not, it becomes necessary to have a clear idea about science. Science is a systematic study of knowledge and fact which develops the correlation-ship between cause and effect. 'Science is not only the collection of facts', according to **Prof. Poincare**, in reality, 'all the facts must be systematically collected, classified and analyzed'.

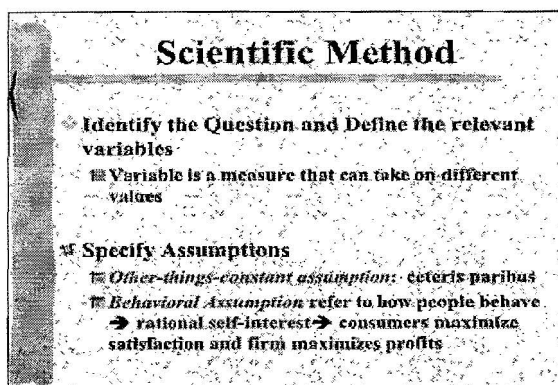


Figure 2.5: Scientific Method

These are the following characteristics of any science subject, such as:

- It is based on systematic study of knowledge or facts;
- It develops correlation-ship between cause and effect;
- All the laws are universally accepted;
- All the laws are tested and based on experiments;
- It can make future predictions;
- It has a scale of measurement.

On the basis of all these characteristics, **Prof. Robbins**, **Prof. Jordon**, **Prof. Robertson** and others claimed economics as one of the subject of science like physics, chemistry, etc. According to all these economists, 'economics' has also several characteristics similar to other science subjects.

- Economics is also a systematic study of knowledge and facts. All the theories and facts related with both micro and macro economics are systematically collected, classified and analyzed.
- Economics deals with the correlation-ship between cause and effect. For example, supply is a positive function of price, i.e., change in price is cause but change in supply is effect.
- All the laws in economics are also universally accepted like law of demand, law of supply, law of diminishing marginal utility, etc.
- Theories and laws of economics are based on experiments like mixed economy is an experimental outcome between capitalist and socialist economies.
- Economics has a scale of measurement. According to **Prof. Marshall**, 'money' is used as the measuring rod in economics. However, according to **Prof. A.K. Sen**, **Human Development Index (HDI)** is used to measure economic development of a country.

However, the most important question which comes up is to understand whether economics is a positive science or a normative science? Positive science deals with all the real things or activities. It gives the solution what is? What was? What will be? It deals with all the practical things. For example, poverty and unemployment are the biggest problems in India. The life expectancy of birth in India is gradually rising. All these above statements are known as positive statements. These statements are all concerned with real facts and information.

On the contrary, normative science deals with what ought to be? What ought to have happened? Normative science offers suggestions to the problems. The statements dealing with these suggestions are coming under normative statements. These statements give the ideas about both good and bad effects of any particular problem or policy. For example, illiteracy is a curse for Indian economy. The backwardness of Indian economy is due to 'population explosion'.

Now an important question arises whether economics is a positive science or a normative science? The economists like **Prof. Senior** (classical economist) and **Prof. Robbins**, **Prof. Freight-men** (modern economists) claimed that economics is a positive science. However **Prof. Pigou** (classical economist), **Prof. Marshall** (neoclassical economist), etc. are of opinion that economics is a normative science.

2.3.2 Economics and Positive Science

Positive means 'value free'. Positive statements are often referred as descriptive statements. The most common usage refers to analysis or theories which only attempt

to describe how things 'are'. A positive statement is a statement about what is and that contains no indication of approval or disapproval. Hence, a positive science explains and describes the existing relationships or explains what is. As such a positive science may be defined as a body of systematised knowledge concerning what it is and with the actual. The objective of positive science is the establishment of uniformities. Thus, in positive economics, we derive propositions, theories and laws following certain rules of logic. These theories, laws and propositions explain the cause and effect relationship. Hence, positive science deals with things as they are, and it simply explains causes and effects without passing any moral judgment on the desirability of having certain ends. When a subject confines itself to statements about causes and their effects and to statement of functional relation, the subject is said to be positive. According to **Lionel Robbins** and **N. Senior**, economics is a positive science. According to **Senior**, an economist is not authorized to add even a word of advice.

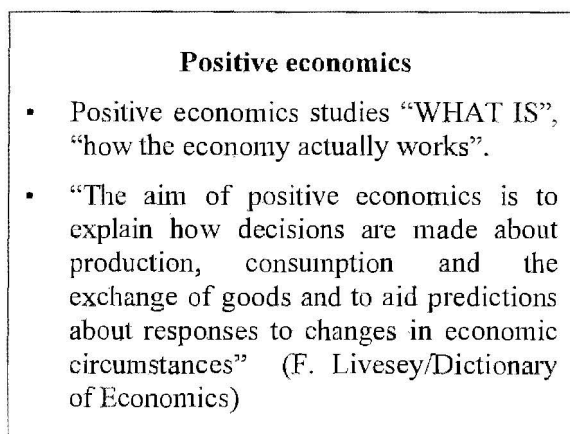


Figure 2.6: Positive Economics

As stated above, Economics is a science. But the question arises whether it is a positive science or a normative science. A positive or pure science analyses cause and effect relationship between variables but it does not pass value judgment. In other words, it states what is and not what ought to be. **Professor Robbins** emphasized the positive aspects of science but **Marshall** and **Pigou** have considered the ethical aspects of science which obviously are normative.

According to **Robbins**, Economics is concerned only with the study of the economic decisions of individuals and the society as positive facts but not with the ethics of these decisions. Economics should be neutral between ends. It is not for economists to pass value judgments and make pronouncements on the goodness or otherwise of human decisions. An individual with a limited amount of money may use it for buying liquor and not milk, but that is entirely his business. A community may use its limited resources for making guns rather than butter, but it is no concern of the economists to condemn or appreciate this policy. Economics only studies facts and makes generalisations from them. It is a pure and positive science, which excludes from its scope the normative aspect of human behaviour.

Complete neutrality between ends is, however, neither feasible nor desirable. It is because in many matters the economist has to suggest measures for achieving certain socially desirable ends. For example, when he suggests the adoption of certain policies for increasing employment and raising the rates of wages, he is making value judgments; or that the exploitation of labour and the state of unemployment are bad and steps should be taken to remove them. Similarly, when he states that the limited resources of the economy should not be used in the way they are being used and should be used in a different way; that the choice between ends is wrong and should be altered, etc. he is making value judgments.

The following statements can ensure economics as a positive science, such as:

- **Logically based:** The ideas of economics are based on absolute logical clarifications and moreover, it develops relationship between cause and effect.
- **Labour Specialization:** Labour law is an important topic of economics. It is based on the law of specialisation of labour. Economists must concern with the causes and effects of labour-division.
- **Not Neutral:** Economics is not a neutral between positive and normative sciences. According to most economists, economics is merely positive science rather than normative science.

It is quite useful to know the difference between positive economics and normative economics. Positive economics is devoid of any ethical position or value judgments. It is primarily empirical or statistical in nature and is independent of normative economics. Positive economics is the study of what is, or how the economic problems facing a society are actually solved. In other words, positive economics is concerned with explaining what it is. It describes theories and laws to explain observed economic phenomena. Positive economics states that monopolist will fix a price which will equate marginal cost with marginal revenue.

Positive economics explains how national income is distributed among different individuals. The study of the actual effect of minimum wage regulations on the economy is a study in positive economics. It involves the examination of which occupations will be affected by the regulations, the extent of substitution of capital for labour and what happens to the displaced workers.

2.3.3 Economics and Normative Science

A normative science is based on norms. Hence, a normative statement expresses a judgment about whether a situation is desirable or undesirable. Therefore, a normative science makes prescriptions and recommendations about what ought to be. In other words, a normative (regulative) science is a body of systematized knowledge relating to criteria of what ought to be and concerned with the ideal. When a subject embraces norms and standards, mixing them with cause effect analysis, the subject is said to be a normative. Normative statements mainly depend on value judgments and consequently there is a lot of scope for disagreement as the ideas of good and bad become subjective.

According to **A.C. Pigou, Paul Streeton** and **Alfred Marshall**, economics is also concerned about normative statements and value judgments.

According to **Streeton**, 'Economics cannot and should not refrain from making value judgments if their studies are to be more than a purely formal technique of reasoning, algebra of choice'.

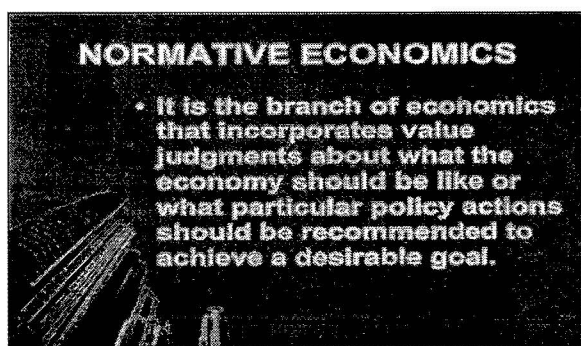


Figure 2.7: Normative Economics

As normative science, Economics involves value judgments. It is prescriptive in nature and described 'what should be the things'. For example, the questions like what should be the level of national income, what should be the wage rate, how the fruits of national product get distributed among people - all fall within the scope of normative science. Thus, normative economics is concerned with welfare propositions. Some economists are of the view that value judgments by different individuals will be different and thus for deriving laws or theories, it should not be used.

The following statements can ensure economics as a normative science, such as:

- **Emotional View:** A rational human being has not only logical view but also has sentimental attachments and emotional views regarding any activity. These emotional attachments are all coming under normative statements. Hence, economics is a normative science.
- **Welfare Activity:** Economics is a science of human welfare. All the economists forwarded their theories for the development of human standard of living. Hence, all the economic statements have their respective normative views.
- **Economic Planning:** Economic planning is one of the main instruments of economic development. Several economists have given their personal views for the successful implementation of economic plan. Hence, economics falls under normative science.

All these lead us to the conclusion that 'Economics' is both positive and normative science. It does not only tell us why certain things happen however, it also gives idea whether it is right thing to happen.

Normative economics is based on positive economics and the value judgments of the society. It provides guidelines for policies to increase and possibly maximise the social welfare. Thus, normative economics is the study of what ought to be. It studies how the economic problems facing the society should be solved. Normative economics is concerned with what should be or what ought to be the things. It is also called prescriptive economics. What price for a product should be fixed, what wage rate should be paid, how income should be distributed, etc. fall within the purview of normative economics. Normative economics involve value judgments. Normative economics is concerned about welfare propositions.

Table 2.1: Differences between Positive Economics and Normative Economics

Positive Economics	Normative Economics
Explains causes and consequences	Discusses the rightness or wrongness of things
Objective of establishment of uniformities	Determinations of ideals, economic goals of public policy
Studies facts as they are and not as they ought to be	Studies things as they ought to be
More light-giving	Light-giving and fruit-bearing
Makes critical analysis of the existing facts and draw conclusions	Judge whether it is socially justified or not
How economic problem is solved	How economic problem should be solved

2.3.4 Economics – A Social Science

The term Social Science refers any subject that deals with human behaviour. Political Science, Psychology, Ethics, etc. come within the definition of Social Science.

Economics is a social science because it deals with one aspect of human behaviour, viz., how men deal with problems of scarcity. **Samuelson** says that Economics is “**the queen of the social sciences**”.

Economics deals with human beings living in a society — it could be in a large group of persons with common interests and problems. It does not deal with problems of solitary individuals. In a community of people, everybody is influenced by the actions of the others.

Economics deals with the activities of people, living in an organised community or society, in so far as such activities are related to the earning and use of wealth or with the problems of scarcity, choice and exchange. Economics is therefore considered to be a branch of sociology which is a study of the history and nature of society. As a consequence of this we find that economics is closely related to the other social sciences like Ethics, Political Science, and History, etc.

Economics deal with the activities of people living in an organised community or society, in such activities which relate to the earning and use of wealth or with the problems of scarcity, choice and exchange. Hence it called a social science.

2.3.5 Economics as an Art

According to **T.K. Mehta**, ‘Knowledge is science, action is art’. According to **Pigou**, **Marshall** and others, economics is also considered as an art. In other way, art is the practical application of knowledge for achieving particular goals. Science gives us principles of any discipline; however, art turns all these principles into reality. Therefore, considering the activities in economics, it can claim as an art also, because it gives guidance to the solutions of all the economic problems.

Art is nothing but practice of knowledge. Whereas science teaches us to know art teaches us to do. Unlike science which is theoretical, art is practical. If we analyze Economics, we find that it has the features of an art also. Its various branches, consumption, production, public finance, etc. provide practical solutions to various economic problems. It helps in solving various economic problems which we face in our day-to-day life.

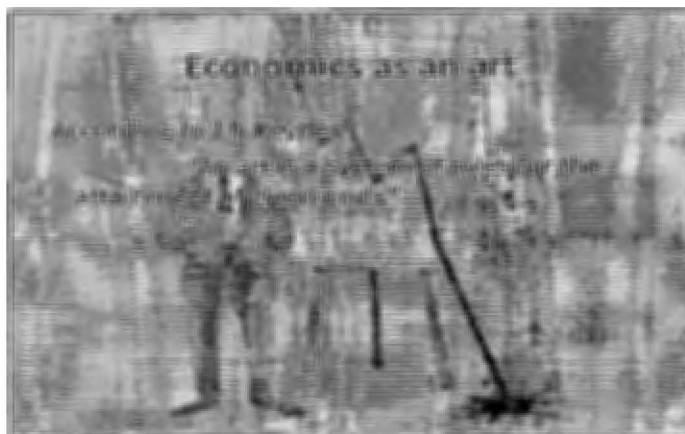


Figure 2.8: Economics as an Art

Therefore, from all the above discussions we can conclude that economics is neither a science nor an art only. However, it is a golden combination of both. According to **Cossa**, science and art are complementary to each other. Hence, economics is considered as both a science as well as an art.

2.4 METHOD OF ECONOMIC ANALYSIS

Economic analysis attempts to find relationship among variables and reach conclusions on the basis logical reasoning from the data collected. Hence, economic analysis helps us to understand the operations of an economy. Every science adopts certain methods for analysis and economics being a science also adopts scientific methods for analysis.

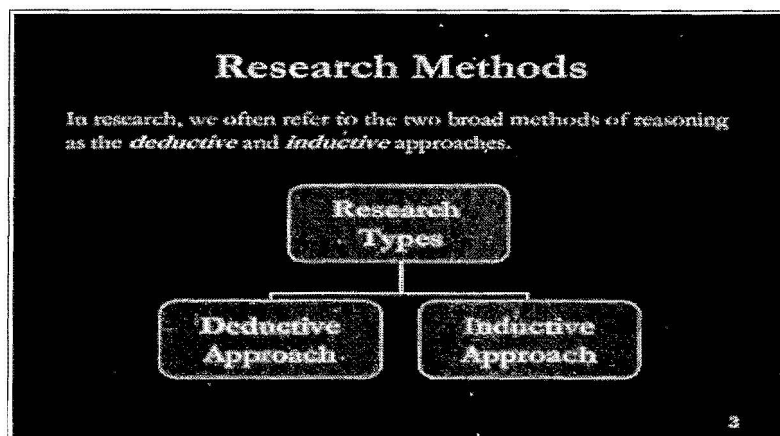


Figure 2.9: Two Methods in Economics

As in the case of every other science, so in the field of economic analysis, there are two important methods useful for investigation and formulation of its principles, laws, generalisations or theorems. They are:

- Deductive method
- Inductive method

Economics adopts two important methods for investigations and formulations of laws and principles. These two methods are 'deductive and inductive' methods. There was a controversy among economists regarding the method to be used for economic analysis as some advocated deductive method while others suggested inductive method. The controversy was ultimately settled by **Marshall** who stated that both induction and deduction are needed for scientific thought as right foot and left foot both are needed for walking.

In the 19th century, it was unclear whether deductive method is preferable to inductive method or vice versa. The English classical economists like **David Ricardo**, **T.R. Malthus**, **John Stuart Mill** and **Nassau Senior** were solid advocates of deductive methodology.

2.4.1 Deductive Method

The deductive method is also called abstract, analytical and a priori method and represents an abstract approach to the derivation of economic generalisations and theories. The principal steps in the process of deriving economic generalisations through deductive logic are:

- Perception of the problem to be enquired into;
- Defining precisely the technical terms and making appropriate assumptions, often called postulates or premises;
- Deducing hypotheses, that is deriving conclusions from the premises through the process of logical reasoning; and
- Testing of hypothesis deduced.

Deductive reasoning provides us with hypothesis which are tested and verified with relevance to facts and figures and then we draw valid economic laws.

- **Perception of the Problem:** In any scientific enquiry, the analyst or theorist must have a clear idea of the problem to be enquired into. He must know the significant variables regarding whose behaviour and interrelationship he wants to derive generalisations. The perception of the problem is by no means an easy task.
- **Definition of Technical Terms and Making of Assumption:** The next step in the process of deriving generalisations is to define precisely and unambiguously the various technical terms to be used in the analysis as well as to state clearly the assumptions or postulates he makes to derive generalisations. As mentioned above, assumptions may be behavioural pertaining to the behaviour of the economic variables or they may be technological relating to the state of technology and the factor endowments. The crucial assumptions are made on the basis of observations or introspection. Crucial assumption that has been made in economics is that consumers try to maximize their satisfaction and producers try to maximise their profits. Likewise, it is assumed that investors try to minimise their risk and maximise the expected rate of their profits. Some of the assumptions are made merely to simplify the analysis and may not be quite realistic. The actual economic world is quite complex and full of details in which numerous factors play a part and act and interact on each other. The introduction of simplifying assumptions is quite necessary in order to bring out the importance of really significant factors having a bearing on the problem under investigation.

According to **Prof. Boulding**, 'economic theory represents just a 'map' of real world phenomenon and not a perfect picture of it'. To quote him, "Just as we do not expect a map to show every tree, every blade of grass in a landscape, so we should not expect economic analysis to take into account every detail and quirk of real economic behavior." It therefore, follows that each and every assumption made by a theory may not be realistic. The crucial factor in building up a valid theory is whether its predictions are corroborated by the facts in the world. A correct scientific theory or generalisation must be expressed in form of a hypothesis that inconceivably refutable as mentioned above.

Professor Friedman in his now well known article "**The Methodology of Positive Economics**" has expressed the view that undue importance should not be given to the 'realism' of assumptions. What matters most from the viewpoint of scientific theory, according to him is whether it enables us to predict accurately.

- **Deducing Hypotheses through Logical Deduction:** The next step in deriving generalisations through deductive logic is deducing hypotheses from the assumptions or premises taken. A hypothesis describes relationship between factors affecting a phenomenon; it establishes cause and effect relationship between the variables having a bearing on the phenomenon. Then through logical process, hypothesis is deduced from the assumptions made. This logical reasoning may be carried out verbally or it may be conducted in symbolic terms using the language of what is known as symbolic logic. The geometric or graphic technique is also usually employed to deduce the hypotheses about the relationship between factors besides, the process of logical deduction may be done with the help of more formal mathematics.

Nowadays in almost all branches of modern economics, the mathematics as a tool of analysis for deriving economic theories and generalisations is being increasingly used. The use of mathematics in economic analysis proves extremely useful where geometrical methods make the analysis more complicated to

comprehend. Besides, the use of mathematical method makes the derivation of economic hypotheses more rigorous and exact. It is worthwhile to note that in deriving analytically sound hypotheses, one should guard against committing logical fallacy in the process of logical deduction. For instance, it is inappropriate to conclude that A must be the cause of B, if A happens to precede B. Further, it is logically fallacious to argue that since there is existence of a high degree of correlation between the two factors, say between the supply of money and the general price level, the former must be the cause of the latter, unless the causation must be logically developed.

Testing or Verification of Hypotheses: Hypotheses obtained above have to be verified before they are established as generalisations or principles of economics. For the verification of hypotheses, economists cannot make controlled experiments, because they have to discern uniformities in behaviour patterns of man. As we cannot conduct experiments on humans, even under controlled conditions.

In a similar way, scientists use laboratories to conduct experiments with lifeless objects of nature with the help of different animals and plants. Therefore, economists have to rely on correct information for them to be able to, forecast accurately for the next year output, which in the event will be affected by many factors besides changes in price.

Therefore, economists have to rely on correct, this prediction documents does not enables to forecast accurately next year output (still less the harvest in the more distant future), which in the event will be affected by many factors besides changes in price.

Testing of Economic Hypotheses through Econometrics

In recent years, a very useful method to test economic hypothesis has been developed. This is the statistical method or what is now popularly called econometric method. The statistical or econometric method to verify and establish the theoretical generalisations occupy an important place because there is limited applicability of controlled experimentation in economics. The various statistical methods such as regression analysis have been developed to empirically test the economic hypotheses on the basis of collected economic data. The merit of econometrics is that the degree of functional relationship between relevant economic variables in precise quantitative terms is obtained by it and also the level of significance of the results can also be estimated. Recently, econometric method has been used to establish the precise relationships between money supply and the price level, quantity of money and the national income, consumption and income, capital accumulation and rate of economic growth and so forth.

It may, however, be pointed out that statistical analysis or econometrics alone cannot be used to derive and establish economic principles and theories. Economic hypotheses or theories must be developed logically before we can meaningfully use statistical analysis to test and verify them. The theory or hypothesis is needed before the selection of the relevant facts and data regarding relevant variables which can be subjected to empirical testing through the methods of econometrics. Prof. Myrdal is quite right, when he says, "Theory, therefore, must always be a priori to the empirical observation of facts". Facts come to mean something only as ascertained and organised in the frame of a theory. Indeed, facts as part of scientific knowledge have no existence outside such a frame. Question must be arranged logically, to make sense and it helps to understand social reality.

It is a method, which goes from general to particular on the basis of general truth. We try to find out particular truth by logical discussions. In the words of Wilson Gee, "by deductive method is meant the reasoning from general to particular or from universal

to individual". We accept certain general facts and use them in certain specific cases to prove our own accepted truth. For example, it is an established fact that "Man is rational" so he will try to purchase lesser quantity of a particular commodity when it is costlier. Masood, who is also a man will behave in the same way and purchase lesser quantity of goods. This method assumes that the behaviour of the general public will also be the behaviour of individual person. Deductive method is used to propound theory regarding the economy. Studies of national income, employment, price level and international trade is made on the basis of deductive method. Macro economic theories are based upon deductive method. It is also known as scientific method.

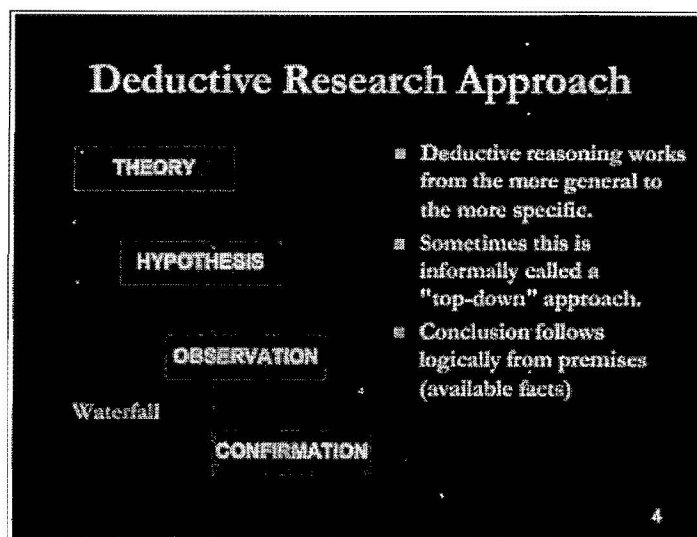


Figure 2.10: Deductive Approach

Merits and Demerits of Deductive Method

The deductive approach to establish economic generalisations was extensively used by Classical and Neo-Classical economists such as Ricardo, Malthus, Senior, J S. Mill, Marx, Marshall and Pigou. It still remains popular with modern economists as it has several merits.

- First, useful mathematical techniques can be employed to derive generalisations of economics. With the aid of rigorous mathematical logic, economic theories can be developed through the process of deduction which can successfully explain economic phenomena.
- Secondly, through deductive logic useful economic theorems can be derived without the tenuous and detailed collection and analysis of data which are required under the alternative inductive method. Thus, as compared to inductive method, method of deduction is less time consuming and less expensive.
- Thirdly, in view of the limited scope for controlled experimentation in economics, the method of deduction is an extremely useful method of deriving generalisations. This is because multiplicity of forces acts simultaneously on an economic phenomenon and it is not possible to eliminate some of these by means of a controlled experiment. This indicates the crucial importance of deductive logic for building up economic principles or generalisations.
- Fourthly, the use of sophisticated mathematical methods in the deductive approach enables the economists to introduce accuracy and exactness in economic principles and theories. In spite of the above-mentioned merits, shortcomings of the deductive approach should not be overlooked.

- The use of deductive method in deriving economic generalisations requires the use of a high-level competence in logic and theoretical abstraction. A good deal of care and objectivity is needed to avoid bad logic or faulty economic reasoning.
- Further, a great demerit of deductive approach is that with it highly sophisticated theoretical models based on highly unrealistic assumptions may be developed which do not have any operational significance. Indeed, such highly irrelevant analytical models with little empirical content and incapable of being used for policy formulation have in fact been developed by economists. Such models are no more than mere "intellectual toys". If economics is to serve as an instrument of social betterment, building of such theoretical models having no operational use should be avoided.
- Lastly, in the derivation of economic hypotheses and conclusions through deductive logic, assumptions play a crucial role. If the assumptions made are such that when on removing them, economic hypothesis based on them is refuted, then making of these assumptions is not valid. Thus, one who uses deductive approach should always keep in mind to what extent the validity of generalisations derived depends on the assumptions made. For instance, the Keynesian macro-analysis is based upon the assumption of a depression ridden capitalist economy with a lot of excess productive capacity. Therefore, a positive harm has been done in applying the Keynesian theories in the context of developing countries such as ours where the assumptions made by Keynes do not hold good. Hence, mere "deductive arm-chair analysis" should be avoided, if the scientific character of economics is to be maintained.

In economics, we start with simple premises and step by step work up to more complex and refined hypothesis. In this method, we descend from the general to the particular. Hence the important points of the deductive method are:

- It is simple and logical.
- It does away with the need for experimentation.
- It leads to accuracy in generalisation due to logical reasoning.

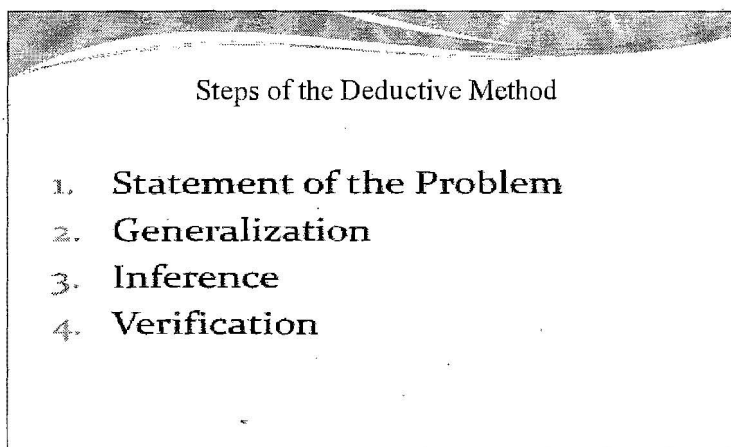


Figure 2.11: Deductive Method

2.4.2 Inductive Method

The inductive method which is also called empirical method derives economic generalisations on the basis of experience and observations. The inductive method works from the particular to the general and is based on facts. The inductive method was adopted by historical school. In this method, detailed data are collected with

regards to a certain economic phenomenon and effort is then made to arrive at certain generalisations which follow from the observations collected. Induction is the process reasoning from a part to the whole or from individual to the universal. It is an ascending process in which facts are collected; arranged and then general conclusions are drawn. There are two forms of induction and they are experimentation and statistical approach. The experimentation is concerned with testing the validity of laws (generalisations) arrived at as a result of deductive reasoning by resorting to the study of actual facts. The statistical method is concerned with the framing of laws (generalisations) on the basis of a large number of facts collected from the various sectors of the economy. However, the inductive method is generally associated with the statistical form of induction. But it is worth mentioning that the number of observations has to be large if it can yield a valid economic generalisation. One should not generalise on the basis of a very few observations.

In this, data is collected with reference to certain economic phenomena and finally generalisations are derived from the collected data and observations. Here we mount from the particular to the general. From observations we build up through reasoning founded on experience, to formulate generalisations based on observed data. The historical school of Germany represented by Carl Knies, Hildebrand, Prof. Roscher and Von Thunen were strong and staunch supporters of the inductive method. It should, however, be emphasized that the division of opinion between the two schools of thought was neither complete nor clear-cut. In the inductive method, economic scientists proceed from a particular angle to scientific problems to bridge the gap between theory and practice. Induction is done by either experimentation or the statistical approach and these are the two forms of induction.

Experimentation has larger scope in the physical sciences and the statistical approach in social sciences like economics. The famous Malthusian Theory of Population and Engel's Law of Consumption are based on the statistical approach. It moves from particular to general on the basis of our experience.

According to Wilson Gee, "Inductive method is the process of reasoning from particular to general or from individual to universal." We study the behaviours of an individual and reach certain conclusion. We study the behaviours of other individuals also. If we reach the same conclusion, we generalise the statement as an observed truth and the theory is propounded.

Economic laws of consumers' behaviour, such as laws of diminishing utility, consumers' surplus and equi-marginal utility have been developed on the basis of inductive method. Theories of rent, wages and interest are also based upon inductive method. This method is also known as historical method, concrete method, analytical method and realistic method. This is due to the fact that this method starts investigation of particular facts, historical events, and tries to generalise the findings of the observation for the whole economy. Microeconomic theories are formulated according to inductive method.

The merits of the inductive method are as follows:

- It leads to precise, measurable conclusions.
- It is highly practical and realistic.
- It is helpful in verifying the conclusions of the deductive method.
- It emphasizes relativity of economic laws which are valid only under certain conditions and circumstances.

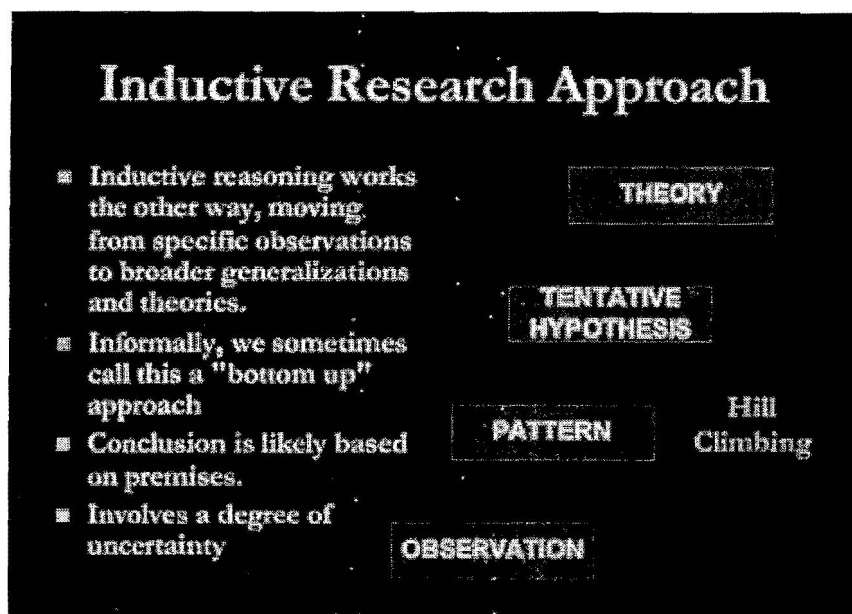


Figure 2.12: Inductive Approach

Demerits of the Inductive Method

The following are the drawbacks of the inductive method:

- There is an underlying risk of drawing false and hurried conclusions from inadequate data and facts.
- The collection of data and facts by itself is no easy task.
- Divorced from deduction which uses logical analysis, it would only produce a mass of unrelated and unconnected facts and figures.

Induction alone would not deliver the goods unless it is supplemented by using deductive reasoning.

2.4.3 Differences in Deductive and Inductive Methods

Table 2.2: Differences between Inductive and Deductive Methods

Deductive Method	Inductive Method
1. It does not generate new knowledge.	1. It generates new knowledge.
2. It is a method of verification.	2. It is a method of discovery.
3. It is the method of instruction.	3. It is a method of teaching.
4. Child gets ready made information and makes use of it.	4. Child acquires first hand knowledge and information by actual observation.
5. It is a quick process.	5. It is a slow process.
6. It encourages dependence on other sources.	6. It builds the mind and gives self confidence and initiative.
7. There is less scope of activity in it.	7. It is full of activity.
8. It is a downward process of thought and leads to useful results.	8. It is an upward process of thought and leads to principles.

The controversy which existed among the earlier economists as to whether deductive or inductive approach is more appropriate in developing economic theories and principles has been resolved. The modern viewpoint in this regard is that both are needed for the proper development of scientific economic theories. Indeed, the two are complementary rather than competitive.

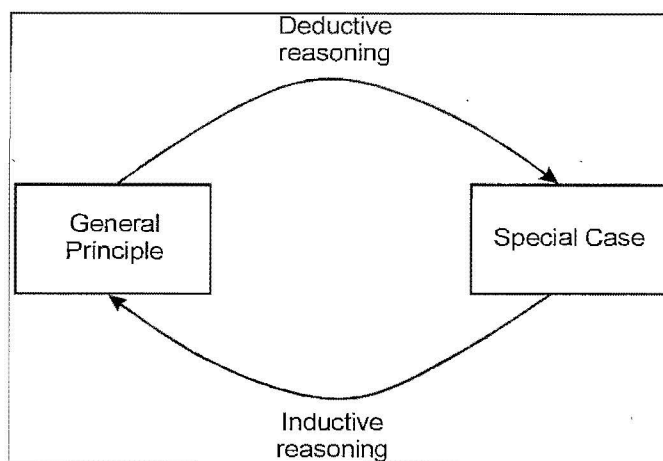
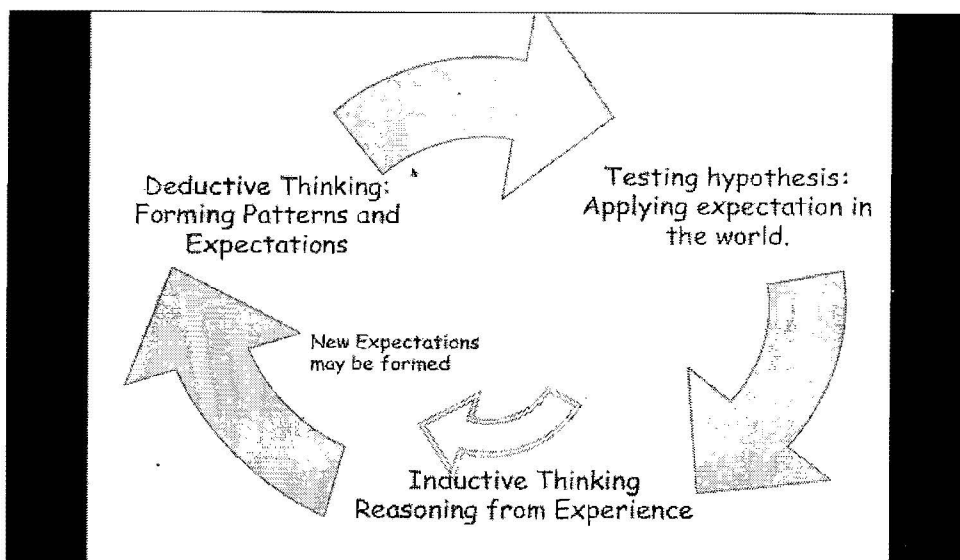


Figure 2.13: Deductive and Inductive Reasoning

The above analysis reveals that independently neither deduction nor induction is helpful in scientific enquiry. In reality, both deduction and induction are related to each other because of some facts. They are the two forms of logic that are complementary and co-relative and help establish the truth.

Marshall also supported the complementary nature of the two methods when he quoted Schmoller: "Induction and deduction are both needed for scientific thought as the right and left foot are needed for walking". And then Marshall stressed the need and use of integrating these methods.

These days, economists are combining induction and deduction in their studies of economic phenomena in various fields for arriving at generalisations from observed facts and for the indirect verification of hypotheses. They are using the two methods to confirm the conclusions drawn through deduction by inductive reasoning and vice versa. Thus true progress in economic enquiries can be made by a wise combination of deduction and induction.

The modern economists first derive economic hypotheses through the process of logical deduction and then empirically test them through statistical or econometric methods. Marshall rightly pointed out, "induction and deduction are both needed for scientific thought as the right and left foot are both needed for walking". Empirical studies made through statistical or inductive method without a theoretical hypothesis to serve as a guide for the selection of data are quite useless. The derivation of economic generalisations through the approach of deductive logic without empirically testing them through inductive method is also not quite proper.

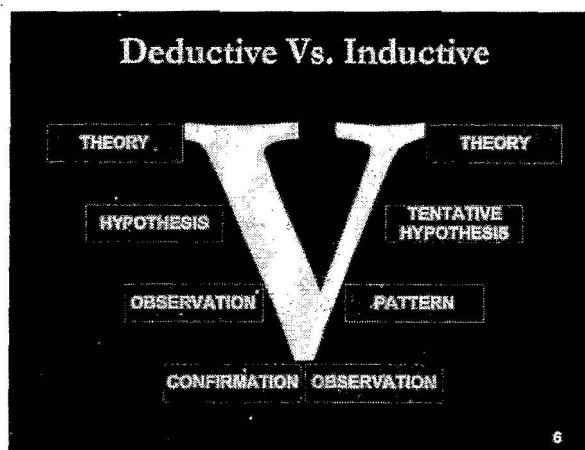


Figure 2.14: Deductive vs Inductive

Empirical studies made in inductive approach also bring to light significant economic facts or phenomena which require analytical explanation through deductive logic. For instance, Farm Management Studies in India in the mid fifties led to the discovery of a fact that output per acre on the small-sized farms is higher than that on large farms. This led to the various theoretical explanations of the phenomenon observed in the empirical studies. On the other hand, a theory or hypothesis is first developed through deductive logic from some assumptions and then predictions based on the hypothesis are tested through inductive or statistical method. If the predictions are found to be consistent with facts, the hypothesis or theory stands proved and if the predictions of the theory are found to be inconsistent with facts, it stands rejected.

Check Your Progress

Fill in the blanks:

- _____ is the study of particular firms, particular households, individual prices, wages, incomes, individual industries, particular commodities.
- Consumers and firms are guided by the objective of _____ of satisfaction and profits respectively.
- Modern economists feel that economist should also suggest how the _____ means should be further increased to satisfy more wants and attain good living.
- _____ economics explains how national income is distributed among different individuals.
- The _____ method is also called abstract, analytical and a priori method and represents an abstract approach to the derivation of economic generalisations and theories.
- The _____ method which is also called empirical method derives economic generalisations on the basis of experience and observations.

2.5 LET US SUM UP

- Microeconomics is the study of economic behaviour of an individual, firm or industry in the national economy. It is a study of a particular unit rather than all the units combined.
- Microeconomics studies how choices are made at the individual level under conditions of scarcity. If there was no scarcity, there would be no need to make choices. Choice must be made from among alternatives.
- Microeconomic theory is capable of dealing with some of the most important social issues of the day. The important among them are environmental pollution, poverty and welfare programs, monopolies and consumer well-being, labour unions and real wages, rising medical expenditure, discrimination in employment, energy problems, taxation and work incentives.
- At present Economics is a social science that deals with human wants and their satisfaction. It is mainly concerned with the allocation of resources for the maximisation of welfare of the people. In other words, Economics is a social science that studies about production, distribution and consumption of goods and services.
- There is a great controversy among the economists regarding the nature of economics, whether the subject 'economics' is considered as science or an art.
- A positive statement is a statement about what is and that contains no indication of approval or disapproval. Hence, a positive science explains and describes the existing relationships or explains what is. As such a positive science may be defined as a body of systematised knowledge concerning what it is and with the actual.
- Positive economics explains how national income is distributed among different individuals. The study of the actual effect of minimum wage regulations on the economy is a study in positive economics.
- As normative science, Economics involves value judgments. It is prescriptive in nature and described 'what should be the things'. For example, the questions like what should be the level of national income, what should be the wage rate, how the fruits of national product get distributed among people - all fall within the scope of normative science.
- Normative economics is based on positive economics and the value judgments of society. It provides guidelines for policies to increase and possibly maximise the social welfare. Thus, normative economics is the study of what ought to be. It studies how the economic problems facing the society should be solved.
- If we analyse economics, we find that it has the features of an art also. Its various branches, consumption, production, public finance, etc. provide practical solutions to various economic problems.
- As in the case of every other science, so in the field of economic analysis, there are two important methods useful for investigation and formulation of its principles, laws, generalisations or theorems.
- The deductive method is also called abstract, analytical and a priori method and represents an abstract approach to the derivation of economic generalisations and theories.

- The inductive method which is also called empirical method derives economic generalisations on the basis of experience and observations. The inductive method works from the particular to the general and is based on facts.
- Marshall also supported the complementary nature of the two methods when he quoted Schmoller: "Induction and deduction are both needed for scientific thought as the right and left foot are needed for walking".

2.6 UNIT END ACTIVITY

Let the students be divided into two groups A and B. Let each group make an analysis on the deductive and inductive methods for supporting the statement that independently neither deduction nor induction is helpful in scientific enquiry. In reality, both deduction and induction are related to each other because of some facts.

2.7 KEYWORDS

Positive Economics: Positive economics is the branch of economics that concerns the description and explanation of economic phenomena. It focuses on facts and cause-and-effect behavioural relationships and includes the development and testing of economics theories.

Normative Economics: Normative economics is a part of economics that expresses value or normative judgments about economic fairness or what the outcome of the economy or goals of public policy ought to be.

Positive Science: Positive science is the part of economics which is objective and fact based. The economic statements do not have to be correct, but they must be able to be tested and proved or disproved.

Normative Science: Normative science is a type of information that is developed, presented, or interpreted based on an assumed, usually unstated, preference for a particular policy or class of policies.

Deductive Method: This aims at testing theories. It means reasoning or inference from the general to the particular or from the universal to the individual.

Inductive Method: These start with the observations and theories are formulated. It is a process of using theory observations to develop general principles about a specific subject.

Empirical Content: Relying on or derived from observation or experiment: empirical results that supported the hypothesis.

Neo-Classical Economists: An approach to economics that relates supply and demand to an individual's rationality and his ability to maximize utility or profit. Neo-classical economics also uses mathematical equations to study various aspects of the economy.

Economic Hypotheses: A supposition or explanation (theory) that is provisionally accepted in order to interpret certain events or phenomena, and to provide guidance for further investigation. A hypothesis may be proven correct or wrong, and must be capable of refutation.

Social Science: The scientific study of human society and social relationships.

2.8 QUESTIONS FOR DISCUSSION

1. Explain the different concepts of economics with regards to the definitions.
2. Is economics a science or an art? Give reasons for your answer.

3. Differentiate between positive and normative economics.
4. Explain the deductive method briefly with its merits and demerits.
5. Write a short note on the inductive method.

Check Your Progress: Model Answer

1. Microeconomics
2. Maximisation
3. Scarce
4. Positive
5. Deductive
6. Inductive

2.9 REFERENCES & SUGGESTED READINGS

Agarwal, M. (2021). *Principles of Microeconomics*. Vikas Publishing House.

Bhaduri, A. (2020). *Microeconomics: Theory and Applications*. Oxford University Press

Choudhury, B. (2021). *Essentials of Microeconomics*. Wiley India Pvt. Ltd.

Dutt, R., & Sundaram, K. P. M. (2021). *Indian Economy (71st ed.)*. S. Chand Publishing.

Ghosh, A. (2020). *Microeconomics: Theory and Applications*. Oxford University Press.

Gordon, R. J. (2019). *Microeconomics (13th ed.)*. Pearson.

Kaur, R. (2022). *Microeconomics: A Textbook for Economics Students*. Kalyani Publishers.

Kumar, N. (2023). *Principles of Microeconomics*. Taxmann Publications Pvt. Ltd.

BLOCK II

UNIT

3

ECONOMIC LAWS

CONTENTS

- 3.0 Aims and Objectives
- 3.1 Introduction
- 3.2 Importance of Role of Economics
- 3.3 Knowledge of Economic Laws
 - 3.3.1 Characteristics of Economic Laws
- 3.4 Importance of Economic Laws
- 3.5 Assumptions of Economic Laws
- 3.6 Basic Concepts in Economics
- 3.7 Law of Diminishing Marginal Utility
- 3.8 Demand Analysis
- 3.9 Law of Demand
 - 3.9.1 Demand Curve
 - 3.9.2 Factors Affecting Demand
- 3.10 Law of Variable Proportion
- 3.11 Let Us Sum Up
- 3.12 Unit End Activity
- 3.13 Keywords
- 3.14 Questions for Discussion
- 3.15 References & Suggested Readings

3.0 AIMS AND OBJECTIVES

After studying this lesson, you should be able to:

- Understand the importance of role of Economics
- Know about the Economic laws and the different characteristics of the law
- Explain the importance of Economic laws
- Understand the basic concepts of Economics
- Explain the law of Diminishing Marginal Utility
- Know about the Demand Analysis and Law of Demand
- Explain the Demand Curve and the factors affecting demand
- Have knowledge on the Law of Variable Proportion

3.1 INTRODUCTION

Economics is a social science which deals with human wants and their satisfaction. It is mainly concerned with the way in which a society chooses to employ its scarce resources which have alternative uses, for the production of goods for present and future consumption. The existence of human wants is the starting point of all economic activity in the world. We need to make efforts to satisfy our wants. Hence, wants, efforts and satisfaction all come under the domain of economics. We may say economics is the science of wants. But in the reality, the means which are there to satisfy our wants are limited. There is scarcity of the means which are needed to satisfy our wants. Time and money along with land, labour and capital which are used in production are limited. Though science has increased our resources, our wants have also increased. Even if we satisfy some wants now soon, new wants appear. But all our wants cannot be satisfied because means are limited. We study economics because there is scarcity of many goods we want.

This problem is common to an individual as well as the state. That is why, we say Economics is the science of scarcity. And scarcity is the basic fact of life. Our wants are unlimited but means are limited. This leads to choice making. If there is unlimited supply of goods which satisfy our wants, the problem of choice will not arise. It is true that we have many wants. But all wants are not of equal importance. So we choose the more important and the more urgent wants. So choice is the essence of economic activity. We may also say that economics is the science of choice. Of course, all goods we want are not scarce. There are certain things like air and sunshine which are available in abundance. Though they are very essential for our life, we do not pay any price for them. They are free goods and they are not very important for our study. But many things we want are scarce and we have to pay a price for them. So, in economics, we study how prices of different things are determined. We may also say that economics is a science that deals with pricing process.

Modern economy is a monetary economy where prices are paid in money. So money plays an important role in the economic life of a society. It is used for buying and selling of goods, for payment of rent, wages, interest and so on. In economics, we study about the role of money in the affairs of mankind. Economics is the science of choice. As there is scarcity of goods; we have to pay a price for them. So, economics studies about the pricing process. And, as prices are paid in money, we study about the part played by money in the economic life of a society.

3.2 IMPORTANCE OF ROLE OF ECONOMICS

Economics has become one of the important branches of social sciences. It is of great practical value in our daily life. In pure sciences, we study the subject to arrive at the truth. But an economist is a social scientist. He studies the subject not only to know the truth for its own sake, but to find out a way for many economic and social problems of the society. An economist has no readymade answer for immediate problems. But he can help the Government in making broad economic policies. According to **Keynes**, "the theory of economics does not furnish a body of settled conclusions immediately applicable to policy. It is a method, rather than a doctrine, an apparatus of the mind, a technique of thinking, which helps its possessor to draw correct conclusions".

Most of the problems of the modern State are economic in nature. So economists play an important role in the affairs of the State. During World War II, the German economy was damaged heavily. There was inflation, shortage of goods and mass unemployment. But the German economy recovered quickly by following the advice

of an economist **Ludwig Erhard**. The German recovery is considered an economic miracle.

Similarly, **J.M. Keynes**, had great influence on the economic policies of the American government when it was in great economic trouble during the 1930s.

In economics, we study about things like prices, rent, wages, interest, profits and taxation. All these affect every person one way or the other.

3.3 KNOWLEDGE OF ECONOMIC LAWS

Economic Laws like other social sciences, economics has its own laws. A law is a statement of what must happen in given certain conditions. The term 'law' means statements of general tendencies. Economic laws generalise the human behaviour regarding economic activities.

According to Professor **Marshall**, "Economic laws or statements of economic tendencies are those social laws which relate to branches of conduct in which the strength of the motives chiefly concerned can be measured by a money price."

Every cause has a tendency to produce some result. For example, in Physics, we study that things fall to the ground because of gravitation. The law of gravitation is a statement of tendency. Similarly, the laws of economics are statements of tendencies. For example, the law of Demand states that 'when there is fall in the price of a good, the demand for it will expand'. It means that there is a tendency among people to buy more when there is fall in the price of a good. Similarly, if price rises, they will buy less.

Laws operate under certain conditions. If these conditions change, they will not operate. This is applicable to all sciences. When some economic laws do not operate, it means that the conditions have changed. We may broadly classify sciences into physical sciences and social sciences. Physics and chemistry are examples of physical sciences. Economics, politics are examples of social sciences. The laws of physical sciences are exact. But the laws of economics are not as exact as the laws of physical sciences. For example, we have the law of gravitation. It is a simple and exact statement. But in economics, we deal with human beings and their behaviour with reference to economic activity. We cannot conduct experiments with human beings either within the laboratory or outside it. That is why, economic laws cannot be as exact as the laws of physical sciences. We may also note that we study about average human behaviour in economics.

As economics deals with man and his behaviour, its laws are complex and inexact. That is why, Marshall has said that "the laws of economics are to be compared with the laws of tides rather than with the simple and exact law of gravitation". The science of tides explains the tides rise and fall under the influence of the Sun and the Moon. Probably there will be high tide on a full moon night. It may be there or it may not be there. It is only a probability.

Similarly, economic laws also indicate probable trends. For example, when there is increase in the quantity of money, there may be increase in the price level but we cannot say exactly by how much prices will rise. The economic laws are more exact than the laws of history and politics because economics make use of money as a measuring rod of utility. Though money is a rough measure, it gives a concrete shape to economic laws.

All economic laws are based on certain assumptions. Let us take the law of demand. It tells that “other things being equal”, when the price of a good falls, people will buy more of the good. By “other things being equal” we mean that:

- the income of the people remains the same,
- their tastes remain the same,
- the prices of other goods remain the same, and
- no new substitute for the good is discovered.

The law will hold forth as long as the above assumptions are fulfilled.

Sometimes, it is said that the laws of economics are hypothetical. That is, we make a hypothesis and only after they are verified by facts and experiments and found true, it becomes a law. But many economic laws cannot be verified by experiment. That is why, we say sometimes that economic laws are hypothetical.

The laws of physical sciences have universal application. But that is not generally the case with regard to economic laws. Of course, there are one or two exceptions. The Law of Diminishing Returns has universal application.

3.3.1 Characteristics of Economic Laws

- ***Economic laws are statements of economic tendency:*** Economic laws, like other laws establish relationship between causes and their effect. As these laws are not cent per cent exact, so they are expressed in terms of economic tendencies. In other words, these laws explain the likelihood of human behaviour under specific conditions. For example, according to the law of demand, the demand of a particular commodity will fall, if there is an increase in its price. In real life, there are certain cases, when demand of the commodity may not fall even after the increase in its price. Economic laws are not as exact as the laws of Physics and Chemistry.
- ***Economic laws are hypothetical:*** Economic laws simply indicate the general tendency of human behaviour. These laws are not applicable in every situation. That is why, every economic law is associated with the phrase, ‘other things being equal’ or ‘other things remaining the same’. For example, the law of diminishing utility explains that utility derived from the use of the successive units of a commodity goes on falling, but this law will apply, when units are uniform, sufficient and there is always continuity in their use.
- ***Economic laws are relative:*** Economic laws are closely related to time, place and situations. Most of the economic laws are not universal. Change of time, place and situations make them ineffective.
- ***Economic laws are human laws:*** Economic laws may be termed as human laws, because they are based upon human behaviour. Laboratory testing of human behaviours cannot be made, as that of matters in physics and salts in chemistry. That is why, economic laws are less exact. It is an accepted truth that every individual is different from the other individual or there are individual differences, so laws regarding human behaviours can never have universal application.
- ***Certain universal laws:*** Certain economic laws have universal application such as problems of scarce means and endless wants. It is equally true for every individual and economy. Marshall has compared the economic laws with the law of tides. It shows that economic laws are less exact, seldom deficit and lack universal application. Due to the use of statistical analysis and mathematical methods economic laws are approaching towards exactness.

3.4 IMPORTANCE OF ECONOMIC LAWS

Economic laws are of great importance in practical life. Some economic laws are applicable to all types of economic systems. They have universal application. For example, we have the law of Diminishing Returns. There are other important laws such as the law of diminishing marginal utility and the law of demand.

Some economists believe that the quantity theory of money is valid under all economic systems – capitalism or socialism or mixed economy.

Let us take some important laws like the law of diminishing marginal utility, the law of demand, the law of diminishing returns and the Malthusian Theory of population and discuss their significance.

The law of diminishing utility is based on actual experience. It tells that the more and more of a thing you have, the less and less you want it. It explains the relationship between the price of a good and the satisfaction you get from it. During summer, generally, there will be fall in the price of mangoes because they are available in plenty. So there is diminishing utility. And as price is related to marginal utility, the price falls. Progressive taxation is based on the law of diminishing utility. As the income increases, the Government asks the rich to pay more taxes by increasing the rates of taxation for them. For it believes that as a man gets more and more money, he will get diminishing utility from it. So even if he parts with more money, the sacrifice will not be much in his case.

The law of demand is based on actual experience. In practice, we find that when price falls, demand increases. Price falls when supply is more. When there is an increase in the supply of a good, its marginal utility diminishes. A seller will try to sell more of his good by reducing its price slightly. The law of diminishing marginal returns has universal application. In agriculture, it means that we cannot double the output by doubling labour and capital. The law applies to manufacturing industry also.

The Malthusian theory of population tells that population increases at a faster rate than food supply. It might not be an exact statement but it was true in the case of most of the poor countries of the world until the Green Revolution. The Green Revolution helped in increasing agricultural productivity. There is the problem of over-population in most of the poor countries of the world. That is why, they spend huge amounts on family planning to reduce population growth. So, most of the laws of economics are of great practical importance.

3.5 ASSUMPTIONS OF ECONOMIC LAWS

Economic laws are the statements of human behaviours. That is why, these laws are not as exact as the laws of natural sciences. Economist deals with human behaviours, which are never constant and exact as the behaviours of natural bodies. In addition to this weakness, the human behaviour cannot be put to laboratory testing as the natural bodies. Important assumptions are mentioned as following:

- **Other Things Remaining the Same:** All the economic laws have the phrase, “Other things being equal” or “other things remaining the same”. It shows that the law will apply at certain place and in certain situation. For example, if the price of Cadbury chocolate falls its demand should increase considerably, but it may not increase because the demand of chocolate is affected by other factors also. It is the income, tastes, preferences and the price of the substitutes which will also affect the demand of Cadbury chocolates. In this case, the law of demand will apply only if the income of the consumers, their tastes, preferences and the price of

substitutes do not change. That is why, economist has to use the phrase, "other things remaining the same".

- ***Rationality of Human Conduct:*** Economic laws presume that the consumers are rational. They will spend their limited resources in such a way that they may get maximum satisfaction. It has been our experience that all the consumers are not rational in their behaviour. There are certain consumers who visit a certain shop or certain type of shops or shops in certain area, knowing well that these shops have been charging comparatively more price than other shops. This extra-ordinary attitude of certain individuals makes economic laws inexact.

3.6 BASIC CONCEPTS IN ECONOMICS

Every science has its own language. Economics has its own language. There are certain terms which are used in a special sense in economics. So we must understand the meaning of some basic concepts like wealth, goods, income, value, price and market. If we do not understand their meaning properly, it may result in a lot of confusion.

Wealth

In economics, anything which has value is called wealth.

- Wealth possesses utility.
- It is scarce.
- It is transferable.

Individual wealth, public wealth, national wealth, international wealth, potential wealth, representative wealth and negative wealth are the main types of wealth.

In ordinary speech, when we refer to wealth, we mean money. But in economics, it has a special meaning. It refers to those scarce goods which satisfy our wants and which have money value. We may consider anything that has money value as wealth in economics.

All economic goods have value-in-exchange. So wealth includes all economic goods. Wealth has been defined as "stock of goods existing at a given time that have money value".

Characteristics of Wealth: The following are the characteristics of wealth:

- It must possess utility. It must have the power to satisfy a want. As Marshall says "they must be desirable".
- It must be limited in supply. For example, air and sunshine are essential for life. We cannot live without them. But we do not consider them as wealth because they are available in large quantities. Such goods are known as free goods.
- Wealth should be transferable. That is, it should be possible for us to transfer the ownership from one person to another.
- It must have money value.
- It may be external. For example, the goodwill of a company is external wealth.

Utility, scarcity and transferability are thus important characteristics of wealth.

Classification of Wealth: Wealth may be classified into:

- Personal wealth (individual wealth),
- Social wealth (collective wealth),

- National wealth ($a + b$), and
- Cosmopolitan wealth (e.g. ocean).

Goods

Anything that satisfies a human want can be considered as “good” in economics. In economics, the term “goods” refer to material and non-material things. Just as an apple or a chair is a good, music or the services of actors, musicians and teachers are some of the examples of goods. Goods can be classified into free goods and economic goods. Goods like air and sunlight which are the gifts of nature are free goods. They are not scarce. So they do not command a price in the market. They are known as free goods. Economic goods command a price in the market. In other words, they have value in-exchange. For, they are scarce in relation to demand. In this connection, we have to remember that what is a free good in one place can become an economic good in another place. It all depends on the supply of a good and the demand for it. For example, in some villages firewood is a free good. But in a town where we have to pay a price for it, it becomes an economic good. Similarly, water which is a free good becomes an economic good when there is scarcity of water.

Goods may be further classified into:

1. **Consumer goods:** Consumer goods are those goods which are consumed directly. They only serve the purpose of direct consumption and yield utility or satisfaction. For example, food, pen, household items, ink, fruits, vegetables, bread and biscuits are frequently used consumer goods. Consumer goods satisfy our wants directly. They can be classified into:

Perishable goods (i.e., vegetables, fish and music), and

Durable goods (i.e., a house, a car, a radio).
2. **Producer goods:** Producer goods are those goods which are not consumed directly. They are used to produce other goods. Machines, tools, factory and buildings are some examples of the producer goods.
3. **Capital goods:** Satisfy our wants indirectly. Machines that are used to make machines are called capital goods. For example, car is a sort of machine. It is a consumers’ good. But there must be some other machine to make a car. That machine is known as capital good or producer good. But what is a consumers’ good in one place can become a producers’ good in another place. For example, when electricity is used for lighting purposes at home, it is a consumers’ good. But the same electricity when used in factories for industrial purposes, it becomes a producers’ good.
4. **Material goods:** Goods which are tangible or visible are material goods. The examples of material goods are a table, a chair, a black board, buildings, roads, a pen, a bed, land, cash, books, a mirror, a wash basin, etc.
5. **Non-material goods:** These are various types of services rendered by specialists. They are not tangible. They cannot be seen and cannot be touched. They do not have a particular shape. The services of doctors, advocates, teachers, pilots, drivers, electricians, nurses, peons, officials, unskilled workers, skilled workers and various other specialists fall in this category.
6. **Transferable Goods:** This classification is based on the basis of ownership of goods. The ownership of most of the material goods can be changed. These can be moved from one place to another, can be transferred from one person to another and from one use to another.

7. **Non-transferable goods:** Some attributes or qualities like intelligence, skill, ability, adventure and dynamism cannot be transferred from one person to another. These are personal qualities.
8. **Durable goods:** Goods which are useful for a long period of time are called durable goods. For examples, a fan, a table, a house, a road, a railway line, a pen, a bed and a chair are durable goods.
9. **Perishable goods:** Those goods, the utility of which cannot be preserved for long and which get rotten very soon are called perishable goods. These are consumed once and they provide utility at the time of consumption only i.e., once only, for example, fruits, vegetables, milk, butter, curd, eggs, etc.
10. **Private goods:** These are goods which are the property of private individuals. They give utility to the person who owns them. Most of the goods in society are private goods. Our houses, shops, farms, household items, hotels, showrooms, factories, private buses and taxis are a few example of private goods.
11. **Public goods:** Public goods are owned by the society collectively. Their ownership lies with the local, state or central authorities. They can be used by all persons. Government hospitals, colleges, schools, roads, railways, public parks, bridges and Government buses are examples of public goods. In socialist countries, most of the goods are public goods.

Income

In economics, when we refer to income, generally we mean money income. According to Seligman, "Income in the economic sense is the flow of satisfactions from economic goods". We know that all economic goods form wealth. The main source of income is wealth. For example, if you own a house, it is your wealth. If you get rent from it, it is your income. There are two points about income – time and amount. There are two kinds of income:

1. Money income
2. Real Income

Generally people earn their incomes in the form of money. Money income is also known as nominal income. But the standard of living of people of a country depends on their real income. Real income depends upon the purchasing power of money and that in turn depends on the price level. Real income refers to the command of a person over actual commodities and services. Just because money incomes of people increase, we cannot say they are better off. It all depends upon how many goods they can command.

Suppose, my money income is ₹ 10, and price of one kilo of rice is ₹ 10, then I can buy one kilo of rice or my income is worth of only one kilo of rice. In the next month, my money income is raised to ₹ 15, but the price of one kilo of rice is increased to ₹ 20. Now my income is worth only $\frac{3}{4}$ kilo of rice. Therefore, inspite of increase in money income, my real income has come down due to higher increase in price. Real income is price adjusted money income.

National Income: National income refers to the value of commodities and services produced by a country during a year.

Marshall defined national income as follows: "The labour and capital of country acting on its natural resources produce annually a certain net aggregate of commodities, material and immaterial, including services of all kinds. This is true net annual income or revenue of the country, or the national dividend".

From the national income of a country, we can find out whether the country is rich or poor. And from the composition of national income, we can find out the relative importance of agriculture, industry and service sector in the economy.

We get per capita income (income per person per year) by dividing national income by the population of the country

$$\text{Per capita income} = \frac{\text{National Income}}{\text{Population}}$$

Value

Value is the economic aspect of a commodity. It is the purchasing power of a commodity in terms of other commodities and services or in terms of money. There are two kinds of value – value-in-use and value-in-exchange. Free goods have no value in exchange. To have some exchange value, a good must possess the following attributes:

- It must possess utility.
- It must be scarce.
- It must be transferable.

The term “value” refers to the exchange qualities of a good. According to Marshall, “the term value is relative and expresses the relation between two things at a particular place and time”. Value is of two kinds:

1. Value-in-use, and
2. Value-in-exchange.

Although air, rain and sunshine have value-in-use, they do not have value-in-exchange. In economics, we are interested only in those goods which have value-in-exchange. For a good to have value-in-exchange, it must possess utility, it must be scarce in relation to demand and it must be possible for us to exchange it. In other words, all economic goods have value-in-exchange.

Value is generally measured in money and it is a relative term. The value of a thing changes according to time and situation. For example, ice has more value in summer than in winter.

Price

When value is expressed in money, it is called price. In ordinary usage, price is the quantity of payment or compensation given by one party to another in return for goods or services. In modern economies, prices are generally expressed in units of some form of currency. (For commodities, they are expressed as currency per unit weight of the commodity, e.g. Euros per kilogram.)

Sometimes, prices can be quoted in terms of quantities of other goods or services but this sort of barter exchange is rarely seen. Prices are sometimes quoted in terms of vouchers such as trading stamps and air miles. In some circumstances, cigarettes have been used as currency, for example in prisons, in times of hyperinflation, and in some places during World War II. In a black market economy, barter is also relatively common.

In many financial transactions, it is customary to quote prices in other ways. The most obvious example is in pricing a loan, when the cost will be expressed as the percentage rate of interest. The total amount of interest payable depends upon credit risk, the loan amount and the period of the loan. Other examples can be found in

pricing financial derivatives and other financial assets. For instance, the price of inflation-linked government securities in several countries is quoted as the actual price divided by a factor representing inflation since the security was issued. Price sometimes refers to the quantity of payment requested by a seller of goods or services, rather than the eventual payment amount. This requested amount is often called the asking price or selling price, while the actual payment may be called the transaction price or traded price. Likewise, the bid price or buying price is the quantity of payment offered by a buyer of goods or services, although this meaning is more common in asset or financial markets than in consumer markets. Economists sometimes define price more generally as the ratio of the quantities of goods that are exchanged for each other.

Generally, economists make no distinction between value and price. All prices are related to one another. They form the price system. The prices most familiar to us are the prices we pay for goods sold in market, that is, retail prices. Many payments like rent, wages and interest are also the prices which we pay respectively to land, labour and capital. Price system plays a very important role in a capitalistic economy. Buyers express their desire for goods only through prices. Every price we pay for a good is a vote in favour of it. It is the price system that regulates the economic activity of a society.

Price theory: Economic theory asserts that in a free market economy the market price reflects interaction between supply and demand: the price is set so as to equate the quantity being supplied and that being demanded. In turn, these quantities are determined by the utility of the asset to different buyers and to different sellers. In reality, the price may be distorted by other factors, such as tax and other government regulations. When a commodity is for sale at multiple locations, the law of one price is generally believed to hold. This essentially states that the cost difference between the locations cannot be greater than that representing shipping, taxes, other distribution costs, etc. In the case of the majority of consumer goods and services, distribution costs are quite a high proportion of the overall price, so the law may not be very useful.

Market

In the ordinary language, market refers to a place where goods are bought and sold. Thus **Koyambedu market** in Chennai refers to a place where vegetables are sold. In economics, market does not refer to any particular place in which goods are bought and sold but it refers to buying and selling of a commodity. In a market a commodity is bought and sold under given conditions and there will be a number of buyers and sellers who will be in close touch with each other. For example, a fish market refers to buying and selling of fish; here both buyers and sellers are in close contact.

According to **Benham**, "Market is any area over which the buyers and sellers are in close touch with one another either directly or through dealers, that prices obtainable in one part of market affect the prices paid in other parts".

Generally speaking, when we talk of markets, we refer to commodities that are bought and sold. But there are markets for things other than commodities. Thus there are labour markets, foreign exchange market, and capital market and so on. For example, we may say the market for an actor, say 'X', is dull. So there may be a market for anything which has a price.

Classification of Markets: Markets may be classified according to space, time and the nature of competition.

According to space, markets are classified into local market (i.e., vegetables, flowers), national market (i.e., sarees) and international market (i.e., steel, cotton, sugar, tea).

Type of Competition; Markets can also be classified according to the type of competition.

Thus, broadly we have perfect markets and imperfect markets. Markets can also be classified into short period markets and long period markets according to time. If the period is short, demand plays an important role in the market and if the period is longer, supply plays an important role. Thus markets can be classified according to space, time and the nature of competition that prevails.

3.7 LAW OF DIMINISHING MARGINAL UTILITY

Law of diminishing marginal utility is the most important law in economics. It was first discovered given by French engineer, Gossen. Therefore, this law is also called Gossen's First Law. This law explains the mode of consumer's satisfaction from consuming a commodity.

It is drawn from the simple law of diminishing utility which indicates that, "As the stock of goods for consumption increases the utility derived from it decreases or diminishes". It is our natural tendency that the more of a thing we have, the less we want it. In fact, this law is based on the satiability characteristic of human wants which means that any particular want taken separately at a time can be fully satisfied.

The law states that, other things being constant, where an individual goes on consuming a commodity. The marginal utility obtained from its additional units goes on diminishing. For example, when you consume the first glass of mango shake in summer, you get the maximum utility. The second glass of mango shake gives less utility than the first because the first has already quenched your thirst to some extent. From the third glass, the utility derived will be still less. If this process goes on, the stage will come when the addition utility from another glass will become zero. If you still go on consuming, it will even become negative.

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

Assumptions

- **Rational consumer:** The consumer is rational and he wants to take maximum satisfaction from his given money income.
- **Cardinal measurement of utility:** Utility is a cardinal concept. It can be measured in quantitative numbers like 1,2,3 and more.
- **Independent utility:** The utility of a thing depends on its own quantity and is not influenced by the quantities of other commodities.
- **Continuous consumption:** There is no time lag during the consumption of the commodities.
- **Homogeneous units:** All the units of the commodity are homogeneous in every respect that is, in size, color, taste, and so on.
- **Constant prices:** There is no change in the income of the price of the commodity and its related goods.
- **Constant income:** There is no change in the income of the consumer.
- **Constant taste, customs and fashions:** There is no change in the tastes, habits, customs and fashions of the consumer.

Explanation of the Law

The law of diminishing marginal utility can be demonstrated with the help of the table and diagram given below:

Table 3.1: Diminishing Marginal Utility of Bananas

No. of Bananas	Marginal Utility	Total Utility
1	8	8
2	6	14
3	4	18
4	2	20
5	0	20
6	-2	18

The table clearly shows that:

- As the number of bananas goes on increasing, the marginal utility goes on diminishing. Up to the consumption of the 4th unit, the marginal utility is positive and total utility is increasing but at a decreasing rate.
- With the consumption of the 5th unit of banana, the marginal utility becomes zero and the total utility is maximum that is 20 units.

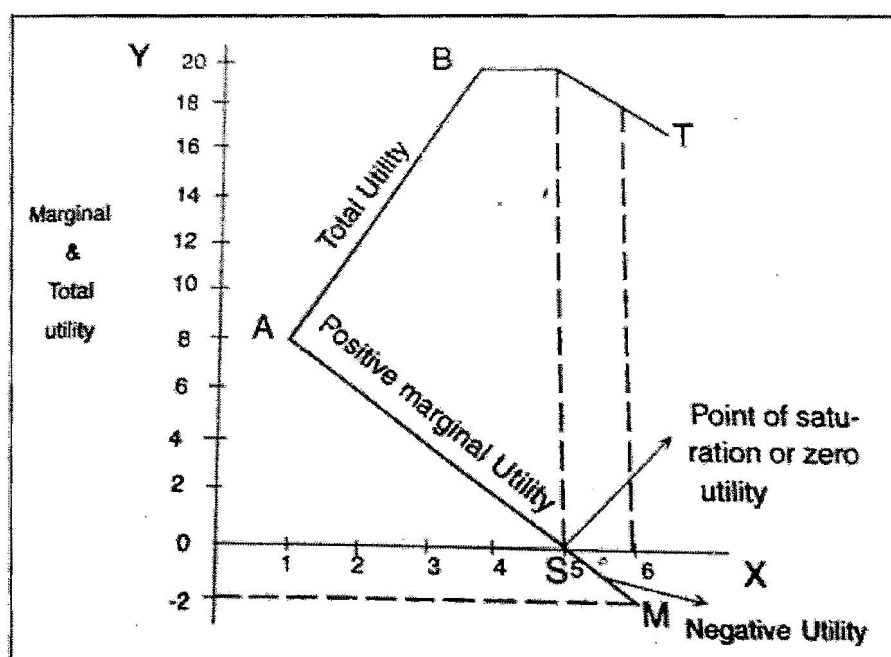


Figure 3.1: Utility Curve of Bananas

- As the 6th unit of bananas is consumed, the marginal utility becomes negative and total utility decreases to 18 units.

In the above figure, AM is the marginal utility is positive and ABT is the total utility curve. Up to the 4th unit the marginal utility is positive and total utility curve AB rises upward. At the 5th unit and at point S, AM touches the x-axis and ABT reaches its peak. It means that the marginal utility is zero and total utility is at maximum. It is also known as the point of saturation. When the 6th unit of bananas are consumed, AM goes down the x-axis and ABT starts falling. Here marginal utility has become negative and total utility starts decreasing.

The law of diminishing marginal utility is only applicable where all the assumptions of this law are fully met. But in practical life it is not so. There are some exceptions or limitations of this law which are given below:

- **Unique and rare things:** It is said that this law is not applicable in the case of certain unique and rare things like stamps, coins, rare paintings and so on. The marginal utility of these things goes on increasing with the increase in their stock.
- **Good books and music:** Prof. Taussing said that 'more and more satisfaction is obtained from reading of good books and listening to good music or songs again and again'. This is an exception of the law.
- **Drunkards:** This law is not applicable in the case of drunkards. A drunkard always goes on demanding more and more wine. But this again is not a valid limitation because the drunkard does not remain in his senses and can no longer be considered a normal person. And every law of economics is applicable to only normal persons.
- **Misers:** It is stated that as the stock of money with a miser increases, the greed for acquiring more and more money increases. Every addition to the stock gives him more and more pleasure. Hence, the marginal utility of money does not diminish for him with more and more money.
- **Distinction goods:** This law is not applicable to the goods of distinction such as ornaments, diamonds, jewellery and other prestigious goods. With the increase in the stock of these things, one desire to get more and more of them.
- **Small increments:** This law is not applicable if the units are too small. If a thirsty man is offered water in a tea spoon, the utility he gets from the second teaspoonful of water will surely be greater than that from the first one.

3.8 DEMAND ANALYSIS

Demand is the willingness to buy a commodity or service which is backed by necessary resources. Demand is an effective desire. It is a desire backed by power to buy and willingness to buy. In economics, demand has the following three attributes.

1. Desire to possess or use a commodity or service.
2. Willingness to possess it.
3. Capacity to buy it.

Both willingness and ability to pay are essential to convert a desire into a demand. If a person is willing to buy a car but he doesn't have the resources to buy it, it is not demand. If he is in a position to buy a car but is not willing to buy, again, it is not demand.

According to **Bober**, "By demand we mean the various quantities of a given commodity or service which consumers would buy in one market in a given period of time at various prices, or at various incomes, or at various prices of related goods".

Demand is meaningless without reference to price; demand is always at a price. Suppose a person is willing to buy a car when its price is ₹ 2 lakhs. He is in a position to pay this price. It is demand for a car. But if the price of the car goes up to ₹ 3 lakhs, he may not afford to buy it. Or he may not think it worthwhile to spend so much money on it. It is no longer a demand. So, demand is always expressed with reference to price.

Similarly, demand is always used with reference to a certain period of time. Demand for woolen clothes is higher in winter than in summer. Demand for water coolers is higher in summer than during winter.

The demand for any commodity or service at a certain price is the quantity or amount of it which will be bought at that price during a given period of time. Without reference to price and time, demand has no meaning.

Types of Demand

- **Joint demand:** When a number of goods and services are demanded for a joint purpose, it is called joint demand. For example, for the construction of a house, several items like cement, sand bricks, iron, wood and labour are required. This is a case of joint demand.
- **Direct demand:** Direct demand is the demand for direct use or consumption. It is the demand for the ultimate object. For example, demand for a car, a house, or a piece of cloth.
- **Derived demand:** The demand for various goods and services to manufacture goods to meet the ultimate or direct demand of purchasers is called derived demand.
- **Composite demand:** The demand for goods or services which can be put to several uses is called composite demand. For example, milk is demanded demand to prepare tea, coffee, butter, ghee, sweets, curd and also for direct consumption.
- **Complementary demand:** When two or more than two goods are demanded because they complement each other's role. It is called complementary demand. For example, pen and ink, bread and butter, car and petrol are some examples of complementary demand.
- **Competitive demand:** A large number of goods compete with each other as substitutes fulfill the same need. For example, tea and coffee, roadways and railways, wheat and rice, vegetable oil and pure ghee are substitutes or near substitutes of each other. Demand for them is called competitive demand.

3.9 LAW OF DEMAND

Law of demand explains the relationship between the price of a commodity and its quantity demanded over a certain period of time. According to this law, other things remaining the same, there is an inverse relationship between the price of a commodity and its quantity demanded.

According to Marshall, "The amount demanded increases with a fall in price and diminishes with a rise in prices".

The law of demand states that other things being constant, there is an inverse relationship between the price of various commodities and their quantity demanded over a certain period of time. In other words, with the increase in the price of a commodity, there is a fall in its demand and with the decrease in its price there is a rise in its demand.

Assumptions of the Law of Demand

- Income of the consumer remains unchanged.
- Prices of other related goods remain constant.
- Tastes of the consumers remain unchanged during the period of time.

- The consumers, expectations about future prices are neutral.
- The effect of advertising is ruled out.
- Other relevant factors like the size of the population, seasonal and climatic factors, habits of the people and all other factors influencing demand remain unchanged.

Individual's Demand Schedule

An individual's demand schedule presents the preference scales of a person for a commodity at its different price levels.

According to **Baumol**, "A demand schedule is a table showing how the quantity demanded of some product during a specified period of time changes as the price of that product changes, holding all other determinants of quantity demanded constant".

In other words, a demand schedule indicates how much a consumer is willing and able to buy at different price levels during a certain period of time.

Table 3.2: Individual Demand Schedule

Price of X (Rs. per kg)	Quantity demanded (kgs per month)
(₹ per kg)	10
1	9
2	8
3	7
4	6
5	5
6	4
7	3
8	2
9	1
10	0

Demand schedule of a person for commodity X shows an inverse relationship between the price of X (P_x) and its quantity demanded.

When the price of X is zero rupees per kilogram i.e., the commodity X has no price, its demand is 10 kilogram per month. With the rise in its price, its demand starts falling.

The inverse relationship also holds good if we start moving upward from below, the price of X being 20 rupees per kilogram, its demand is zero. In other words, the consumer is not willing to buy the commodity at all. But when its price starts falling, the quantity demanded begins to increase.

3.9.1 Demand Curve

An individual's demand curve is a graphic representation of his demand schedule. It shows how the quantity demanded of commodity changes with the changes in its price.

According to **Samuelson**, "The picture of the demand schedule is called the demand curve".

Individual's Demand Curve

An individual's demand curve is the graphical depiction of the quantity demanded by him at different levels of price. It is the graphical representation of an individual's demand schedule.

Table 3.3: Quantity Demanded at Different Prices

Price of x (₹ per kg)	Demand for X (kgs per month)
0	8
1	7
2	6
3	5
4	4
5	3
6	2
7	1
8	0

The information contained in the above table can be presented in a graph like figure, which is called demand curve.

In the Figure below, quantity demanded is measured on X axis and price of the commodity is measured on Y axis. Plotting each pair of values i.e., price and commodity as a point on the graph and joining the points, we get the individual's demand curve for commodity X.

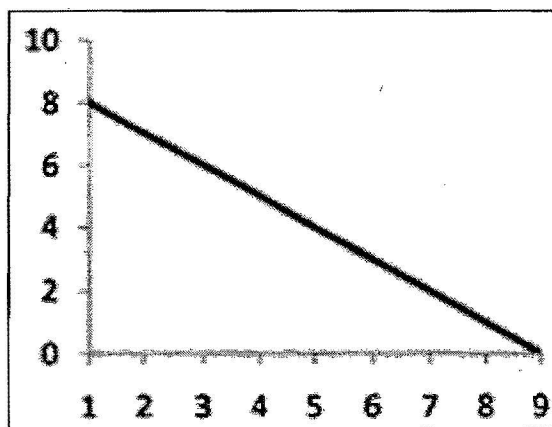


Figure 3.2: Demand Curve for X

Market Demand Schedule

Market demand schedule for a commodity is the sum of the demand schedules of the individual consumers. In other words, the market demand schedule represents the preference scale of all the consumers taken together. It shows how much quantity is demanded at different price levels by the society.

Table 3.4: Market Demand Schedule

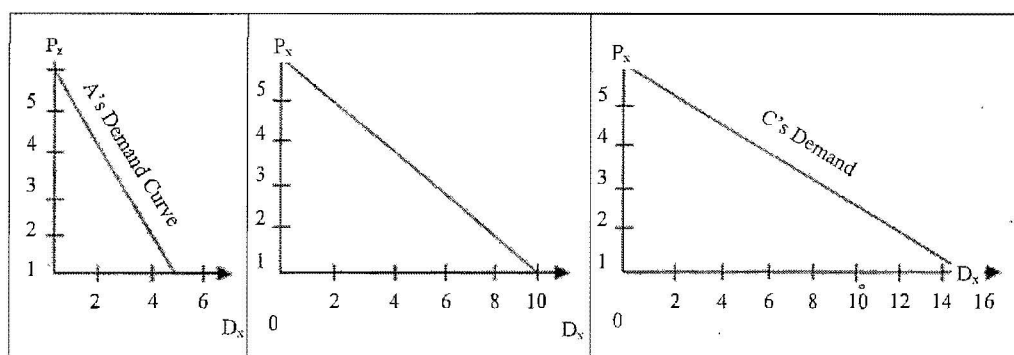
Price of X	A's demand (QA)	B's demand (QB)	C's demand (QC)	Total Demand (QDX)
5	0	0	0	0
4	1	2	3	6
3	2	4	6	12
2	3	6	9	18
1	4	8	12	24
0	5	10	15	30

Figure 3.3 shows the demand curve of A.

Figure 3.4 shows the demand curve of B.

Figure 3.5 shows the demand curve of C.

The horizontal summation of all the individual demand curves will produce the market demand curve. Therefore, the market demand for X is the Sum of all the individual demands in the economy.



Demand for X

Figure 3.3: A's
Demand CurveFigure 3.4: B's
Demand CurveFigure 3.5: C's
Demand Curve

The table above shows the horizontal summation of the quantity demanded of X by persons A, B and C. By plotting different aggregate points of the quantity demanded and the respective price levels, we can draw the market demand curve. Here the aggregate form of above table is reproduced.

$$\text{Total demand (DX)} = \text{A's demand} + \text{B's demand} + \text{C's demand}$$

Table 3.5: Aggregate Market Demand

Px	Dx
5	0
4	6
3	12
2	18
1	24
0	30

Market Demand Curve

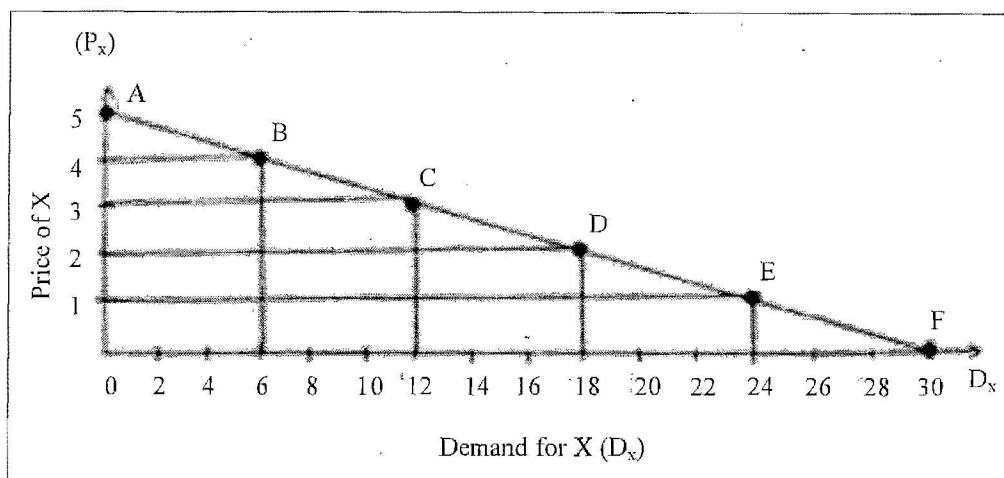


Figure 3.6: Market Demand Curve

Above figure depicts the market demand curve on the basis of the market demand schedule shown in table above. It is the summation of individual's demand schedule in horizontal form.

The different point on the market demand curve show the willingness of the society to buy a particular quantity of the commodity X at its different price levels.

Understanding of why the Demand Curve Slopes Downwards

The Diagram for Demand Curve shows that demand curve slopes downward to the right.

The following specific factors are responsible for the downward slope of a demand curve:

- **Income Effect:** When the price of a commodity falls, real income of its consumer increases in terms of this commodity. In other words, their purchasing power increases since they are required to pay less for the same quantity.

According to another economic law, increase in real income (or purchasing power) increases demand for goods and services in general and for the goods with reduced price in particular. The increase in demand on account of increase in real income is called income effect.

- **Substitution Effect:** When the price of a commodity falls, it becomes cheaper compared to its substitutes, their prices remaining constant. In other words, when price of a commodity falls, price of its substitutes remain the same, its substitute becomes relatively costlier. Consequently, rational consumers tend to substitute cheaper goods for costlier ones within the range of normal goods - goods whose demand increases with increase in consumer's income - other things remaining the same. Therefore, demand for the relatively cheaper commodity increases. The increase in demand on account of this factor is known as substitution effect.
- **Diminishing Marginal Utility:** Marginal utility is the utility derived from the marginal unit a commodity when its price falls. When a person buys a commodity, he exchanges his money income with the commodity in order to maximise his satisfaction. He continues to buy goods and services so long as marginal utility of his money is less than the marginal utility of the commodity. Consequently, demand for a commodity increase when its price falls.

Hence from the following we understand that:

- ❖ With the fall in the prices of commodity or commodities, the value of a unit of money increases. The same unit of money can buy more goods at lower prices than at higher prices.
- ❖ Rise in real income takes place with the fall in the price of a commodity. Most probably, a part of the rise in the real income is spent on the same commodity of which the price has fallen.
- ❖ It is observed that a large number of goods are substitutes of several goods in some ways or the other. With the fall in the price of a commodity, the cheaper commodity is preferred to the commodities whose prices have not changed.
- ❖ A commodity is put to several uses when it becomes cheaper. For example, when tomatoes become cheaper, tomato sauce is prepared by the housewives.
- ❖ The fall in the price of a commodity has a psychological effect also. People like and enjoy buying more, which they were unable to do at higher prices.

Assumptions in the Law of Demand

According to **Stigler and Boulding**, the law of demand is based on the following assumptions:

- There should be no change in the income of consumers.
- There should be no change in the tastes and preferences of the consumers, because the law of the demand applies only when the tastes and preferences of the consumers remain constant.
- Price of the related commodities should remain unchanged.
- The commodity in questions should be a normal one.
- There should be no change in the size of population.
- There distribution of income and wealth should be equal.
- There should be continuous demand except in case of indivisible commodities.
- There should be perfect competition in the market.

Importance of the Law: The law of demand has been of great theoretical and practical importance in economics because of:

- Price Determination
- Importance for the Consumer
- Importance to Finance Minister
- Importance for Planning
- Importance for Producers
- Importance for Farmers

Exceptions to the Law of Demand

The law of demand is one of the fundamental laws of economics. The law of demand, however, does not apply to the following cases:

- Expectations regarding future prices
- Prestigious goods
- Giffen goods

3.9.2 Factors Affecting Demand

Some of the important factors which influence the demand for goods and services are listed in the following paragraphs:

- **Income of the household:** The income is a decisive variable which greatly influences the volume of quantity demanded as well as its quality. An increase or decrease in income increases or decreases the demand for a commodity.
- **Prices of other commodities:** Many goods have a definite relationship with each other. Some are substitutes of and some are complementary to other goods. Even, goods which are not substitutes in the strict economic sense are competitive in some way or the other.

Any rise or fall in the prices of substitutes of a commodity will affect its demand and shift the demand curve to the right or the left. For example, the rise in the price of tea will expand the demand for coffee.

- **Tastes and preferences:** Tastes and preferences of people highly influence the demand for goods. The tastes, habits and preferences of the people vary from area to area and from time to time. The varying social, religious, economic and environmental conditions of different people influence their choice of food, clothing, living conditions, houses, entertainment and what not.
- **Advertising:** These days it is the age of advertising and the media - both print and visual are highly affecting the life style of people. An aggressive advertising campaign tends to shift the demand curve of a particular commodity to the right.
- **Product life-cycle:** The product life-cycle model states that demand pattern for a commodity undergoes some typical changes at different stages of the life-cycle. The life-cycle concept is very relevant in case of durable goods like TVs, cars and computers.
- **Size and composition of population:** The size of population of a country determines the level of demand for all goods and services. The larger the population of a country, the larger the quantity of goods and services demanded by it. If there are many to be fed, clothed and housed, demand is supposed to be high.
- **Distribution of income:** Uneven distribution of income and wealth greatly squeezes the demand level in an economy. It is a common fact that the rich sections of society have a low propensity to consume. Their demand pattern encourages the demand for comforts and luxuries.
- **Scientific and technological development:** Science and technology are there to revolutionise the life style of people. Almost all economic activities are being speeded up by scientific discoveries and inventions. Thousands of new products are entering our daily life. New wants are emerging. Daily arrival of new products, new machines and new services had greatly influenced the demand pattern of the society.
- **State of the economy:** The state of economy i.e., whether it is developed or under developed, experiencing inflation or deflation also influences the demand for goods and very services. The people of developed countries enjoy a very high standard of living. Their size of demand is very high, as compared to the people of under developed countries.
- **Changes in money supply:** Increase in money supply raises the money income of people. People get enhanced purchasing power. The increase in money supply which is generally the outcome of increased economic activities of the state puts a lot of money in the hands of the people. Their demand level increase day by day.

- **Miscellaneous factors:**

- ❖ Changes in fashion raise the demand for the goods which are in vogue. Goods which are out of fashion are not purchased by people even at lower prices.
- ❖ Changing weather and climatic conditions also influence the demand for several goods. Demand for woolen clothes increases during winter. Eggs are more in demand during winter as compared to summer.
- ❖ Changing habits also alter the demand conditions in an economy. Increasing demand for tea, coffee, cold drinks, eggs, non-vegetarian food items, snacks and ice creams is being witnessed because of changing habit and tastes of the people.
- ❖ A system of progressive taxation, particularly income and wealth taxes, reduces the disposable income of the high income group. Demand for comforts and luxuries are greatly affected by it.
- ❖ Religious and social factors have their own role to play in influencing the demand for goods and services. Demand for sweets increases considerably on every Tuesday because the Hindus offer “prasad” in temples on that day.

3.10 LAW OF VARIABLE PROPORTION

Law of variable proportions establishes the short run relationship between the changes in output and the changes in inputs. In the short period, some factors are fixed and some are variable. So in the short run, if we want to increase the output, we have to vary the variable factors only. The law is called the law of variable proportions because when in the short run, increasing doses of variable factors are applied upon some fixed factors, the factor proportion changes. The law of variable proportions which comprises three stages applies in all economic fields. Prof. Samuelson has stated that an increase in some inputs relative to other comparatively fixed inputs will cause output to increase; but after a point, the extra output resulting from the same additions of inputs will become less and less; this falling of extra returns is a consequence of the fact that the new doses of varying resources have less and less of the constant resources to work with.

Law of Returns

The law of return takes three forms:

1. Law of diminishing returns
 2. Law of constant returns
 3. Law of increasing returns
1. **Law of Diminishing Returns:** The law of diminishing returns is one of the oldest and most controversial parts of economic theory. This law states that if the quantity of one factor, say land, is fixed and to increase output, more and more units of labour and capital are applied, increase in output will take place at a decreasing rate. In other words, the marginal increase in output will be comparatively smaller than the increase in labour and capital. We need to keep the following points in mind:
 - ❖ A production function shows the relationship between inputs of capital and labour and other factors and the outputs of goods and services.
 - ❖ Production of goods requires resources or inputs. These inputs are called factors of production named as land, labour, capital and organisation.

- ❖ Production Function in Economics with one or two variables input. A rational producer is always interested that he should get the maximum output from the set of resources or inputs available to him. He would like to combine these inputs in a technically efficient manner so that he obtains maximum desired output of goods. The relationship between the inputs and the resulting output is described as production function in Economics.
- ❖ A production function shows the relationship between the amounts of factors used and the amount of output generated per period of time. It can be expressed in algebra form as under:

$$x = f(\text{land, labour, capital})$$

- ❖ This equation tells us the quantity of the product X which can be produced by the given quantities of inputs (land, labour, capital) that are used in the process of production. Here, it may be noted that production function shows only the maximum amount of output which can be produced from given inputs. It is because production function includes only efficient production process.
- ❖ The analysis of production function is generally carried with reference to time period which is called short period and long period. In the short run, production function is explained with one variable factor and other factors of productions are held constant. We have called this production function as the Law of Variable Proportions or the Law of Diminishing Returns.

Assumptions of the Law

- ❖ The technique of production remains constant.
- ❖ The co-efficient of production are variable, i.e., factor proportions are variable.
- ❖ Some factors can be held constant.
- ❖ The units of variable factor are homogeneous.

In the long run, production function is explained by assuming all the factors of production as variable. There are no fixed inputs in the long run. Here the production function is called the Law of Returns to scale of production. As it is difficult to handle more than two variables in graph, we therefore, explain the Laws of Returns according to scale of production by assuming only two inputs i.e., capital and labour and study how output responds to their use. Production function is expressed as

$$Q = f(K, L).$$

Law of Diminishing Marginal Returns

- ❖ Total Product (TP): This is the total output produced by workers.
- ❖ Marginal Product (MP): This is the output produced by an extra worker.

Definition: Law of Diminishing Marginal Returns

- ❖ Diminishing Returns occurs in the short run when one factor is fixed (e.g. Capital).
- ❖ If the variable factor of production is increased, there comes a point where it will become less productive and therefore there will eventually be a decreasing marginal and then average product.

- ❖ This is because if capital is fixed extra workers will eventually get in each other's way as they attempt to increase production. E.g. think about the effectiveness of extra workers in a small café. If more workers are employed production could increase but more and more slowly.
- ❖ This law only applies in the short run because in the long run all factors are variable.
- ❖ Assume the wage rate of the worker is 10, then the cost of labour or worker is 10.
- ❖ The Marginal Cost (MC) of a sandwich will be the Cost of the worker divided by the number of extra sandwiches that are produced
- ❖ Therefore as the cost of marginal product increases then there is a decline in the marginal cost and vice versa.
- ❖ A good example of Diminishing Returns includes the use of chemical fertilizers—a small quantity leads to a big increase in output. However, increasing its use further may lead to declining Marginal Product (MP) as the efficacy of the chemical declines.

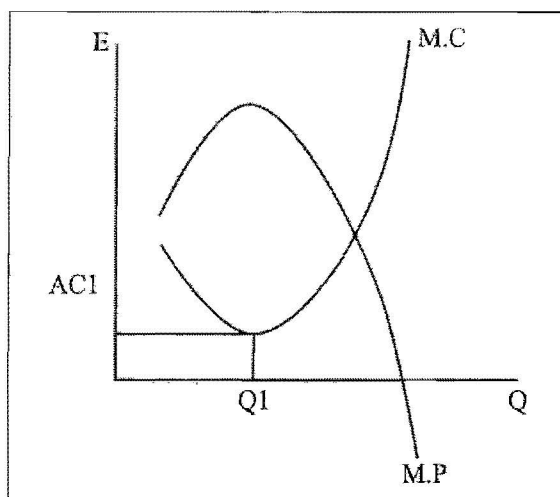


Figure 3.7: Diminishing Returns Curve

2. **Law of Constant Returns:** The law of constant returns states that the increase in output or marginal physical product is the same rate as that in the units of labour and capital. Additional units of labour and capital yield the same return. It is seen that per unit cost of production remains the same at all levels of output.

The laws of returns to scale can also be explained in terms of the isoquant approach. The laws of returns to scale refer to the effects of a change in the scale of factors (inputs) upon output in the long run when the combinations of factors are changed in the same proportion. If by increasing two factors, say labour and capital, in the same proportion, output increases in exactly the same proportion, there are constant returns to scale. If in order to secure equal increases in output, both factors are increased in larger proportionate units, there are decreasing returns to scale. If in order to get equal increases in output, both factors are increased in smaller proportionate units, there are increasing returns to scale. The returns to scale can be shown diagrammatically on an expansion path “by the distance between successive ‘multiple-level-of-output’ isoquants, that is, isoquants that show levels of output which are multiples of some base level of output, e.g., 100, 200, 300, etc.”

3. **Law of Increasing Returns:** The law of increasing returns states that the marginal increase in output is proportionately higher than the increase in the units of labour and capital. When more and more units of labour and capital are applied, they bring increasing returns or raise total output at an increasing rate. The law of increasing returns is based on the assumption that there always remains ample scope for improvements in the techniques of production. The improvements in the methods of production, use of modern machines and increased division of labour raise the productivity. The theory also assumes that some of the factors or atleast one factor is indivisible. Most of the remaining factors are divisible. The law of increasing returns states that an addition in units of inputs brings higher and higher levels of marginal output.

The figure given below shows the case of increasing returns to scale where to get equal increases in output, lesser proportionate increases in both factors, labour and capital, are required.

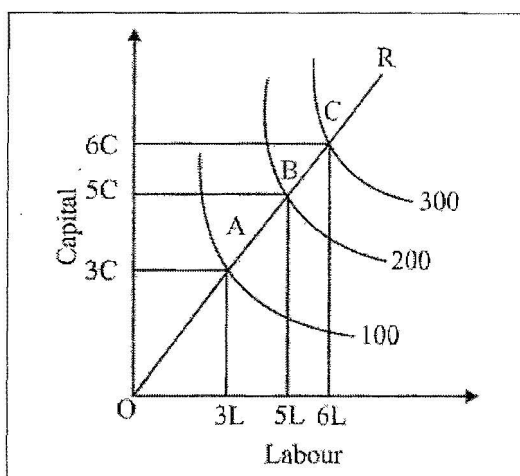


Figure 3.8: Increasing Returns to Scale Curve

It follows that in the figure:

100 units of output require $3C + 3L$

200 units of output require $5C + 5L$

300 units of output require $6C + 6L$

So that along the expansion path OR, $OA > AB > BC$. In this case, the production function is homogeneous of degree greater than one.

The increasing returns to scale are attributed to the existence of indivisibilities in machines, management, labour, finance, etc. Some items of equipment or some activities have a minimum size and cannot be divided into smaller units. It is seen that when a business unit expands, the returns to scale increases because the indivisible factors are employed to their full capacity. Increasing returns to scale also result from specialisation and division of labour. When the scale of the firm expands there is wide scope for specialisation and division of labour. Work can be divided into small tasks and workers can be concentrated to narrower range of processes. For this, specialised equipment can be installed. Thus with specialisation efficiency increases and increasing returns to scale follow:

Further, as the firm expands, it enjoys internal economies of production. It may be able to install better machines, sell its products more easily, borrow money

cheaply, procure the services of more efficient manager and workers, etc. All these economies help in increasing the returns to scale more than proportionately.

Not only this, a firm also enjoys increasing returns to scale due to external economies. When the industry itself expands to meet the increased long-run demand for its product, external economies appear which are shared by all the firms in the industry. When a large number of firms are concentrated at one place, skilled labour, credit and transport facilities are easily available. Subsidiary industries crop up to help the main industry. Trade journals, research and training centers appear which help in increasing the productive efficiency of the firms. Thus these external economies are also the cause of increasing returns to scale.

Decreasing Returns to Scale:

The figure given below shows the case of decreasing returns where to get equal increases in output, larger proportionate increases in both labour and capital are required.

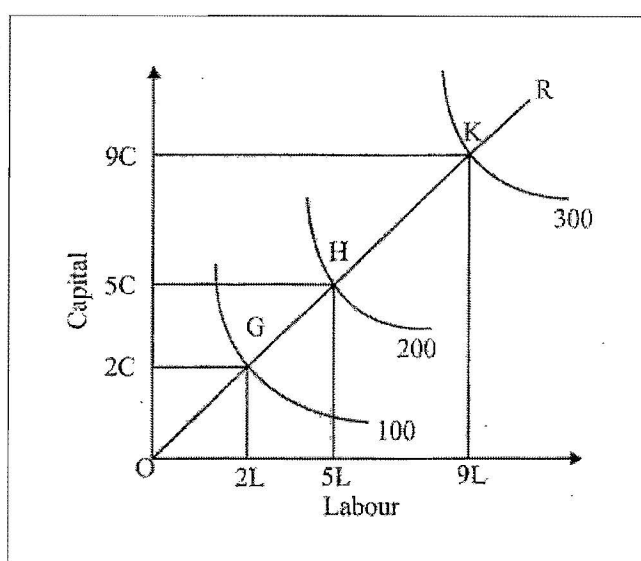


Figure 3.9: Decreasing Returns to Scale Curve

It follows that:

100 units of output require $2C + 2L$

200 units of output require $5C + 5L$

300 units of output require $9C + 9L$

So that along the expansion path OR, $OG < GH < HK$.

In this case, the production function is homogeneous of degree less than one.

Returns to scale may start diminishing due to the following factors:

1. Indivisible factors may become inefficient and less productive.
2. Business may become unwieldy and produce problems of supervision and coordination.

Large management creates difficulties of control and rigidities.

3. To these internal diseconomies are added external diseconomies of scale. These arise from higher factor prices or from diminishing productivities of

the factors. As the industry continues to expand the demand for skilled labour, land, capital, etc. rises.

There being perfect competition, intensive bidding raises wages, rent and interest. Prices of raw materials also go up. Transport and marketing difficulties emerge. All these factors tend to raise costs and the expansion of the firms leads to diminishing returns to scale so that doubling the scale would not lead to doubling the output.

Constant Returns to Scale

The figure given below shows the case of constant returns to scale. Where the distance between the isoquants 100, 200 and 300 along the expansion path OR is the same, i.e., $OD = DE = EF$. It means that if units of both factors labour and capital are doubled, the output is doubled. To treble the output, units of both factors are trebled.

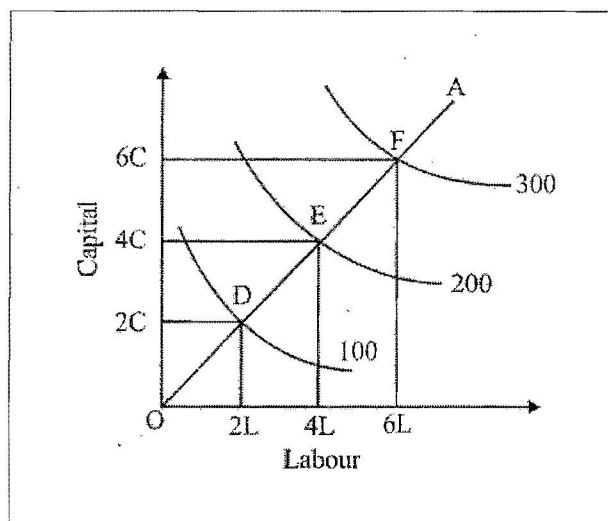


Figure 3.10: Constant Returns to Scale Curve

It follows that:

100 units of output require $1(2C + 2L) = 2C + 2L$

200 units of output require $2(2C + 2L) = 4C + 4L$

300 units of output require $3(2C + 2L) = 6C + 6L$

Return to scale are constant due to the following factors:

1. The returns to scale are constant when internal economies enjoyed by a firm are neutralized by internal diseconomies so that output increases in the same proportion.
2. Another reason is the balancing of external economies and external diseconomies.
3. Constant returns to scale also result when factors of production are perfectly divisible, substitutable, and homogeneous and their supplies are perfectly elastic at given prices.

That is why, in the case of constant returns to scale, the production function is homogeneous of degree one.

Check Your Progress

Fill in the blanks:

1. The existence of human wants is the starting point of all _____ activity in the world.
2. Economic laws like other laws establish _____ between causes and their effect.
3. Law of _____ proportions establishes the short run relationship between the changes in output and the changes in inputs.
4. In the short run, production function is explained with one variable factor and other factors of productions are held _____
5. _____ is the willingness to buy a commodity or service which is backed by necessary resources.
6. Law of _____ explains the relationship between the price of a commodity and its quantity demanded over a certain period of time.

3.11 LET US SUM UP

- Economics is a social science which deals with human wants and their satisfaction. It is mainly concerned with the way in which a society chooses to employ its scarce resources which have alternative uses, for the production of goods for present and future consumption. The existence of human wants is the starting point of all economic activity in the world.
- Economics has become one of the important branches of social sciences. It is of great practical value in our daily life. In pure sciences, we study the subject to arrive at the truth. But an economist is a social scientist. He studies the subject not only to know the truth for its own sake, but to find out a way for many economic and social problems of the society. An economist has no readymade answer for immediate problems.
- Economic Laws like other social sciences, economics has its own laws. A law is a statement of what must happen given certain conditions. The term 'law' means statements of general tendencies. Economic laws generalise the human behaviour regarding economic activities.
- As economics deals with man and his behaviour, its laws are complex and inexact. That is why, **Marshall** has said that "the laws of economics are to be compared with the laws of tides rather than with the simple and exact law of gravitation". The science of tides explains the tides rise and fall under the influence of the Sun and the Moon. Probably there will be high tide on a full moon night. It may be there or it may not be there. It is only a probability.
- Economic laws are of great importance in practical life. Some economic laws are applicable to all types of economic systems. They have universal application. For example, we have the Law of Diminishing Returns. There are other important laws such as the Law of Diminishing Marginal Utility and the Law of Demand.
- Economic laws are the statements of human behaviours. That is why, these laws are not as exact as the laws of natural sciences. Economist deals with human behaviours, which are never constant and exact as the behaviours of natural bodies.
- Every science has its own language. Economics has its own language. There are certain terms which are used in a special sense in economics. So we must understand the meaning of some basic concepts like wealth, goods, income, value,

price and market. If we do not understand their meaning properly, it may result in a lot of confusion.

- Anything that satisfies a human want can be considered as “good” in economics. In economics, the term “goods” refer to material and non-material things. Just as an apple or a chair is a good, music or the services of actors, musicians and teachers are some of the examples of goods.
- Marshall defined national income as follows: “The labour and capital of country acting on its natural resources produce annually a certain net aggregate of commodities, material and immaterial, including services of all kinds. This is true net annual income or revenue of the country, or the national dividend”.
- When value is expressed in money, it is called price. In ordinary usage, price is the quantity of payment or compensation given by one party to another in return for goods or services.
- Law of diminishing marginal utility is the most important law in economics. It was first discovered given by French engineer, Gossen. Therefore, this law is also called Gossen’s First Law. This law explains the mode of consumer’s satisfaction from consuming a commodity.
- Demand is the willingness to buy a commodity or service which is backed by necessary resources. Demand is an effective desire. It is a desire backed by power to buy and willingness to buy.
- Law of demand explains the relationship between the price of a commodity and its quantity demanded over a certain period of time. According to this law, other things remaining the same, there is an inverse relationship between the price of a commodity and its quantity demanded.
- An individual’s demand curve is a graphic representation of his demand schedule. It shows how the quantity demanded of commodity changes with the changes in its price.
- Law of variable proportions establishes the short run relationship between the changes in output and the changes in inputs. In the short period, some factors are fixed and some are variable. So in the short run, if we want to increase the output, we have to vary the variable factors only. The law is called the law of variable proportions because when in the short run, increasing doses of variable factors are applied upon some fixed factors, the factor proportion changes.

3.12 LESSON END ACTIVITY

Economists try to avoid making interpersonal comparisons of utility and national income in relation to market prices. However, such comparisons may seem reasonable and useful to make, especially from the standpoint of social policies like taxation and programs to aid the poor. Explain the statement with the help of a presentation.

3.13 KEYWORDS

Social Science: The scientific study of human society and social relationships. It is a subject within the field of social science, such as economics or politics.

Scarcity: The state of being scarce or in short supply.

Economic Laws: Economic laws is the legal theory and system under which economic relations were a legal discipline independent of criminal law and civil law. These generalise the human behaviour regarding economic activities.

Law of Diminishing Returns: It is used to refer to a point at which the level of profits or benefits gained is less than the amount of money or energy invested.

Law of Demand: A microeconomic law that states, all other factors being equal, as the price of a good or service increases, consumer demand for the good or service will decrease, and vice versa.

Law of Diminishing Marginal Utility: The law of diminishing marginal utility is a law of economics stating that as a person increases consumption of a product while keeping consumption of other products constant, there is a decline in the marginal utility that person derives from consuming each additional unit of that product.

Malthusian theory of population: Of relating to Malthus or his theory that population tends to increase at a faster rate than its means of subsistence and that unless it is checked by moral restraint or by disease, famine, war, or other disaster widespread poverty and degradation inevitably result.

Demand Curve: A graph showing how the demand for a commodity or service varies with changes in its price.

Isoquants: Isoquants is derived from quantity and the Greek word meaning 'equal'. It is a contour line drawn through the set of points at which the same quantity of output is produced while changing the quantities of two or more inputs.

3.14 QUESTIONS FOR DISCUSSION

1. What is the significance of role of economics in the society as a whole?
2. What are economic laws and why are they important for the economy?
3. What is the law of diminishing marginal utility? Do all people consuming all goods exhibit this law? Give some examples of possible exceptions to the law of diminishing marginal utility.
4. What is the law of demand and why are demand curves for most goods downward sloping?
5. Explain the law of variable proportions and what does law of return state?

Check Your Progress: Model Answer

1. Economic
2. Relationship
3. Variable
4. Constant
5. Demand
6. Demand

3.15 REFERENCES & SUGGESTED READINGS

Agarwal, M. (2021). *Principles of Microeconomics*. Vikas Publishing House.

Bhaduri, A. (2020). *Microeconomics: Theory and Applications*. Oxford University Press

Choudhury, B. (2021). *Essentials of Microeconomics*. Wiley India Pvt. Ltd.

Dutt, R., & Sundaram, K. P. M. (2021). *Indian Economy (71st ed.)*. S. Chand Publishing.

Ghosh, A. (2020). *Microeconomics: Theory and Applications*. Oxford University Press.

Gordon, R. J. (2019). Microeconomics (13th ed.). Pearson.

Kaur, R. (2022). Microeconomics: A Textbook for Economics Students. Kalyani Publishers.

Kumar, N. (2023). Principles of Microeconomics. Taxmann Publications Pvt. Ltd.

UNIT

4

BASIC PROBLEMS OF INDIAN ECONOMY

CONTENTS

- 4.0 Aims and Objectives
- 4.1 Introduction
- 4.2 Significance and Advantages of Economics
- 4.3 Different Economic Systems
- 4.4 Economic Problems
- 4.5 Reasons behind Economic Problems
 - 4.5.1 Problems faced by an Economy
- 4.6 General Framework Explaining the Economic Problems
- 4.7 Characteristics of an Underdeveloped Economy
- 4.8 Problems faced by Indian Economy
- 4.9 Factors affecting Economic Growth
- 4.10 Objectives for Planning in India
- 4.11 Achievements of the Economic Planning in India
- 4.12 Drawbacks of the Economic Planning
- 4.13 Let Us Sum Up
- 4.14 Unit End Activity
- 4.15 Keywords
- 4.16 Questions for Discussion
- 4.17 References & Suggested Readings

4.0 AIMS AND OBJECTIVES

After studying this lesson, you should be able to:

- Discuss the importance and advantages of Economics
- Know about the Different Economic Systems and Economic problems
- Explain the reasons for the Economic problems
- Know about the various Economic problems of the society
- Understand the General Framework explaining the Economic problems
- Describe the characteristics of an Underdeveloped Economy
- Know about the problems faced by Indian Economy
- Explain the Factors affecting Economic Growth
- Understand the objectives for Planning in India
- Know about the Achievements and Drawbacks of the Economic Planning in India

4.1 INTRODUCTION

We know that in every society there are unlimited wants and the resources are limited or scarce. It is seen that these resources also have alternative uses. Due to this reason every society has to decide what they are to produce using these scarce resources. Hence each economy has to make a choice by thinking of the kind of products they want or what quantity is to be produced. Like every economy needs to decide whether to produce more services such as transport or hospitals, or consumable goods such as more clothes, houses or more capital goods such as roads, buildings, etc. The economy must decide which goods and services to produce and which goods and services to exclude from production if the problem of choice arises between commodities. Any allocation of resources of the society would result in the production of a particular combination of different goods and services. The goods and services thus produced will have to be distributed among the individuals of the society. The allocation of the limited resources and the distribution of the final mix of goods and services are two of the basic economic problems faced by the society.

Production, exchange and consumption of goods and services are among the basic economic activities of life. In the course of these basic economic activities, every society has to face scarcity of resources and it is the scarcity of resources that gives rise to the problem of choice. The scarce resources of an economy have competing usages. In other words, every society has to decide on how to use its scarce resources.

In reality, all economies are mixed economies where some important decisions are taken by the government and the economic activities are by and large conducted through the market. The only difference is in terms of the extent of the role of the government in deciding the course of economic activities. In the United States of America, the role of the government is minimal. The closest example of a centrally planned economy is the Soviet Union for the major part of the twentieth century. In India, since Independence, the government has played a major role in planning economic activities. However, the role of the government in the Indian economy has been reduced considerably in the last couple of decades.

4.2 SIGNIFICANCE AND ADVANTAGES OF ECONOMICS

As we have read earlier that economics is concerned with the satisfaction of human wants. It is related to production, consumption and distribution of resources in the economy among individuals and groups. Economics, these days touches everyone, whether he is an employee, a businessman, a tailor, an advocate, a labourer, a banker or a house-wife. Economics has got both theoretical and practical significance.

Advantages

- ***Increase in knowledge:*** The study of Economics helps us to understand the concepts of national income, employment, consumption, savings, capital formation, investment, price mechanism, demand and supply, etc. It also enables us to understand the fiscal, monetary and industrial policy of the government.
- ***Developing analytical attitude:*** Economics as a science creates and develops logical thinking towards various economic problems. The study of Economics makes us capable of analysing various data regarding economic events.
- ***Significance for the consumers:*** Every consumer has limited means to satisfy his unlimited wants. Economics is significant for the consumers in the sense that it tells them, how to make the best possible use of the funds available with them among different heads.

- **Significance for producers:** Production is the effective combination of land, labour, capital and enterprise as factors of production. Producers attain the knowledge of producing maximum quantity of goods at minimum cost. Economics helps the producers in determining the remuneration of various factors of production, i.e., wages to workers, rent to land, and interest to capital and profit to entrepreneur. It also helps the producers in the fixation of the price of their commodity.
- **Significance for workers:** The study of Economics enables workers to understand their significance in the production process. They are also in a position to understand the concept of wages. They discuss labour problems with the management and save themselves from being exploited.
- **Significance for politicians:** A good politician must have the knowledge of various economic problems such as unemployment, rising prices, vicious circle of poverty and economic development of various sectors and regions. It is a tragedy that our politicians misuse the statistics to prove their point of view and not present the real situations.
- **Significance for academicians:** Economics as a science develops scientific outlook. Economic theories explain the concept of consumption, production, investment and distribution. They also tell about the various economic problems, their causes, effects and their possible solutions.
- **Significance for administrators:** Fiscal and monetary policies are formulated by the administrators, so they must know the theories of taxation and finance. It will enable them to understand the sources of public revenue and debt.
- **Effective man-power planning:** Developing economies suffer from over-population and under-utilisation of resources. Unemployment is their chronic disease. Economics will help in making effective plans for making the best possible use of all the adult people.
- **Helpful in fixing price:** Economic theories regarding value and equilibrium tell the producers to raise their output upto a limit, where marginal cost equals marginal revenue. It also helps the manufacturers to fix up price under different situations.
- **Solving distribution problems:** Production as we know is the result of the combination of factors of production, such as land, labour, capital and enterprise. Land is paid rent, labour is paid wages and salaries, interest is paid on capital and the enterprise gets profit. It is very difficult to fix the reasonable remuneration payable to each factor of production.

Theory of distribution in Economics suggests that every factor should be paid according to its marginal productivity. Economics these days touches each and every aspect of human life.

4.3 DIFFERENT ECONOMIC SYSTEMS

An economic system refers to how the different economic elements will solve the central problems of an economy: what, how and for whom to produce. That refers to the production and distribution of goods and services within which economic activity takes place. It refers to the way different economic elements, individual workers and managers, productive organisation such as factories or firms and government agencies are linked together to form an organic whole. An economic system is a way of answering these basic questions. Different economic systems answer the above questions differently.

Economic system consists of various individuals and their institutions like banking institutions, educational institutions and economic institutions. The most general economic systems are:

- Traditional Economy
- Capitalist Economy
- Socialist Economy
- Mixed Economy

Traditional Economy

In traditional economy, the basic problems are solved by traditions and custom rules every aspect of behaviour. It produces exactly to its consumption requirements. It is a subsistence economy. There is not much of sales as there is only small scale production. The same product will be produced by every generation. The production techniques are traditional.

Capitalist Economy

A capitalist economy is an economic system in which the production and distribution of commodities take place through the mechanism of free markets. Hence, it is also called as market economy or free trade economy. Each individual be it a producer, consumer or resource owner has considerable economic freedom. An individual has the freedom to buy and sell any number of goods and services and to choose any occupation. Thus, a market economy has no central coordinator guiding its operation. But self-organisation emerges amidst the functioning of market forces namely supply, demand and price. The salient features of capitalism are:

- **Right to Private Property:** Individuals have the right to buy and own property. There is no limit and they can own any amount of property. They also have legal rights to use their property in any way they like.
- **Profit-Motive:** Profit is the only motive for the functioning of capitalism. Production decisions involving high risks are taken by individual only to earn large profits. Hence, profit-motive is the basic force that drives the capitalist economy.
- **Freedom of Choice:** The question 'what to produce?' will be determined by the producers. They have the freedom to decide. The factors of production can also be employed anywhere freely to get due prices for their services. Similarly consumers have the freedom to buy anything they want.
- **Market Forces:** Market forces like demand, supply and price are the signals to direct the system. Most of the economic activities are centered on price mechanism. Production, consumption and distribution questions are expected to be solved by market forces.
- **Minimal Role of Government:** As most of the basic economic problems are expected to be solved by market forces, the government has minimal role in the economy. Their role will be limited to some important functions. They include regulation of market, defence, foreign policy, currency, etc.

Merits of Capitalist Economy

- **Increase in Productivity:** In a capitalist economy every farmer, trader or industrialist can hold property and use it in any way he likes. He increases the productivity to meet his own self-interest. This in turn leads to increase in income, saving and investment.

- **Maximises the Welfare:** It is claimed that there is efficiency in production and resource use without any plan. The self-interest of individual also promotes society's welfare.
- **Flexible System:** The shortages and surpluses in the economy are generally adjusted by the forces of demand and supply. Thus, it operates automatically through the price mechanism.
- **Non-interference of the State:** The State has a minimum role to play. There is no conflict between the individual interest and the society. The economic institutions function automatically preventing the interference of the government.
- **Low Cost and Qualitative Products:** The consumers and producers have full freedom and therefore it leads to production of quality products at low costs and prices.
- **Technological Improvement:** The element of competition under capitalism drives the producers to innovate something new to boost the sales and thereby bring about progress.

Disadvantages of Capitalist Economy

- **Inequalities:** Capitalism creates extreme inequalities in income and wealth. The producers, landlords, traders reap huge profits and accumulate wealth. Thus the rich become richer and the poor poorer. The poor with limited means are unable to compete with the rich. Thus capitalism widens the gap between the rich and the poor creating inequality.
- **Leads to Monopoly:** Inequality leads to monopoly. Mega corporate units replace smaller units of production. Firms combine to form cartels, trusts and in this process bring about reduction in number of firms engaged in production. They ultimately emerge as Multinational Corporations (MNCs) or Transnational Corporations (TNCs). They often hike prices against the welfare of consumer.
- **Depression:** There is over-production of goods due to heavy competition. The rich exploit the poor. The poor are not able to take advantage of the production and hence are exploited. At another level, over-production leads to glut in the market and hence depression. This leads to economic instabilities.
- **Mechanisation and Automation:** Capitalism encourages mechanisation and automation. This will result in unemployment particularly in labour surplus economies.
- **Welfare Ignored:** Under capitalism, private enterprises produce luxury goods that give higher profits and ignore the basic goods which give less profit. Thus the welfare of public is ignored.
- **Exploitation of Labour:** Stringent labour laws are enacted for the exclusive profit motive of capitalists. Fire and hire policy will become the order of the day. Such laws also help to exploit the labour by keeping their wage rate at its lowest minimum.
- **Basic Social Needs are Ignored:** There are many basic social sectors like literacy, public health, poverty, drinking water, social welfare, and social security. As the profit margin in these sectors is low, capitalists will not invest. Hence most of these vital human issues will be ignored in a capitalist system.

Socialist Economy

In a socialist economy, the means of production are owned and operated by the State. All decisions regarding production and distribution are taken by the central planning

authority. Hence the socialist economy is also called as planned economy or command economy. The government plays an active role. Social welfare is given importance; hence equal opportunity is given to all. All such advantages have delivered high level of human development. Some of the most successful socialist economies are China, Cuba, Vietnam and North Korea. The following are the basic characteristic features of socialism:

- **Social Welfare Motive:** In socialist economies, social or collective welfare will be the prime motive. Unlike capitalism, profit will not be the aim of policy making. The decisions will be taken keeping the maximum welfare of the people in mind. Thus social well-being of people will be the purpose of development.
- **Limited Right to Private Property:** The right to private property is limited. All properties of the country will be owned by the State. That is, the ownership is collective in nature. Hence no individual can accumulate too much property as in the case of capitalism.
- **Central Planning:** Most of the economic policy decisions will be taken by a centralised planning authority. Each and every sector of the economy will be directed by well designed planning.
- **No Market Forces:** In a centralised planned system of development, market forces have only a limited role to play. Production, commodity and factor prices, consumption and distribution will be governed by development planning with welfare motive.

Merits of Socialist Economy

- **Efficient Use of Resources:** The resources are utilised efficiently to produce socially useful goods without taking the profit margin into account. Production is increased by avoiding wastes of competition.
- **Economic Stability:** Economy is free from business fluctuations. Government plans well and everything is well coordinated to avoid over-production or unemployment. There is stability because the production and consumption of goods and services are well regulated.
- **Maximization of Social Welfare:** All citizens work for the welfare of the state. Everybody receives his or her remuneration. The state concentrates on the production of basic necessities instead of luxury goods. The state provides free education, cheap and congenial housing, public health amenities and social security for the people.
- **Absence of Monopoly:** The elements of corporation and monopoly are eliminated since there is absence of private ownership. The state is a monopoly but produces quality goods at reasonable price.
- **Basic Needs are Met:** In socialist economies, basic human needs like water, education, health, social security, etc, are provided. Human development is more in socialist countries.
- **No Extreme Inequality:** Since the social welfare is the ultimate goal, there is less concentration of wealth. Extreme inequality is prevented in socialist system.

Demerits of Socialism

- **Bureaucratic Expansion:** A socialist economy is operated under a centralised command and control system. People here work out of fear of higher authorities. It does not give any initiative for the people to work hard.
- **No Freedom:** Allocation of factors of production is not done rationally and there is no freedom of choosing the occupation. Jobs are provided by the State. Place of work is also provided by the State. The consumer's choice is very limited.

- **Absence of Technology:** Work is monotonous and no freedom is given. Any change in the production process will alter the entire plan. Hence any innovation cannot be easily enforced. Everything is rigid and technological changes are limited.
- Absence of competition makes the system inefficient.

Mixed Economy

In a mixed economy, both public and private institutions exercise economic control. The public sector functions as a socialistic economy and the private sector as a free enterprise economy. All decisions regarding what, how and for whom to produce are taken by the state. The private sector produces and distributes goods and services. It manufactures consumer and capital goods in the interest of public welfare. A mixed economy possesses the freedom to hold private property, to earn profit, to consume, produce and distribute and to have any occupation. But if these freedoms affect public welfare adversely, they are regulated and controlled by the State. The main features of mixed economic system are:

- **Co-existence of Public and Private Sectors:** In a mixed economy, both the public and the private sectors initiatives will be there. The most strategically and nationally important sectors of the economy will be reserved for the public sector. The rest will be left for private operation. While the public sector will have social welfare as the prime motive, the private sector will function with profit motive.
- **Consolidation of Merits of Capitalism and Socialism:** As seen above, both capitalism and socialism have merits and demerits. Mixed economy is expected to retain only the merits of the two systems. For instance, the government is expected to allow private investment, but the government also controls monopolies.
- **Planning:** Economic planning is another important feature of the mixed economy. Planning will direct the relative roles of public and private sectors and their respective jurisdictions.

Merits of Mixed Economy

- **Efficient Resource Utilisation:** The resources are utilised efficiently as good features of both capitalism and socialism coexist. If there is misallocation of resources, the State controls and regulates it. This ensures the efficient utilisation of resources.
- **Prices are Administered:** The prices are not fixed always by forces of demand and supply. In the case of goods which are scarce, the prices are administered by the government and such goods are also rationed.
- **Social Welfare:** In a mixed economy, planning is centralised and there is overall welfare. Workers are given incentives and reward for any innovations. There is social security provided to the workers. Inequalities of income and wealth are reduced.

Demerits of Mixed Economy

- **Lack of Co-ordination:** The coordination between the public and private sectors is poor in a mixed economy. Public sector spends huge public resources for infrastructure. The private sector aims at profit maximisation by using the infrastructure created by the public sector. But they lack social responsibility and fail to spend for public causes like health, education. The private sector also dislikes any restriction imposed on it by the government.

- **Red Tapism and Delay by Public Sector:** There is every chance that the public sector works inefficiently. There is too much of Red Tapism and corruption leading to delays in decision-making and project implementation. They result in inefficiency and also affect production.
- **Economic Fluctuations:** The mixed economies experience economic fluctuations. On the one hand, the private sector does not operate under very rigid conditions prescribed by the government. On the other hand, the public sector too does not operate under very rigid conditions enforced by the planned economy. The lack of policy coordination between private and public sector results in economic fluctuations.

4.4 ECONOMIC PROBLEMS

In any society, human wants are unlimited. If one want is satisfied, the other appears soon. For instance, if the basic needs of human beings (e.g., food, clothing and shelter) are satisfied then some secondary needs appear very soon. These secondary needs may be social needs, i.e., need for attaining a social function, need for fulfilling some social obligations, etc. However, in comparison to these unlimited human wants, the resources required to satisfy such wants remain limited.

We cannot find any single individual, family or country in the whole world, who can fulfill all his wants. It clearly shows that wants are unlimited and the means are limited. Thus, this scarcity of means in relation to wants brings forth before us the problem that how much resources should be used in satisfying different wants. In this way, one has to choose certain set of wants from among unlimited wants, which are to be satisfied by his limited resources. In Economics, this very problem of choice making is called economic problem.

Explaining it Prof. Friedman has also said that whenever limited resources are used to satisfy different ends, economic problem arises. According to Prof. Eric Roll, “the economic problem is essentially a problem arising from the necessity of choice; choice of the manner in which limited resources with the alternative uses are disposed off. It is the problem of husbandry of resources”.

Thus, the main problem before any society is to satisfy the unlimited wants with limited resources. Here arises the problem of choice or selection. It implies that every society has to arrange its requirements in order of priority. Then, with its limited resources, the society has to satisfy the human wants in order of priority. In Economics, we try to analyse the causes behind these basic economic problems and find out possible ways to solve the said problems.

4.5 REASONS BEHIND ECONOMIC PROBLEMS

As we have read earlier that all societies face the economic problem, which is the problem of how to make the best use of limited, or scarce, resources. The economic problem exists because, although the needs and wants of people are endless, the resources available to satisfy needs and wants are limited. The main causes behind the economic problems of any society are:

- **Unlimited human wants:** Every human being requires varieties of goods and services for maintaining and improving his or her standard of living. Whenever the basic needs of food, clothing and shelter are fulfilled then the people feel that they ‘want’ and ‘need’ education, book, pen and pencil, eraser, chair, table, television, tape-recorder, CD-player, computer, travel, sports, finer clothes, washing machine, and thousands of such items. In a modern society, these wants are increased further in response to the pressures of fashion and advertising. These wants appear one after another like untiring waves of the sea.

- **Limited resources for satisfying these wants:** Production of various goods and services require resources like land resources, mineral resources, forest resources, physical capital (e.g., machines, factory sheds, etc.) and money capital, human resources (e.g., skilled man power), etc. However, compared to the unlimited wants for various goods and services, these resources seem to be insufficient. It implies that even if all these available resources are fully employed for producing various goods and services, only a small part of human wants can be satisfied. So, scarcity of resources is an important reason behind the economic problem in any society.

4.5.1 Problems faced by an Economy

Economics is mainly concerned with the achievements and uses of material requirements to satisfy human wants. However, human wants are unlimited and productive resources are unlimited. Therefore, goods and services which satisfy human wants are scarce. Because of the scarcity and limited resources and limited availability of goods and services we have basic economic problems. In recent times, economists have analysed economic systems from a broad perspective. The available resources of the society may be used to produce various commodities for different groups and in different manner. It requires that decisions regarding the following should be made. These modern economists talk about three main economic problems:

1. What to produce;
2. How to produce; and
3. For whom to produce.
4. How to use the Resources efficiently.

In short, these are called the 'What, How and for Whom' questions.

What to Produce?

The very first question that any economic system must answer is: What goods and services are to be produced in a society and in what quantities? This question arises from the fact that human wants are unlimited, while resources are limited. The satisfaction of human wants requires the consumption of goods and services. Human beings, therefore, wish to consume goods and services. But, since resources are limited, the economic system cannot produce all types of goods and services. Even any particular good or service cannot be produced in an infinitely large quantity. Only finite amounts of a limited number of goods and services can be produced. Therefore, there arises this decision problem. The economy must decide which goods and services to produce and which goods and services to exclude from production. The economy must choose its production plan carefully. Everything cannot be produced and even those things which are produced cannot be produced in unlimited quantities.

How to Produce?

The second basic problem that every economy must solve is that of deciding how to produce the goods and services (that the economy has decided to produce). A particular quantity of a particular good or service can be produced in many different ways. The economy must choose a particular way of producing the specified amount of the good. Moreover, this must be done for each of the different goods and services that the economy wants to produce. This is the problem of choice of technique. There are mainly two types of technology available for the production of a good. First is the labour intensive technology, which uses more labour than machines and second is the capital intensive technology, in which there is more use of capital or machines as compared to the labour. Further it means with what combination of resources a society decides to produce goods. Usually, there are various alternatives; there are various

techniques of production of a commodity. In order to explain these problems we take into account the two factors of production, they are labour and capital. An economy having abundance of labour would produce labour intensive production, on the other hand, economy having huge supply of capital intensive production. For example, India is a Labour Intensive Country and Japan is Capital Intensive Country.

Choice of Techniques

In the language of the economists, a particular way of producing a particular good or service (or a set of goods and services) is called a technique of production. For instance, in some cases, a particular amount of a particular good can be produced by different combinations of inputs. Thus, it may be that 10 tons of wheat can be produced either on 2 hectares of land by 5 agricultural workers or on 4 hectares of land by 2 workers. Here, there are two techniques for producing 10 tons of wheat: (2 hectares of land, 5 workers) and (4 hectares of land, 2 workers). An economy which has decided to produce 10 tons of wheat must choose between these two techniques. There is a similar problem for every good (or every set of goods). Therefore, the question 'how to produce' is also known as the problem of choice of techniques.

For Whom to Produce?

This is the problem of distribution of goods between different income groups of the society. How many resources are used for the rich and the middle class and what is left for the poor? This tells us about the relative importance the economy gives to the needs of the rich and poor. It also means the choice between present and the future needs. It implies how the national product is distributed among the various sections of societies, there are limited resources which an economist has to decide who should get what and how much. This is to say how the national income is distributed among various segments of the society. An economy has to check whether this distribution is proper and the weaker section of the society is not deprived of the basic necessities of life.

Suppose now that the first two basic problems have been solved i.e., the economy has decided the amounts of production of various goods and services and has also chosen the appropriate techniques for producing them. There still remains the problem of deciding the manner in which the produced goods and services will be used. That will, obviously, be used to satisfy human wants. But among the members of society, who will receive how much of the produced commodities? In other words, after the commodities have been produced, there remains the task of deciding how they will be distributed. Who will get (to consume) the produced commodities? This is known as the question: 'For whom to produce? It is also known as the problem of distribution.

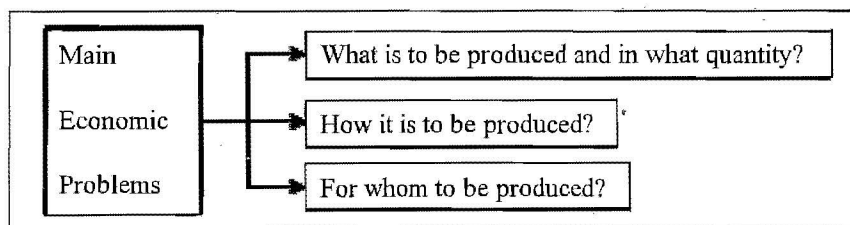


Figure 4.1: Problems Relating Produced Goods and Services

How to Use Resources Efficiently?

The last basic problem is how to use the resources efficiently. Resources are efficiently used if the maximum output is obtained from a given quantity of resources. Resources can be made efficient by carefully handling the following areas:

- Proper training on using the resources
- Proper maintenance of machine and tools

- Division of labour
- Avoiding wastage of all kinds

4.6 GENERAL FRAMEWORK EXPLAINING THE ECONOMIC PROBLEMS

Every economic system, be it capitalist, socialist or mixed has to deal with the problem of scarcity of resources relative to wants for them. The problem of scarcity of resources is felt not only by individuals but also by a society as a whole. Along with the individuals, a society as whole has limited resources. It has to decide what to produce with the limited resource. It has to make choice about the quantity of different commodities. Choice emanates from scarcity. Thus our choice is always constrained or limited by scarcity of our resources. Suppose we have enough resources we can produce all that we want.

All such choices can be made with help of production possibility curve. The production-possibility curve separates outcomes that are possible for the society to produce from those which cannot be produced subject to the available resources.

Professor Paul Samuelson is a leading figure among those economists who have explained the working of the economic system through these three questions. According to Samuelson, the main functions of an economic system are to answer these three questions.

Explanation of these Problems using Production Possibility Curve

Professor Samuelson used the concept of the production possibility curve to explain the economic problem of a society.

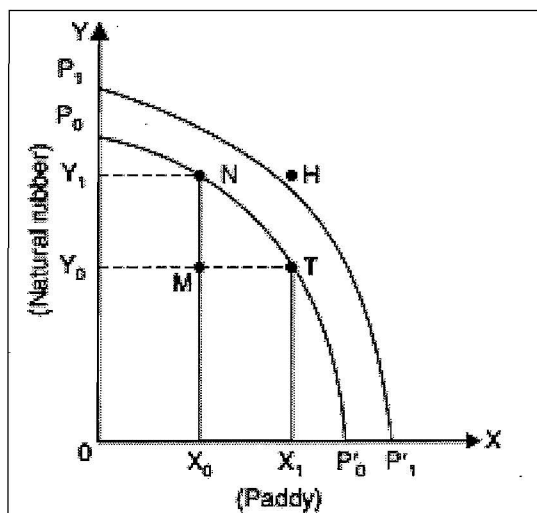


Figure 4.2: Production Possibility Curve

A production possibility curve is the locus of all such combinations of two commodities which can be produced in a country with its given resources and technology. In the figure above, P_0P_0' is the production possibility curve of a country. It shows different combinations of paddy (X) and natural rubber (Y) which the country can produce with its available resources and technology. It can choose any such combination like N or T which lies on this curve.

- **Limited resource:** Here, the combination point N shows $0Y_1$ amount of natural rubber and $0X_0$ amount of paddy. Again, the combination point T shows $0Y_0$ amount of natural rubber and $0X_1$ amount of paddy. Thus, point N shows

relatively higher amount of natural rubber as compared to point T. It implies that if the country wants to produce more of paddy, it has to reduce the production of natural rubber. This shows the limited availability of natural resources. Due to this reason, the country cannot choose any such combination like 'H' which lies beyond the production possibility curve.

- **The problem of 'what to produce and in what quantity':** This curve also reflects the problem of 'what to produce'. If the country uses all of its resources for the production of only natural rubber then the maximum possible production of natural rubber will be OP'_0 . In that case, there will be no production of paddy. Similarly, if the country uses all of its resources for the production of paddy then, the maximum possible production of paddy will be OP_0' . But in that case, the production of natural rubber will be zero.
- **Efficient utilisation of available resources:** If the country chooses the combination point M, i.e., if it produces OX_0 of paddy and OY_0 of natural rubber then it would indicate inefficient utilisation of resources. Here, the country can increase the production of paddy from OX_0 to OX_1 by keeping the production of natural rubber unchanged at OY_0 (i.e., the country can move from point M to T). Similarly, in this situation, the country can also increase the production of natural rubber from OY_0 to OY_1 by keeping the production of paddy unchanged at OX_0 (i.e., the country can move from point M to N). Thus, if the country chooses any combination of X and Y on the production possibility curve, it implies efficient utilisation of available resources. However, if it chooses any combination that lies below that curve, it would indicate inefficient utilisation or under utilisation of resources.
- **Improvement in technology and increase in the amount of resources:** If new resources are available or if the level of technology is improved (e.g., application of high-yielding varieties of seeds, better methods of cultivation, better irrigational facilities, etc.) then the whole production possibility curve will shift outward. This is shown by $P_1P'_1$ curve in Figure 4.2. In that case, the country can produce more of both X and Y commodities. The possible ways of solving the basic economic problems will be discussed in subsequent lesson.

4.7 CHARACTERISTICS OF AN UNDERDEVELOPED ECONOMY

- **Low per Capita Income:** The level of per capita income is very low in underdeveloped countries.
- **Poor Level of Living:** The vast majority of people in under-developed nations lie under the conditions of poverty, malnutrition, disease, illiteracy, etc. Even basic necessities of life such as minimum food clothing and shelter are not easily accessible to the poor masses.
- **High Rate of Growth of Population:** Population growth in under developed countries neutralises economic growth. High population implies greater consumption expenditure and lower investments in productive activities and slows down the economic development.
- **Highly Unequal Income Distribution:** The income inequality between the rich and the poor people within the under-developed countries is also very high.
- **Prevalence of Mass Poverty:** Low level of per capita income combined with high degree of inequalities in its distribution leads to widespread poverty in under-developed countries.

- **Low Levels of Productivity:** The Productivity level (i.e., output produced per person) tends to be very low in an under-developed country which is mainly due to:
 - ❖ Inefficient workforce which itself is a consequence of poverty, ill health and lack of education;
 - ❖ Low work culture;
 - ❖ Low use of capita in the form of machinery and equipment.
- **Low Rate of Capital Formation:** The saving rate in an under-developed country is quite low and rate of capital formation is also is very slow.
- **Technological Backwardness:** In most of the sectors, an under-developed economy the techniques of production employed are generally obsolete mainly due to low saving rate.
- **High Level of Unemployment:** Unemployment levels are very high in the underdeveloped countries mainly due to lack of capital and low level of development in various economic sectors, these countries are not able to absorb the rising labour supply.
- **Low Social Indicators of Development:** The under-developed countries have very low social indicators such as low literacy rate, high infant mortality rate, low expectancy of life, etc. as compared to the developed countries.

4.8 PROBLEMS FACED BY INDIAN ECONOMY

Let us now list the features of Indian economy as follows:

- **Low per capita income:** Economic growth of any country can be viewed from its level of national income and per capita income. It is said that higher the level of national income, higher is the rate of economic growth. India is known in the world as a country with low per capita income. Per capita income is defined as the ratio of national income over population. It gives the idea about the average earning of an Indian citizen in a year, even though this may not reflect the actual earning of each individual. India's per capita income for the year 2012-2013 is estimated at ₹ 39,168. This comes to about ₹ 3,264 per month. If we compare India's per capita income with other countries of the world then it can be seen that India is well behind many of them. For example, the per capita income of USA is 15 times more that of India while China's per capita income is more than three times of India.
- **Vast inequalities in income and wealth:** Not only per capita income is low, but Indian economy is also marked by great inequalities in the distribution of income and wealth. In India, as years roll on, inequalities are on the rise. The logical corollary of this inequality is mass poverty. Nearly 60 per cent of the total population share one-third of India's national income while only rich 5 per cent of the total population enjoy the same amount of national income.

This inequality widens the problem of poverty. Even in 1972-73, more than 50 per cent of the total population lived below the poverty line. Thanks to some economic progress it has come down from 36 per cent in 1993-94 to about 27.5 per cent in 2004-05, poverty estimate based on Uniform Recall Period. In short, Indian economy still reels under the vicious circle of poverty.
- **Heavy population pressure:** India is world's second largest populated country after China. According to the 2011 census, India's population stands at more than 121 crores. It increased at a rate of 1.03 per cent during 1990-2001. The main

cause of fast rise in India's population is the sharp decline in death rate while the birth rate has not decreased as fast. Death rate is defined as the number of people died per thousand of population while birth rate is defined as the number of people taking birth per thousand of population. In 2010, the birth rate was 22.1 persons per one thousand populations while the death rate was only 7.2 persons per one thousand populations. Low death rate is not a problem. In fact, it is a sign of development. Low death rate reflects better public health system. But high birth rate is a problem because it directly pushes the growth of population. After 1921, India's population increased very fast because birth rate declined very slowly while death rate declined very fast. From 49 in 1921, the birth rate declined to 22.1 in 2010 while during the same time period, death rate declined from 49 to 7.2. Hence the population growth was very rapid in India. Heavy population pressure has become a major source of worry for India. It has put burden on the public exchequer to mobilise enough resources to provide public education, health care, infrastructure, etc.

- ***Dependence of population on agriculture:*** Majority of India's working population depends on agricultural activities to pursue their livelihood. In 2011 about 58 per cent of India's working population was engaged in agriculture. Less developed countries live mainly upon agriculture and extra active industries, like mining, fisheries and forests. Predominance of agriculture is explained from the view point of sector composition of national income and occupational pattern. In spite of this, the contribution of agriculture to India's gross domestic product is a little over 17 per cent. A major concern of agriculture in India is that productivity in this sector is very less. There are many reasons for this. There is heavy population pressure on land to sustain huge number. Due to population pressure on land the per capita availability of land area is very low and not viable for extracting higher output. Two, since per capita land availability is less, a majority of people are forced to become agricultural labour working at low wages. Three, Indian agriculture suffers from lack of better technology and irrigation facilities. Four, mostly people, who are not educated or not trained properly, are engaged in agriculture. So it adds to low productivity in agriculture.
- ***Poverty and inequality:*** Another very disheartening thing about India is that it has world's largest number of poor people. As per reports of Government of India, in 2011-12 about 269.3 million people in India were poor. This was about 22 per cent of India's population. A person is termed poor if he/she is not able to consume the required amount of food to get a minimum calorie value of 2400 in rural area and 2100 in urban area. For this, the person must earn the required amount of money as well to buy the food items. The government has also estimated that the required amount of money is ₹816 in rural area and ₹1000 in urban area per head per month. This comes to about ₹28 in rural area and ₹33 in urban area per head per day. This is called poverty line. This implies that 269.9 million people of India were not able to earn such little amount in 2011-12.

Poverty goes with inequality in income and wealth distribution. Very few in India possess materials and wealth while majority have control over no or very little wealth in terms of land holding, house, fixed deposits, shares of companies, savings, etc. Only top 5 per cent of households control about 38 per cent of total wealth in India while the bottom 60 per cent of household has control over only 13 per cent of the wealth. This indicates concentration of economic power in a very few hands.

Another issue linked to poverty is the problem of unemployment. One of the most important reasons of poverty in India is that there is lack of job opportunities for all the persons who are in the labour force of the country. Labour force comprises of the adult persons who are willing to work. If adequate numbers of jobs are not

created every year, the problem of unemployment will grow. In India, every year large number of people are added to the labour force due to increase in population, increase in number of educated people, lack of expansion of industrial and service sector at the required speed, etc.

- **Higher rate of capital formation or investment:** At the time of independence, one of the major problems of Indian economy was deficiency in capital stock in the form of land and building, machinery and equipment, saving, etc. In order to continue the cycle of economic activities such as production and consumption, a certain ratio of production must go towards saving and investment. However, the required ratio was never generated in the first four to five decades after independence. The simple reason behind this was higher consumption of necessary items by the population, which happened to be poor and lower middle income class. Collective household saving was very less due to this. Consumption of durable items was also very less. But in recent years things have changed. Economists have calculated that in order to support the growing population, India requires 14 per cent of its GDP to be invested. It is encouraging to note that the saving rate of India for the year 2011 stands at 31.7 per cent. The ratio of gross capital formation was 36.6 per cent. This is possible because people are now able to save in banks, consume durable goods and there has been large scale investment taking place on public utilities and infrastructure.
- **Massive unemployment:** In LDCs, not only natural resources are under-utilised but also a massive wastage occurs in the case of manpower resources. Slow economic growth rate on the one hand, and rapid growth of population on the other hand, has accentuated the problem of unemployment in India.

Between 1971 and 1999, the number of unemployed in India increased by 10 times though the number of job-seekers increased by 2.5 per cent annually; but the employment possibilities increased by a modest rate of 1.8 per cent. The number of registered job-seekers in 2006-07 stood at 40.7 million. Unemployment rate has been rising persistently since the days of economic reforms began. It rose from 1.96 per cent in 1993-94 to 2.39 per cent in 2004-05.

However, employment growth in 2004-05 that stood at 2.89 compared to 0.98 per cent in 1999-2000 is an encouraging development. But employment growth in recent decades does not commensurate with the labour force growth rate. What we experience now is the 'jobless growth'.

- **Underdeveloped infrastructure:** Being an under developed country, India's infrastructural facilities or economic and social overheads of capital are inadequate. It consists of:
 - ❖ Transport and communications,
 - ❖ Energy,
 - ❖ Finance, housing and insurance,
 - ❖ Science and technology, and
 - ❖ Health, education, etc.

Availability of these infrastructures creates the conditions for favourable growth. The superstructure of an economy largely depends on the availability of infrastructural facilities.

As far as social and economic overheads are concerned, India is poor. It is indeed true that her railway and road networks are comparable to the developed nations. But her demand for other infrastructural facilities and services outpace their supplies.

- **Low level of technology:** Compared to other countries, India is poor in information technology. In 2005, the use of personal computers per 1,000 Indians was as low as 16 as against 762 per 1,000 US people. India's health expenditure as a percentage of GDP was 1.39 per cent in 2007-08 over the USA's 15% of GDP.

Thus, India's social infrastructural facilities are not only inadequate compared to the needs, but also awfully low compared to different countries of the world.

Due to illiteracy, use of advanced or sophisticated technology is rather an exception in India. Because of the limited growth of technological institution, we are forced to use primitive methods of technology whose productivity is low.

Though modern industrial sectors employ advanced technology, village industries still employ old and hackneyed methods even in the age of modern science and globalised world. This is nothing but technological dualism that persists in LDCs like India. Truly speaking, low productivity of Indian labour is explained in terms of low level of technology.

4.9 FACTORS AFFECTING ECONOMIC GROWTH

The process of economic growth is a highly complex phenomenon and is influenced by numerous and varied factors such as political, social and cultural factors. These factors are as follows:

Economic Factors

- **Natural Resources:** The principal factor affecting the development of an economy is the natural resources. The natural resources include the land area and the quality of the soil, forest wealth, good river system, minerals and oil resources, good climate, etc. For economic growth, the existence of natural resources in abundance is essential. A country deficient in natural resources may not be in a position to develop rapidly. However, the availability of rich natural resources are a necessary condition for economic growth but not a sufficient one. In less developed countries, natural resources are unutilised, or under-utilised. This is one of the reasons of their backwardness. On the other hand, countries such as Japan, Singapore, etc. are not endowed with abundant natural resources but they are among the developed nations of the world. These countries have shown commitment towards preserving the available resources, putting best efforts to manage the resources, minimising waste of resources, etc.
- **Capital Formation:** Capital formation is another important factor for development of an economy. Capital formation is the process by which a community's savings are channelised into investments in capital goods such as plant, equipment and machinery that increases nation's productive capacity and worker's efficiency thus ensuring a larger flow of goods and services in a country. The process of capital formation implies that a community does not spend whole of its income on goods for current consumption, but saves a part of it and uses it to produce or acquire capital goods that greatly add to productive capacity of the nation.
- **Technological Progress:** Technological progress is a very important factor in determining the rate of economic growth. Technological progress mainly implies the research into the use of new and better methods of production or the improvement of the old methods. Sometimes technical progress results in the availability of natural resources. But generally technological progress results in increase in productivity. In other words, technological progress increases the ability to make a more effective and fruitful use of natural and other resources for increasing production. By the use of improved technology it is possible to have greater output from the use of given resources or a given output can be obtained

by the use of a smaller quantity of resources. The technological progress improves an ability to make a fuller use of the natural resources e.g., with the aid of power-driven farm equipment a marked increase has been brought about in agricultural production. The USA, UK, France, Japan and other advanced industrial nations have all acquired the industrial strength from use of advanced technology. In fact, economic development is facilitated with the adoption of new techniques of production.

- **Human Resources Development:** A good quality of population is very important in determining the level of economic growth. So the investment in human capital in the form of educational and medical and such other social schemes is very much desirable. Human resource development increases the knowledge, the skills and the capabilities of the people that increase their productivity.
- **Population Growth:** Labour supply comes from population growth and it provides expanding market for goods and services. Thus, more labour produces larger output which a wider market absorbs. In this process, output, income and employment keep on rising and economic growth improves. But the population growth should be normal. A galloping rise in population retards economic progress. Population growth is desirable only in a under-populated country. It is, however, unwarranted in an overpopulated country like India.
- **Social Overheads:** Another important determinant of economic growth is the provision of social overheads like schools, colleges, technical institutions, medical colleges, hospitals and public health facilities. Such facilities make the working population healthy, efficient and responsible. Such people can well take their country economically forward.

Non-economic Factors

Non-economic factors that include socio-economic, cultural, psychological and political factors are also equally significant as are economic factors in economic development. We discuss here some of the essential non-economic factors which determine the economic growth of an economy.

- **Political Factors:** Political stability and strong administration are essential and helpful in modern economic growth. The stable, strong and efficient government, honest administration, transparent policies and their efficient implementation develop confidence of investors and attracts domestic as well as foreign capital that leads to faster economic development.
- **Social and Psychological Factors:** Social factors include social attitudes, social values and social institutions which change with the expansion of education and transformation of culture from one society to the other. The modern ideology, values, and attitudes bring new discoveries and innovations and consequently to the rise of the new entrepreneurs. The outdated social customs restricts occupational and geographical mobility and thus pose an obstacle to the economic development.
- **Education:** It is now fairly recognised that education is the main vehicle of development. Greater progress has been achieved in those countries, where education is wide spread. Education plays an important role in human resource development, improves labour efficiency and removes mental block to new ideas and knowledge thus contributes to economic development.
- **Desire for Material Betterment:** The desire for material progress is a necessary precondition for economic development. The societies that focus on self-satisfaction, self-denial, faith in fate, etc. limit risk and enterprise and thus keep the economy backward.

4.10 OBJECTIVES FOR PLANNING IN INDIA

India needs a lot of planning for its economy. Its development process has been continuing through five year plan since the first plan period during 1951-56. The advantage of planning is very well known. Through planning the country sets its priorities first and provides the financial estimates to achieve the same. Accordingly efforts are made to mobilise resources from various sources atleast cost. India has already completed eleven five year plan periods and the twelfth plan is in progress. After every plan a review is made analysing the achievements and short falls. Accordingly, things are rectified in the next plan.

Today India is a growing economy and is recognised everywhere as a future economic power. The per capita income of India is growing at a higher rate than before. India is seen as a big market for various products. All these are possible due to planning in India. During the planning era, India has made progress in different directions. Still, considering the needs of the country, it is inadequate.

The various objectives of economic planning in India are drawn keeping in view its socio-economic problems. Accordingly the objectives as follows:

- **Economic Growth:** The objective of achieving economic growth implies that the real national income and per capita income must grow every year at a targeted rate. Real national income is the measure of national income at a given years price or at a constant price. Real per capita income is the average income of individuals in the economy. It is argued that in order to achieve higher standard of living for each individual/household and the society as a whole, both per capita income and national income must grow in real terms. Since income represents purchasing power, increase in income will enhance the purchasing power of people and the country. When purchasing power will increase then individuals can buy more goods and services to satisfy their wants. The country as a whole can pay for its purchases from abroad called import. Increase in real income also means that the output level or quantity of output is higher than before. Here output includes output in different sectors of the economy such as agricultural output, industrial output and services to satisfy the needs of India's growing population increase in output every year has to be achieved. To achieve higher rate of output, the economy must increase its rate of investment to create infrastructure and capital stock. Infrastructure includes power projects, roads, railways, airports, ports, telecommunication network, buildings, etc. Capital stock includes plant, machinery, banking and insurance, etc. Investment in all these things is necessary to achieve economic growth in real income hence the planners of the country set a target for growth in each five year plan keeping in view the growth of population and demand for goods and services, etc.
- **Increase in Employment:** Employment refers to engagement of the labour force in gainful economic activity such as production of goods and services. Income is generated through the production process where the production process involves employment of factors of production provided by the households. You know that factors of production include land, labour, capital and organisation/entrepreneurship. These factors are owned by the households of the country. As factors are scarce resources and needed to produce goods and services, it is important for the government to create opportunities where in they can be properly used. The production capacity of an economy depends on the amount of the factor resources it possesses. The required amount of output can be generated if these factors of production get employment. The value of the output then can be distributed among the factors as their income in the form of wage for labour, rent to the owner of land and building, interest to the owner of capital and profit to the

entrepreneur. If the country is not able to create employment opportunities to gainfully engage the factors of production, the required amount of output cannot be produced and hence income cannot be generated. Take the example of labour resources in the country. You know that the population of the country supplies the labour force which is in the age group of 15 to 59 years. Every year due to increase in population the number of people in the labour force is also increasing. Most of them are also educated. If there is no enough scope to get employment then they will remain unemployed and unutilised. In fact, the unemployment situation in India is very bad. Besides causing increase in consumption without corresponding increase in production, unemployment also is a cause of various social problems such as poverty and crime, etc. So planners of the Indian economy put creation of employment as a major objective of five year plans.

- **Reduction in Inequality of Income:** India is a country with diverse economic standard of its population. This means that in terms of income level, India lacks uniformity. A large section of India's population belongs to lower income group and termed as poor where as a few are very rich with very high level of income. Income disparity is a major concern of the social angle, women are the worst affected in terms of income standard irrespective of their caste or religion. Similarly the scheduled caste and scheduled tribe population belong to the marginalised section of Indian society as they are at the bottom of the pyramid of development. One of the major reasons of inequality in income is the unequal distribution of asset holding such as per capita land holding, possession movable and immovable property from inheritance, etc. A majority of India's population lives in the rural area and their main work is agriculture. But a few are big land lords and majority is marginal or small farmers and agricultural labourers. Agricultural labourers are so called because they do not have their own land to cultivate and move from one place to another in search of job on a daily or weekly wage basis. Their situation is worse because of their illiteracy and lack of scope in organising themselves. One to their low income they do not have anything to begin to their next generation on the other hand the landlords enjoy higher returns to their property and due to existence of law of inheritance the property remains with their future generations. Hence the rich remains rich and poor remain poor in the country due to possession and lack of private property respectively. India is badly affected due to this inequality. The poor people are not able to support the market due to lack of purchasing power where too much purchasing power with the rich has caused wasteful consumption to increase. Most of the social evils are created due to inequality. Hence, our planners aimed at reducing the inequality in income distribution through planning.
- **Reduction in Poverty:** Another major objective of planning in India is "reduction in poverty". At the time of independence more than fifty per cent of India's population was poor. By the year 2014, nearly 27 to 28 per cent of India's population is under poverty as per government estimates. You will come to know about the manner in which poverty is estimated in India in the lesson on poverty and employment. For the time being let us confine our notion of poverty to the situation where an individual is unable to satisfy his/her basic minimum needs of life. There are lot of people in the country who are not even getting a square meal a day. Lack of employment is a major cause of poverty. It is aggravated by unequal distribution of national wealth and income. Poverty is termed as a curse on human dignity and it has seriously tarnished the image of India in the world. Developed countries do not count India seriously due to its inability to remove poverty. It is proper planning to remove poverty completely from the country.
- **Modernisation of the Economy:** India has been a country of continuous exploitation by foreign powers such as the Mughals who ruled for more than two

hundred years and the British who also ruled the country for another two hundred years. The British in particular, left the country in dire poverty and under-development when they handed over power to Indian government in 1947. Because of the historical reasons Indian economy could not rise from its traditional level of functioning. It remained an agrarian economy and industrially backward.

There was no development in new technology and technological upgradation. Lack of modern technology is a major reason for Indian economy to suffer from low productivity in agriculture and lack of industrial development. During the time of independence and also for many years after that, the major contributor to India's GDP is under-developed industrial and service sector. Combined with his lack of better education and skill development of the population, the occupational structure has also remained biased towards agriculture. Hence, to reverse such trend it is necessary to change the structure of GDP of India by improving the quality of human resources and developing industries and service sector. This can be done by modernisation of the economy.

- **Ensuring Social Justice and Equality:** Indian planning also aimed at achieving a socialistic pattern of society. It can be achieved by ensuring its population social justice and equity. In fact, all the objectives said above are necessary to achieve social justice. But the sufficient condition for sustaining social justice and equitable distribution of income is to introduce reforms in various sectors by changing the age old systems which have perpetuated poverty and inequality and obstructed development of industrial and service sector or caused low productivity in agriculture. So the planners thought to introduce reforms in agriculture and economic policy so that they facilitate growth and equitable distribution of the benefits of development.

4.11 ACHIEVEMENTS OF THE ECONOMIC PLANNING IN INDIA

Economic planning in India was started in 1951. As said earlier, there were certain objectives of economic planning which include: achieving economic growth in terms of increase in real national and per capita income, increase in the level of employment, removal of inequality in the distribution of income removal of poverty, ensuring social and economic justice, etc.

By 2014, India has completed 63 years of planning and has entered into twelfth plan period. It is high time to know the achievements of planning keeping in view its objectives. Let us discuss them.

- **Achievements in Economic Growth:** Achieving economic growth was a major objective of planning. To achieve growth it is necessary to achieve increase in national income and per capita income as well as increase in production of agricultural and industry sectors. A review of different plans shows that, the first five year plan was a success as it achieved a growth rate of 3.6 per cent against a target of 2.1 per cent growth rate in national income. Then except for 5th and 6th plans, during the other plan periods i.e., from second to eleven five year plan the targeted growth rate in national income could not be achieved.

Similarly, the per capita income has attained growth but the rate of growth has been very slow. For example, during the first 30 years of planning the per capita income grew at a very slow rate of 1.2 per cent per year. Recently, this growth rate has increased to some extent. Coming to agriculture, the food grain production has gone up from 51 million ton at the beginning of the first plan to 257.4 million tons in 2011-12. Particularly the production of rice, wheat has been

spectacular, but production of pulses and oil seeds, etc., has been below target. In terms of industrial development, a major achievement has been the diversification of Indian industries. There has been expansion of transport and communications, growth in generation and distribution of electricity and considerable progress in steel, aluminum, engineering goods, chemicals, fertilizers and petroleum products. During the planning period, the per capita availability consumer goods and other essential items has increased considerably. The goods worth mentioning here include cereals, sugar, milk, egg, edible oil, tea, cloth and electricity.

- **Creation of Infrastructure:** India has achieved a great deal in the area of creation of infrastructure. There has been huge expansion of roads and railway networks. Domestic air travel has increased significantly. Expansion of irrigation and hydro-electric projects has given boost to agricultural production. There has been growth in establishment of towns and cities due to increase in urban infrastructure. Communication network in the form of mobile telephony, internet has expanded tremendously.
- **Development in Education:** One of the brightest areas of achievements of planning has been the development in education in India. There has been a significant increase in the enrolment of children at school level. There are 378 universities and 18,064 colleges in India which is a good development for higher education. India has also 1.52 lakh higher secondary and 10.43 lakh primary and upper primary schools.
- **Development of Science and Technology:** Another significant area of achievement has been the growth in science and technology including the increase in technical and skilled manpower. India's march in space research has been noticed by the developed countries. It has made impact in the field of nuclear energy as well. Today India's dependence on foreign experts for consultation has reduced. On the contrary it is now able to send technical experts to various foreign countries in the Middle East, Africa, etc.
- **Expansion of Foreign Trade:** Due to industrialisation in the country, India's dependence on import of capital goods has delivered. Many items, which were imported earlier are being produced domestically now. Due to industrial progress, India is also able to export manufacturing and engineering goods.

4.12 DRAWBACKS OF THE ECONOMIC PLANNING

Besides the achievements as told above, there are many unfulfilled tasks which the planning in India is yet to achieve completely.

- **Failure to eradicate poverty and inequality completely:** Even after more than sixty years of planning, India has not been able to remove poverty completely. More than 240 million people are still under absolute poverty according to official estimates. The situation is worse in rural area. The government has introduced many antipoverty measures but they have not been very successful so far. Similarly, there is no significant improvement in the distribution of income and asset holding resulting in existence of inequality. The number of landless agricultural labourers is very high as compared to the land holding population. The process of industrialisation has helped some big industrial houses. This has resulted in concentration of economic wealth and power in few hands. This trend must be reversed if India wants to achieve equity and social justice.
- **Persisting problem of unemployment:** In spite of growth in income and output, India's employment situation has not improved much. Due to faster growth of population and labour force the situation has worsened further. According to

official estimates India's unemployment rate is 6.6%. There is also huge backlog of unemployment due to lack of creation of required amount of jobs every year.

- **Failure to curtail corruption and black money:** Existence of rampant corruption in various public offices is a matter of grave concern in India. Common person faces a lot of problem in getting things done without giving bribe. In fact, corruption has become a major political issue in elections. Various forms of corruption include paying or accepting bribe, non-payment of tax to government, political influence to get contract, secret understanding among sellers to increase price, etc. Corruption has given rise to black money which is not accounted anywhere but very much in circulation. A sizeable portion of India's GDP is unaccounted for. Black money creates inflation and pressure in the society. It is also the root cause of inequality in distribution of income as people who possess black money grow richer at the cost of common citizen.
- **Unrealistic plans:** The foremost drawback of Indian plans is that they are based on such assumptions which are invariably inaccurate. For instance, assumptions of capital output ratio, rate of growth, etc. all are over optimistic. Again, estimates regarding the raising of financial resources from taxation and public borrowing have always proved wrong.
- **Wrong implementation:** Wrong implementation of various plans is one of the major obstructions in the path of its success. To Sixth Five Year Plan, the deficiencies in implementation are largely due to inadequate planning of projects at the initial stages. It causes slippages in schedule and poor performance. There are other factors which have been identified for the faulty implementation of plans.
- **Fast growth rate of population:** Growth rate of population is also another retarding factor in the smooth working of the Five Year Plans. Consequently, most of the resources are utilised only for basic needs of the growing population and only a smaller portion is left for development activities. In this way, population is greatly responsible for slowing the pace of economic development during plan periods.
- **No proper coordination:** There also has been no proper coordination among central and state governments which is largely responsible for the failure of plans. Moreover, private sector and public sector do not see eye to eye to each other.

The working groups are overwhelmingly dominated by bureaucrats while a sizable part of the economy is associated in the hands of private sector. Therefore, it is not surprising that both sectors lack in co-ordination which results in failure of achieving certain objectives within a limited time period.

Check Your Progress

Fill in the blanks:

1. The _____ must decide which goods and services to produce and which goods and services to exclude from production is the problem of choice between commodities.
2. Theory of _____ in economics suggests that every factor should be paid according to its marginal productivity.
3. In a _____ economy, both public and private institutions exercise economic control.

Contd...

4. The economic problem exists because, although the needs and wants of people are endless, the _____ available to satisfy needs and wants are limited.
5. Per capita _____ is defined as the ratio of national income over population.
6. By _____, India has completed 63 years of planning and has entered into twelfth plan period.

4.13 LET US SUM UP

- We know that in every society there are unlimited wants and the resources are limited or scarce. It is seen that these resources also have alternative uses. Due to this reason, every society has to decide what they are to produce using these scarce resources. Hence, each economy has to make a choice by thinking of the kind of products they want or what quantity is to be produced.
- As we have read earlier that economics is concerned with the satisfaction of human wants. It is related to production, consumption and distribution of resources in the economy among individuals and groups. Economics, these days touches every one, whether he is an employee, a businessman, a tailor, an advocate, a labourer, a banker or a house-wife. Economics has got both theoretical and practical significance.
- An economic system is a way of answering these basic questions. Different economic systems answer the above questions differently. An economic system refers to how the different economic elements will solve the central problems of an economy: what, how and for whom to produce. It refers to the production and distribution of goods and services within which economic activity takes place.
- In any society, human wants are unlimited. If one want is satisfied, the other appears soon. For instance, if the basic needs of human being (e.g., food, clothing and shelter) are satisfied then some secondary needs appear very soon. These secondary needs may be social needs, i.e., need for attaining a social function, need for fulfilling some social obligations, etc
- As we have read earlier that all societies face the economic problem, which is the problem of how to make the best use of limited, or scarce, resources. The economic problem exists because, although the needs and wants of people are endless, the resources available to satisfy needs and wants are limited.
- Because of the scarcity and limited resources and limited availability of goods and services we have basic economic problems. In recent times, economists have analysed economic systems from a broad perspective. The available resources of the society may be used to produce various commodities for different groups and in different manner. It requires that decisions regarding the following should be made.
- Every economic system, be it capitalist, socialist or mixed has to deal with the problem of scarcity of resources relative to wants for them. The problem of scarcity of resources is felt not only by individuals but also by a society as a whole. Along with the individuals, a society as whole has limited resources. It has to decide what to produce with the limited resource.
- Economic growth of any country can be viewed from its level of national income and per capita income. It is said that higher the level of national income, higher is the rate of economic growth. India is known in the world as a country with low

per capita income. Per capita income is defined as the ratio of national income over population.

- Another very disheartening thing about India is that it has world's largest number of poor people. As per reports of Government of India, in 2011-12 about 269.3 million people in India were poor. This was about 22 per cent of India's population.
- The process of economic growth is a highly complex phenomenon and is influenced by numerous and varied factors such as political, social and cultural factors.
- India needs a lot of planning for its economy. Its development process has been continuing through five year plan since the first plan period during 1951-56. The advantage of planning is very well known. Through planning the country sets its priorities first and provides the financial estimates to achieve the same.
- Economic planning in India was started in 1951. As said earlier, there were certain objectives of economic planning which include: achieving economic growth in terms of increase in real national and per capita income, increase in the level of employment, removal of inequality in the distribution of income removal of poverty, ensuring social and economic justice.

4.14 UNIT END ACTIVITY

Let the students make a presentation with the help of power point and internet on the salient features of the different economy. List the ways on how they solve their basic problems.

4.15 KEYWORDS

Analytical Attitude: It is good at breaking down problems into smaller parts to find solutions.

Traditional Economy: It is an original economic system in which traditions, customs, and beliefs that helps to shape the goods and services which the economy produces, as well as the rules and manner of their distribution.

Capitalist Economy: An economic system and an ideology based on private ownership of the means of production and their operation for profit. Characteristics central to capitalism include private property, capital accumulation, wage labour, voluntary exchange, a price system, and competitive markets.

Socialist Economy: System which is characterised by social ownership and democratic control of the means of production, which may mean autonomous cooperatives or direct public ownership; wherein production is carried out directly for use.

Mixed Economy: An economic system combining private and state enterprise.

Production Possibility Curve: Depicting all maximum output possibilities for two goods, given a set of inputs consisting of resources and other factors. The PPF assumes that all inputs are used efficiently.

Per capita income: Measures the average income earned per person in a given area (city, region, country, etc.) in a specified year.

LDC: Lesser Developed Country

GDP: Gross Domestic Product

4.16 QUESTIONS FOR DISCUSSION

1. What is the significance and advantages of an economic system?
2. "Economics discusses the use of scarce resources to satisfying unlimited ends". Critically elaborate this definition of economics.
3. What are salient features of a capitalist economy?
4. Explain the various problems faced by an Indian economy.
5. What are the factors affecting the economic growth and what are objectives for planning in India?

Check Your Progress: Model Answer

1. Economy
2. Distribution
3. Mixed
4. Resources
5. Income
6. 2014

4.17 REFERENCES & SUGGESTED READINGS

- Agarwal, M. (2021). Principles of Microeconomics. Vikas Publishing House.
- Bhaduri, A. (2020). Microeconomics: Theory and Applications. Oxford University Press
- Choudhury, B. (2021). Essentials of Microeconomics. Wiley India Pvt. Ltd.
- Dutt, R., & Sundaram, K. P. M. (2021). Indian Economy (71st ed.). S. Chand Publishing.
- Ghosh, A. (2020). Microeconomics: Theory and Applications. Oxford University Press.
- Gordon, R. J. (2019). Microeconomics (13th ed.). Pearson.
- Kaur, R. (2022). Microeconomics: A Textbook for Economics Students. Kalyani Publishers.
- Kumar, N. (2023). Principles of Microeconomics. Taxmann Publications Pvt. Ltd.
- Mishra, S. K., & Puri, V. K. (2020). Microeconomics. Himalaya Publishing House.

BLOCK III

UNIT

5

ELASTICITY OF DEMAND

CONTENTS

- 5.0 Aims and Objectives
- 5.1 Introduction
- 5.2 Meaning of Demand
- 5.3 The Law of Demand
 - 5.3.1 Demand Schedule
 - 5.3.2 Demand Curve
 - 5.3.3 Factors behind the Law of Demand
- 5.4 Limitations of Law of Demand
 - 5.4.1 Types of Goods
- 5.5 Meaning and Definition of Elasticity of Demand
- 5.6 Various Concepts of Elasticity of Demand
- 5.7 Importance of the Concept of Elasticity of Demand
- 5.8 Let Us Sum Up
- 5.9 Unit End Activity
- 5.10 Keywords
- 5.11 Questions for Discussion
- 5.12 References & Suggested Readings

5.0 AIMS AND OBJECTIVES

After studying this lesson, you should be able to:

- Understand the meaning of Demand
- Know about the Law of Demand
- Describe the limitations of Law of Demand
- Know about the meaning of Elasticity of Demand
- Analyze the various concepts of Elasticity of Demand
- Know the importance of the concept of Elasticity of Demand

5.1 INTRODUCTION

In Economic science, the term "demand" refers to the desire, backed by the necessary ability to pay. The demand for a good at a given price is the quantity of it that can be bought per unit of time at the price. Supply and demand are the most fundamental tools of economic analysis. Most applications of economic reasoning involve supply and demand in one form or another.

In Economics, demand is related to various factors especially with human wants. When the will to purchase a particular commodity is supported by money it is called demand. Demand depends upon various factors and the change in these factors affect demand, so it is necessary to find out the relationship between changes in these factors and change in demand. This relationship is called demand function. Other things being constant change in price causes the change demand is referred as Law of Demand. Also proportionate change in price causes the proportionate change in demand, is called Elasticity of Demand. Thus, in order to study the relationship between various factors and demand is important to the students.

The concepts of demand and supply are useful for explaining what is happening in the market place. Every market transaction involves an exchange and many exchanges are undertaken in a single day. The circular flow of economic activity explains clearly that everyday there are a number of exchanges taking place among the four major sectors mentioned earlier. A market is a place where we buy and sell goods and services. A buyer demands goods and services from the market and the sellers supply the goods in the market. In economics, demand is "the quantity of goods and services that will be bought for a given price over a period of time". For example, if 10 Lakhs laptops are purchased in India during a year at an average price of ₹ 25000/- then we can say that the annual demand for laptops is 10 Lakhs units at the rate of 25,000/-.

The meaning of the term demand is commonly taken as the desire for a thing. In economics, meaning of the word demand is different from the commonly used. In economics, the word demand is always backed by the enough money to purchase a thing in market.

5.2 MEANING OF DEMAND

Demand means the ability and willingness to buy a specific quantity of a commodity at the prevailing price in a given period of time. Therefore, demand for a commodity implies the desire to acquire it, willingness and the ability to pay for it.

The term 'demand' refers to a 'desire' for a commodity backed by ability and willingness to pay for it. Unless a person has an adequate purchasing power or resources and the preparedness to spend his resources, his desire for a commodity would not be considered as his demand. For example, if a man wants to buy a car but he does not have sufficient money to pay for, his want is not his demand for the car. A want with three attributes - desire to buy, willingness to pay and ability to pay becomes effective demand. Only on effective demand figures in economic analysis and business decisions. The term 'demand' for a commodity (i.e., quantity demanded) has always a reference to 'a price', 'a period of time' and 'a place'. Any statement regarding the demand for a commodity without reference to its price, time of purchase and place is meaningless and is of no practical use. For instance, to say 'demand for TV sets is 50,000' carries no meaning for a business decision, nor it is of any use in any kind of economic analysis.

According to **Stonier and Hague**, "Demand in economics means to pay for the goods demanded". It means a consumer is willing to purchase a commodity and who is having sufficient money, thus the will to purchase a commodity is transformed into demand. Purchasing power therefore plays an important part in creation of demand.

Benham has defined it as "the demand for anything at a given price is the amount of it which will be bought per unit of time at the price." This definition stresses on three aspects of demand viz. price, quantity demanded and time. Thus demand comprises of the elements as purchasing power, price, quantity and time.

Demand and supply are the driving force behind a market economy. This is one of the most important managerial factors because it assists the managers in predicting

changes in production and input prices. The manager can take better decisions regarding the kind of product to be produced, the quantity, the cost of the product and its selling price.

5.3 THE LAW OF DEMAND

The law of demand states that the demand for a commodity increases when its price decreases and it falls when its price rises, other things remaining constant. This is an empirical law, i.e., this law is based on observed facts and can be verified with new empirical data. As the law reveals, there is an inverse relationship between the price and quantity demanded. The law holds under the condition that “other things remain constant”. “Other things” include other determinants of demand, viz., consumers’ income, price of the substitutes and complements, taste and preferences of the consumer, etc. These factors remain constant only in the short run. In the long run, they tend to change. The law of demand, therefore, holds only for a short time.

5.3.1 Demand Schedule

The law of demand can be presented through a demand schedule. Demand schedule is a series of prices placed in descending (or ascending) order and the corresponding quantities which consumers would like to buy per unit of time. Based on the logic of demand curve in figure, a hypothetical demand schedule for a commodity, tea, is given in table below:

Table 5.1: Demand Schedule for Tea

<i>Price per cup of tea (₹) consumer per day</i>	<i>No. of cups of tea demand by a combination</i>	<i>Points representing Price-quantity</i>
7	1	<i>i</i>
6	2	<i>j</i>
5	3	<i>k</i>
4	4	<i>l</i>
3	5	<i>m</i>
2	6	<i>n</i>
1	7	<i>o</i>

The table given above presents seven alternative prices of tea and the corresponding quantities (number of cups of tea) demanded per day. At each price, a unique quantity is demanded. As the table shows, as price of tea per cup decreases, daily demand for tea increases. This relationship between, quantity demanded of a product and its price is the basis of the law of demand.

5.3.2 Demand Curve

The law of demand can also be presented through a demand curve. A demand curve is a locus of points showing various alternative price quantity combinations. Demand curve shows the quantities of a commodity which a consumer would buy at different prices.

The curve DD is the demand curve. It reads the law of demand. Each point on the demand curve shows one unique price-quantity combination. The combinations read downward along the demand curve show decreasing price of tea and increasing number of cups of tea demanded. Price-quantity combinations read upwards show increasing price of tea per cup and decreasing number of cups of tea per day consumed by an individual. Thus, the demand curve shows a functional relationship between the alternative prices of a commodity and its corresponding quantities which consumer would like to buy during a specific period of time, say day, per week, per month, per season, or per year.

5.3.3 Factors behind the Law of Demand

The Demand curve in figure 5.1; slopes downward to the right; this is because of the Law of Demand. The downward slope of the demand curve depicts the law of demand, i.e., the quantity of a commodity demanded per unit of time increases as its price falls, and vice versa. The factors that make the law of demand operate are given ahead:

Market Demand Curve

Market demand is a sum of the individual demand for a commodity in market. Different consumers purchase different quantity at various prices. So all the consumers demand for a particular price which is summed up and market demand is computed at different prices. This provides the total market demand schedule. This table shows that there are two consumers A and B in market.

Table 5.2: Market Demand

Price (₹)	'A's Demand	'B's Demand	Market Demand
5	20	10	30
4	25	15	40
3	10	20	50

Quantities demanded by A and B consumers are as

$$20 + 10, 25 + 15$$

and

$$30 + 20 \text{ at the prices ₹5, 4 and 3 respectively.}$$

It shows the total market demand as 30, 40 and 50 units respectively at the above prices.

If this price-quantity demands relationship is plotted on a graph. We get the downward slopping demand curve. This shows the inverse relationship between the price and quantity demanded of a commodity as shown in Table on page 113; for the commodities and the respective Demand curve in Figure 5.1.

Assumptions

The law of demand is based on following assumptions:

- Consumer's tastes and preferences remain constant. i.e., there is no change in it.
- Income remains constant.

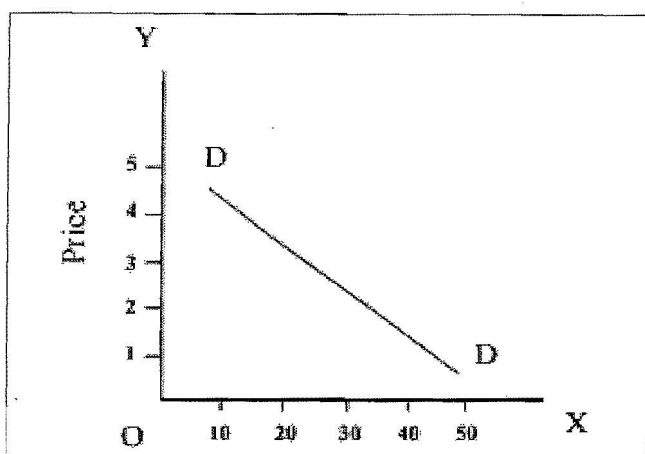


Figure 5.1: Demand Curve

- Prices of substitutes and complements remain constant.
- No substitute is available to the commodity.
- Population remains constant.

Substitution Effect

When price of a commodity falls, prices of all other related goods (particularly of substitutes) remaining constant, the goods of latter category become relatively costlier. Or, in other words, the commodity whose price has fallen becomes relatively cheaper. Since utility maximising consumers substitute cheaper goods for costlier ones, demand for the cheaper commodity increases. The increase in demand on account of this factor is known a substitution effect. Income effect as a result of fall in the price of a commodity, the real income of the consumer increases. Consequently, his purchasing power increases since he is required to pay less for the same quantity. The increase in real income encourages the consumer to demand more of goods and services. The increase in demand on account of increase in real income is known as income effect. It should however be noted that the income effect is negative in case of inferior goods. In case the price of an inferior goods accounting for a considerable proportion of the total consumption expenditure falls substantially, consumers' real income increases and they become relatively richer. Consequently, they substitute the superior goods for the inferior ones. As a result, the consumption of inferior goods falls. Thus, the income effect on the demand for inferior goods becomes negative.

5.4 LIMITATIONS OF LAW OF DEMAND

There are the limitations to the law of demand. They are as follows:

- **Change in income:** If there is change in consumer's income. Law of demand does not operate.
- **Change in tastes and preferences:** If the tastes and preferences of people may go on change, the law of demand could not be found true.
- **Change in prices of other goods:** If prices of other goods i.e., substitutes and complements are changed, the law of demand doesn't show the inverse relationship between price and demand for a commodity.
- **Population change:** If population changes the law of demand does not hold true.
- **Availability of close substitutes:** If there is existence of close substitutes to consumer's goods, the law of demand doesn't fulfill the inverse relationship between price and demand.

Exceptions to the Law of Demand

The law of demand does not apply to the following cases:

- ***Expectations regarding further prices:*** When consumers expect a continuous increase in the price of a durable commodity, they buy more of it despite increase in its price with a view to avoiding the pinch of a much higher price in future. For instance, in pre-budget months, prices generally tend to rise. Yet, people buy more of storable goods in anticipation of further rise in prices due to new levies.
- ***Status Goods:*** The law does not apply to the commodities which are used as a status symbol of enhancing social prestige or for displaying wealth and riches, e.g., gold, precious stones, rare paintings, antiques, etc. goods mainly because their prices are high and buy more of them when their prices move up.
- ***Giffen Goods:*** Another exception to the law of demand is the classic case of Giffen goods. Giffen good may be any inferior commodity much cheaper than its superior substitutes, consumed by the poor households as an essential commodity. If price of such goods increases (price of its substitute remaining constant), its demand increases instead of decreasing because in case of a Giffen good, income effect of a price rise is greater than its, substitution effect. The reason is when the price of inferior good increases, income remaining the same, the poor people cut the consumption of the superior substitute so that they may buy more of the inferior good in order to meet their basic need.
- ***War:*** War period is exception to the law of demand. In this period, scarcity of various goods is prevailing in the country. So people are purchasing goods more at higher prices also. It means that during the war period even though commodity prices remain high, people can demand more and more goods.
- ***Economic Depression:*** The period of economic depression is also another exception to the law of demand. During this period, commodity prices exist at its lowest level, till people do not demanding it in a large quantity. It means that during the period of economic depression price and demand both are remaining lower. Hence, law of demand doesn't be operated.
- ***Essential Goods:*** The goods which are necessary to life of human beings. A consumer doesn't reduce its daily consumption as its price rises or doesn't increase or the price falls.

5.4.1 Types of Goods

There are various types of goods as follows:

- ***Consumer's and Producer's Goods:*** The goods used in final consumption by the consumers are called consumer's goods. Human wants are fulfilled by these goods. Every person consumes these goods to remain efficient. So every person is consuming these goods, e.g., food, milk, coffee, fruits, TV, refrigerator, etc. The goods used by the producer to produce the consumers goods, i.e., inputs are called producer's goods, e.g., machinery, raw material, building, vehicles, etc. The relationship between consumer goods and producers goods is directly proportional. As the demand for consumer's goods increases the demand for producer's goods also increases.
- ***Perishable and Non-perishable Goods:*** The goods which are finished after consumption are called perishable goods, e.g., food, tea, coffee, fruits, milk, vegetables, etc. All of these goods may finish after consumption. So they are called perishable goods. The goods which are used repeatedly in consumption are

called non-perishable goods, e.g., vehicles, motors, bicycles, TV, freeze, mobile, washing machine, clothes, etc.

- **Autonomous Goods:** The goods which are prime in consumption and they have independent demand they are called as autonomous goods, e.g., house is prime good and steel, cement is secondary goods. Similarly motor car and petrol, etc.
- **Derived Goods:** The goods whose demand depends upon the demand for other goods are called derived goods, e.g., house, sand, cement and steel. The demand for steel, cement and sand depends upon the demand of house so, demand for sand, cement, steel is called derived demand and these goods are called derived goods.

5.5 MEANING AND DEFINITION OF ELASTICITY OF DEMAND

Demand extends or contracts respectively with a fall or rise in price. The quality of demand by virtue of which it changes when price changes is called Elasticity of Demand.

In economics, the term elasticity means a proportionate change in one variable relative to a proportionate change in another variable. The quantity demanded of a good is affected by changes in the price of the good, changes in price of other goods, changes in income and changes in other factors. Elasticity is a measure of just how much of the quantity demanded will be affected due to a change in price or income.

Elasticity of Demand is a technical term used by economists to describe the degree of responsiveness of the demand for a commodity due to a fall in its price. A fall in price leads to an increase in quantity demanded and *vice versa*.

“The elasticity (or responsiveness) of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price”.

— *Dr. Marshall*

Elasticity of demand refers to the rate of change of demand to the rate of change in price. Law of demand only expresses the inverse relationship between price and demand of a commodity. But it doesn't say about the proportionate change in demand to the proportionate change in price.

Therefore the concept of elasticity of demand is developed, by 'Alfred Marshall'. Elasticity of demand is defined as "It is ratio of proportionate change in quantity demanded to the proportionate change in price of a commodity". It means that elasticity of demand shows the ratio of percentage change in demand to the percentage change in price. Thus, the elasticity of demand expresses the degree of correlation between demand and price. It is the rate at which quantity demanded varies with a change in price. With the help of this definition elasticity of demand is expressed in mathematical term as:

$$e = \frac{\Delta q}{q} \div \frac{\Delta p}{p}$$

Where

e = Elasticity of demand

q = Initial demand

Δq = Change in demand

p = Initial price

Δp = Change in price

e.g. Let us assume that price of a commodity is decreased, from ₹ 10 to ₹ 5 so that demand increased from 10 to 20 units. Therefore elasticity of demand is calculated as:

$$\begin{aligned} e &= \frac{\Delta q}{q} \div \frac{\Delta p}{p} = \frac{10}{10} \div \frac{5}{10} \\ &= \frac{10}{10} \times \frac{10}{5} \\ &= \frac{10}{5} \\ &= 2 \text{ Therefore elasticity of demand is equal to 2} \end{aligned}$$

Elasticity of Demand is a technical term used by economists to describe the degree of responsiveness of the demand for a commodity due to a fall in its price. A fall in price leads to an increase in quantity demanded and vice versa.

Elasticity means sensitiveness or responsiveness of demand to the change in price. This change, sensitiveness or responsiveness, may be small or great. Take the case of salt. Even a big fall in its price may not induce an appreciable extension in its demand. On the other hand, a slight fall in the price of oranges may cause a considerable extension in their demand. That is why, we say that the demand in the former case is 'inelastic' and in the latter case it is 'elastic'.

The demand is elastic when with a small change in price there is a great change in demand; it is inelastic or less elastic when even a big change in price induces only a slight change in demand. In the words of Dr. Marshall, "The elasticity (or responsiveness) of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price". But the demand cannot be perfectly 'elastic' or 'inelastic'.

Completely elastic demand will mean that a slight fall or rise in the price of the commodity concerned induces an infinite extension or contraction in its demand. Completely inelastic demand will mean that any amount of fall or rise in the price of the commodity would not induce any extension or contraction in its demand. Both these conditions are unrealistic. That is why, we say that elasticity of demand may be 'more or less', but it is seldom perfectly elastic or absolutely inelastic.

5.6 VARIOUS CONCEPTS OF ELASTICITY OF DEMAND

The law of demand indicates the direction of change in quantity demanded to a change in price. It is price elasticity of demand which is usually referred to as elasticity of demand. It states that when price falls, demand rises. But, besides price elasticity of demand, there are various other concepts of demand elasticity.

Demand for a good is determined by its price, incomes of the people, prices of related goods, etc. Quantity demanded of a good will change as a result of a change in the size of any of these determinants of demand. Demand always varies with price.

The law of demand states that there is an inverse relationship between price and quantity demanded. But it does not tell us anything about the proportionate changes. When price of any commodity changes, then demand of that commodity is affected. But the extent of variation is not uniform in all cases. In some cases, the variation is

extremely wide, while in some other cases it may be just nominal. The extent of variation in demand is thus technically expressed as elasticity of demand.

The concept of elasticity of demand, therefore, refers to the degree of responsiveness of quantity demanded of goods to a change in its price, income and prices of related goods. Accordingly, there are three concepts of demand elasticity:

- Price elasticity
- Income elasticity
- Cross elasticity

1. **Price elasticity** of demand relates to the responsiveness of quantity demanded of a good to the change in the price. Price elasticity of demand is a measure of the responsiveness of change in quantity demanded of a good/service to a change in price, *Ceteris Paribus*. As the law of demand indicates, when the price of a good/service increases, the demand of it will decrease. Conversely, when the price of a product decreases, the demand of the product will increase. However, the extent to which a price change impacts the demand differs widely from produce to product.

Price elasticity of demand = (Change in quantity demanded) / (Change in price)

If this value is bigger than one, the product is said to be price elastic (price sensitive), whereby a change in price will lead to a greater than proportionate change in quantity demanded. If the PED is smaller than one, the product will be price inelastic (price insensitive), where percentages change in price will lead to a smaller percentage change in quantity demanded. And when PED=1, the product is unit elastic, where an X% change in price will result in an X% change in quantity demanded.

2. **Income elasticity** of demand refers to the sensitiveness of quantity demanded in the change in incomes. Another factor that can affect the price elasticity of demand would be the price of a good relative to a proportion of one's disposable income; so as one's income changes, the price of the good in terms of a percentage of one's income will change, thus affecting quantity demanded. Income elasticity of demand measures the relationship between a change in quantity demanded for a good and a change in real income.

The income elasticity is calculated by (% change in demand)/(% change in income)

For normal goods, as consumers' income rises, the quantity demanded will rise. Necessities such as food will have a Income Elasticity of Demand smaller than 1 (whereby a change in income will bring about a less than proportionate change in quantity demanded) and luxury goods such as TV sets will have a Income Elasticity of Demand bigger than 1 (whereby a change in income will bring about a more than proportionate change in quantity demanded). However, for inferior goods as consumers' income rises quantity demanded will decrease. Potential examples of inferior goods (this occurs only when there are superior goods available and only if consumers can afford them) include the demand for low-price foods, cigarettes and alcohol.

3. **Cross elasticity** of demand means the degree of responsiveness of demand of goods to a change in the price of related goods, which may be either a substitute for it or a complementary with it.

One of the factors that affect the price elasticity of demand is the substitutes and complementary product that a good or service has. And cross-price elasticity of

demand measures the responsiveness of demand for good X following a change in the price of a related good Y.

Besides these three kinds of elasticity's, there is another type of elasticity of demand called elasticity of substitution which refers to the change in quantity demanded of a good in response to the change in its relative price alone, real income of the individual remaining the same. For complementary goods, the two goods are in joint demand. That is, the relationship between the price of good Y and quantity demanded for good X will look like a normal demand curve. Goods in joint demand are closely related, and the stronger the relationship between two products, the higher cross-price elasticity of demand will be.

A good example would be games and game consoles, as one cannot function without another. And as the price of one increase, the quantity demanded for the complementary good will decrease like any other normal goods due to joint demand, and vice versa. On the other hand, with substitute goods such as several competing brands of bread, an increase in the price of one good will lead to an increase in demand for the rival product, as consumers will likely switch to the cheaper product. And conversely a decrease in price of one good will lead to a decrease in demand for the rival product. It is seen that when consumers become regular purchasers of a product (effect of brand loyalty), the cross price elasticity of demand against rival products will decrease. This reduces the substitution effect that causes consumers to switch to another product when an increase in price occurs, which makes demand less sensitive to price. The result is that firms will potentially be able to charge a higher price, increase total revenue and achieve higher profits.

As said above, price elasticity of demand expresses the response of quantity demanded of a good to changes in its price, given the consumer's income, his tastes and prices of all other goods. Thus, price elasticity means the degree of responsiveness or sensitiveness of quantity demanded of a goods to change in its prices. In other words, price elasticity of demand is a measure of the relative change in its price. Price elasticity can be precisely defined as 'the proportionate change in quantity demanded in response to a small change in price, divided by the proportionate change in price' - (Mrs. Robinson).

Thus,

$$\begin{aligned}\text{Price Elasticity} &= \frac{\text{Proportionate change in the Quantity Demanded}}{\text{Proportionate change in price}} \\ &= \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}} \\ &= \frac{\Delta Q/Q}{\Delta P/P} = \frac{10}{20} = 0.5\end{aligned}$$

ΔQ = change in quantity demanded

ΔP = change in price

P = price

Q = quantity demanded

For example:

Quantity demanded is 20 units at a price of ₹500. When there is a fall in price to ₹400 it results in a rise in demand to 32 units. Therefore the change in quantity demanded is 12 units resulting from the change in price of ₹100.

The Price Elasticity of Demand is $= 500/20 \times 12/100 = 3$

It is a matter of common knowledge and observation that there is a considerable difference between different goods in regard to the magnitude of response of demand to the changes in price. The demand for some goods is more responsive to the changes in price than those of others. In terminology of economics, we would say that the demand for some goods is more elastic than those for the others or the price elasticity of demand of some goods is greater than those of the others.

Marshall who introduced the concept of elasticity in economic theory remarks that the elasticity or responsiveness of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price.

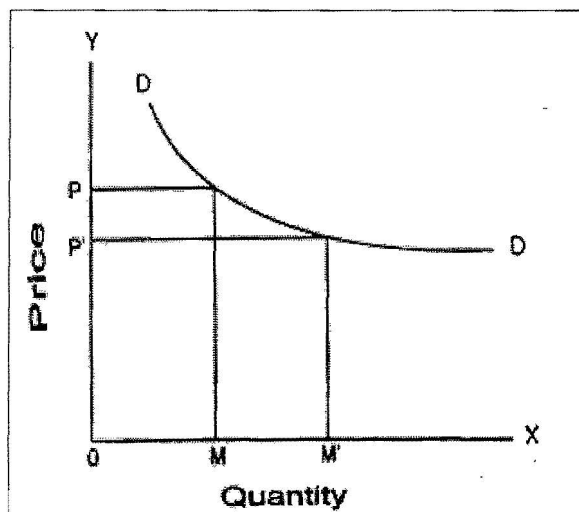


Figure 5.2: More Elastic Demand Curve

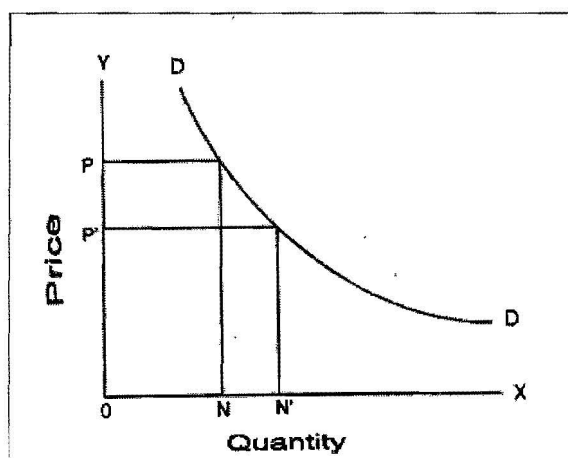


Figure 5.3: Less Elastic Demand Curve

This will be clear from Figures 5.2 and 5.3 which represent two demand curves. For a given fall in price, from OP to OP', increase in quantity demanded is much greater in Figure 5.2 than in Figure 5.3.

Therefore, demand curve in Figure 5.2 is more elastic than the demand curve in Figure 5.3 for a given fall in price. Demand for the goods represented in Figure 5.2 is generally said to be elastic and the demand for the goods in Figure 5.3 to be inelastic.

It should however, be noted that the terms elastic and inelastic are used in the relative sense. In other words, elasticity is a matter of degree only. Demand for some goods is

only more or less elastic than others. There is no commodity in the real world for which the demand is completely inelastic. Similarly, in the actual world, we find no example of goods whose demand is perfectly elastic. Thus, when we say that demand for a good is elastic, we mean only that the demand for it is relatively more elastic. Likewise, when we say that demand for a good is inelastic, we do not mean that its demand is absolutely inelastic but only that it is relatively less elastic.

In economic theory, elastic and inelastic demands have come to acquire precise meanings. Demand for goods is said to be elastic if the elasticity of demand for it is greater than one. Similarly, the demand for goods is called inelastic if elasticity of demand for it is less than one. Elasticity of demand equal to one, or in other words; unit elasticity of demand, therefore, represents the dividing line between elastic and inelastic demand. It will now be clear that by inelastic demand we do not mean perfectly inelastic but only that the elasticity of demand is less than unity; and by elastic demand we do not mean absolutely elastic but that the elasticity of demand is greater than one.

As said above, goods move along in variation in respect to elasticity of demand, i.e., their responsiveness to changes in price. Some goods like common salt, wheat and rice are very unresponsive to the changes in their prices. The demand for salt remains practically the same for a small rise or fall in its price. Therefore, demand for common salt is said to be 'inelastic.' Demand for goods like radios, refrigerators, etc. are elastic, since changes in their prices bring about large changes in their quantity demanded. The main reason for differences in elasticity of demand is the possibility of substitution, i.e., the presence or absence of competing substitutes.

The greater the ease with which substitutes can be found for a commodity or with which it can be substituted for other commodities the greater will be the price elasticity of demand of that commodity.

Goods are demanded because they satisfy some particular wants and in general wants can be satisfied in a variety of alternative ways. For instance, the want for entertainment can be gratified by having a radio set, or by possessing a gramophone, or by going to cinema or by visiting theatres. If the price of radio set falls, then the quantity demanded of radio sets will rise greatly; since fall in the price of radio will induce some people to buy radios in place of having gramophones or visiting cinemas and theatres. Thus, the demand for radios is elastic. Likewise, if the price of 'Lux' falls its demand will greatly rise because it will be substituted for other varieties of soap—such as **Jai, Hamam and Oasis**, etc. On the contrary the demand for necessary goods like salt is inelastic.

The demand for salt is inelastic since it satisfies a basic human want and no substitutes for it are available. People would consume almost the same quantity of salt whether it becomes slightly cheaper or dearer than before.

5.7 IMPORTANCE OF THE CONCEPT OF ELASTICITY OF DEMAND

The concept of elasticity of demand has both theoretical and practical value.

- **Theoretical Importance:** The concept of elasticity of demand is very useful as it has got both theoretical and practical advantages. As regards its importance in the academic interest, the concept is very helpful in the theory of value.

In the words of Keynes, "The concept of elasticity is so important that in the provision of terminology and apparatus to aid thought, I do not think, Marshall did any greater service than by the explicit introduction of the idea of the elasticity".

- **Practical Importance:** The concept may be used in understanding as well as tackling various economic problems:

❖ *Price Determination:* Use of the concept of elasticity of demand is required in the price determination of a commodity under different market conditions. Under perfect competition, in the short run in which supply is absolutely inelastic price depends upon the elasticity of demand. If demand suddenly falls and supply remaining is fixed then prices will fall, and, if demand suddenly rises, prices will rise as output cannot be increased. Again, the stability of prices also depends on the elasticity of demand and elasticity of supply. If either the demand or the supply is elastic, fluctuations in prices will be within narrow limits.

Further, if the demand for an agricultural commodity is inelastic, increased production may spell disaster to the economic condition of farmers. So the government can adopt measures to save the plight of the farmers.

A monopoly seller must have a knowledge relating to the elasticity of demand for his product while determining the price of his commodity. The monopolist will produce a commodity in the range of his demand curve where demand is said to be elastic. He will never produce in the range of the demand curve where demand is inelastic. Obviously, price determination of the monopoly product will be governed by the elasticity of demand.

- ❖ *Price Discrimination by Monopolists:* Price discrimination refers to the act of selling the technically same products at different prices to different section of consumers or in different in sub-markets. The policy of price-discrimination is profitable to the monopolist when elasticity of demand for his product is different in different sub-markets. Those consumers whose demand is inelastic can be charged a higher price than those with more elastic demand.
- ❖ *Wage Determination:* The concept of elasticity of demand is employed in wage determination. Wages, in modern days, are determined through the process of collective bargaining. Trade union will be successful in raising the wage rate provided labour demand is deemed to be inelastic. This is because of the fact that the degree of substitution between labour and other labour substituting inputs is less.

Trade union becomes cautious in demanding higher wage rates when the demand for labour is said to be elastic. Under the circumstance, the employer may be forced to employ more machines for cheaper input than labour.

This concept may be employed in analysing the problems connected with changes in the conditions of supply. Economists are interested in knowing the effect on employment in the software industry following a rise in the wages of workers engaged in this industry. We can answer this question in terms of figure given below:

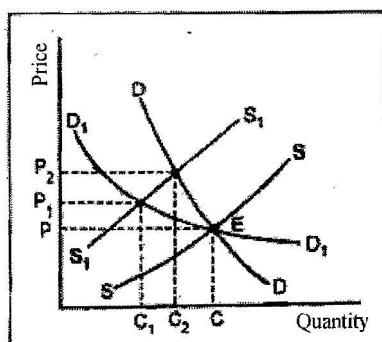


Figure 5.4: Demand for Supply of Computer

Here DD is a rather inelastic demand curve whereas demand curve D_1D_1 is an elastic one. Both these demand curves intersect the supply curve, SS, at point E. Thus, the equilibrium price is OP and equilibrium quantity demanded and supplied is OC.

Let there be an increase in the wages of workers in the computer industry. Consequently, the supply curve for computer will shift left to S_1S_1 and the price will rise to OP_2 if demand curve is assumed to be DD and to OP_1 if demand curve is D_1D_1 . However, output contracts more in the case of elastic demand (from OC to OC_1). If demand is inelastic, output will shrink less (from OC to OC_2).

According to Jack Harvey, "The general rule is that where demand is elastic, a change in supply will cause the quantity sold to change rather than price; where demand is inelastic, price changes rather than the quantity sold. Thus, trade union will find it more difficult to obtain a wage increase for its members without creating unemployment where the elasticity of demand for the product made is high".

- ❖ *Policy Determination:* The concept of elasticity of demand is of great importance to a finance minister. While imposing tax or raising the existing tax rates, the finance minister must have sufficient knowledge of the elasticity of demand for the taxed commodity.

If the demand for the product is inelastic, the purpose of the tax, say revenue-earning will be served. That is why, taxes are mostly imposed or rates of taxes are raised in the case of commodities having inelastic demand. The concept may be used in the determination of incidence of a tax. It is easier to shift the burden of taxes on to the consumers if the product demand is assumed to be inelastic. Further, whether exportable or importable be taxed or not, the concept of elasticity may be of great use.

- ❖ *Exchange Rate Determination:* In international trade too, the concept may be employed. For instance, as far as exchange rate (i.e., the rate at which one currency is exchanged for another currency) determination is concerned, the concept of elasticity of demand is of great importance. In international trade theory, within the limits set by the comparative costs, the terms of trade also depends on the elasticity of demand of each country for the goods of other countries.

The concept of elasticity of demand is used to justify whether devaluation of a currency is a right step in curbing balance of payment problems of a country. Devaluation is expected to correct the balance of payments disequilibrium if the sum of the elasticity of demand for export and import exceeds unity.

Elasticity of demand is a concept which has much applicability as far as business decision-making is concerned and is, therefore, of much importance in modern economics. In fact, most businessmen should try to form as precise an idea of elasticity as possible. The concept of elasticity of demand is useful in business decision-making because "it is a convenient shorthand way of expressing the effects of price change on demand for a commodity and as such it is relevant to price fixing".

- ❖ *Levy of taxes:* The government will get higher revenue if tax is increased on goods having inelastic demand. Conversely, the government will get lower revenue if tax is increased on goods having elastic demand.

The government can impose higher taxes and collect more revenue if the demand for the commodity on which a tax is to be levied is inelastic. On

the other hand, in case of a commodity with elastic demand high tax rates may fail to bring in the required revenue for the government.

Government should provide subsidy on those goods whose demand is elastic and in the production of the commodity the law of increasing returns operates.

- ❖ *Shifting of tax burden:* To what extent a producer can shift the burden of indirect tax to the buyers by increasing price of his product depends upon the degree of elasticity of demand.

If the demand is inelastic the larger part of the indirect tax can be shifted upon buyers by increasing price. On the other hand, if the demand is elastic than the burden of tax will be more on the producer.

- ❖ *Importance in International Trade:* Terms of trade refer to the rate at which domestic commodities are exchanged for foreign commodities. The terms of trade will be favourable to a country if its exports enjoy inelastic demand in the world market. The concept of elasticity of demand is of crucial importance in many aspects of international trade.

The success of the policy of devaluation to correct the adverse balance of payment depends upon the elasticity of demand for exports and imports of the country. The policy of devaluation would be beneficial when demand for exports and imports is price-elastic.

A country will benefit from international trade when: (i) it fixes lower price for exports items whose demand is price elastic and high price for those exports whose demand is inelastic, (ii) the demand for imports should be inelastic for a fall in price and inelastic for rise in price.

The terms of trade between the two countries also depends upon the elasticity of demand of exports and imports of two countries. If the demand is inelastic, the terms of trade will be in favour of the seller country.

- ❖ *Paradox of poverty amidst plenty:* A bumper crop, instead of bringing prosperity to farmers, brings poverty. This is called the paradox of poverty amidst plenty. It happens due to inelastic demand for most of the agricultural products. When supply of crops increases as a result of rich harvest, their prices drastically fall due to inelastic demand. As a result, their total income goes down.
- ❖ *Pricing of joint supply products:* The goods that are produced by a single production process are joint supply products. The cost of production of these goods is also together. Therefore, while determining the prices of these products their elasticity of demand is considered. The price of a joint supply product is fixed high if its demand is inelastic and low price is fixed for that joint supply product whose demand is elastic.

It is clear from the examples shown above that elasticity has a significant effect on the imposition of taxes on buyers. In the case of cigarettes, there is an extremely inelastic demand for the good, due the lack of presence of no close substitutes and the addictive nature of the product. People demand some goods and services that are essential and scarce. We call these goods inelastic. The market will consume inelastic goods at a certain quantity regardless of price.

Goods which are highly elastic, one for which there are many substitutes responds to price increases to a greater extent. Firms should understand the elasticity of goods or services when pricing them. Of course, the firm has its own elasticity of supply, determined by separate factors.

Check Your Progress

Fill in the blanks:

1. Demand curve shows the _____ of a commodity which a consumer would buy at different prices.
2. Demand and _____ are the driving force behind a market economy.
3. Since utility maximising consumers _____ cheaper goods for costlier ones, demand for the cheaper commodity increases.
4. In economics, the term _____ means a proportionate change in one variable relative to a proportionate change in another variable.
5. The goods which are finished after consumption are called _____ goods.
6. Under perfect competition, in the short run in which supply is absolutely inelastic price depends upon the _____ of demand.

5.8 LET US SUM UP

- In economic science, the term "demand" refers to the desire, backed by the necessary ability to pay. The demand for a good at a given price is the quantity of it that can be bought per unit of time at the price. Supply and demand are the most fundamental tools of economic analysis. Most applications of economic reasoning involve supply and demand in one form or another.
- The term 'demand' refers to a 'desire' for a commodity backed by ability and willingness to pay for it. Unless a person has an adequate purchasing power or resources and the preparedness to spend his resources, his desire for a commodity would not be considered as his demand.
- The law of demand states that the demand for a commodity increases when its price decreases and it falls when its price rises, other things remaining constant. This is an empirical law, i.e., this law is based on observed facts and can be verified with new empirical data. As the law reveals, there is an inverse relationship between the price and quantity demanded.
- The law of demand can be presented through a demand schedule. Demand schedule is a series of prices placed in descending (or ascending) order and the corresponding quantities which consumers would like to buy per unit of time.
- The law of demand can also be presented through a demand curve. A demand curve is a locus of points showing various alternative price quantity combinations. Demand curve shows the quantities of a commodity which a consumer would buy at different prices.
- The downward slope of the demand curve depicts the law of demand, i.e., the quantity of a commodity demanded per unit of time increases as its price falls, and *vice versa*.
- Demand extends or contracts respectively with a fall or rise in price. This quality of demand by virtue of which it changes (increases or decreases) when price changes (decreases or increases) is called Elasticity of Demand.
- Elasticity of demand refers to the rate of change of demand to the rate of change in price. Law of demand only expresses the inverse relationship between price and demand of a commodity. But it doesn't say about the proportionate change in demand to the proportionate change in price.

- Price elasticity of demand relates to the responsiveness of quantity demanded of a good to the change in the price. Price elasticity of demand is a measure of the responsiveness of change in quantity demanded of a good/service to a change in price, *Ceteris Paribus*.
- Income elasticity of demand refers to the sensitiveness of quantity demanded in the change in incomes. Another factor that can affect the price elasticity of demand would be the price of a good relative to a proportion of one's disposable income; so as one's income changes, the price of the good in terms of a percentage of one's income will change, thus affecting quantity demanded.
- Cross elasticity of demand means the degree of responsiveness of demand of goods to a change in the price of related goods, which may be either a substitute for it or a complementary with it.
- Marshall who introduced the concept of elasticity in economic theory remarks that the elasticity or responsiveness of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price.
- In economic theory, elastic and inelastic demands have come to acquire precise meanings. Demand for goods is said to be elastic if the elasticity of demand for it is greater than one. Similarly, the demand for goods is called inelastic if elasticity of demand for it is less than one.
- *In the words of Keynes*, "The concept of elasticity is so important that in the provision of terminology and apparatus to aid thought, I do not think, Marshall did any greater service than by the explicit introduction of the idea of the elasticity".
- Use of the concept of elasticity of demand is required in the price determination of a commodity under different market conditions. Under perfect competition, in the short run in which supply is absolutely inelastic price depends upon the elasticity of demand.
- The goods that are produced by a single production process are joint supply products. The cost of production of these goods is also together. Therefore, while determining the prices of these products their elasticity of demand is considered. The price of a joint supply product is fixed high if its demand is inelastic and low price is fixed for that joint supply product whose demand is elastic.

5.9 UNIT END ACTIVITY

Using the data shown in the table below about demand for smart phones, calculate the price elasticity of demand from point B to point C, Point D to Point E, and point G to point H. Classify the elasticity at each point as elastic, inelastic, or unit elastic.

Points	P	Q
A	60	3,000
B	70	2,800
C	80	2,600
D	90	2,400
E	100	2,200
F	110	2,000
G	120	1,800
H	130	1,600

5.10 KEYWORDS

Price Elasticity: It is a measure for the effect of a price change or a change in the quantity supplied on the demand for a product or service.

Elastic Demand: It is that demand for a product which is sensitive to price changes. For example, if the selling price of a product is increased, there will be fewer units sold. If the selling price of a product decreases, there will be an increase in the number of units sold.

Inelastic Demand: It is the demand whose percentage change is less than a percentage change in price. For example, if the price of a commodity rises twenty-five per cent and demand decreases by only two per cent, demand is said to be inelastic.

Normal Goods: These are any goods for which demand increases when income increases, and falls when income decreases but price remains constant, i.e., with a positive income elasticity of demand.

Giffen Goods: In economic theory, is a good that is in greater demand as its price increases. For example, if the price of an essential food staple, such as rice, rises it may mean that consumers have less money to buy more expensive foods, so they will actually be forced to buy more rice.

Luxury Goods: These are the products that are not essential but are highly desired and associated with wealthy or affluent people. They are bought for several reasons: to support self-worth and status, or for the product's quality and craftsmanship.

Income Elasticity of Demand: Measures the responsiveness of the quantity demanded for a good or service to a change in the income of the people demanding the good, *Ceteris Paribus*. It is calculated as the ratio of the percentage change in quantity demanded to the percentage change in income.

Cross Elasticity of Demand: It measures the responsiveness of the quantity demanded for a good to a change in the price of another good, *Ceteris Paribus*.

Mixed Economy: An economic system combining private and state enterprise.

Price Mechanism: It is an economic term that refers to the manner in which the prices of commodities affect the demand and supply of goods and services. Price mechanism affects both buyers and sellers who negotiate prices of goods or services.

Market Demand Schedule: It is a tabulation of the quantity of a good that all consumers in a market will purchase at any given price. Generally, there is an inverse relationship between the price and the quantity demanded.

Demand Curve: A graph showing how the demand for a commodity or service varies with changes in its price.

Paradox of Poverty: It is the situation which has two opposite features and therefore appears strange. Why does poverty exist when economic development takes place?

Monopolists: A person or business that has a monopoly.

5.11 QUESTIONS FOR DISCUSSION

1. Explain the Law of demand and the factors behind it.
2. Explain perfectly elastic demand and perfectly inelastic demand with a suitable example.
3. Describe the three concepts of Elasticity of Demand.
4. Explain the importance of Elasticity of Demand.

5. In terminology of economics, we would say that the demand for some goods is more elastic than those for the others or the price elasticity of demand of some goods is greater than those of the others. Explain the statement.

Check Your Progress: Model Answer

1. Quantities
2. Supply
3. Substitute
4. Elasticity
5. Perishable
6. Elasticity

5.12 REFERENCES & SUGGESTED READINGS

- Agarwal, M. (2021). *Principles of Microeconomics*. Vikas Publishing House.
- Bhaduri, A. (2020). *Microeconomics: Theory and Applications*. Oxford University Press
- Choudhury, B. (2021). *Essentials of Microeconomics*. Wiley India Pvt. Ltd.
- Dutt, R., & Sundaram, K. P. M. (2021). *Indian Economy (71st ed.)*. S. Chand Publishing.
- Ghosh, A. (2020). *Microeconomics: Theory and Applications*. Oxford University Press.
- Gordon, R. J. (2019). *Microeconomics (13th ed.)*. Pearson.

UNIT

6

MEASURING ELASTICITY OF DEMAND

CONTENTS

- 6.0 Aims and Objectives
- 6.1 Introduction
- 6.2 Understanding Elasticity of Demand
- 6.3 Types of Elasticity of Demand
- 6.4 Determinants of Elasticity
- 6.5 Measurement of Elasticity of Demand
- 6.6 Importance of Elasticity
- 6.7 Demand Forecasting
 - 6.7.1 Kinds of Demand Forecasting
- 6.8 Purpose of Demand Forecasting
- 6.9 Methods of Demand Forecasting
- 6.10 Importance of Demand Forecasting
- 6.11 Let Us Sum Up
- 6.12 Unit End Activity
- 6.13 Keywords
- 6.14 Questions for Discussion
- 6.15 References & Suggested Readings

6.0 AIMS AND OBJECTIVES

After studying this lesson, you should be able to:

- Understand the concept of Elasticity of Demand
- Explain the types of Elasticity of Demand
- Know about the determinants of Elasticity
- Understand the measurement of Elasticity of Demand
- Describe the importance of Elasticity of Demand
- Know about and kinds of Demand Forecasting
- Explain the purpose of Demand Forecasting
- Analyze the methods of Demand Forecasting
- Understand the importance of Demand Forecasting

6.1 INTRODUCTION

The law of demand explains the functional relationship between price and demand. In fact, the demand for a commodity depends not only on the price of a commodity but also on other factors such as income, population, tastes and preferences of the consumer. The law of demand assumes these factors to be constant and states the inverse price-demand relationship. Barring certain exceptions, the inverse price-demand relationship holds well in case of the goods that are bought and sold in the market.

Demand always varies with price. The law of demand states that there is an inverse relationship between price and quantity demanded. But it does not tell us anything about the proportionate changes. When price of any commodity changes, then the demand of that commodity is affected. But the extent of variation is not uniform in all cases. In some cases, the variation is extremely wide, while in some other cases, it may be just nominal. The extent of variation in demand is thus technically expressed as elasticity of demand. The law of demand explains the direction of a change as it states that with a rise in price the demand contracts and with a fall in price it expands. However, it fails to explain the extent or magnitude of a change in demand with a given change in price. In other words, the law of demand merely shows the direction in which the demand changes as a result of a change in price, but does not throw any light on the amount by which the demand will change in response to a given change in price. Thus, the law of demand explains the qualitative but not the quantitative aspect of price-demand relationship.

Although it is true that demand responds to change in price of a commodity, such response varies from commodity to commodity. Some commodities are more responsive or sensitive to change in price while some others are less.

The concept of the elasticity of demand has great significance as it explains the degree of responsiveness of demand to a change in price. It thus elaborates the price-demand relationship. The elasticity of demand thus means the sensitiveness or responsiveness of demand to a change in price.

According to **Marshall**, “the elasticity (or responsiveness) of demand in a market is great or small accordingly as the demand changes (rises or falls) much or little for a given change (rise or fall) in price”.

From the above discussion, it will be clear that though different commodities react to a change in price in the same direction; the degree of their response differs. Demand for some commodities is more sensitive or responsive to a change in price, while it is less responsive for some others. Elasticity of demand is a measure of relative changes in the amount demanded in response to a small change in price. Certain goods are said to have an elastic demand while others have an inelastic demand. The demand is said to be elastic when a small change in price brings about considerable change in demand. On the other hand, the demand for a good is said to be inelastic when a change in price fails to bring about significant change in demand.

The concept of elasticity can be expressed in the form of an equation as:

$$E_p = \text{Percentage change in quantity demanded} / \text{Percentage change in the price}$$

6.2 UNDERSTANDING ELASTICITY OF DEMAND

The word ‘elasticity’ is a technical term which stands for the sensitivity or responsiveness of a dependent variable to the changes in independent variables. The elasticity of demand is the responsiveness of demand to the changes in the price of a commodity, income of the consumers and the prices of related goods. Demand

extends or contracts respectively with a fall or rise in price. This quality of demand by virtue of which it changes (increases or decreases) when price changes (decreases or increases) it is called Elasticity of Demand.

The demand is elastic when with a small change in price there is a great change in demand; it is inelastic or less elastic when even a big change in price induces only a slight change in demand. In the words of **Dr. Marshall**, "The elasticity (or responsiveness) of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price". But the demand cannot be perfectly 'elastic' or 'inelastic'.

Completely elastic demand will mean that a slight fall or rise in the price of the commodity concerned induces an infinite extension or contraction in its demand. Completely inelastic demand

will mean that any amount of fall or rise in the price of the commodity would not induce any extension or contraction in its demand. Both these conditions are unrealistic. That is why, we say that elasticity of demand may be 'more or less', but it is seldom perfectly elastic or absolutely inelastic.

Price Elasticity of Demand

A proportionate change in quantity demanded brought by a proportionate change in price is called the price elasticity of demand. The price elasticity of demand is a measure of responsiveness of the quantity demanded to a change in the price of a good, *ceteris paribus*. Elasticity of demand may be defined as "the percentage change in the quantity demanded by the percentage change in price". *—Alfred Marshall*

$$E_d = (-) \frac{\text{Proportionate change in quantity demanded}}{\text{Proportionate change}}$$

6.3 TYPES OF ELASTICITY OF DEMAND

The extent of responsiveness of demand with change in the price is not always the same. The demand for a product can be elastic or inelastic, depending on the rate of change in the demand with respect to change in price of a product. Elastic demand is the one when the response of demand is greater with a small proportionate change in the price. On the other hand, inelastic demand is the one when there is relatively a less change in the demand with a greater change in the price. There are three types of elasticity of demand:

1. Price elasticity of demand
2. Income elasticity of demand
3. Cross elasticity of demand

1. ***Price elasticity of demand:*** The concept of price elasticity of demand is concerned with the change in price to the change in demand. It shows the effect of change in price to the change in demand. "Marshall" was the first economist, who defined the price elasticity of demand as the ratio of percentage change in quantity demanded in response to a percentage change in price.

- ❖ The price elasticity of demand attempts to measure the relationship between percentage change in price and percentage change in demand for a given commodity.

$$\text{Thus, Price elasticity of demand} = \frac{\% \text{ change in demand for } x}{\% \text{ change in price for } x}$$

$$e = \frac{\Delta q}{q} \div \frac{\Delta p}{p} \quad \therefore e = \frac{\Delta q}{p} \times \frac{p}{q}$$

Where,

- e = Price elasticity of demand
- Δq = Change in quantity demanded
- q = Original quantity demanded
- Δp = Change in price
- p = Original price

For better understanding the concepts of elastic and inelastic demand, the price elasticity of demand has been divided into five types. These are as follows:

- ❖ Perfectly Elastic or Infinite Elasticity Demand
- ❖ Perfectly Inelastic Demand
- ❖ Relatively Elastic Demand
- ❖ Relatively Inelastic Demand
- ❖ Unit Elastic Demand

These are shown in figure below:

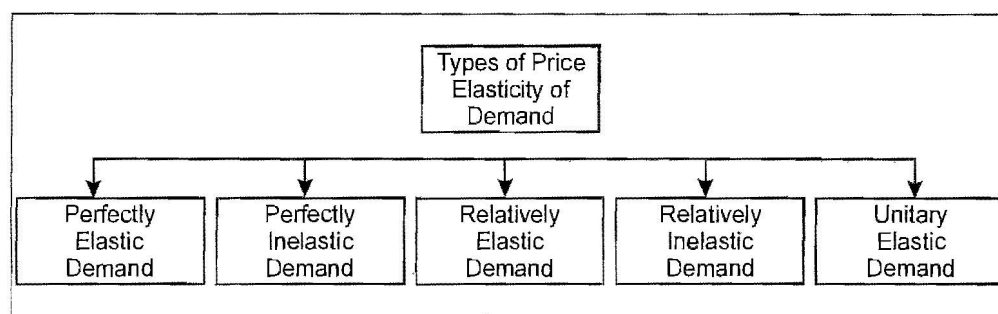


Figure 6.1: Different Types of Price Elasticity of Demand

- ❖ *Perfectly Elastic Demand*: When no change in price of a product causes a major change in its demand, it is said to be perfectly elastic demand. In perfectly elastic demand, a no change in price causes increase in demand to infinity. In perfectly elastic demand, the demand curve is represented as a horizontal straight line, which is shown in figure below:

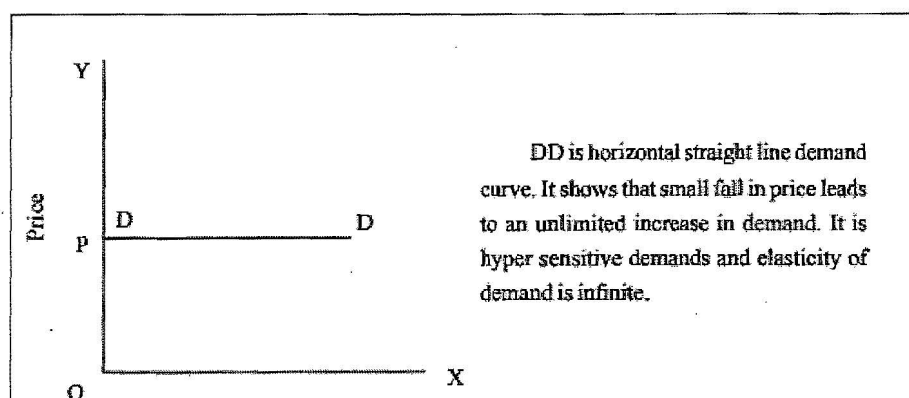


Figure 6.2: Perfectly Elastic Demand

- ❖ *Perfectly Inelastic Demand*: When any change in price doesn't cause any change in demand, it may be large or small doesn't cause any amount of change in demand. In this case, demand remains constant to change in price. So it is called perfectly inelastic demand. It is diagrammatically shown as below. DD is demand curve. It is vertical straight line curve parallel to Y axis. It shows there is no change in quantity demanded as price changes. Price changes from OP to OP₁, but demand remains OD i.e., same.

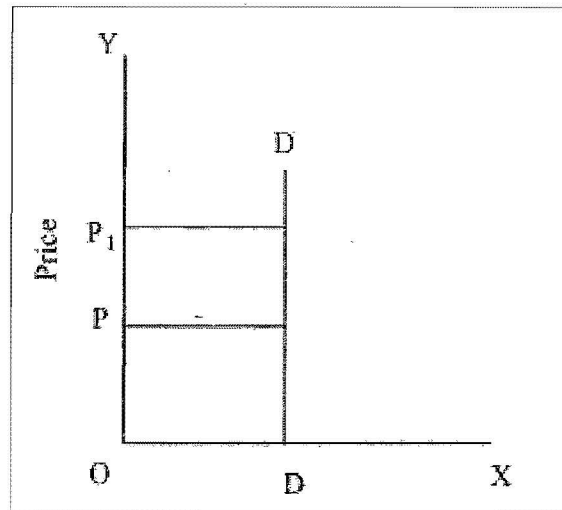


Figure 6.3: Perfectly Inelastic Demand

- ❖ *Relatively Elastic Demand ($e > 1$)*: When change in price is followed by big change in demand, it is called elastic demand. In other words, when the change in quantity demanded is greater than change in price, it is called relatively elastic demand. In this case, elasticity of demand is greater, than 1 ($e > 1$). It is diagrammatically shown as below. In the figure ahead, change in price PP₁ is smaller than the change in demand QQ₁. Therefore, DD demand curve is flatter.

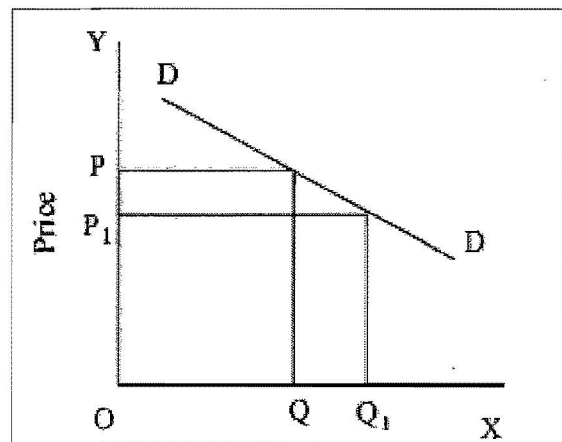


Figure 6.4: Relatively Elastic Demand

- ❖ *Relatively Inelastic Demand ($e < 1$)*: When change in demand is smaller than change in price, it is referred as relatively inelastic demand i.e., large change in price leads to smaller change in quantity demanded. Diagrammatically it is shown as follows:

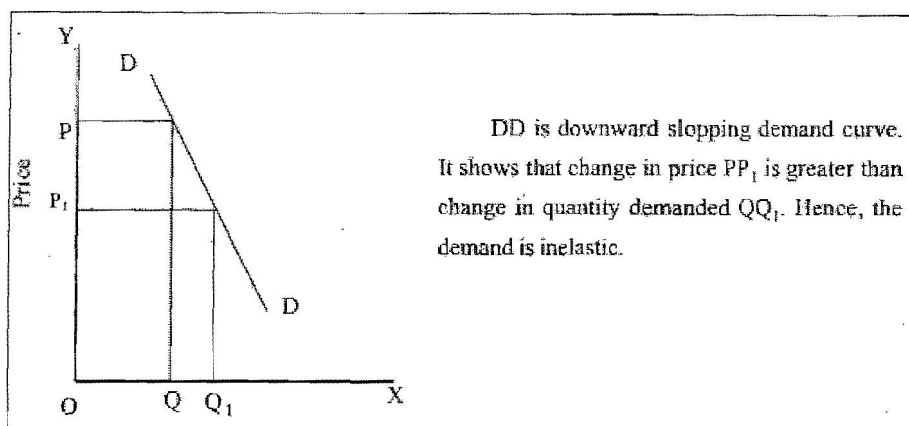


Figure 6.5: Relatively Inelastic Demand

- ❖ **Unit Elasticity of Demand ($e = 1$):** When the change in price is exactly equal to the change in demand, it is referred as unitary elastic demand. Here, demand changes in equal proportion of change in price. Therefore elasticity of demand is equal to 1. It is shown in the figure below:

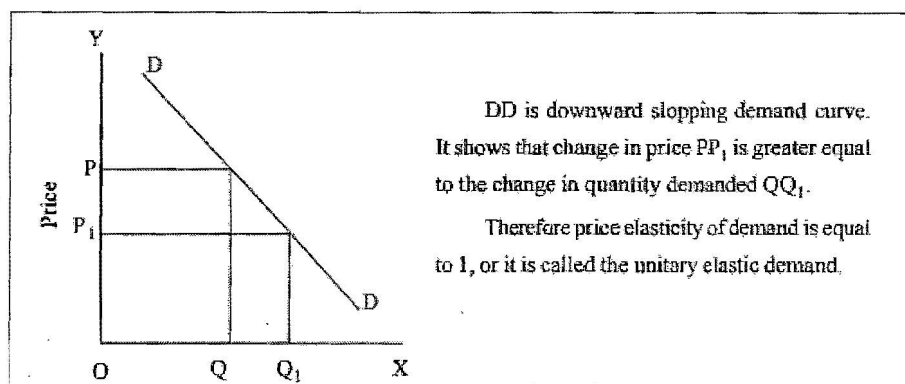


Figure 6.6: Unit Elasticity of Demand

- Income Elasticity of Demand:** The income elasticity of demand measures the responsiveness of the quantity demanded to a change in income. The analysis of the response of demand to changes in income both personal and national, is extremely important for planners, business people and industrialists. All round economic development increases the income level of the people. As income rises, people increase their demand for goods and services. In simple words, the income elasticity of demand measures the response of the quantity demanded to the changes in income.

When person's income affects the demand for a commodity it results into income elasticity of demand. As income changes, demand also changes. "The Ratio of change in income to the change in demand is referred as the income elasticity of demand". It measures the responsiveness of demand to changes, in income. Therefore, it is defined as "Income elasticity of demand is to ratio of the percentage change in the quantity demanded to the percentage change in income".

Mathematically, it is put up as:

$$\text{Income elasticity of demand} = \frac{\text{Proportionate change in demand}}{\text{Proportionate change in income}}$$

$$E_y = \frac{\Delta q}{q} \div \frac{\Delta y}{y} = \frac{\Delta q}{\Delta y} \times \frac{y}{q}$$

Where,	E_y =	Income elasticity of demand
	Δq =	Change in quantity demanded
	q =	Original demand
	ΔY =	Change in income
	y =	Original income.

Income elasticity of demand could be zero, -ve, or + ve. If it is positive, it can be shown as $E_y = 1$, $E_y > 1$, or $E_y < 1$. When it is 1, income elasticity is unitary, if it is greater than 1, demand is income elastic and when it is less than 1, demand is income inelastic.

3. **Cross Elasticity of Demand:** There are many substitutes or complementary goods available to any commodity in market. Therefore, if there is change in the price of substitutes, it affects the demand for a particular commodity. Therefore, the concept of elasticity of demand is applied to the two commodities related to each other. The relationship between the two commodities can be either substitutive or complementary. In the context of these relationship, the term cross elasticity of demand is used.

The cross elasticity of demand measures the responsiveness of quantity demanded to a change in the prices of the related goods. A large number of goods are related to each other either in the form of substitutes or as complements. For example, tea and coffee, butter and margarine, fuel wood and cooking gas, refined oil and 'vanaspati' ghee are substitutes of each other. A fountain pen and ink, a car and petrol are complementary goods. Nowadays, a large number of brands of a commodity are entering the markets daily. They are competing with one another for a larger share of the market. In a broader sense, they are very near substitutes of one another.

Cross elasticity of demand is defined as "The ratio of proportionate change in quantity demanded of commodity A to a given proportionate change in the price of related commodity B".

In order to calculate the cross elasticity of demand following formula is used.

$$\text{Cross elasticity of demand} = \frac{\text{Percentage change in the quantity demanded of A}}{\text{Percentage change in the price of B}}$$

Suppose, that A and B are two commodities substitutes to each other. If the price of B rises and the price of A remains constant, it causes to rise in the quantity demanded of commodity A; because the consumers will substitute A for B. On the contrary, if price of A rises and B's price remains constant. It leads to rise in demand of a commodity B. Because now consumers are prefer B for A.

6.4 DETERMINANTS OF ELASTICITY

- **Nature of the commodity:** Humans wants, i.e., the commodities satisfying them can be classified broadly into necessities, on one hand and comforts and luxuries, on the other hand. The nature of demand for a commodity depends upon this classification. The demand for necessities is inelastic and for comforts and luxuries it is elastic.
- **Availability of substitutes available:** The availability of substitutes is a major determinant of the elasticity of demand. The large the number of substitutes, the higher is the elastic. It means if a commodity has many substitutes, the demand will be elastic. As against this in the absence of substitutes, the demand becomes relatively inelastic because the consumers have no other alternative but to buy the same product irrespective of whether the price rises or falls.

- **Number of uses:** If a commodity can be put to a variety of uses, the demand will be more elastic. When the price of such commodity rises, its consumption will be restricted only to more important uses and when the price falls the consumption may be extended to less urgent uses, e.g. coal electricity, water, etc.
- **Depends on the demand for the commodity:** This factor also greatly influences the nature of demand for a commodity. If the consumption of a commodity can be postponed, the demand will be elastic.
- **Range of prices:** The demand for very low-priced as well as very high-price commodity is generally inelastic. When the price is very high, the commodity is consumed only by the rich people. A rise or fall in the price will not have significant effect in the demand. Similarly, when the price is so low that the commodity can be brought by all those who wish to buy, a change, i.e., a rise or fall in the price, will hardly have any effect on the demand.
- **Proportion of income spent:** Income of the consumer significantly influences the nature of demand. If only a small fraction of income is being spent on a particular commodity, say newspaper, the demand will tend to be inelastic.
- **Unequal distribution of income:** According to Taussig, unequal distribution of income and wealth makes the demand in general, elastic.
- **Durable goods:** In addition, it is observed that demand for durable goods, is usually elastic.
- **Availability of complementary goods:** The nature of demand for a commodity is also influenced by the complementarities of goods.

From the above analysis of the determinants of elasticity of demand, it is clear that no precise conclusion about the nature of demand for any specific commodity can be drawn. It depends upon the range of price, and the psychology of the consumers. The conclusion regarding the nature of demand should, therefore be restricted to small changes in prices during short period. By doing so, the influence of changes in habits, tastes, likes customs etc., can be ignored.

6.5 MEASUREMENT OF ELASTICITY OF DEMAND

There are five methods of measurement of elasticity of demand:

1. Total Outlay Method or Expenditure Method
 2. Proportional Method
 3. Point Method or Geometrical Method
 4. Arc Method
 5. Revenue Method
1. **Total Outlay Method or Total Expenditure Method:** The expenditure incurred by the consumer while buying a commodity and the revenue received by the sellers while selling the commodity are the two sides of the same coin. These two figures always remain equal. There is a clear cut relationship between the expenditure on a commodity and its price changes. There is also a meaningful co-relation between the price changes and the total revenue receipts of the sellers. Here we are more interested in knowing the behaviour of the total expenditure due to changes in price. With a fall in the price of a commodity, its quantity demanded increases. But what happens to the total expenditure, it depends upon the change in the quantity demanded in response total given price cut. Total expenditure method was formulated by **Alfred Marshall**.

In this method; change in total expenditure on a commodity resulted due to the price change is compared and elasticity is measured. These changes are compared in three ways as given below:

- ❖ When there is change in price - rise or fall. It doesn't lead to change in the total outlay on a commodity, it means that if price changes but total outlay on a commodity doesn't change or remains the same. It is referred as unitary elastic demand ($e = 1$).
- ❖ In this case, price rise is followed by decrease in total outlay or fall in price is resulted into rise in total outlay on a commodity. It is called as elastic demand as in this case elasticity of demand is greater than 1 ($e > 1$).
- ❖ If price rises, total outlay also rises or price falls, total outlay also falls. This type of elasticity is called as inelastic demand. Also it is referred as price elasticity of demand is less than one ($e < 1$).

This method is explained with the help of following table:

Table 6.1: Elasticity of Demand based on Total Expenditure

Price (₹)	Demand (unit)	Total Outlay (₹)	Elasticity of Demand
10	5	50	$e = 1$
5	10	50	
10	5	50	
5	20	100	$e > 1$
10	5	50	
5	7	35	$e < 1$

2. **Proportional Method or Percentage Method:** Under this method, we measure elasticity by comparing the percentage in price with the percentage change in demand. The elasticity of demand is unity, greater than unity, or less than unity, according as the change in demand is proportionate, more than proportionate, or less than proportionate to the change in price respectively. The elasticity is the ratio of the percentage change in the quantity demanded to the percentage change in the price charged.

The price elasticity of demand is defined as the proportionate change in the quantity demanded in response to a change in price. This method can also be used by converting our data into percentage form because the elasticity of demand is also defined as a percentage change in quantity demanded due to a percentage change in the price.

$$\text{Elasticity of Demand (ED)} = \frac{\text{Proportionate Change in Demand}}{\text{Proportionate Change in Price}}$$

Implications:

- ❖ This method should be used when there is a very small change in price and quantity demanded.
- ❖ The coefficient of price elasticity of demand is always negative. It is because when price changes, demand changes in the opposite direction. But by convention, we ignore negative sign.
- ❖ The elasticity of demand is relative. It is not expressed in any unit rather expressed in percentage or infractions.

3. **Point Method:** This method was also suggested by Marshall and it takes into consideration a straight line demand curve and measures elasticity at different points on the curve. This method has now become very popular method of measuring elasticity. In this method, the elasticity of demand is measured at any point on demand curve.

The point price elasticity of demand is the measurement of price elasticity of demand at a particular point on the demand curve.

“Elasticity computed at a single point on the curve for an infinitely small change in price, is point elasticity”.

– *Leftwich*

In order to measure elasticity of demand at any point on a demand curve, the formula used is as below. Elasticity of demand at any point on demand curve is the ratio of lower part of the demand curve to the upper part of the demand curve, from that point, where elasticity of demand is to be measured.

$$\text{Price Elasticity of Demand} = \frac{\text{Lower segment of the demand curve from that point}}{\text{Upper segment of the demand curve from that point}}$$

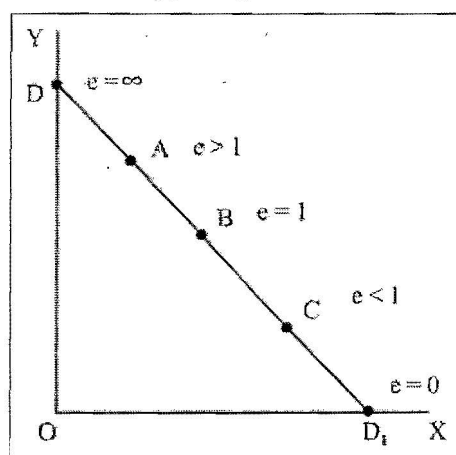


Figure 6.7: Point Elasticity of Demand Curve

DD₁ is a straight line demand curve. It's length is 4". A, B, C are points lying on that curve. B is a mid point, which divides DD curve equally into two parts. So BD = BD₁ = 2. A point lies at the mid point of segment BD. Therefore BA = AD = 1. Similarly C Point lies at the mid point of segment BD, so BC = CD₁ = 1.

4. **Arc Elasticity or Arc Method:** The arc elasticity of demand measures the price elasticity of demand between two points on a demand curve. According to **Leftwich**, “when elasticity is computed between two separate points on a demand curve, the concept is called arc elasticity”.

We have studied the measurement of elasticity at a point on a demand curve. But when elasticity is measured between two points on the same demand curve, it is known as arc elasticity. In the words of **Prof. Baumol**, “Arc elasticity is a measure of the average responsiveness to price change exhibited by a demand curve over some finite stretch of the curve”.

Arc elasticity is the price elasticity of demand between two points on a demand curve. It can be computed both for linear and non-linear demand curves. Arc elasticity of demand can be computed with the use of the following formula:

$$(ED) = - \frac{\frac{\Delta Q}{(Q_1 + Q_2)/2}}{\frac{\Delta P}{(P_1 + P_2)/2}}$$

5. **Revenue Method:** Average revenue, marginal revenue and the elasticity of demand have a definite relationship which is presented in the following form:

$$Ed = \frac{\text{Average Revenue}}{\text{Average Revenue} - \text{Marginal Revenue}}$$

This is also written in the following form:

$$Ed = \frac{P}{P - M}$$

Since, Price (P) = Average Revenue (A)

$$\text{Average Revenue} = \frac{\text{Total Revenue}}{\text{Units of goods sold}}$$

Marginal revenue = Net revenue received by selling one more unit of a good.

- ❖ When $AR > MR$ and MR is positive, the demand is more elastic.
- ❖ When AR is positive but MR is equal to zero the demand is unity elastic.
- ❖ When AR is positive and MR is negative, the demand is less elastic.
- ❖ When AR is zero, elasticity of demand is also zero.

6.6 IMPORTANCE OF ELASTICITY

The concept of elasticity is of great importance both in economic theory and in practice.

- Theoretically, its importance lies in the fact that it deeply analyses the price-demand relationship. The law of demand merely explains the qualitative relationship while the concept of elasticity of demand analyses the quantitative price-demand relationship.
- The pricing policy of the producer is greatly influenced by the nature of demand for his product. If the demand is inelastic, he will be benefited by charging a high price. If on the other hand, the demand is elastic, low price will be advantageous to the producer. The concept of elasticity helps the monopolist while practicing the price discrimination.
- The price of joint products can be fixed on the basis of elasticity of demand. In case of such joint products such as wool and mutton, cotton and cotton seeds, separate costs of production are not known. High price is charged for a product having inelastic demand (say cotton) and low price for its joint product having elastic demand (say cotton seeds).
- The concept of elasticity of demand is helpful to the Government in fixing the prices of public utilities.
- The elasticity of demand is important not only in pricing the commodities but also in fixing the price of labour viz., wages.
- The concept of elasticity of demand is useful to Government in formulation of economic policy in various fields such as taxation, international trade, etc. (a) The concept of elasticity of demand guides the finance minister in imposing the commodity taxes. He should tax such commodities which have inelastic demand so that the Government can raise handsome revenue, (b) The concept of elasticity of demand helps the Government in formulating commercial policy. Protection and subsidy is granted to the industries which face an elastic demand.

- The concept of elasticity of demand is very important in the field of international trade. It helps in solving some of the problems of international trade such as gains from trade, balance of payments, etc. policy of tariff also depends upon the nature of demand for a commodity.

In a nutshell, it can be concluded that the concept of elasticity of demand has great significance in economic analysis. Its usefulness in branches of economic such as production, distribution, public finance, international trade, etc., has been widely accepted.

6.7 DEMAND FORECASTING

Demand forecasting is an estimate of the future demand and it is based on the statistical data about past behaviour and the relationship of the various determinants. As the future is uncertain, the forecasting of demand cannot be accurate. However, forecasting gives a reliable approximation of future demand.

Demand forecasting is an important concept in Business Economics. Producer always makes various plans for production. In regards to expand his business he needs to take review of market. Some economical techniques are used by businessmen, one of them is demand forecasting. With the help of demand forecasting producer can design some plans for resource allocations, capital allocation, raw materials, arrangements of machinery and change in business administration, etc. With the help of demand forecasting producer takes decisions regarding changes in production for that purpose, he uses statistical data and tools. Demand forecasting can build-up a good platform to producer to judge changes and increase in future demand and production in the market.

Demand forecasting means an estimate of future demand for the product of a business firm. Demand forecasting is defined by various economists as follows:

According to **D. Gopal Krishna**, "Forecasting means to know the trend or behaviour after a period of time".

Another definition states that "demand forecasting refers to an estimate of future demand for the product", or "It is an objective assessment of the future course of demand".

These definitions means that demand forecasting is an estimate of future demand in order to find out the future trend of demand for product. With the help of these estimates firms can determine the volume of its future production, cost of production as well as capital budgeting decisions. Thus, demand forecasting is useful to business manager in decision making.

6.7.1 Kinds of Demand Forecasting

Demand forecasting may be undertaken at three different levels, viz., firm level, industry level and macro level, i.e., at the level of the economy as a whole.

Micro level or at the level of firm: This refers to the demand forecasting by the firm for its product. This is the type of forecasting in which the management of a firm is really interested.

Industry level: Forecasting of demand for the product of an industry as a whole may be done by the association of all the firms composing the industry, or by a trade association.

Macro level: Estimating industry demand for the economy as a whole will be based on national income and national expenditure, the index of industrial production, and so on.

6.8 PURPOSE OF DEMAND FORECASTING

- **Short-term Forecasting:** The purposes of demand forecasting will depend upon the periods for which it is made. Short-term demand forecasting helps the management to take decisions on current business operations with a given production capacity of the firm. This type of demand forecasting is a short period forecasting of demand, for the product of a business firm. They are generally made for the period of one year. It is related with sales, inputs, price and finances of the business firm. Short-term forecasting are essential for the formulation of suitable price policy, cost policy, sales policy and financial policy of a business firm. If business manager expects a rise in input prices, he could buy it as early as possible. Also he can adopt a policy, which reduces the cost of production and helps to increase the sale of his product. Such policy also provides prior information about production and sales, which is necessary to raise the future capital. Thus, short-term demand forecasting means the short period estimates of demand for a product of business firm. The various factors involved are as follows:
 - ❖ *Suitable production policy:* In the short run, the firm should anticipate, as correctly as possible, seasonal variations in demand and produce accordingly. Otherwise, the firm runs the risk of producing more and burdened with unsold stocks. Short-term demand forecasting helps to formulate a proper production policy to avoid fluctuations in production.
 - ❖ *Suitable purchase policy:* The short-term demand forecasting helps not only to determine the volume of production but also in determining the volume of raw materials and other inputs to be purchased and to control the volume of inventory stocks. This helps to avoid unnecessary purchases and stocking of inputs and helps to reduce costs of production.
 - ❖ *Suitable price policy:* Short-term demand forecasting helps the company to determine a suitable price policy depending upon the anticipation of the market conditions. The firm can fix a higher or lower price, as the case may be.
 - ❖ *Fix sales targets:* Short-term demand forecasting helps the company to set realistic sales targets for each individual salesman and for the company as a whole. In the absence of demand forecasting, the company will be forced to have unrealistic sales targets, which may be either too high or too low.
 - ❖ *Fix short-term financial plans:* Short-term demand forecasts help the company to plan not only for sales and production but also plan for the finances required to achieve the production and sales targets.

Thus, short-term demand forecasts are useful for determining sales quotas, inventory control, production schedule and budgeting and planning cash flows.

- **Long-term Forecasting:** Every manager of a business firm is interested in long term business forecasts of demand. These forecasts are made for the period of 5 years, 10 years, 20 years or more than that period. These forecasts are necessary for the expansion of the firm. Total demand for product of business firm can be estimated with the help of long term demand forecasts. Planning for a new plant and expansion of an existing plant depends upon long-term forecasting. Long term demand forecasts are difficult to predict the demand, costs, sales, prices and competition. Because of very long time period. Various changes take place in economic variables. So, the forecasts made in one time can't be proved true in another time in long run.

Long-term forecasting of probable demand for a product of a company is generally for a period of 3 to 5 years, but in certain cases, it can even be for periods upto 10 years (and in special cases, even upto 20 years). Such forecasting may be carried out for the three reasons:

- ❖ *Business Planning:* When a firm is planning for long-term investment, that is, when it is deciding about the expansion of its existing capacity and its scale of production or when it is adding a new unit of production, it has to know the nature of demand for its product over a number of years.
- ❖ *Financial Planning:* On the basis of long-term demand and sales and, therefore, of production, the firm estimates its long-term requirements of finance and make arrangements to raise necessary funds and at concessional rates of interest.
- ❖ *Manpower Planning:* Long-term business growth and expansion and financial planning will have to be accompanied by long-term manpower planning. For training and personnel development take considerable time to complete. Naturally, long-term demand forecasting is useful for manpower planning.

A careful analysis of the above three purposes of long-term demand forecasting will show that they flow out from the first, viz., business planning. Long-term demand forecasting is useful in determining capital expenditure (i.e., planning long-term investment), in planning raw material requirements, financial requirement and determine the size and scope of research and development programs.

6.9 METHODS OF DEMAND FORECASTING

The various methods used for demand forecasting can be broadly classified into “survey of buyers intentions, opinion surveys, controlled market experiments, trend projections, and regression analysis of economic indicators”. We shall explain each one of these methods here.

- *Survey of Buyer's Intentions:* A direct method of demand forecasting for the short period is to find out what the consumers prefer and intend to buy. For this, a company may undertake surveys of what buyers plan to buy during a forthcoming period, say, a year. If the product is one which is largely sold to a few large industrial buyers, the opinion survey can take the form of interview of these buyers. If the product is a consumer's durable, a sample survey may be taken to question a few representative consumers about what they are planning or intending to buy.
- *Collective Opinion Survey:* This is a variant of the survey method. The salesmen employed by a firm to canvass orders are closest to customers. They have the most intimate feel of the market and are in a position to assess the reaction of the consumers of the product of the firm. These salesmen estimate the expected sales of the product in their respective regions and territories. These estimates are added, reviewed and revised in the light of proposed changes in designs, selling prices, advertisement campaigns, expected changes in the policies of competitors, etc. In this exercise, the opinions of all top executives and departmental heads, such as the production manager, sales manager, marketing manager, the managerial economist, etc., are also considered. Thus, the final sales forecast or demand forecast is the result of “collective opinion”.
- *Survey of Expert's Opinions:* This is another variant of survey method. A company may engage experts in the field of market research and demand forecasting to analyse the past and present economic conditions, undertake sample

surveys of the market, carry out opinion polls and then forecast demand. When a number of marketing specialists take part in the exercise and if there are differences in their approach and conclusions, the differences are ironed out and a consensus is arrived at through mutual discussions. This is often referred to a Delphi method of demand forecasting.

- **Market Experiments:** A company may conduct studies and experiments to find out the behaviour of consumers under actual or controlled market conditions. For instance, a company may select some representative markets having similar characteristics. Such as population, occupational distribution, income levels, consumer's preferences, etc. Then it conducts market experiments by varying separately certain determinants of demand such as price, advertisement expenditure, packaging, etc., and assuming others to remain constant. It may change the variables over time, either simultaneously in all the markets or in selected markets. It records the resultant changes in demand and calculates the respective elasticity coefficients. In this way, the company assesses the important demand determinants like price, advertisement expenditure, product design, etc., on sales.
- **Trend Projections:** Every company has accumulated data on the sales of its product for the past many years. The firm arranges such sales data chronologically and then prepares time series relating to sales to represent the pattern of effective demand for a particular product. The time series are used to prepare a trend line which is projected into the future. The trend of time series refers to the long-term persistent movement of data in one direction, either upward or downward. There are two methods used for trend projections—the method of moving averages and the method of least squares.
 - ❖ The method of moving averages is a simple method involving the calculation of moving averages for a 3-year period, or a 4-year period, to find out the trend.
 - ❖ The method of least squares is more scientific than the moving average method and is most commonly used. It uses the straight line equation $y = a + bX$ in which Y is the demand for the product, as is the autonomous quantity demanded, X is the determinant or the variable on which Y depends.
- **Regression Analysis of Economic Indicators:** This approach bases demand forecasting on certain economic indicators, as for example
 - ❖ Personal disposable income (i.e., total income minus direct taxes such as income tax) for the demand for consumers goods;
 - ❖ Farm incomes for the demand of agricultural implements such as tractors, pump sets, etc.;
 - ❖ Construction contracts for demand of building materials such as cement, bricks, etc. The managerial economist collects such information, attempts to establish the relationship between the demand for a product and the particular economic indicator through the method of least squares and derives the regression equation.

6.10 IMPORTANCE OF DEMAND FORECASTING

Forecasting of demand is very necessary process in managerial decision making. These forecasts are important to the entrepreneurs, producers, firms and industries. It is important in regards to the following points:

- **To understand future quantitative demand:** By analysing the past data we can find out the future demand in quantity. So it is essential for future planning to the firm and industries.

- **To predict supply of commodities:** Demand forecasting shows the approximate future demand for a commodity in physical quantity. With the help of this future demand producer can decide future supply and production of his product.
- **To predict the price of commodity:** Demand forecasting helps to firm or producer to understand the future price of his product. With the rise and fall in future demand, he can forecast in respect of future price.
- **Useful for capital budgeting:** Demand forecasting is also useful in capital budgeting. With the help of demand forecasts, producer gets the idea in respect of future demand for his product. If future demand remains high he forecasts that more capital is required to fulfill it. So he tries to search the different sources of capital accumulation.
- **Useful in resource planning:** Demand forecasting is useful to producer or firm in resource planning, i.e., in capital budgeting as well as in personal planning.
- **Firm can determine the sales targets:** Demand forecasting also helps in determining the sales targets to the firm. Demand forecasting provides rough estimates of future demand. By using it a firm can determine the target of future sales for its product.
- **Useful in inventory management:** It is useful to producer in inventory management. With the help of demand forecasts firm can decide the stock of raw material to fulfill the future demand, larger the future demand, large will be the demand for stock of raw material and vice versa.
- **Useful for industrial expansion:** Demand forecasting helps to the firm and industry to take the decision in regards to the expansion or contraction of their business. Higher future demand for firm's product leads to the expansion of its business and vice versa.

Check Your Progress

Fill in the blanks:

1. The concept of the elasticity of demand has great significance as it explains the degree of _____ of demand to a change in price.
2. _____ extends or contracts respectively with a fall or rise in price.
3. The demand for a product can be elastic or inelastic, depending on the rate of _____ in the demand with respect to change in price of a product.
4. The analysis of the response of _____ to changes in income both personal and national is extremely important for planners, business people and industrialists.
5. Demand _____ is an estimate of the future demand and it is based on the statistical data about past behaviour and the relationship of the various determinants.
6. The _____ elasticity of demand measures the price elasticity of demand between two points on a demand curve.

6.11 LET US SUM UP

- The law of demand explains the functional relationship between price and demand. In fact, the demand for a commodity depends not only on the price of a commodity but also on other factors such as income, population, tastes and preferences of the consumer. The law of demand assumes these factors to be constant and states the inverse price-demand relationship. Barring certain

exceptions, the inverse price-demand relationship holds well in case of the goods that are bought and sold in the market.

- The word 'elasticity' is a technical term which stands for the sensitivity or responsiveness of a dependent variable to the changes in independent variables. The elasticity of demand is the responsiveness of demand to the changes in the price of a commodity, income of the consumers and the prices of related goods. Demand extends or contracts respectively with a fall or rise in price. This quality of demand by virtue of which it changes (increases or decreases) when price changes (decreases or increases) it is called Elasticity of Demand.
- The extent of responsiveness of demand with change in the price is not always the same. The demand for a product can be elastic or inelastic, depending on the rate of change in the demand with respect to change in price of a product. Elastic demand is the one when the response of demand is greater with a small proportionate change in the price.
- The availability of substitutes is a major determinant of the elasticity of demand. The large the number of substitutes, the higher is the elastic. It means if a commodity has many substitutes, the demand will be elastic. As against this in the absence of substitutes, the demand becomes relatively inelastic because the consumers have no other alternative but to buy the same product irrespective of whether the price rises or falls.
- Theoretically, its importance lies in the fact that it deeply analyses the price-demand relationship. The law of demand merely explains the qualitative relationship while the concept of elasticity of demand analyses the quantitative price-demand relationship.
- Demand forecasting is an estimate of the future demand and it is based on the statistical data about past behavior and the relationship of the various determinants. As the future is uncertain, the forecasting of demand cannot be accurate. However, forecasting gives a reliable approximation of future demand.
- The purposes of demand forecasting will depend upon the periods for which it is made. Short-term demand forecasting helps the management to take decisions on current business operations with a given production capacity of the firm. This type of demand forecasting is a short period forecasting of demand, for the product of a business firm.
- Every manager of business firm is interested in long term business forecasts of demand. These forecasts are made for the period of 5 years, 10 years, 20 years or more than that period. These forecasts are necessary for the expansion of the firm. Total demand for a product of business firm can be estimated with the help of long term demand forecasts.
- The various methods used for demand forecasting can be broadly classified into survey of buyers intentions, opinion surveys, controlled market experiments, trend projections, and regression analysis of economic indicators.
- Forecasting of demand is very necessary process in managerial decision making. These forecasts are important to the entrepreneurs, producers, firms and industries

6.12 UNIT END ACTIVITY

Make a presentation and list out the important points of elasticity of demand in managerial decision making for different products and services.

6.13 KEYWORDS

Elasticity of Demand: It is a measure used in economics to show the responsiveness, or elasticity, of the quantity demanded of a good or service to a change in its price, ceteris paribus.

Demand Forecasting: Demand forecasting is predicting future demand for the product. In other words, it refers to the prediction of probable demand for a product or a service on the basis of the past events and prevailing trends in the present.

Inelastic Demand: Demand whose percentage change is less than a percentage change in price. For example, if the price of a commodity rises twenty-five per cent and demand decreases by only two per cent, Demand is said to be inelastic.

Complementary Goods: Complementary Goods is a good with a negative cross elasticity of demand, in contrast to a substitute goods'. This means a goods' demand is increased when the price of another good is decreased. Conversely, the demand for a good is decreased when the price of another good is increased.

Substitute Goods: In contrast to a complementary good, is a good with a positive cross elasticity of demand; this means a good's demand is increased when the price of another good is increased; both in the same direction.

Cross Elasticity: It measures the responsiveness of the quantity demanded for a good to a change in the price of another good, ceteris paribus.

Short-term Forecasting: It is usually used in short term objectives covering less than one year for example material requirement planning, scheduling, budgeting, etc.

Long-term Forecasting: It is a common statistical task in business, where it helps to inform decisions about the scheduling of production, transportation and personnel, and provides a guide to long-term strategic planning.

6.14 QUESTIONS FOR DISCUSSION

1. Explain perfectly elastic demand and perfectly inelastic demand with a suitable example.
2. What are the different types of Elasticity of Demand?
3. Explain the slope of income demand curve for a superior and inferior good.
4. Which are different methods of measuring Elasticity of Demand?
5. What is meant by Demand Forecasting? Why is it important for the managers of business firm?

Check Your Progress: Model Answer

1. Responsiveness
2. Demand
3. Change
4. Demand
5. Forecasting
6. Arc

BLOCK IV

UNIT

7

FACTORS OF PRODUCTION

CONTENTS

- 7.0 Aims and Objectives
- 7.1 Introduction
- 7.2 Resources and Different Technologies of Production
- 7.3 Factors of Production
 - 7.3.1 Land
 - 7.3.2 Labour
 - 7.3.3 Capital
 - 7.3.4 Organisation or Entrepreneur
- 7.4 Division of Labour
 - 7.4.1 Division of Labour and Market
- 7.5 Efficiency of Labour
 - 7.5.1 Productive and Unproductive Labour
- 7.6 Factors Affecting Efficiency
 - 7.6.1 Advantages of Efficient Labour
- 7.7 Mobility of Labour
 - 7.7.1 Types of Mobility of Labour
 - 7.7.2 Importance of Mobility of Labour
- 7.8 Factors Obstructing Mobility of Labour
- 7.9 Criticisms of Factors of Production
- 7.10 Importance of Factors of Production
- 7.11 Factors Affecting Productivity
 - 7.11.1 Labour Productivity
 - 7.11.2 Sources of Information
- 7.12 Factors that Affect Economic the Growth of a Country
 - 7.12.1 Important Factors that Affect the Economic Growth of a Country
- 7.13 Let Us Sum Up
- 7.14 Unit End Activity
- 7.15 Keywords
- 7.16 Questions for Discussion
- 7.17 References & Suggested Readings

7.0 AIMS AND OBJECTIVES

After studying this lesson, you should be able to:

- Know about the Resources and Different Technologies of Production
- Understand the different factors of Production
- Explain Division of Labour and Efficiency of Labour
- Analyze Productive and Unproductive Labour
- Know about the factors that affect Efficiency
- Understand the advantages of Efficient Labour
- Understand the types and importance of Mobility of Labour
- Explain the factors obstructing Mobility of Labour
- Explain the various criticisms of factors of Production

7.1 INTRODUCTION

Production refers to the transformation of inputs or resources into outputs of goods and services. Inputs are those resources that are used in the production of goods and services. According to a general way of analysis, inputs are classified into labour, capital, land and entrepreneur. For example, if we want to produce wheat, we need land, fertilizer, water, workers and some machinery. These are called inputs or factors of production. The output is wheat. The output can also be service rather than a good. Examples of services are education, medicine, banking, communication, transportation and many others.

The term “Production” refers to all of the activities involved in the production of goods and services, from borrowing to setting up of expansion of production facilities, to hiring workers, purchasing raw materials, running quality control, and so on, rather than referring merely to the physical transformation of inputs into outputs of goods and services. In a broader sense, activities adding value to the product are a part of the production process.

Each of these broad categories, however includes a great variety of basic input. For example, labour includes farmer, bus driver, assembly line worker, accountants, lawyers, doctors, scientists and govt. officials. Capital consists of all the man made resources helping in the production process. It includes machinery, building, inventory and others. In the same manner, land represent the natural resources for which human being have done nothing to bring them about. It includes land, natural resources, minerals, rivers, sunlight and even natural talent in a person. As far as the entrepreneurship is concerned there is a controversy regarding its classification. Some economists call entrepreneurship as a distinct factor of production, which is ultimate risk taker in the production process, while other regard it a distinct type of labour only.

7.2 RESOURCES AND DIFFERENT TECHNOLOGIES OF PRODUCTION

The resources used to produce economic goods and services also called commodities are called factors of production. These resources are the physical assets needed to produce commodities. Economic resources are the goods or services available to individuals and businesses used to produce valuable consumer products.

The classic economic resources include land, labour and capital. Entrepreneurship is also considered an economic resource because individuals are responsible for creating businesses and moving economic resources in the business environment. These economic resources are also called the factors of production. The factors of production describe the function that each resource performs in the business environment.

The way that these resources are combined to produce is called technology. For example, a man with a shovel digging a ditch is one technology from which ditches can be obtained. Another technology that can produce the same commodity as a man with a shovel is a backhoe and an operator - the former is more labour intensive, and the latter is more capital intensive.

Goods and services can be produced in more than one way. For example, the production of cloth can be made either with the help of handloom or with the help of power loom. The first one is labour intensive technology of production and the second one is capital intensive technology of production. When a farmer makes use of wooden plough, bullocks, etc. in the production of food grains, he uses the labour intensive technology of production. On the other hand, when he uses tractor, pump set, harvester in the production of food grains, he uses capital intensive technology of production. In this way, the technology of production can be of the following two types:

1. Labour Intensive Technology
2. Capital Intensive Technology

Labour Intensive Technology: When we make more use of labour and less use of capital per unit of output in the production of our commodity that is called labour intensive technology. This type of technology is used in household enterprises and in the enterprises which make production for self consumption or in case of small scale production.

Capital Intensive Technology: When we make more use of capital and less use of labour per unit output in the production of our commodity, it is called capital intensive technology of production. This type of technology is used when the production is made on a large scale for sale in the market in order to earn profit. In corporations and government enterprises generally there is the use of capital intensive technology of production because there is large scale production of goods and services.

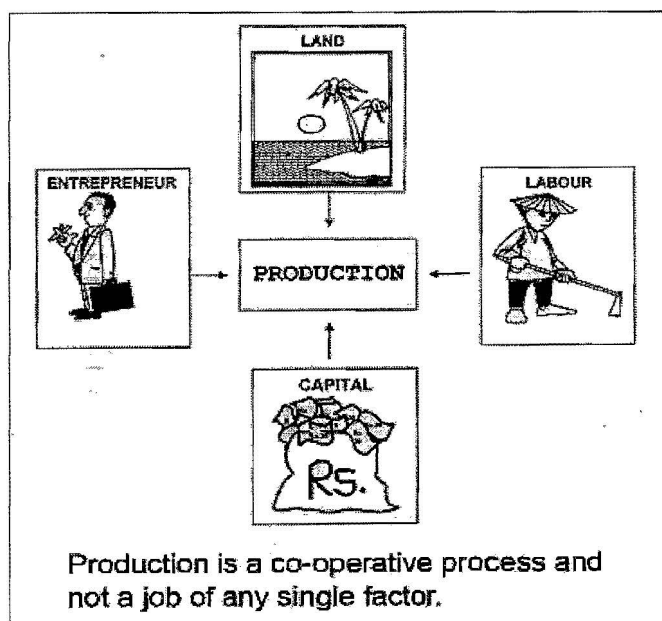


Figure 7.1: Production is a Co-operative Process

Another aspect of organising the production activity is division of labour. Division of labour increases the efficiency of workers due to which large scale production becomes possible. Division of labour means splitting up of the production activity into many processes and assigning every process among different workers according to their aptitude and ability.

7.3 FACTORS OF PRODUCTION

A factor of production is an economic term that describes the inputs that are used in the production of goods or services in order to make an economic profit. The factors of production include land, labour, capital and entrepreneurship. These production factors are also known as management, machines, materials and labour, and knowledge has recently been talked about as a potential new factor of production.

The resources (input) used to produce final products (output) are termed as factors of production. A factor of production is indispensable for production because without it no production is possible. In economic terms, factors of production can be defined as inputs that are used for the production of goods or services with the aim to make economic profit.

A factor of production may be defined as “that good or service which is required for production”.

Capital and organisation are derived from the primary factors of production, and are called derived factors of production. These derived factors of production, when combined with the primary factors of production, raise total production. According to the traditional classification, there are four factors of production. They are Land, Labour, Capital and Organisation or Entrepreneur.

7.3.1 Land

Land as a factor of production refers to all those natural resources or gifts of nature which are provided free to man. It includes within itself several things such as land surface, air, water, minerals, forests, rivers, lakes, seas, mountains, climate and weather. Thus, ‘Land’ includes all things that are not made by man. In literary sense, land is regarded as soil. However, in economics, land, a factor of production, has a much wider scope.

Marshall has defined land as, “the materials and the forces which nature gives freely for man’s aid, in land and water, in air and light and heat”. Land refers to a natural resource that can be utilised to produce income. It is a useful factor of production, but is available in limited quantity.

Land not only consists of mere surface of land but also includes all the natural sources such as oceans, mountains, forests, etc. Thus, land is a significant part of production which facilitates in the production of goods and services in one way or the other.

Significance of Land

- (i) Perceived as a gift of nature to man.
- (ii) Considered to be available in fixed quantity; therefore, does not have a supply price. This implies that the change in price of land does not affect its supply.
- (iii) Regarded as a permanent input having certain inherent properties which are original and indestructible.
- (iv) Considered as an immobile factor of production.

(v) Considered to have infinite variation in terms of fertility. This leads to variation in the prices of land.

(vi) Land is a passive factor of production.

As a gift of nature, the initial supply price of land is zero. However, when used in production, it becomes scarce. Therefore, it fetches a price, accordingly.

7.3.2 Labour

Labour is the human input into the production process. **Alfred Marshall** defines labour as 'the use or exertion of body or mind, partly or wholly, with a view to secure an income apart from the pleasure derived from the work'. Labour constitutes one of the important factors of production. This factor involves human services and efforts for the production of goods or services. Labour is commonly thought of a group of unskilled labour working in factories. However, in economic terms, a work, physical or mental, carried out for monetary purpose is called labour.

A work that is undertaken by an individual for the sake of interest and pleasure, then the individual would not be regarded as labour in economics. Among all the factors of production, labour is the only factor that is living. This peculiarity of labour differentiates it from rest of the factors of production.

Labour refers to the act of working for some monetary benefits against physical and mental activity. It does not comprise of any leisure activity. It includes the services of a factory worker, any professional workers such as engineers, doctors, teachers, lawyer, etc. Thus labour forms an essential aspect of production.

Significance of Labour

(i) Labour cannot be separated from labourer. This is because labourer needs to sell his or her labour.

(ii) Labour is defined as the perishable factor of production that has no reserve price.

(iii) Labour is considered as the weakest commodity in terms of bargaining power.

(iv) Change in the price of labour would affect the supply of labour. In case of other commodities, supply rises with the rise in prices. In case of labour, supply of labour decreases with an increase in prices (wages) and vice versa. For example, if the wage of a worker reduces, then other family members of worker start working to meet up the requirements of their family.

(v) Adjustments in supply and demand of labour is difficult because it is difficult to increase or decrease labour instantly.

(vi) Labour is mobile. Man moves from one place to another from a low paid occupation to a high paid occupation.

Labour can assume several forms. Digging earth, breaking stones, carrying loads comprise simple labour operations but labour also covers highly qualified and skilled managers, engineers and technicians.

7.3.3 Capital

Capital is the man made physical goods used to produce other goods and services. In the ordinary language, capital means money. In economics, capital refers to that part of man-made wealth which is used for the further production of wealth.

According to **Marshall**, "Capital consists of those kinds of wealth other than free gifts of nature, which yield income". Money is regarded as capital because it can be used to buy raw materials, tools, implements and machinery for production. The terms capital

and wealth are not synonymous. Capital is that part of wealth which is used for the further production of wealth. Thus, all wealth is not capital but all capital is wealth.

Capital means all human-made materials such as tools, equipments, infrastructure, machinery, seeds, plants, modes of transportation such as rail, road and air, etc. In general, it encompasses all affluences eliminating land, as land is utilised for supplementary production of affluence. Nowadays capital not only includes physical capital but also involves human capital which is defined as "process of increasing knowledge, the skills and capacities of all people of the country". Human capital is more vital than the physical capital since without human's interference the materialistic capital cannot be utilised effectively.

Prof. Galbraith defines capital as "We now get the larger part of our industrial growth not from more capital investment but from investment in men and improvements brought about by improved men",

Capital has two economic definitions as a factor of production. Capital can represent the monetary resources companies use to purchase natural resources, land and other capital goods. Monetary resources flows through the national economy as individuals buy and sell resources to individuals and businesses.

Capital also represents the major physical assets individuals and companies use when producing goods or services. These assets include buildings, production facilities, equipment, vehicles and other similar items. Individuals may create their own capital production resources, purchase them from another individual or business or lease them for a specific amount of time from individuals or other businesses.

Forms of Capital

1. Physical Capital or Material Resources,
 2. Money Capital or Monetary Resources, and
 3. Human Capital or Human Resources.
1. **Physical Capital:** All man-made physical assets like plant and machinery, tools, buildings, roads, dams and communication, etc., are the various forms of physical capital.

Characteristics of Physical Capital

- (a) It is an asset which has a specific life period.
 - (b) Physical capital asset can be used in production again and again. As a result, it undergoes wear and tear or depreciation.
 - (c) When used in production, it gives a series of annual income flows called annuities, during its life period. Accumulation of more and more physical capital is called physical capital formation.
2. **Money Capital:** The investment that is made in the form of money or monetary instruments is called money capital. A household saves its income in the form of bank deposits, shares and securities or other monetary instruments. These are the sources of money capital.
 3. **Human Capital:** Human capital refers to the quality of labour resources, which can be improved through investments in education, training, and health. Higher the investments in human capital, higher will be the productivity.

Characteristics of Capital

1. Capital is a passive factor of production.

2. Capital is man-made.
3. Capital is not an indispensable factor of production i.e., production is possible even without capital.
4. Capital has the highest mobility.
5. Supply of capital is elastic.
6. Capital is productive.
7. Capital lasts over time (A plant may be in operation for a number of years).
8. Capital involves present sacrifice (cost) to get future benefits.

7.3.4 Organisation or Entrepreneur

The prime aspects of production such as land, labour and capital are correspondingly nature, man and material modes of production. Without these factors it is unfeasible to produce and making use of these factors effectively there has to be some source. This source is nothing but the organisation which hires them from their owners by paying rent, salary and interest and makes a decision upon the amount of each required for production. Organisation refers to the services of an entrepreneur who controls, organizes and manages the policy of a firm, innovates and undertakes all risks.

An entrepreneur is a person who combines the different factors of production (land, labour and capital), in the right proportion and initiates the process of production and also bears the risk involved in it. The entrepreneur is also called 'organiser'. Entrepreneurship is risk taking, managerial, and organisational skills needed to produce goods and services in order to gain a profit. In modern times, an entrepreneur is referred to as 'the changing agent of the society'. He is not only responsible for producing the socially desirable output but also to increase the social welfare.

Entrepreneurship is considered a factor of production because economic resources can exist in an economy and not be transformed into consumer goods. Entrepreneurs usually have an idea for creating a valuable good or service and assume the risk involved with transforming economic resources into consumer products. Entrepreneurship is also considered a factor of production since someone must complete the managerial functions of gathering, allocating and distributing economic resources or consumer products to individuals and other businesses in the economy.

Functions of an Entrepreneur

1. **Identifying Profitable Investing Opportunities:** Conceiving a new and most promising and profitable idea or capturing a new idea available in the market is the foremost function of an entrepreneur. This is known as identifying profitable investible opportunities.
2. **Taking a decision on the size of unit of production:** An entrepreneur has to decide the size of the unit – whether big or small depending upon the nature of the product and the level of competition in the market.
3. **Deciding the location of the production unit:** A rational entrepreneur will always locate his unit of production nearer to both factor market and the end-use market. This is to be done in order to bring down the delay in production and distribution of products and to reduce the storage and transportation cost.
4. **Identifying the optimum combination of factors of production:** The entrepreneur, after having decided to start a new venture, takes up the task of hiring factors of production. Further, he decides in what combinations he should combine these factors so that maximum output is produced at minimum cost.

5. ***Making innovations:*** According to Schumpeter, basically an entrepreneur is an innovator of new markets and new techniques of production. A new market increases the sales volume whereas a new cost cutting production technique will make the product cheaper. This will in turn increase the volume of sales and the profit.
6. ***Deciding the reward payment:*** The factors used in production have to be rewarded on the basis of their productivity. Measuring the productivity of the factors and the payment of reward is the crucial function of an entrepreneur.
7. ***Taking risks and facing uncertainties:*** According to Hawley, "a business is nothing but a bundle of risks. Products are produced for future demand. The future is uncertain. The investments are made in the present. This is the serious risk in the process of production. One who is ready to accept the risk becomes a successful entrepreneur".

A prudent entrepreneur forecasts the future risks scientifically and take appropriate decision in the present to overcome such risks.

According to **Knight**, "one of the important functions of entrepreneur is uncertainty bearing".

7.4 DIVISION OF LABOUR

The concept 'Division of Labour' was introduced by Adam Smith in his book 'An Enquiry into the Nature and Causes of Wealth of Nations'.

Division of Labour means dividing the process of production into distinct and several component processes and assigning each component in the hands of a labour or a set of labourers, who are specialists in that particular process.

For example, a tailor stitches a shirt in full. In the case of garment exporters, cutting of cloth, stitching of hands, body, collars, holes for buttons, stitching of buttons, etc., are done independently by different workers. Therefore, they are combining the parts into a whole shirt.

A tailor may stitch a maximum of four shirts a day. In the case of garment exports firm, it may stitch more than 100 shirts a day. Thus, division of labour results in increased production.

Division of labour is of the following two types:

1. ***Product based division of labour:*** If a worker specializes in the production of a single good or service, it is called product based division of labour. In case of small farmers, a potter, a cobbler or a carpenter in a village we see that there is the use of product based division of labour. It is very common in household enterprises of developing countries like India. When the production is made for self consumption or on a small scale there is the use of product based division of labour. For example, most of the farmers in our country make production of food grains mainly for self consumption. All of them make use of product based division of labour.
2. ***Process based division of labour:*** In big production units like corporations and government enterprises where the production is made on a very large scale, there is the use of process based division of labour. In case of process based division of labour, the production of a commodity is divided into many processes and a worker specializes in one or two processes i.e., called process based division of labour. For example, Britannia Bread Company manufactures bread. Raw material for bread is wheat flour. Conversion of wheat flour into bread requires three or

four processes. The flour has to be converted into dough and dough has to be kept into containers for baking. Containers are kept in ovens for baking. The baked bread is cut into appropriate size and packed. All processes required in manufacturing of bread are undertaken by different workers and nobody can claim that he has manufactured the bread. He can say that he has performed one or two processes in the preparation of the bread.

In government sector also, the supply of any single good or service depends on the process based division of labour. For example, take the case of a simple street lighting to be provided in a newly constructed group housing complex. It undergoes several processes. First is the installation of electric poles in the streets. The second process is connecting all the poles with electric wires. The third is fitting electric bulbs and tubes and the final stage is the release of electric supply from sub-station. All these processes are undertaken by different workers. For removing any defect in the functioning of the system, these are another team of workers from maintenance department who put the system in order.

Division of labour increases the efficiency of workers and lead to the possibility of inventions and discoveries because of repetitive nature of work. It encourages the use of machines in place of manual labour. It also leads to the use of capital intensive technique of production.

7.4.1 Division of Labour and Market

Division of labour is an economic concept which states that dividing the production process into different stages enables workers to focus on specific tasks. If workers can concentrate on one small aspect of production, this increases overall efficiency – so long as there is sufficient volume and quantity produced.

This concept was popularised by Adam Smith in ‘An Inquiry into the Nature and Causes of the Wealth of Nations’ (1776). He used the example of a pin factor. Adam Smith noted how the efficiency of production was vastly increased because workers were split up and given different roles. He stated that division of labour plays a vital role in increasing the productivity of labour. According to him, division of labour is the dynamic instrument for economic growth and development.

It is stated “Division of Labour is limited by the extent of market”. When markets for a commodity grows from local to national and national to international, producers of that commodity divide and subdivide the processes of its production into finer and finer divisions of labour. Each sub-division is assigned to a particular set of specialist workers. As a result, production rises enormously.

For explaining the importance of division of labour, Adam Smith cited an example of pin making in an organisation. The pin making function of an organisation involves 18 processes. If these 18 processes are performed by a single worker, it would not be possible to complete the whole function or it may take much time to produce a single pin. Therefore, if these tasks are divided among a number of workers, then it would be easier to produce large number of pins in a day.

According to Stinger, “the division of labor is not a quaint practice of eighteenth century pin factories; it is a fundamental principle of economic organization.” Therefore, division of labour is useful to an organisation in many ways.

There are different types of division of labour, which are explained as follows:

- (i) **Simple Division of Labour:** This refers to the division of labour on the basis of their skills and occupations, such as carpenters and blacksmiths. It is also referred as functional division of labour.

- (ii) **Complex Division of Labour:** It refers to the division of labour on the basis of business processes and sub-processes. For example, most of the organisations have different names for their processes such as marketing process, manufacturing process and distribution process. These processes are delegated to different groups of labour depending on their skills and abilities.
- (iii) **Territorial Division of Labour:** This refers to the division of labour on the basis of geographical locations. In this type of division of labour, the processes are performed by specific cities or towns that are specialised in it. For example, in India, Kashmir is famous for its carpets and shawls, whereas Punjab is popular for agriculture.

Merits of Division of Labour

1. Division of labour improves efficiency of labour when labour repeats doing the same tasks.
2. Facilitates the use of machinery in production, resulting in inventions
3. Workers need less training as they only have to master a small number of tasks.
4. It is faster to use one particular tool and do one job.
5. No time is wasted with a worker dropping a tool and then picking up another, every time he needs to move onto a new item.
6. There is no need to move around the factory, the work can be brought to the worker.
7. Workers can concentrate on those jobs which best suit their skills.

Demerits of Division of Labour

1. Repetition of the same task makes labour to feel that the work is monotonous and stale. It kills the humanity in him.
2. Narrow specialisation reduces the possibility of labour to find alternative avenues of employment. This results in increased unemployment.
3. Kills the growth of handicrafts and the worker loses the satisfaction of having made a commodity in full.
4. If workers are highly specialised, then the job can become very boring and repetitive. This can lead to low labour morale.
5. If workers lose the motivation to concentrate and do a good job, mistakes may creep in as they get bored.
6. An assembly line could grind to a halt if there is a blockage on one particular area.
7. Adam Smith himself recognised this potential problem and advocated education of the workforce so that they wouldn't get too demoralised by their repetitive job.

7.5 EFFICIENCY OF LABOUR

In ordinary language, by 'labour' we mean the work done by coolies, which is hard manual labour, generally unskilled. But in Economics, the term 'labour' has a wider meaning. It does not merely mean manual labour. It includes mental work too. It thus embraces the work of labourers, engineers, clerks, typists, managers, policemen and other government officials, teachers, lawyers, domestic servants, etc. All type of work comes under 'labour' in Economics, provided it is done for money. Labour may thus be defined as "any exertion of mind or body undergone partly or wholly with a view

to earning some good other than the pleasure derived directly from the work" — (Marshall).

Ford motor factories - In the 1920s, H. Ford made use of the assembly line to increase the productivity of producing motor cars. On the assembly line, there was division of labour with workers concentrating on particular jobs.

A very basic example of division of labour could be seen in food gathering. In early societies, men would be the hunters, women and children would prepare the food and collect berries. The idea was that it was a very simple division of labour to enable the best use of different skill sets.

Nowadays, there is even greater division of labour in food production. Farmers will buy seeds, fertilizers and tractors from different companies. They will just concentrate on one aspect of food production. The tools and food processing is handled by different workers and a different stage in the production cycle.

7.5.1 Productive and Unproductive Labour

For a long time, there was disagreement among the economists as to what type of labour was productive and what was unproductive. The Physiocrats, a French school of economists in the 18th century, considered that only agriculture was productive labour, for only in agriculture real production took place.

Industry was not considered productive. According to Adam Smith, only that which resulted in the production of something tangible was productive. Thus, he excluded the services of lawyers, doctors, teachers singers, etc. from the category of productive labour. Later, however, the work of manufacturing goods was also recognised as productive.

Gradually it was recognised that the work of the trader in stocking goods and in transporting them also added to the value of a commodity was therefore productive. Banking and insurance work also came to be included under the heading 'productive'. Now all types of work, including the work of men of professions like medicine, law and teaching, as well as the work of domestic servants is regarded as productive. In short, all labour in the economic sense productive.

The term 'unproductive labour' is now applied even to wasted labour or undirected labour, or labour which has failed to achieve its purpose, even in such cases, some economists say that the labour is productive, for when it was applied the intention was productive. It was only known – writer wards that it failed to produce anything. Even misdirected labour is productive from the point of view of the labourer, as he gets payment for it; it is unproductive from the point of view society only.

7.6 FACTORS AFFECTING EFFICIENCY

In the past, labour was considered an ordinary commodity to be bought and sold in the market like other commodities. It was not recognised that labour was not only a means to an end but was also an end in itself. The efficiency of a worker depends on two set of factors:

- (a) Power to Work
- (b) Will to Work

Labour's Power to Work

The Labour's Power to Work depends on the following factors:

- **Inherent Qualities:** The Jats of the Jullundur Division in the Punjab are said to be more efficient farmers than Meos of Gurgaon district or Rajputs of Kangra

district. A man inherits some qualities from the racial stock to which he belongs. Some races are known to be more hardier than the others.

These qualities are beyond an individual's control and are largely the outcome of climate and natural environment. The inhabitants of temperate and cold regions are more efficient than those of the tropics and sub-tropics. Hot climate has a weakening influence and makes sustained work difficult.

- **Acquired Qualities:** There are, however, certain qualities which a worker acquires by education, general and technical. Among these attributes may be mentioned honesty, intelligence, perseverance, judgment, health and strength of the body, resourcefulness, sense of responsibility, etc. Efficiency of labour depends also on these qualities. An honest, intelligent and hard-working person will undoubtedly be more efficient in his work than one who lacks these qualities.
- **Earnings:** If a worker is getting a good wage, he will be able to provide himself with good food and other necessities of life. It will add to his health, strength and power of endurance, and he will undoubtedly become a better worker. "The economy of high wages" is a well known maxim. "Low wages are dear wages". Fair and prompt payment is a great incentive to better work. It encourages the worker to do his best.
- **Factory Environment and Equipment:** If the factory is neat and well-ventilated and the surroundings are sanitary and attractive, the workers will be able to put in better work. Similarly, if the machinery is modern and up-to-date, if the raw materials are of good quality, if the manager is competent and can effectively marshal his labour force, the output of labour will increase.
- **Hours of Work:** It has been proved that long hours mean low efficiency. The worker is overcome by fatigue. He works leisurely and half-heartedly, which means lower efficiency. If the working day is of a reasonable duration, and there are proper rest pauses, the worker will be able to put in better work.
- **Labour Organisation:** Proper organisation of labour inside the factory will improve labour efficiency. A good trade union can also improve labour efficiency through its fraternal functions. The worker's will to work is strengthened by his ambition to rise, his desire to make the most of an opportunity, the inducement of efficiency bonuses or profit-sharing schemes and his sense of duty. All these factors add to a worker's zeal. The more earnest he is, the greater is his productivity.
- **Efficiency of Indian Labour:** It is said that Indian labour is less productive. This is true. Indian labour compares unfavourably with Japanese, British and American labour. His productivity is much lower. There are several factors responsible for comparative inefficiency of Indian labour some of which are beyond his control. The fault is not of labour alone. Production is a co-operative effort. Unless all the factors of production are satisfactory, production will not be upto the mark.

The Indian labour is no doubt less efficient; but it is not due to any inherent deficiencies of his own. The sub-tropical climate weakens him physically. Extremes of heat and cold make factory work a great ordeal. His wage is extremely low and is hardly enough to keep his body and soul together. Besides, labour is not properly organised.

It is caste-ridden and migratory. He is generally illiterate and lacks technical training. The factory conditions are very depressing and foreign to his natural tastes and temperament. He is supplied with second-rate machinery and equipment. The supply of raw materials is also unsatisfactory. Even the managers are not very competent. The

worker is condemned to long hours of work. In view of the above conditions, it is really surprising that the Indian worker is able to do even as much work as he is doing.

Efficiency of Indian labour can be improved by removing these defects, i.e., by imparting him general and technical education, by improving the working conditions in factories, by reducing the duration of the working day, by increasing wages, through sensible trade union activities and by giving the workers a sense of participation in the factory work, etc.

7.6.1 Advantages of Efficient Labour

Several advantages arise from efficiency of labour.

- Efficient labour benefits the individual worker himself, his employer, and the nation as a whole. The worker gains from his own efficiency. He wins the regard of his fellow-workers and the approval of his boss. He is also able to earn more and enjoy a higher standard of living.
- The factory owner stands to gain much from an efficient labourer. Such a labourer needs less supervision, does not waste materials, and carefully handles his machines. The repair charges are thus reduced and the cost of production lowered. Efficient labour is more economical.
- The nation at large ultimately benefits from an efficient population. The national wealth increases. The level of skill, intelligence and physique improves.
- Above all, it adds to the competitive strength of the country's industries. It is well-known that Japan's industrial supremacy in the markets of the world is largely due to the efficiency of the Japanese labour.

Efficient labour is a great national asset. The economic backwardness of India may be partly attributed to the lower efficiency of Indian labour.

7.7 MOBILITY OF LABOUR

Of all kinds of luggage, man is said to be the most difficult to transport, with the exception of land, perhaps labour is the least mobile factor. Man finds one excuse or another for not leaving his native place. He clings to his hearth and home, and is reluctant to leave his kith and kin.

He is content with what he has and has no urge to venture abroad. Indian labour is particularly less mobile. This is due to his ignorance, conservatism, caste considerations and comparative lack of quick and cheap means of communication and transport.

7.7.1 Types of Mobility of Labour

Mobility of labour takes the following forms:

- **Geographical Mobility:** This means moving from one town to another, from one state to another, or from one country to another. Of all types of mobility this is the most difficult. Man dreads a change as a child dreads the dark. He suffers from inertia and likes to stay on where he is. He is prepared to put up with known hardship rather than face unknown ones.

Vague fear attaches to new and strange places. One wants to live amongst one's kith and kin. Differences in religion, caste and language — all deter workmen from going to distant places. The Punjab worker, especially the Sikh, is comparatively more mobile. He is found in almost all parts of the world — America, Canada, Australia, New Zealand and Africa. He is known all the world over.

- **Occupational Mobility:** This is of two types: horizontal and vertical. Horizontal Mobility means that the worker moves from one occupation to another, but almost in the same grade, e.g., a typist gives up service and opens a business of his own on the same lines. Or a carpenter becomes a blacksmith. Moving on the same industrial plane is comparatively easy, because it does not entail any marked change in work.
- **Vertical Mobility:** This type of mobility on the other hand means moving from a lower occupation to a higher occupation, e.g., a 'mistri' or a mechanic becomes a mechanical engineer, or a school teacher becomes a college professor. This type of mobility is not easy. It calls for an improvement in power to work and understand, and needs opportunity and the means of using it.

7.7.2 Importance of Mobility of Labour

Mobility is of great advantage to the worker himself. Undoubtedly most of those who leave their village homes for distant industrial centers or foreign lands are able to improve their prospects. They are able to raise themselves up economically. By trying luck elsewhere one generally meets good luck. One rots by staying at home. Nothing can be achieved without showing an adventurous spirit.

A mobile labour force is also advantageous from the point of view of the industrial structure. We find new industries establishing themselves and old ones expanding. It is necessary that labour should move out of the latter into the former. It is through mobility of labour alone that supply of labour is adjusted to the demand for it.

It may be noted that a growing population makes for mobility of labour. The new generation can move into new industries. A country with a stationary population however, will be seriously handicapped in this respect. Mobility of labour checks unemployment. Labour moves from places where it is not wanted to those where it is wanted. In this way, unemployment is reduced. In fact, this is one of the functions of labour exchanges.

Factors which have Increased Mobility

In recent years, several factors have facilitated the mobility of labour. The following are the main factors which have made labour more mobile than before:

- (i) **Development in communication and transport:** The workers have been able to move from one industrial centre to another in search of better job owing to the development of the means of communication and transport. Political boundaries have been practically wiped out and distance has been annihilated. People can be employed anywhere, they can remain in constant communication with home, and come back when required.
- (ii) **Spread of education and information:** Spread of education and information about other countries and places has also helped in this direction. Education has given the workers new knowledge about other places and induced them to move out.
- (iii) **Advent of machinery:** Advent of machinery has also made it easy for the workers to move from one industry to another, because mechanical work is almost the same everywhere. The development of automatic machinery has lessened the importance of specialised skill.
- (iv) **Vocational guidance:** Vocational guidance offered by the State and the advice of the Employment Exchanges have also added to the mobility of labour. The workers are helped to get into more suitable jobs or get jobs if they are unemployed.

- (v) *Technical education and training:* The concept of technical education and training has also been very helpful in giving mobility to labour. The workers are given technical training and are thus equipped for superior and better jobs than before in search of which they freely move about. These are the principal-causes, which have made workers more mobile in recent times. They are no longer as stay-at-home as they used to be in the past.

7.8 FACTORS OBSTRUCTING MOBILITY OF LABOUR

Of all factors labour or man is the least mobile. Capital exists in the form of money and appliances of production. They are lifeless things, and can be sent to different places. However, it is not worthwhile to dismantle heavy machinery which has already been installed in a place and to carry it to some other place. Man, on the other hand, is not merely actuated by economic or monetary considerations. His place is generally fixed in society, and he does not like to be plucked out of certain surroundings.

He wants to live in the midst of his kith and kin. He is stay-at-home and dreads a change. Among the obstacles in the way of mobility of labour may be mentioned the differences of language, customs, laws, climate, etc. On account of all these hindrances man is inclined to carry on in the place where he has once come to settle. He will not be easily drawn away by the lure of a little extra income. He suffers from inertia and does not like to move. That is why, it is remarked that "of all sorts of luggage man is the most difficult to be transported".

Indian labour is comparatively more immobile. India is a vast country and there are great differences in climate, customs, language, etc. A Punjabi is almost a foreigner in Calcutta or Bombay. These differences discourage an Indian worker from moving to a different place. Lack of education and information about the conditions in other centers of work also stands in his way.

7.9 CRITICISMS OF FACTORS OF PRODUCTION

Several economists have criticisms for the above factors of production.

- Economist Benham has objected to a broader meaning of land as a factor of production. As per him, it is convenient to consider only land as factor of production, rather than such elements as sunshine, climate, etc. which does not enter directly into costs. Likewise, it is incorrect to group together the services of an untalented worker with that of professionals. It would consequently, be more appropriate to chunk collectively all standardised units, whether hectares of land, workers or capital goods and to regard each group as an individual factor of production. This method gives us a hefty integer of factors of production and each group is regarded as a separate factor.
- Over and again, the distinction amidst land, labour and capital are not apparent. To take land and capital, it is said that land is a gift of nature whose supply cannot be amplified while capital is human made whose supply is amendable. This is not correct for the reason that the supply of land can also be greater than before by cleaning it, draining and irrigating it and fertilising it by the pains of human and capital. The supply of land does not consign to its area alone, but to its productivity.
- We might regard each unit of a factor as discrete from other units of that factor, but one factor can be substituted for some other factor. For instance, land can be used intensively by employing more labour or more capital in the form of fertilisers, better seeds and superior techniques. By doing so, we substitute labour or capital for land. Likewise labour can be substituted for capital and capital for

labour in a factor. In the former case, labour intensive techniques are used. The level of swap of one factor for another will, nevertheless depend on the most competent scheme of production to be used relatively to the cost of the factor to be substituted.

- Moreover, we find that land, labour and capital frequently get mingled into one another and it is tricky to specify the involvement of each individually. For example, when land is vacant canals are dug and fences are erected, the efficiency of land enhances. But all these development on land are feasible by making capital investments and through labour. In such a condition, it is feasible to stipulate the involvement of land, labour and capital escalating efficiency. Likewise, the sum of money spent on cultivating and exercising workers is integrated under capital. So when such workers produce articles by functioning machines in a factory, they put in their labour as well as ability by using raw materials which are also the product of labour and machines used on land. Thus, it is hard to unravel the contribution of land, labour and capital in such cases.
- The complexity begins as to whether the contribution of land, labour and capital should be taken as such, or of their services. If the community is to plan for the prospect or find out the production possibilities open to it, then the contribution of the factors of production should be measured. Keeping the outlook in view, land may be put to more fruitful uses, labour may be trained for diverse occupations requiring higher skills and capital may be used for producing more roundabout means of production and machinery. Thus "the central economic problem for any community is how to make the best use of its labour and other resources and for this purpose the community must consider the various alternatives. It must consider what the men and the land and the capital might contribute towards output if they were used in different ways and not merely what in fact they are contributing now".
- Finally, it is habitual not to treat the organisation as discrete from labour. This is ambiguous and misjudges the role of the entrepreneur as a factor of production. As a substance of statement, labour and entrepreneur are quite dissimilar from each other. An entrepreneur is a man of special managerial aptitude who controls, organizes and manages the entire business of a firm. It is he who utilises all types of workers and puts them at the places where they are the most appropriate by quality of their education and training.

7.10 IMPORTANCE OF FACTORS OF PRODUCTION

The concept of the factor of production is of great significance in modern economic study:

- It is used in the theory of production in which the range of combinations of factors of production help in generating output when a firm functions under rising or declining costs in the short-run and when the proceeds to scale boosts or shrinks in the long run. Moreover, we can also know how the least cost combination of factors can be attained by a firm.
- The theory of cost of production also depends upon the combination of factors engaged in business and the prices that are paid to them. From the point of view of the theory of costs of production, factors of production are divided as fixed factors are variable factors.
- Fixed factors are those whose costs do not vary with the variation in output, such as machinery, tube well, etc. Variable factors are those whose quantities and costs vary with the variation in output. Larger outputs entail larger quantities of labour,

raw materials, power, etc. So as long as a firm covers the costs of production of the variable factors it employs, it will persist to produce even if it fails to cover the costs of production of the hired factors and sustains loss. But this is only feasible in the short-run; in the long-run, it must cover the costs of production of both the fixed and variable factors. Thus the distinction amidst fixed and variable factors is of much value for the theory of the firm.

- Finally, the concept of factor of production is used in elucidating the theory of factor-pricing. For this idea, factors of production are divided into specific and non-specific. A factor of production which is specific in use earns a higher reward than a non-specific factor. This also solves the problem of distribution of earnings to the various resource owners.

7.11 FACTORS AFFECTING PRODUCTIVITY

All the factors which are related to input and output components of a production process are likely to affect productivity. These factors can be divided into two main categories, namely:

Category I

- Primary factors are effort and working capacity of an individual. The question then is “What makes the difference between an economy where labour is highly productive and an economy where labour is less productive”. In the highly productive labour situation, this worker winds up, at the end of the day, with lots of goods and services, a rich economy. But if productivity is low, the same amount of labour yields a low output, a relatively poor economy.
- Organisation factors are related to the design and transformation process required to produce some item, the nature of training and other skill imparted to workers to perform certain operations in a production process, control and various other incentives.
- Conventions and traditions of the organisation e.g., activities of labour unions, medical facilities, worker and executive understanding, etc.

Category II

- Factors related to output: research and development techniques, improvement in technology and efficient sales strategy of the organisation will lead to improvement in output.
- Efficient use of input resources, better stores control, production control policy, maintenance of machines, etc. will minimise the cost of production.
- The factors listed in category I and II can be further divided into four major classes viz.
 - ❖ Technological
 - ❖ Managerial
 - ❖ Labour
 - ❖ External factors
 - ❖ The **technological factors** can increase the output per unit of input substantially. They can be defined in terms of technology employed, tools and raw material used.
 - ❖ The **labour factors** are characterised by the degree of skills of the work force, health, and attitude towards management, training and discipline.

- ❖ **Managerial factors** can be located in organisational structure, scheduling of work, financial management, layout innovation, personnel policies and practice work environment, material management, etc.
- ❖ **External factors** are innumerable and identifiable in the environment which an organisation has to interact with e.g., the power and transport facilities, tariffs and taxes, etc. have important bearing on the levels of productivity.

Some of these factors are controllable and some are uncontrollable and demarcation should be made between the two.

7.11.1 Labour Productivity

Introductory Labour productivity is an important economic indicator that is closely linked to economic growth, competitiveness, and living standards within an economy. Labour productivity represents the total volume of output (measured in terms of Gross Domestic Product, GDP) produced per unit of labour (measured in terms of the number of employed persons) during a given time reference period. The indicator allows data users to assess GDP-to-labour input levels and growth rates over time, thus providing general information about the efficiency and quality of human capital in the production process for a given economic and social context, including other complementary inputs and innovations used in production.

Given its usefulness in conveying valuable information on a country's labour market situation, it was one of the indicators used to measure progress towards the achievement of the Millennium Development Goals (MDGs), under Goal 1 – Eradicate poverty and hunger, and it was included as one of the indicators proposed to measure progress towards the achievement of the Sustainable Development Goals (SDG), under Goal 8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

Productivity represents the amount of output per unit of input. Output is measured as Gross Domestic Product (GDP) for the aggregate economy expressed at Purchasing Power Parities (PPP) to account for price differences in countries.

The GDP represents the monetary value of all goods and services produced within a country over a specified period of time.

Employment comprises of all persons of working age who during a specified brief period, such as one week or one day, were in the following categories: (a) paid employment – whether at work or with a job but not at work; or (b) self-employment – whether at work or with an enterprise but not at work.

The indicator on labour productivity is calculated as follows:

$$\text{Labour productivity} = \frac{\text{GDP at constant prices}}{\text{Number of employed persons}}$$

7.11.2 Sources of Information

The economic growth in a country can be ascribed either to increased employment or to more effective work by those who are employed. The latter effect can be described through statistics on labour productivity. Labour productivity therefore is a key measure of economic performance. The understanding of the driving forces behind it, in particular the accumulation of machinery and equipment, improvements in organisation as well as physical and institutional infrastructures, improved health and skills of workers considered as human capital and the generation of new technology, is important for formulating policies to support economic growth. Such policies may focus on regulations on industries and trade, institutional innovations, government

investment programs in infrastructure as well as human capital, technology or any combination of these.

Labour productivity estimates can support the formulation of labour market policies and monitor their effects. For example, high labour productivity is often associated with high levels or particular types of human capital indicating priorities for specific education and training policies. Likewise, trends in productivity estimates can be used to understand the effects of wage settlements on rates of inflation or to ensure that such settlements will compensate workers for realised productivity improvements.

Information on output, measured as GDP, is best derived from a country's national accounts.

Labour force surveys are typically the preferred source of information on employment to use in the denominator of the labour productivity indicator. Such surveys can be designed to cover virtually the entire non-institutional population of a given country, all branches of economic activity, all sectors of the economy and all categories of workers, including the self-employed, contributing family workers, casual workers and multiple jobholders. In addition, such surveys generally provide an opportunity for the simultaneous measurement of the employed, the unemployed and persons outside the labour force (and thus, the working-age population) in a coherent framework.

Other types of household surveys and population censuses could also be used as sources of employment. The information obtained from such sources may however be less reliable since they do not typically allow for detailed probing on the labour market activities of the respondents.

Finally, productivity measures can contribute to the understanding of how labour market performance affects living standards. When the intensity of labour utilisation (the average number of annual working hours per head of the population) is low, the creation of employment opportunities is an important means of raising per capita income in addition to productivity growth.

National Output measures are obtained from national accounts and represent, as much as possible, GDP at market prices for the aggregate economy. However, despite common principles that are mostly based on the United Nations System of National Accounts, there are still significant problems in international consistency of national accounts estimates, in particular for economies outside the OECD. The factors affecting the comparability of the data across countries include differences in the treatment of output in services sectors, differences in the procedures used to correct output measures for price changes, and differences in the degree of coverage of informal economic activities in developing economies and of the underground economy in developed economies in national accounts.

Estimates of employment are as much as possible, for the average number of persons with one or more paid jobs during the year. In many countries, statistics on the number of self-employed and family workers in agricultural and informal manufacturing activities are less reliable than those for employees. As in the case of output estimates, the employment estimates are sensitive to under coverage of informal or underground activities, which harbour a substantial part of labour input.

7.12 FACTORS THAT AFFECT THE ECONOMIC GROWTH OF A COUNTRY

The term economic growth is associated with economic progress and advancement. Economic growth can be defined as an increase in the capacity of an economy to produce goods and services within a specific period of time. Economic growth can be

defined as a positive change in the level of goods and services produced by a country over a certain period of time. An important characteristic of economic growth is that it is never uniform or same in all sectors of an economy. For example, in a particular year, the telecommunication sector of a country has marked a significant contribution in economic growth whereas the mining sector has not performed well as far as the economic growth of the country.

Economic growth can be achieved when the rate of increase in total output is greater than the rate of increase in population of a country. For example, in 2005-2006, the rate of increase in India's GNP was 9.1%, while its population growth rate was 1.7%. In economics, economic growth refers to a long-term expansion in the productive potential of the economy to satisfy the wants of individuals in the society. Sustained economic growth of a country has a positive impact on the national income and level of employment, which further results in higher living standards.

Economic analysis provides an insight into the essentials of an economy. It is a systematic process for determining the optimum use of scarce resources and selecting the best alternative to achieve the economic goal. Moreover, economic analysis helps in assessing the causes of different economic problems such as inflation, depression, and economic instability. It is performed by taking into consideration various economic variables such as demand, supply, prices, production cost, wages, labour and capital.

7.12.1 Important Factors that Affect the Economic Growth of a Country

- (a) **Human Resource:** The quality of human resource is dependent on its skills, creative abilities, training and education. If the human resource of a country is well skilled and trained then the output would also be of high quality. Human resource refers to one of the most important determinant of economic growth of a country. The quality and quantity of available human resource can directly affect the growth of an economy.

On the other hand, a shortage of skilled labour hampers the growth of an economy, whereas surplus of labour is of lesser significance to economic growth. Therefore, the human resources of a country should be adequate in number with required skills and abilities, so that economic growth can be achieved.

- (b) **Natural Resources:** Affect the economic growth of a country to a large extent. Natural resources involve resources that are produced by nature either on the land or beneath the land. The resources on land include plants, water resources and landscape.

The resources beneath the land or underground resources include oil, natural gas, metals, non-metals and minerals. The natural resources of a country depend on the climatic and environmental conditions. Countries having plenty of natural resources enjoy good growth than countries with small amount of natural resources.

The efficient utilisation or exploitation of natural resources depends on the skills and abilities of human resource, technology used and availability of funds. A country having skilled and educated workforce with rich natural resources takes the economy on the growth path. The best examples of such economies are developed countries such as United States, United Kingdom, Germany and France. However, there are countries that have few natural resources, but high per capita income such as Saudi Arabia, therefore, their economic growth is very high. Similarly, Japan has a small geographical area and few natural resources, but achieves high growth rate due to its efficient human resource and advanced technology.

(c) **Capital Formation:** This involves land, building, machinery, power, transportation and medium of communication. Producing and acquiring all these man-made products is termed as capital formation. Capital formation increases the availability of capital per worker, which further increases capital/labour ratio. Consequently, the productivity of labour increases which ultimately results in the increase in output and growth of the economy.

(d) **Technological Development:** Technological development helps in increasing productivity with the limited amount of resources. The selection of right technology also plays an important role for the growth of an economy. On the contrary, an inappropriate technology - results in high cost of production.

Technology development refers to one of the important factors that affect the growth of an economy. Technology involves application of scientific methods and production techniques. In other words, technology can be defined as nature and type of technical instruments used by a certain amount of labour.

Countries that have worked in the field of technological development grow rapidly as compared to countries that have less focus on technological development. The selection of right technology also plays an important role for the growth of an economy. On the contrary, an inappropriate technology results in high cost of production.

(e) **Social and Political Factors:** Play a crucial role in economic growth of a country. Social factors involve customs, traditions, values and beliefs, which contribute to the growth of an economy to a considerable extent. For example, a society with conventional beliefs and superstitions resists the adoption of modern ways of living. In such a case, achieving becomes difficult. Apart from this, political factors such as participation of government in formulating and implementing various policies have a major part in economic growth.

Economic growth is directly related to percentage increase in GNP of a country. In real sense, economic growth is related to increase in per capita national output or net national product of a country that remain constant or sustained for many years.

Check Your Progress

Fill in the blanks:

1. Economic resources are the goods or services available to individuals and businesses used to produce valuable _____ products.
2. Division of labour increases the _____ of workers due to which large scale production becomes possible.
3. A factor of production is an _____ term that describes the inputs that are used in the production of goods or services in order to make an economic profit.
4. Labour refers to the act of working for some _____ benefits against physical and mental activity.
5. The investment that is made in the form of _____ or monetary instruments is called money capital.
6. Division of labour increases the efficiency of workers and leads to the possibility of inventions and discoveries because of _____ nature of work.

7.13 LET US SUM UP

- Production refers to the transformation of inputs or resources into outputs of goods and services. Inputs are the resources used in the production of goods and services. As a convenient way to analysis, inputs are classified into labour, capital, land and entrepreneur.
- The resources used to produce economic goods and services also called commodities are called factors of production. These resources are the physical assets needed to produce commodities. Economic resources are the goods or services available to individuals and businesses used to produce valuable consumer products.
- A factor of production is an economic term that describes the inputs that are used in the production of goods or services in order to make an economic profit. The factors of production include land, labour, capital and entrepreneurship. These production factors are also known as management, machines, materials and labour, and knowledge has recently been talked about as a potential new factor of production.
- Land not only consists of mere surface of land but also includes all the natural sources such as oceans, mountains, forests, etc. Marshall defines land as "By land is meant materials and forces which nature gives freely for man's aid, in land, water, in air, light and heat". Thus land is a significant part of production which facilitates in the production of goods and services in one way or the other.
- Labour refers to the act of working for some monetary benefits against physical and mental activity. It does not comprise of any leisure activity. It includes the services of a factory worker, any professional workers such as engineers, doctors, teachers, lawyer, etc. Thus labour forms an essential aspect of production.
- Capital is the man made physical goods used to produce other goods and services. In the ordinary language, capital means money. In Economics, capital refers to that part of man-made wealth which is used for the further production of wealth.
- The prime aspects of production such as land, labour and capital are correspondingly nature, man and material modes of production. Without these factors it is unfeasible to produce and making use of these factors effectively there has to some source. This source is nothing but the organisation which hires them from their owners by paying rent, salary and interest and makes a decision upon the amount of each required for production. Organisation refers to the services of an entrepreneur who controls, organises and manages the policy of a firm, innovates and undertakes all risks.
- Division of Labour means dividing the process of production into distinct and several component processes and assigning each component in the hands of a labour or a set of labourers, who are specialists in that particular process.
- Division of labour is an economic concept which states that dividing the production process into different stages enables workers to focus on specific tasks. If workers can concentrate on one small aspect of production, this increases overall efficiency – so long as there is sufficient volume and quantity produced.
- Industry was not considered productive. According to Adam Smith, only that which resulted in the production of something tangible was productive. Thus he excluded the services of lawyers, doctors, teachers singers, etc. from the category of productive labour. Later, however, the work of manufacturing goods was also recognised as productive.

- In the past, labour was considered an ordinary commodity to be bought and sold in the market like other commodities. It was not recognised that labour was not only a means to an end but was also an end in itself.
- The Indian labour is no doubt less efficient; but it is not due to any inherent deficiencies. The sub-tropical climate weakens him physically. Extremes of heat and cold make factory work a great ordeal. His wage is extremely low and is hardly enough to keep his body and soul together. Besides, labour is not properly organised.
- Mobility is of great advantage to the worker himself. Undoubtedly most of those who leave their village homes for distant industrial centers or foreign lands are able to improve their prospects. They are able to raise themselves up economically. By trying luck elsewhere one generally meets good luck. One rots by staying at home. Nothing can be achieved without showing an adventurous spirit.
- Of all factors labour or man is the least mobile. Capital exists in the form of money and appliances of production. They are lifeless things, and can be sent to different places. However, it is not worthwhile to dismantle heavy machinery which has already been installed in a place and to carry it to some other place.
- Several economists have criticisms for the above factors of production. Economist Benham has objected to a broader meaning of land as a factor of production. As per him, it is convenient to consider only land as factor of production, rather than such elements as sunshine, climate etc. which does not enter directly into costs. Likewise, it is incorrect to group together the services of an untalented worker with that of professionals.
- The concept of the factor of production is of great significance in modern economic study. It is used in the theory of production in which the a range of combinations of factors of production help in generating output when a firm functions under rising or declining costs in the short-run and when the proceeds to scale boosts or shrinks in the long run.
- Labour productivity is an important economic indicator that is closely linked to economic growth, competitiveness and living standards within an economy. Labour productivity represents the total volume of output (measured in terms of Gross Domestic Product, GDP) produced per unit of labour (measured in terms of the number of employed persons) during a given time reference period.
- The economic growth in a country can be ascribed either to increased employment or to more effective work by those who are employed. The latter effect can be described through statistics on labour productivity.
- The term economic growth is associated with economic progress and advancement. Economic growth can be defined as an increase in the capacity of an economy to produce goods and services within a specific period of time. Economic growth can be defined as a positive change in the level of goods and services produced by a country over a certain period of time.

7.14 UNIT END ACTIVITY

Make a presentation and describe how the improvement in the factors of production – land, labour, capital and organisation help in the economic growth of the country. Why are these considered as factors of production?

7.15 KEYWORDS

Factors of Production: A factor of production is an economic term that describes the inputs that are used in the production of goods or services in order to make an economic profit. The factors of production include land, labour, capital and entrepreneurship.

Economic resource: Economic resource are the goods or services available to individuals and businesses used to produce valuable consumer products. The classic economic resources include land, labour and capital.

Labour Intensive Technology: Industry or process where a larger portion of total costs is due to labour as compared with the portion for costs incurred in purchase, maintenance and depreciation of capital equipment. Agriculture, construction and coal-mining industries are examples of labour intensive industries.

Capital Intensive Technology: It refers to a business process or an industry that requires large amounts of money and other financial resources to produce a good or service.

Economic profit or loss: An economic profit or loss is the difference between the revenue received from the sale of an output and the opportunity cost of the inputs used. In calculating economic profit, opportunity costs are deducted from revenues earned.

Physical Capital: Physical capital is one of the three primary factors of production, also known as inputs in the production function. The others are natural resources (including land), and labour — the stock of competences embodied in the labour force.

Human Capital: The skills, knowledge, and experience possessed by an individual or population, viewed in terms of their value or cost to an organisation or country.

Vertical Mobility: It refers to a person or group's movement up or down a status hierarchy. This is commonly referred to as social mobility, yet vertical mobility can also refer to any movement up or down a hierarchy of any kind, not necessarily related to social status in the same way that social mobility is.

MDG: Millennium Development Goals

SDG: Sustainable Development Goals

7.16 QUESTIONS FOR DISCUSSION

1. What is production and why are the factors of production important?
2. Define labour. What is meant by division of labour?
3. Describe the characteristics of capital.
4. What are the functions of entrepreneur?
5. What is land and what are the peculiarities of land?

Check Your Progress: Model Answer

1. Consumer
2. Efficiency
3. Economic
4. Monetary
5. Money
6. Repetitive

7.17 REFERENCES & SUGGESTED READINGS

- Gordon, R. J. (2019). *Microeconomics (13th ed.)*. Pearson.
- Kaur, R. (2022). *Microeconomics: A Textbook for Economics Students*. Kalyani Publishers.
- Kumar, N. (2023). *Principles of Microeconomics*. Taxmann Publications Pvt. Ltd.
- Mishra, S. K., & Puri, V. K. (2020). *Microeconomics*. Himalaya Publishing House.
- Varian, H. R. (2022). *Intermediate Microeconomics: A Modern Approach (10th ed.)*. W.W. Norton & Company.

UNIT

8

LAW OF VARIABLE PROPORTION

CONTENTS

- 8.0 Aims and Objectives
- 8.1 Introduction
- 8.2 Law of Variable Proportion
 - 8.2.1 Assumptions for Law of Variable Proportion
- 8.3 The Three Stages of Production
- 8.4 Law of Returns to Scale
- 8.5 Causes Responsible for Law of Variable Proportion
- 8.6 Applicability of the Law of Variable Proportions
- 8.7 Importance of Law of Variable Proportion
- 8.8 Economies of Scale
- 8.9 Economies of Large Scale Production
 - 8.9.1 Internal Economies
 - 8.9.2 External Economies
- 8.10 Diseconomies of Large Scale Production
- 8.11 Let Us Sum Up
- 8.12 Unit End Activity
- 8.13 Keywords
- 8.14 Questions for Discussion
- 8.15 References & Suggested Readings

8.0 AIMS AND OBJECTIVES

After studying this lesson, you should be able to:

- Understand the Law of Variable Proportion
- Know about the three Stages of Production
- Explain the Law of Returns to Scale
- Describe the causes responsible for Law of Variable Proportion
- Understand the importance of Law of Variable Proportion
- Know about the Economies of Scale
- Explain the economies and diseconomies of Large Scale Production

8.1 INTRODUCTION

Law of Variable Proportions occupies an important place in economic theory. This law is also known as Law of Proportionality. The effect of variations in the proportions of factors of production are commonly introduced into our economic analysis through the statement of the principle of diminishing productivity in the following statement - 'In a given state of arts, after a certain point is reached, the application of further units of any variable factor to another fixed factor or a combination of fixed factors will yield less than proportionate returns'. The logic of the analysis seems to demonstrate that not only that we distinguish the effects of changes in the proportions of factors from the changes in the state of arts but also that we distinguish them from the effects of changes in the scale of production.

It explains the production function keeping other factors fixed, with one factor variable. In the short run, when output of a commodity is sought to be increased, the law of variable proportions comes into operation. Therefore, when the number of one factor is increased or decreased, while other factors are constant, the proportion between the factors is altered. For instance, there are two factors of production viz., labour and land.

Labour is a variable factor and land is a fixed factor. Now, suppose we have a land measuring 5 hectares. We grow wheat on it with the help of variable factor i.e., labour. Accordingly, the proportion between land and labour will be 1: 5. If the number of labourers is increased to 2, the new proportion between labour and land will be 2: 5. Due to change in the proportion of factors there will also emerge a change in total output at different rates. This tendency in the theory of production is called the Law of Variable Proportion.

According to **Benham**, "As the proportion of the factor in a combination of factors is increased after a point, first the marginal and then the average product of that factor will diminish".

Samuelson define law of variable proportion in the following way:

"An increase in some inputs relative to other fixed inputs will in a given state of technology cause output to increase but after a point the extra output resulting from the same additions of extra inputs will become less and less".

In the words of **Leftwitch**, "The law of variable proportion states that if the inputs of one resource is increased by equal increment per unit of time while the inputs of other resources are held constant, total output will increase, but beyond some point the resulting output increases will become smaller and smaller".

8.2 LAW OF VARIABLE PROPORTION

Law of variable proportions establishes the short run relationship between the changes in output and the changes in inputs. In the short period, some factors are fixed and some are variable. So in the short run, if we want to increase the output, we have to vary the variable factors only. The law is called the law of variable proportions because when in the short run, increasing doses of variable factors are applied upon some fixed factors, the factor proportion changes.

The law of variable proportions which comprises three stages applies in all economic fields. **Prof. Samuelson** has stated that an increase in some inputs relative to other comparatively fixed inputs will cause output to increase; but after a point, the extra output resulting from the same additions of inputs will become less and less; this falling of extra returns is a consequence of the fact that the new doses of varying resources have less and less of the constant resources to work with.

The law of variable proportions comprises three stages. At the initial level, when a variable factor is increased on some fixed factors, the factor proportion becomes favourable. It increases the marginal output at an increasing rate. After sometime, when the factor proportion becomes optimum, marginal output reaches the maximum level. For a while, the optimum level is not disturbed by an increase in variable inputs. So the marginal output remains constant for a few doses. But when the variable factor is increased further, the optimum factor proportion is disturbed. It becomes unfavourable. The marginal output starts declining. At this stage, the law of diminishing returns starts operating.

8.2.1 Assumptions for Law of Variable Proportion

1. Only one factor is variable while others are held constant. The state of technology is assumed to be given and constant. If there is an improvement in technology, the production function will move upward.
2. All units of the variable factor are homogeneous. The law assumes that factor proportions are variable. If factors of production are to be combined in a fixed proportion, the law has no validity.
3. There is no change in technology. The state of technology is assumed to be given and constant. If there is an improvement in technology the production function will move upwards.
4. It is possible to vary the proportions in which different inputs are combined. The units of variable factor are homogeneous. Each unit is identical in quality and amount with every other unit.
5. It assumes a short-run situation, for in the long-run all factors are variable. The law operates in the short-run when it is not possible to vary all factor inputs.
6. The product is measured in physical units, i.e., in quintals, tonnes, etc.

Given these assumptions, let us illustrate the law with the help of Table 8.1, where on the fixed input land of 4 acres, units of the variable input labour are employed and the resultant output is obtained. The production function is revealed in the first two columns. The average product and marginal product columns are derived from the total product column. The average product per worker is obtained by dividing column (2) by a corresponding unit in column (1). The marginal product is the addition to total product by employing an extra worker. 3 workers produce 36 units and 4 produce 48 units. Thus the marginal product is 12 i.e., (48-36) units.

Table 8.1: Law of Variable Proportion Stages

No. of Workers (1)	Total Product (2)	Average Product (3)	Marginal Product (4)		
1	8	8	8	}	Stage I
2	20	10	12		
3	36	12	16		
4	48	12	12	}	Stage II
5	55	11	7		
6	60	10	5		
7	60	8.6	0	}	Stage III
8	56	7	-4		

An analysis of the table shows that the total, average and marginal products increase at first, reach a maximum and then start declining. The total product reaches its maximum when 7 units of labour are used and then it declines. The average product continues to rise till the 4th unit while the marginal product reaches its maximum at the 3rd unit of labour, then they also fall. It should be noted that the point of falling output is not the same for total, average and marginal product.

The marginal product starts declining first, the average product following it and the total product is the last to fall. This observation points out that the tendency to diminishing returns is ultimately found in the three productivity concepts. The law of variable proportions is presented diagrammatically in Figure 8.1. The TP curve first rises at an increasing rate up to point A where its slope is the highest. From point A upwards, the total product increases at a diminishing rate till it reaches its highest point C and then it starts falling.

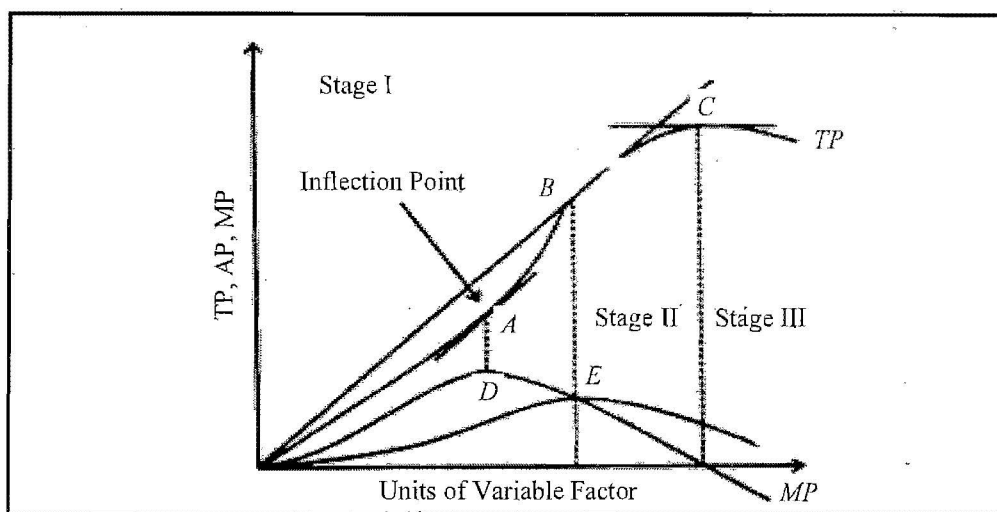


Figure 8.1: Law of Variable Proportion Curve

Point A where the tangent touches the TP curve is called the inflection point upto which the total product increases at an increasing rate and from where it starts increasing at a diminishing rate. The Marginal Product (MP) curve and the Average Product (AP) curve also rise with TP. The MP curve reaches its maximum point D when the slope of the TP curve is the maximum at point A.

The maximum point on the AP curves is E where it coincides with the MP curve. This point also coincides with point B on TP curve from where the total product starts a gradual rise. When the TP curve reaches its maximum point C the MP curve becomes zero at point F. When TP starts declining, the MP curve becomes negative. It is only when the total product is zero that the average product also becomes zero. The rising, the falling and the negative phases of the total, marginal and average products are in fact the different stages of the law of variable proportions which are discussed below.

8.3 THE THREE STAGES OF PRODUCTION

Stage I: Increasing Returns

In stage I, the average product reaches the maximum and equals the marginal product when 4 workers are employed, as shown in the Table 8.1. This stage is portrayed in the Figure 8.1 from the origin to point E where the MP curve reaches its maximum and the AP curve is still rising. In this stage, the TP curve also increases rapidly. Thus this stage relates to increasing returns. Here land is too much in relation to the workers

employed. It is, therefore, profitable for a producer to increase more workers to produce more and more output. It becomes cheaper to produce the additional output. Consequently, it would be foolish to stop producing more in this stage. Thus, the producer will always expand through this stage I.

Causes of Increasing Returns

1. The main reason for increasing returns in the first stage is that in the beginning the fixed factors are larger in quantity than the variable factor. When more units of the variable factor are applied to a fixed factor, the fixed factor is used more intensively and production increases rapidly.
2. In the beginning, the fixed factor cannot be put to the maximum use due to the non applicability of sufficient units of the variable factor. But when units of the variable factor are applied in sufficient quantities, division of labour and specialisation lead to per unit increase in production and the law of increasing returns operate.
3. Another reason for increasing returns is that the fixed factors are indivisible which means that they must be used in a fixed minimum size. When more units of the variable factor are applied on such a fixed factor, production increases more than proportionately. This point towards the law of increasing returns.

Stage II: Diminishing Returns

It is the most important stage of production. Stage II starts when at point E where the MP curve intersects the AP curve which is at the maximum. Then both continue to decline with AP above MP and the TP curve begins to increase at a decreasing rate till it reaches point C. At this point, the MP curve becomes negative when the TP curve begins to decline in the Figure 8.1 given above; Table 8.1 show this stage when the workers are increased from 4 to 7 to cultivate the given land there is decline in the marginal product. This is shown in the Figure 8.1 graphically in form of the MP curve which declines negatively.

In Figure 8.1, it lies between BE and CF. Here land is scarce and is used intensively. More and more workers are employed in order to have larger output. Thus the total product increases at a diminishing rate and the average and marginal product decline. This is the only stage in which production is feasible and profitable because in this stage, the marginal productivity of labour, though positive, is diminishing but is non-negative. Hence, it is not correct to say that the law of variable proportions is another name for the law of diminishing returns. In fact, the law of diminishing returns is only one phase of the law of variable proportions.

The law of diminishing returns in this sense has been defined by **Prof. Benham** thus: "As the proportion of one factor in a combination of factors is increased, after a point, the average and marginal product of that factor will diminish".

Causes for Diminishing Marginal Returns

The stage of diminishing marginal returns in the production function with one factor variable is the most important. The question arises as to why we get diminishing marginal returns after a certain amount of the variable factor has been added to a fixed quantity of the other factor.

As explained above, increasing returns to a variable factor occur initially primarily because of the more effective and fuller use of the fixed factor becomes possible as more units of the variable factor are employed to work with it.

Once the point is reached at which the amount of the variable factor is sufficient to ensure the efficient utilisation of the fixed factor, then further increases in the variable

factor will cause marginal and average products of a variable factor to decline because the fixed factor then becomes inadequate relative to the quantity of the variable factor.

In other words, the contributions to the production made by the variable factor after a point become less and less because the additional units of the variable factor have less and less of the fixed factor to work with. The production is the result of the co-operation of various factors aiding each other. Now, how much aid one factor provides to the others depends upon how much there is of it.

Eventually, the fixed factor is abundant relative to the number of the variable factor and the former provides much aid to the later. Eventually, the fixed factor becomes more and more scarce in relation to the variable factor so that as the units of the variable factor are increased they receive less and less aid from the fixed factor. As a result, the marginal and average products of the variable factor decline ultimately.

The phenomenon of diminishing marginal returns, like that of increasing marginal returns, rests upon the indivisibility of the fixed factor. As explained above, the important reason for increasing returns to a factor in the beginning is the fact that the fixed factor is indivisible which has to be employed whether the output to be produced is small or large.

1. **Optimum Combination of Factors:** When the indivisible fixed factor is not being fully used, successive increases in a variable factor add more to output since fuller and more efficient use is made of the indivisible fixed factor. But there is generally a limit to the range of employment of the variable factor over which its marginal and average products will increase.

There will usually be a level of employment of the variable factor at which indivisible fixed factor is being as fully and efficiently used as possible. It will happen when the variable factor has increased to such an amount that the fixed indivisible factor is being used in the best or optimum proportion with the variable factor. Once the optimum proportion is disturbed by further increases in the variable factor, returns to a variable factor i.e., marginal product and average product will diminish primarily because the indivisible factor is being used too intensively, or in other words, the fixed factor is being used in non-optimal proportion with the variable factor.

Whereas if the fixed factor was perfectly divisible, neither the increasing nor the diminishing returns to a variable factor would have occurred. If the factors were perfectly divisible, then there would not have been the necessity of taking a large quantity of the fixed factor in the beginning to combine with the varying quantities of the other factor. In the presence of perfect divisibility, the optimum proportion between the factors could have always been achieved. Perfect divisibility of the factors implies that a small firm with a small machine and one worker would be as efficient as a large firm with a large machine and many workers.

2. **Imperfect Substitutes:** Diminishing returns to a factor occurs because fixed and variable factors are imperfect substitutes of one another. There is a limit to the extent of which one factor of production can be substituted for another.

For example, labour can be substituted in place of capital or capital can be substituted in place of labour till a particular limit. But, beyond the optimum limit, they become imperfect substitutes of one another, which lead to diminishing returns.

The productivity of the factors would be the same in the two cases. Thus, we see that if the factors were perfectly divisible, then the question of varying factor proportions would not have arisen and hence the phenomena of increasing and diminishing marginal returns to a variable factor would not have occurred.

Prof. Bober rightly remarks: "Let divisibility enter through the door, law of variable proportions rushes out through the window".

Joan Robinson goes deeper into the causes of diminishing returns. She holds that, the diminishing marginal returns occur because the factors of production are imperfect substitutes for one another. As seen above, diminishing returns occur during the second stage since the fixed factor is now inadequate relatively to the variable factor. Now, a factor which is scarce in supply is taken as fixed.

When there is a scarce factor, quantity of that factor cannot be increased in accordance with the varying quantities of the other factors, which, after the optimum proportion of factors is achieved, results in diminishing returns.

If now some factors were available which perfect substitute of the scarce fixed factor was, then the paucity of the scarce fixed factor during the second stage would have been made up by the increase in supply of its perfect substitute with the result that output could be expanded without diminishing returns.

Thus, even if one of the variable factors which we add to the fixed factor were perfect substitute of the fixed factor, then when, in the second stage, the fixed factor becomes relatively deficient, its deficiency would have been made up for increase in the variable factor which is its perfect substitute.

Thus, **Joan Robinson** says, "What the Law of Diminishing Returns really states is that there is a limit to the extent to which one factor of production can be substituted for another, or, in other words, that the elasticity of substitution between factor is not infinite.

If this was not true, it would be possible, when one factor of production is fixed in amount and the rest are in perfectly elastic supply, to produce part of the output with the aid of the fixed factor, and then, when the optimum proportion between this and other factors was attained, to substitute some other factor for it and to increase output at constant cost". We, therefore, see that diminishing returns operate because the elasticity of substitution between factors is not infinite.

Stage III: Negative Marginal Returns

Production cannot take place in stage III either. For in this stage, total product starts declining and the marginal product becomes negative. The employment of the 8th worker actually causes a decrease in total output from 60 to 56 units and makes the marginal product minus 4. In the figure, this stage starts from the dotted line CF where the MP curve is below the A axis. Here the workers are too many in relation to the available land, making it absolutely impossible to cultivate it.

Causes for Negative Marginal Returns

As the amount of a variable factor continues to be increased to a fixed quantity of the other factor, a stage is reached when the total product declines and the marginal product of the variable factor becomes negative.

This phenomenon of negative marginal returns to the variable factor in stage 3 is due to the fact that a number of the variable factor becomes too excessive relative to the fixed factor so that they obstruct each other with the result that the total output falls instead of rising.

Besides, too large a number of the variable factor also impairs the efficiency of the fixed factor. The proverb "too many cooks spoil the broth" aptly applies to this situation. In such a situation, a reduction in the units of the variable factor will increase the total output.

1. **Limitation of Fixed Factor:** The negative returns to a factor apply because some factors of production are of fixed nature, which cannot be increased with increase in variable factor in the short run.
2. **Poor Coordination between Variable and Fixed Factor:** When variable factor becomes too excessive in relation to fixed factor, then they obstruct each other. It leads to poor coordination between variable and fixed factor. As a result, total output falls instead of rising and marginal product becomes negative.
3. **Decrease in Efficiency of Variable Factor:** With continuous increase in variable factor, the advantages of specialisation and division of labour start diminishing. It results in inefficiencies of variable factor, which is another reason for the negative returns to eventually set in.

The Optimum and the Best Stage

In stage I, when production takes place to the left of point E, the fixed factor is excess in relation to the variable factors which cannot be used optimally. To the right of point F, the variable input is used excessively in Stage III. Therefore, no producer will produce in this stage because the marginal production is negative. Thus, the first and third stages are of economic absurdity or economic nonsense. So, production will always take place in the second stage in which total output of the firm increases at a diminishing rate and MP and AP are the maximum, then they start decreasing and production is optimum. This is the optimum and best stage of production.

8.4 LAW OF RETURNS TO SCALE

In the long run, expansion of output can be achieved by variation in the use of all factors as all factors are variable. The laws of returns to scale refer to the effects of changes in the scale of production. In the long run, output can be increased by effecting a change in the use of all factors keeping the same proportion or by changes in different proportions.

The degree of responsiveness of output to a proportionate change in the quantity of all inputs is called returns to scale. There are three possibilities via; (a) constant returns to scale, (b) increasing returns to scale and (c) decreasing returns to scale.

Constant Returns to Scale

In the case of constant returns to scale, when all factor of production are increased in a given proportion, the output would also increase in the same proportion. For example, if the quantity of labour and capital is increased by 10%, output also increases by 10%. If labour and capital are doubled, output also doubles. Similarly, if all inputs are reduced by a given proportion, output is reduced by the same proportion.

Increasing Returns to Scale

In the case of increasing returns to scale, when all factors are increased in a given proportion, output increases by a greater proportion. For example, if the amount of labour and capital is increased by 10%, output increases by more than 10%. If the quantity of labour and capital doubles, output more than doubles.

Decreasing Returns to Scale

In the case of decreasing returns to scale, output increases in a smaller proportion than the increase in all inputs, i.e., in this case as inputs are increased by a particular proportion, output increases less than proportionately. For example, if inputs are increased by 10% output increases by less than 10%. If inputs double, outputs will less than double.

8.5 CAUSES RESPONSIBLE FOR LAW OF VARIABLE PROPORTION

There are many causes which are responsible for the application of the law of variable proportions.

They are as follows:

1. **Underutilisation of Fixed Factor:** In initial stage of production, fixed factors of production like land or machine, is underutilised. More units of variable factor, like labour, are needed for its proper utilisation. As a result of employment of additional units of variable factors there is proper utilisation of fixed factor. In short, increasing returns to a factor begins to manifest itself in the first stage.
2. **Fixed Factors of Production:** The foremost cause of the operation of this law is that some of the factors of production are fixed during the short period. When the fixed factor is used with variable factor, then its ratio compared to variable factor falls. Production is the result of the co-operation of all factors. When an additional unit of a variable factor has to produce with the help of relatively fixed factor, then the marginal return of variable factor begins to decline.
3. **Optimum Production:** After making the optimum use of a fixed factor, then the marginal return of such variable factor begins to diminish. The simple reason is that after the optimum use, the ratio of fixed and variable factors becomes defective. Let us suppose a machine is a fixed factor of production. It is put to optimum use when 4 labourers are employed on it. If 5 labourers are put on it, then total production increases very little and the marginal product diminishes.
4. **Imperfect Substitutes:** Mrs. Joan Robinson has put the argument that imperfect substitution of factors is mainly responsible for the operation of the law of diminishing returns. One factor cannot be used in place of the other factor. After optimum use of fixed factors, variable factors are increased and the amount of fixed factor could be increased by its substitutes.

Such a substitution would increase the production in the same proportion as earlier. But in real practice factors are imperfect substitutes. However, after the optimum use of a fixed factor, it cannot be substituted by another factor.

8.6 APPLICABILITY OF THE LAW OF VARIABLE PROPORTIONS

The law of variable proportions is universal as it applies to all fields of production. This law applies to any field of production where some factors are fixed and others are variable. That is why, it is called the law of universal application.

The main cause of application of this law is the fixity of any one factor. Land, mines, fisheries, house building, etc. are not the only examples of fixed factors. Machines, raw materials may also become fixed in the short period. Therefore, this law holds fairly good in all activities of production like agriculture, mining and manufacturing industries.

1. **Application to Agriculture:** With a view of raising agricultural production, labour and capital can be increased to any extent but not the land, being fixed factor. Thus, when more and more units of variable factors like labour and capital are applied to a fixed factor then their marginal product starts to diminish and this law becomes operative.

2. **Application to Industries:** In order to increase production of manufactured goods, factors of production has to be increased. It can be increased as desired for a long period, being variable factors. Thus, the law of increasing returns operates in industries for a long period. But, this situation arises when additional units of labour, capital and enterprise are of inferior quality or are available at higher cost.

As a result, after a point, marginal product increases less proportionately than increase in the units of labour and capital. In this way, the law is equally valid in industries.

Postponement of the Law

The postponement of the law of variable proportions is possible under the following conditions:

- (i) **Improvement in Technique of Production:** The operation of the law can be postponed in case variable factors techniques of production are improved.
- (ii) **Perfect Substitute:** The law of variable proportion can also be postponed in case factors of production are made perfect substitutes i.e., when one factor can be substituted for the other.

8.7 IMPORTANCE OF LAW OF VARIABLE PROPORTION

The Law of Variable Proportion has universal applicability in any branch of production. It forms the basis of a number of doctrines in economics:

- The Malthusian theory of population stems from the fact that food supply does not increase faster than the growth in population because of the operation of the law of diminishing returns in agriculture.
- Ricardo also based his theory of rent on this principle. According to him rent arises because the operation of the law of diminishing return forces the application of additional doses of labour and capital on a piece of land.
- Similarly the law of diminishing marginal utility and that of diminishing marginal physical productivity in the theory of distribution are also based on this theory.
- The law is of fundamental importance for understanding the problems of under-developed countries. In such agricultural economies the pressure of population on land increases with the increase in population. This leads to declining or even zero or negative marginal productivity of workers. This explains the operation of the law of diminishing returns.
- The law of variable proportions occupies an important place in modern economic theory. It influences every aspect of economic life. This law (especially its phase of diminishing returns) has universal application in the field of production, in any form.
- A number of economic principles find their expression in the law of diminishing returns. Principle of Substitution, Marginal Utility Theory of Value, Marginal Productivity Theory of Distribution, Ricardian Theory of Rent and Malthusian Theory of Population are some illustrations.
- Law of variable proportions has vast general applicability. This law applies as much to industries as to agriculture. However, in agriculture, where nature plays the major role, diminishing returns set in at an early stage than the industries, where man's role is more important.
- Experiences of the underdeveloped countries of the world justify the operation of this law in agriculture. Phenomenon of disguised unemployment revealing zero or near zero or negative marginal productivity of labour is one such example.

Withdrawal of disguised unemployed people and employing it in industrial sector can increase the output of agriculture.

- Agricultural production and productivity can be substantially increased by making advancement in agricultural technology through progress in science. Scientific rotation of crops, improved seeds, fertilisers, modern implements, better irrigation facilities, etc. are some ways in which this can be done.
- This will also solve the problem of food crises and starvation. Most of developed countries of the world have been successful on this front. However, technology advancement shifts the total product curve upwards. It will just postpone the operation of this law and eventually diminishing returns will set in.

Thus, the application of the law of variable proportions is inevitable, inexorable and all pervading.

8.8 ECONOMIES OF SCALE

Economies of scale are defined as the cost advantages that an organisation can achieve by expanding its production in the long run. The scale of production refers to the amount of factors used, the quantities of products produced, and the techniques of production adopted by a producer. As production increases with the increase in the quantities of land, labour and capital, the scale of production expands.

Production may be carried on a small scale or on a large scale by a firm. When a firm operates by using less capital and small quantities of other factors of production, the scale of production is said to be small. On the other hand, a firm using more capital and larger quantities of other factors is said to be operating on a large scale. The scale of production of an industry expands with the increase in the number of firms in the industry, or/and with the increase in the size of the firms in it.

A firm expands its scale of production for the purpose of earning larger profits and thereby derives many economies of large scale production which, in turn, help it in lowering the costs of production and increasing its productive efficiency. When the majority of firms enjoy the economies of large scale production, they are also available to an industry which comprises those firms.

In other words, these are the advantages of large scale production of the organisation. The cost advantages are achieved in the form of lower average costs per unit. It is a long term concept. Economies of scale are achieved when there is an increase in the sales of an organisation. As a result, the savings of the organisation increases, which further enables the organisation to obtain raw materials in bulk. This helps the organisation to enjoy discounts. These benefits are called as economies of scale.

8.9 ECONOMIES OF LARGE SCALE PRODUCTION

Economies of large scale production have been classified by Marshall into Internal Economies and External Economies. Internal economies are internal to a firm when its costs of production are reduced and output increases. They are open to a single factory or a single firm independently of the action of other firms.

They result from an increase in the scale of output of the firm, and cannot be achieved unless the output increases. They are not the result of inventions of any kind, but are due to the use of known methods of production which a small firm does not find worthwhile. External Economies are external to firms which are available to it when the output of the whole industry increases with the expansion of the industry itself. They are "shared by a number of firms or industries when the scale of production in any industry or group of industries increases. They are not monopolized by a single

firm when it grows in size, but are conferred on it when some other firms grow larger”.

The economies of scale are divided into internal economies and external economies discussed as follows:

8.9.1 Internal Economies

Refer to real economies which arise from the expansion of the plant size of the organisation. These economies arise from the growth of the organisation itself.

Causes of Internal Economies

Internal economies which accrue to a firm when it expands are caused by two factors: (1) Indivisibility and (2) Specialisation

1. **Indivisibilities:** Many fixed factors of production are indivisible in the sense that they must be used in a fixed minimum size. Such “factors of production can be most efficiently employed at a fairly large output, but work less efficiently at small outputs because they cannot be divided into smaller units”. Thus as output increases, the indivisible factors which were being used below capacity can be utilised to their full capacity thereby reducing costs. Such indivisibilities arise in the case of labour, machines, marketing, finance and research.

Labour is not divisible in the sense that if a manager works half the time, he may be paid half the salary. Or, as put by Stonier and Hague, “he cannot be chopped into half, and asked to produce half the current output”. For instance, a college will require the services of a principal regardless of the number of students and lecturers.

Similar is the case with a factory manager, an engine driver, or a commercial pilot who will carry on his duties up to the maximum operational capacity. A factory manager with the maximum operational capacity of 1000 workers in the factory may be managing the same with 200 workers to start with. But when the factory expands in size and the number of workers increases gradually to 1000, the salary of the manager is spread over this number and thus there is a saving on this count to the management.

Even if we presume that the salary of the manager also increases with the increase in his duties, it would not be increased in proportion to the increase in his duties because when he was appointed, the salary fixed by the management was in keeping with the maximum size of the factory with 1000 workers.

A machine is also indivisible in this sense. Let us take an example. Suppose a hydroelectric plant is installed with the maximum capacity of producing 2 lakh kw of electricity. In the beginning, it may start producing 20,000 kw of electricity. The cost of producing a unit of power would be very high to the electricity board because of the high cost of installing and operating the plant. But as the plant starts producing more units and till it reaches its maximum capacity of 2 lakh kw, the per unit cost of electricity will continue to fall.

Similarly, a firm may enjoy marketing indivisibilities with its expansion. The same representatives may be asked to sell the products in large areas, and per unit cost of advertisement in a newspaper, on the radio, or on the TV may be considerably reduced.

It may also procure cheap and timely finance. People subscribe to the shares and debentures of a large firm readily. Again, the larger the number of shares and debentures floated in the market, the smaller will be the cost of managing such issues.

There are also research indivisibilities. A large firm has the capacity to set up a research laboratory and benefit by the invention of new processes of production which help in expanding production and reducing costs.

2. **Specialisation:** Division of labour which leads to specialisation is another cause of internal economies. When a firm expands in size, not only its production increases, but the quantity of raw materials and the number of workers also increase. This necessitates division of labour whereby each worker is assigned one particular job and the splitting up of processes into sub-processes for greater efficiency.

For example, the production process may be split into four departments relating to manufacturing, assembling, packing and marketing under the charge of separate managers who may work under the overall charge of the general manager who will coordinate the activities of the four departments. Thus specialisation will lead to greater productive efficiency and to reduction in costs.

The different examples of internal economies of scale are as follows:

1. **Technical economies of scale:** Occur when organisations invest in the expensive and advanced technology. This helps in lowering and controlling the costs of production of organisations. These economies are enjoyed because of the technical efficiency gained by the organisations. The advanced technology enables an organisation to produce a large number of goods in short time. Thus, production costs per unit falls leading to economies of scale.

Prof. Cairncross divides technical economies into the following five parts:

- (i) **Economies of Superior Technique:** It is only large firms which can afford to pay for costly machines and install them. Such machines are more productive than small machines. The high cost of such machines can be spread over a larger output which they help to produce. Per unit cost of production falls in a large firm, that employs costly and superior plant and equipment and enjoys a technical superiority over a smaller firm.
- (ii) **Economies of Increased Dimensions:** The installation of large machines itself brings many advantages to a firm. The cost of operating large machines is less than that of operating small machines. Even the cost of construction is relatively lower for large machines than for small ones. The manufacture of a double-decker bus is lower as compared to the manufacture of two ordinary buses. Moreover, a double-decker carries more passengers than an ordinary bus and at the same time requires only a driver and a conductor like the latter. Thus, its operating costs are relatively lower.
- (iii) **Economies of Linked Processes:** A large firm is able to reduce its per unit cost of production by linking the various processes of production. For instance, a large sugar manufacturing firm may own its sugarcane farms, manufacture sugar, pack it in bags, transport and distribute sugar through its own transport and distribution departments. Thus, by linking the various processes of production and sale, a large firm saves the expenses incurred on intermediaries, thereby reducing unit cost of production.
- (iv) **Economies of by-products:** A large firm possesses greater resources than a small firm and is able to utilise its waste material as a by-product. For example, the molasses left over after manufacturing sugar from the sugarcane can be used for producing spirit by installing a plant for the purpose.
- (v) **Economies of Increased Specialisation:** A large firm is able to reap economies by dividing its production processes into sub-processes thereby leading to

greater division of labour and to increased specialisation. This increases the productive efficiency of the firm and reduces the unit cost of production.

2. **Marketing economies of scale:** A large firm also reaps the economies of buying and selling. It buys its requirements of various inputs in bulk and is, therefore, able to secure them at favourable terms in the form of better quality inputs, prompt delivery, transport concessions, etc. Because of its larger organisation, it produces quality products which are offered for sale in attractive packing by its packing department. It may also have a sales department manned by experts who carry on salesmanship, propaganda and advertisement through the various media efficiently. Thus, a large firm is able to reap the economies of marketing through its superior bargaining power and efficient packing and sales organisation.

The marketing economies of scale are achieved in case of bulk buying, branding, and advertising. For instance, large organisations enjoy benefits on advertising costs as they cover larger audience. On the other hand, small organisations pay equal advertising expenses as large organisations, but do not enjoy such benefits on advertising costs.

3. **Financial economies of scale:** This takes place when large organisations borrow money at lower rate of interest. A large firm can procure cheap and timely finance both from the banks and the market because it possesses large assets and good reputation. It can also raise fresh capital by floating shares and debentures in the capital market. It is in this way that a large firm reaps financial economies. These organisations have good credibility in the market. Generally, banks prefer to grant loans to those organisations that have a strong foothold in the market and have good repaying capacity.
4. **Managerial economies of scale:** Occur when large organisations employ specialised workers for performing different tasks. These workers are experts in their fields and use their knowledge and experience to maximise the profits of the organisation. For instance, in an organisation, accounts and research department are created and managed by experienced individuals, so that all costs and profits of the organisation can be estimated properly.
5. **Commercial economies:** Refer to economies in which organisations enjoy benefits of buying raw materials and selling of finished goods at lower cost. A large firm is in a better position than a small firm in spreading its risks. It can produce a variety of products, and sell them in different areas. By the diversification, of its products the large firm is able to reduce risks by counterbalancing the loss of one product by the gain from other products. By the diversification of markets, it can counter-balance the fall in demand in one market by the increased demand in other markets. Even if the demand in the other markets for the products of the firm is constant, the loss can be easily borne by it.

A firm undertakes great risk by depending excessively on one source for its supply of power and raw materials. It can avoid risks by having alternative sources of supply in the case of power and different sources for the supply of raw materials. For instance, a large firm can avoid the losses arising from failure of regular power-supply by installing a generator of its own.

There may be a separate head for manufacturing, assembling, packing, marketing, general administration, etc. This leads to functional specialisation which increases the productive efficiency of the firm. These managerial economies also reduce per unit cost of management because with expansion of the firm, the various departmental managers will manage large output as efficiently as they were managing small output at the same salary.

Large organisations buy raw materials in bulk; therefore, enjoy benefits in transportation charges, easy credit from banks, and prompt delivery of products to customers.

6. **Research Economies:** A large firm possesses larger resources than a small firm and can establish its own research laboratory and employ trained research workers. When they invent new production techniques or processes, the latter become the property of the firm which utilises them for increasing its output and reducing costs.
7. **Welfare Economies:** All firms have to provide welfare facilities to their workers. But a large firm, with its large resources, can provide better working conditions in and outside the factory. It may run subsidised canteens, provide crèches for the infants of women workers and recreation rooms for the workers within the factory premises. It may also provide cheap houses, educational and medical facilities for the families of workers and recreational clubs outside the factory. Though the expenses on such facilities are very heavy, yet they tend to increase the productive efficiency of the workers which helps in raising production and reducing costs.

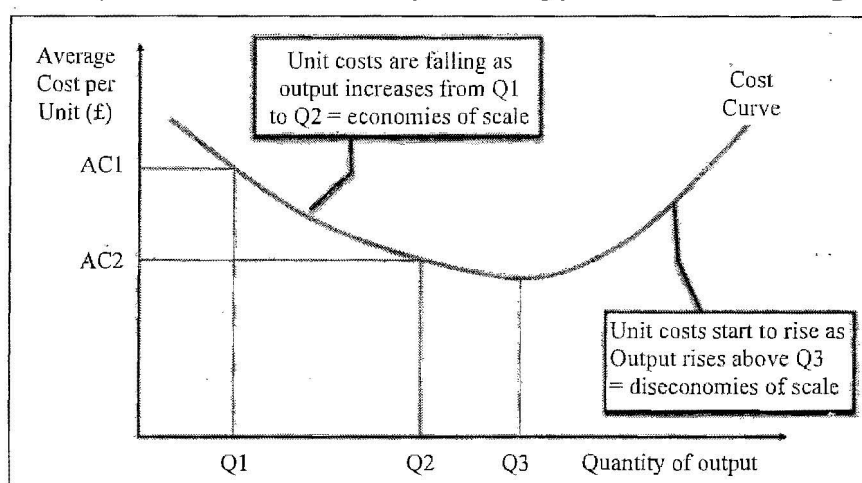


Figure 8.2: Economies of Scale

8.9.2 External Economies

External Economies occur outside the organisation. These economies occur within the industries which benefit organisations. When an industry expands, organisations may benefit from better transportation network, infrastructure, and other facilities. External economies benefit all firms within the industry as the size of the industry expands. Such economies accrue to firms when the industry is localised in a particular area, makes inventions and evolves specialisation of production processes.

This helps in decreasing the cost of an organisation. The different examples of external economies of scale are discussed as follows:

1. **Economies of Concentration:** When an industry is concentrated in a particular area, all the member firms reap some common economies. First, skilled labour is available to all the firms. Second, means of transport and communications are considerably improved. The industry may ask the railway authorities for additional facilities for more wagons, loading and unloading, etc. Road transporters may also provide special facilities to the firms. Third, banks, insurance companies and other financial institutions set up their offices in the area and the firms get cheap and timely credit. Fourth, the electricity board supplies adequate power to the firms, often at concessional rates. Last, subsidiary industries develop to supply the localised industry with tools, equipment and raw materials. All these facilities tend to lower the unit cost of production of all the

firms in the industry. It refers to economies that arise from the availability of skilled labour, better credit and transportation facilities.

2. **Economies of Information:** An industry is in a better position to set up research laboratories than a large firm because it is able to pool larger resources. It can employ highly paid and more experienced research personnel. The fruits of their research in the form of new inventions are passed on to the firms through a scientific journal. The industry can also set up an information centre which may publish a journal and pass on information regarding the availability of raw materials, modern machines, export potentialities of the products of the industry in various countries of the world and provide other information needed by the firms. All this helps in raising the productive efficiency of the firms and reduction in their cost. They imply to the advantages that are derived from publication related to trade and business. The central research institutions are the source of information for organisations.
3. **Economies of Welfare:** As compared to a large firm, an industry is in a more advantageous position to provide welfare facilities to the workers. It may get land at concessional rates and procure special facilities from the municipal corporation of the area for setting up housing colonies for the workers, public health recreational facilities, etc. It may also establish educational institutions, both general and technical, so that a continuous supply of skilled labour is available to the industry. Such facilities increase the efficiency of the workers who help raise the quality and quantity of the products of the industry.
4. **Specialisation Economies:** The firms in an industry may also reap the economies of specialisation. When an industry expands in size, firms start specialising in different processes and the industry benefits on the whole. For example, in the cotton textile industry some firms may specialise in manufacturing thread. Others in printing, still others in dyeing, some in long cloth, some in 'dhotiès', some in shirting, etc. As a result, the productive efficiency of the firms specialising in different fields increases and the unit cost of production falls.

Diseconomies of scale occur when the long run average costs of the organisation increases. It may happen when an organisation grows excessively large. In other words, the diseconomies of scale cause larger organisations to produce goods and services at increased costs.

8.10 DISECONOMIES OF LARGE SCALE PRODUCTION

The economies of scale cannot continue indefinitely. A time comes in the life of a firm or an industry when further expansion leads to diseconomies in place of economies. Internal and external diseconomies are in fact the limits to large scale production which are discussed below. There are a number of causes for diseconomies of scale.

Types of Diseconomies of Scale

There are two types of diseconomies of scale, namely, internal diseconomies and external diseconomies, discussed as follows:

1. **Internal diseconomies of scale:** It refers to diseconomies that raise the cost of production of an organisation. The main factors that influence the cost of production of an organisation include the lack of decision, supervision and technical difficulties.
2. **External diseconomies of scale:** It refers to diseconomies that limit the expansion of an organisation or industry. The factors that act as restraint to expansion

include increased cost of production, scarcity of raw materials and low supply of skilled labourer.

Causes for Diseconomies of Scale

The causes for diseconomies of scale are as follows:

1. **Communication Diseconomies:** Act as a major reason for diseconomies of scale. If production goals and objectives of an organisation are not properly communicated to employees within the organisation, it may lead to over-production or production. This may lead to diseconomies of scale.

Apart from this, if the communication process of the organisation is not strong then the employees would not get adequate feedback. As a result, there would be less face-to-face interaction among employees - thus the production process would be affected.
2. **Financial Diseconomies:** An entrepreneur needs finance to expand his business. But finance may not be easily available in the required amount at the appropriate time. Lack of finance prevents the firm from expanding in the required direction and retards its production plans thereby increasing costs.
3. **Lack of Motivation Diseconomies:** Lack of motivation amongst the workers leads to fall in productivity levels. In case of a large organisation, workers may feel isolated and are less appreciated for their work, thus their motivation diminishes. Due to poor communication network, it is harder for employers to interact with the employees and build a sense of belongingness. This leads to fall in the productivity levels of output owing to lack of motivation. This further leads to increase in costs of the organisation.
4. **Managerial Diseconomies:** The check to the further expansion of a firm is due to the failure on the part of the management to supervise and control the business properly. There is a limit beyond which a firm becomes unwieldy and hence unmanageable. Supervision becomes lax and the workers do not work efficiently, wastages arise, decision-making becomes difficult, coordination between workers and management disappears and production costs increase.
5. **Loss of Control Diseconomies:** Loss of control acts as the main problem of large organisations. Monitoring and controlling the work of every employee in a large organisation becomes impossible and costly. It is harder to make out that all the employees of an organisation are working towards the same goal. It becomes difficult for managers to supervise the sub-ordinates in large organisations.
6. **Marketing Diseconomies:** The expansion of a firm beyond a certain limit may also involve marketing problems. Raw materials may not be available in sufficient quantities due to their scarcities. The demand for the products of the firm may fall as a result of changes in tastes of the people and the firm may not be in a position to change accordingly in the short period. The market organisation may fail to foresee changes in market conditions whereby the sales might fall.
7. **Technical Diseconomies:** A large scale firm often operates heavy capital equipment which is indivisible. Its aim is to maximise profits which it does by equalizing its marginal costs with the price (marginal revenue) of the product. Under perfect competition, it might produce at its minimum average cost in the long run. However, due to the presence of the diseconomies of finance, marketing or management, the firm may fail to operate its plant to its maximum capacity. It may have excess capacity or idle capacity. For example, if the plant can manufacture 2000 units of the commodity per day, the firm may be producing

1500 units per day. Thus the firm operates below its full capacity. As a result, cost per unit increases.

8. **Risk taking Diseconomies:** As the scale of production of a firm expands, risks also increase with it. An error of judgment on the part of the sales manager or the production manager may adversely affect sales or production which may lead to great loss.
9. **External Diseconomies:** If an industry expands as a whole, its growing demand for the various factors of production like labour, capital, raw materials, etc. may eventually raise their prices. The localisation of industries may lead to shortages of transport, power, labour, raw materials and equipments. All such external diseconomies tend to raise cost per unit.

Check Your Progress

Fill in the blanks:

1. As the proportion of the factor in a combination of factors is _____ after a point, first the marginal and then the average product of that factor will diminish.
2. Law of variable proportions establishes the short run relationship between the _____ in output and the changes in inputs. In the short period, some factors are fixed and some are variable.
3. The main reason for increasing returns in the first stage is that in the beginning the _____ factors are larger in quantity than the variable factor.
4. _____ returns to a factor occurs because fixed and variable factors are imperfect substitutes of one another.
5. After making the _____ use of a fixed factor, then the marginal return of such variable factor begins to diminish.
6. _____ of scale are defined as the cost advantages that an organisation can achieve by expanding its production in the long run.

8.11 LET US SUM UP

- Law of Variable Proportions occupies an important place in economic theory. This law is also known as Law of Proportionality. The effect of variations in the proportions of factors of production are commonly introduced in to our economic analysis through the statement of the principle of diminishing productivity in the following statement - 'In a given state of arts, after a certain point is reached, the application of further units of any variable factor to another fixed factor or a combination of fixed factors will yield less than proportionate returns'.
- Law of variable proportions establishes the short run relationship between the changes in output and the changes in inputs. In the short period, some factors are fixed and some are variable. So in the short run, if we want to increase the output, we have to vary the variable factors only. The law is called the law of variable proportions because when in the short run, increasing doses of variable factors are applied upon some fixed factors, the factor proportion changes.
- The main reason for increasing returns in the first stage is that in the beginning the fixed factors are larger in quantity than the variable factor. When more units of the variable factor are applied to a fixed factor, the fixed factor is used more intensively and production increases rapidly.

- The stage of diminishing marginal returns in the production function with one factor variable is the most important. The question arises as to why we get diminishing marginal returns after a certain amount of the variable factor has been added to a fixed quantity of the other factor.
- As the amount of a variable factor continues to be increased to a fixed quantity of the other factor, a stage is reached when the total product declines and the marginal product of the variable factor becomes negative.
- In the long run, expansion of output can be achieved by variation in the use of all factors as all factors are variable. The laws of returns to scale refer to the effects of changes in the scale of production. In the long run, output can be increased by effecting a change in the use of all factors keeping the same proportion or by changes in different proportions.
- The law of variable proportions is universal as it applies to all fields of production. This law applies to any field of production where some factors are fixed and others are variable. That is why, it is called the law of universal application.
- The Law of Variable Proportion has universal applicability in any branch of production. It forms the basis of a number of doctrines in economics.
- Economies of scale are defined as the cost advantages that an organisation can achieve by expanding its production in the long run. The scale of production refers to the amount of factors used, the quantities of products produced, and the techniques of production adopted by a producer. As production increases with the increase in the quantities of land, labour and capital, the scale of production expands.
- Economies of large scale production have been classified by Marshall into Internal Economies and External Economies. Internal economies are internal to a firm when its costs of production are reduced and output increases. They are open to a single factory or a single firm independently of the action of other firms.
- Internal Economies are firm-specific, or caused internally, while external economies of scale occur based on larger changes outside of the firm. Both types result in declining marginal costs of production; yet, the net effect is the same.
- The economies of scale cannot continue indefinitely. A time comes in the life of a firm or an industry when further expansion leads to diseconomies in place of economies. Internal and external diseconomies are in fact the limits to large scale production.

8.12 UNIT END ACTIVITY

Prepare a Marginal Product schedule for increasing production when only one input is increased. Indicate the phases of Law of Variable Proportion.

8.13 KEYWORDS

Variable Factor: It provides the extra inputs that a firm needs to expand short-run production.

Fixed Factor: A fixed factor is one, whose quantity cannot readily be changed in response to desired changes in output or market conditions. Its quantity remains the same, whether the level of output is more or less or zero.

Variable Proportion: It states that as the quantity of one factor is increased, keeping the other factors fixed, the marginal product of that factor will eventually decline.

Increasing Returns: If output increases by more than the proportional change in inputs, there are increasing returns to scale.

Diminishing Returns: If output increases by less than that proportional change in inputs, there are decreasing returns to scale.

Imperfect Substitutes: It refers to a product or service that cannot be used in exactly the same way as the good or service it replaces. Imperfect substitutes have a lesser level of substitutability, and therefore exhibit variable marginal rates of substitution along the consumer indifference curve.

Scale of Production: It refers to the amount of factors used, the quantities of products produced, and the techniques of production adopted by a producer.

Negative Marginal Returns: Diminishing marginal returns means that the marginal product of the variable input is falling. Diminishing returns occur when the marginal product of the variable input is negative. That is when a unit increase in the variable input causes total product to fall.

Optimum Production: Where per-unit production cost is lowest and therefore profit margin is the highest.

Internal Economies: Internal economies of scale are firm-specific, or caused internally, while external economies of scale occur based on larger changes outside of the firm. Both types result in declining marginal costs of production; yet, the net effect is the same.

External Economies: These occur outside of a firm but within an industry. For example investment in a better transport network servicing an industry will result in a decrease in costs for a company working within that industry.

Indivisibility: not divisible; not separable into parts; incapable of being divided.

8.14 QUESTIONS FOR DISCUSSION

1. Explain the law of variable proportion and give reasons for the answer.
2. What do you understand by economies of scale?
3. State the behaviour of total product when one input is increased for increasing the production according to the law of variable proportion.
4. State the behaviour of marginal product in the law of variable proportion. Explain the causes of this behaviour.
5. What do you understand from diseconomies of large scale production? What are the different types and causes for it?

Check Your Progress: Model Answer

1. Increased
2. Changes
3. Fixed
4. Diminishing
5. Optimum
6. Economies

8.15 REFERENCES & SUGGESTED READINGS

- Choudhury, B. (2021). *Essentials of Microeconomics*. Wiley India Pvt. Ltd.
- Dutt, R., & Sundaram, K. P. M. (2021). *Indian Economy (71st ed.)*. S. Chand Publishing.
- Ghosh, A. (2020). *Microeconomics: Theory and Applications*. Oxford University Press.
- Gordon, R. J. (2019). *Microeconomics (13th ed.)*. Pearson.
- Kaur, R. (2022). *Microeconomics: A Textbook for Economics Students*. Kalyani Publishers.
- Kumar, N. (2023). *Principles of Microeconomics*. Taxmann Publications Pvt. Ltd.
- Mishra, S. K., & Puri, V. K. (2020). *Microeconomics*. Himalaya Publishing House.

UNIT

9

THEORIES OF POPULATION

CONTENTS

- 9.0 Aims and Objectives
- 9.1 Introduction
- 9.2 Malthusian Theory
- 9.3 Criticism of the Malthus Theory
- 9.4 Marx's Response to Malthus' Thesis
- 9.5 Applicability of the Malthusian Theory
- 9.6 Theory of Demographic Transition
- 9.7 Criticisms of the Demographic Theory
- 9.8 The Optimum Theory of Population
- 9.9 Superiority of the Optimum Theory Over the Malthusian Theory
- 9.10 Criticisms of the Optimum Theory
- 9.11 Let Us Sum Up
- 9.12 Unit End Activity
- 9.13 Keywords
- 9.14 Questions for Discussion
- 9.15 References & Suggested Readings

9.0 AIMS AND OBJECTIVES

After studying this lesson, you should be able to:

- Understand the Malthusian Theory
- Know about the Criticism of the Malthus Theory
- Explain Marx's Response to Malthus' Thesis
- Analyse the Applicability of the Malthusian Theory
- Know about the Theory of Demographic Transition
- Explain the Criticisms of the Demographic Theory
- Understand the Optimum Theory of Population
- Describe the Superiority of Optimum theory over the Malthusian Theory
- Know about the Criticisms of the Optimum Theory

9.1 INTRODUCTION

The theories about population have remained an important subject since time which is immemorial. Many of the ancient philosophers like **Confucius** (China), **Kautilya** (India), **Ibn Khaldin** (Arab), **Plato** (Greece) and modern thinkers like **Adam Smith**, **David Richard** and others, either directly or indirectly, have said somewhat significant on population issues. The growth of population was very low until the eighteenth century since there was rough overall balance between births and death rates. **Kautilya**, a contemporary of **Plato**, had written in his **Arthashastra** that 'a large population is a source of political, economic and military strength of a nation'.

Similarly, the 14th century Arab historian, **Ibn Khaldin** maintained in his theory of 'rise and fall' that the growth of dense population is generally favourable to the maintenance and increase of imperial power. The Chinese philosopher, **Confucius** argued that a numerical balance be maintained between population and environment. Thus, he was not in favour of unchecked growth of population. He was the first who gave the concept of optimum population level. In ancient Greece, the earliest thinkers favoured the expansion of population, but **Plato** advocated the absolute limit of population.

One of the earliest demographers Edmond Halley (1656-1742) was the first scientist to use death statistics in different age groups to determine a person's likelihood of death as he or she passed through each age group (Population Today, 1986). But, as a science, it emerged only in the last 250 years. The systematic compilation of data was first begun on a large scale in the 19th century Europe.

9.2 MALTHUSIAN THEORY

Thomas Robert Malthus (1766-1834) was the key figure to analyse the population statistics. His formulation on population was a landmark in the history of population theories. He generalised the relationship between population factors and social change.

In his **Essay on the Principle of Population** (1798), **Malthus** argued that because of the strong attraction of the two sexes, the population could increase by multiples, doubling every twenty-five years. He contended that the population would eventually grow so large that food production would be insufficient. Human capacity for reproduction exceeded the rate at which subsistence from the land can be increased. **Malthus** further wrote 'Population when unchecked increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio'.

Malthus contended that the world's population was growing more rapidly than the available food supply. He argued that the food supply increases in an arithmetic progression (1, 2, 3, 4 and so on), whereas the population expands by a geometric progression (1, 2, 4, 8 and so on).

According to him, the population could increase by multiples, doubling every twenty-five years. He said the gap between the food supply and population will continue to grow over time. Even though food supply will increase, it would be insufficient to meet the needs of expanding population. Moreover, the famine and other natural calamities cause widespread sufferings and increase the death rate, which is nature's check against population.

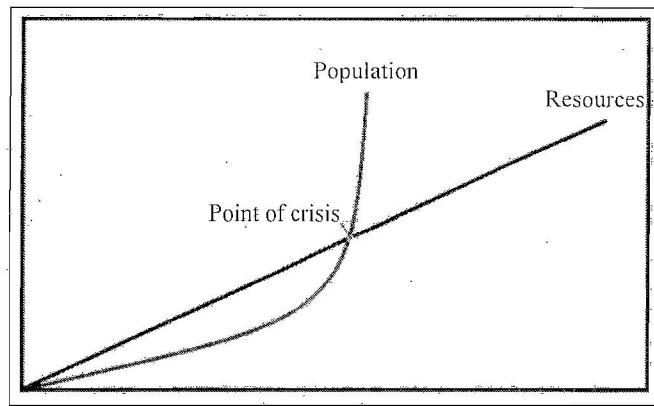


Figure 9.1: Malthus' Basic Theory

In brief, **Malthus** theory states that:

1. There is a natural sex instinct in human beings to increase at a fast rate. As a result, population increases in geometrical progression and if unchecked doubles itself every 25 years. Thus starting from 1, population in successive periods of 25 years will be 1, 2, 4, 8, 16, 32, 64, 128, 256 (after 200 years). Population is necessarily limited by the means of subsistence.
2. On the other hand, the food supply increases in a slow arithmetical progression due to the operation of the law of diminishing returns based on the supposition that the supply of land is constant. Thus the food supply in successive similar periods will be 1, 2, 3, 4, 5, 6, 7, 8 and 9 (after 200 years). Population invariably increases where means of subsistence increased, unless prevented by some very powerful and obvious checks.
3. Since population increases in geometrical progression and the food supply in arithmetical progression, population tends to outrun food supply. Thus an imbalance is created which leads to over-population. This is depicted in Figure 9.2.

The food supply in arithmetical progression is measured on the horizontal axis and the population in geometrical progression on the vertical axis. The curve M is the Malthusian population curve which shows the relation between population growth and increase in food supply. It rises upward swiftly. These checks, and the checks which repress the superior power of population and keep its effects on a level with the means of subsistence, are all resolvable into moral restraint, vice and misery.

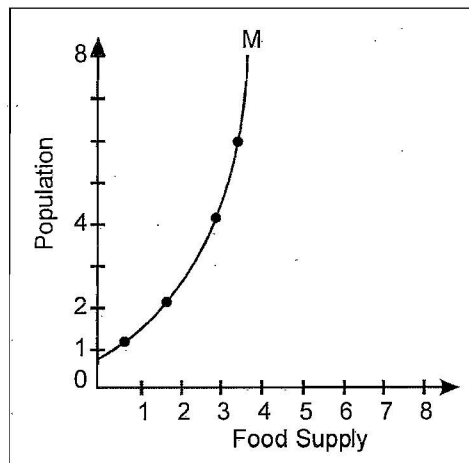


Figure 9.2: Imbalance in Population

4. To control over-population resulting from the imbalance between population and food supply, Malthus suggested preventive checks and positive checks. The preventive checks are applied by a man to control the birth rate. They are foresight, late marriage, celibacy, moral restraint, etc. If people fail to check growth of population by the adoption of preventive checks, positive checks operate in the form of vice, misery, famine, war, disease, pestilence, floods and other natural calamities which tend to reduce population and thereby bring a balance with food supply.

According to **Malthus**, preventive checks are always in operation in a civilized society, for positive checks are crude. Malthus appealed to his countrymen to adopt preventive checks in order to avoid vice or misery resulting from the positive checks.

Malthus based his above arguments on man's two basic characteristics essential to the maintenance of life:

- i. Need for food
- ii. Passion between sexes

It was the second which led people to marry at a relatively early age and would result in such a large number of births that the population would double itself in few years if unchecked by misery and *vice versa*.

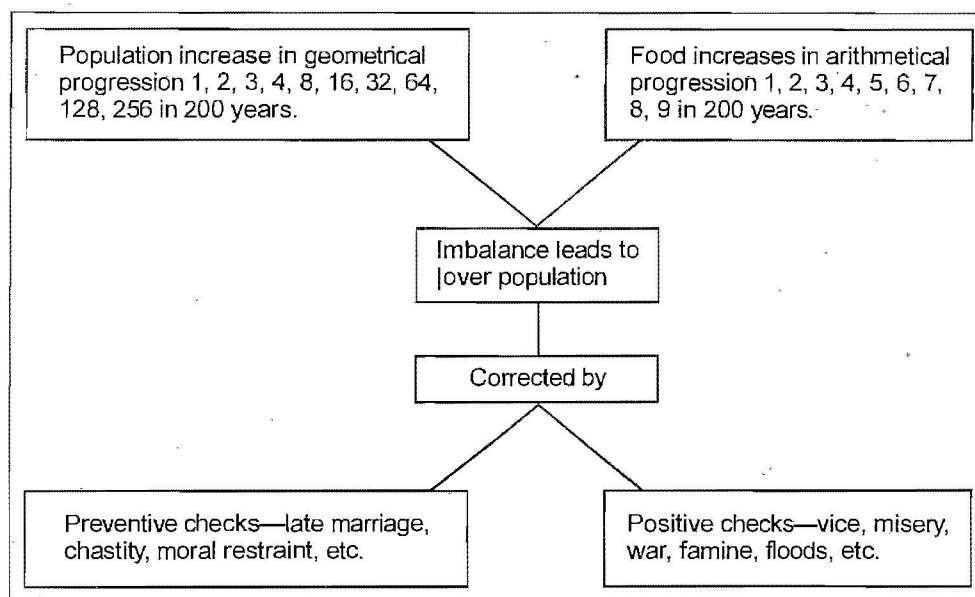


Figure 9.3: Malthusian Theory of Production

Malthus referred to two classes of checks which kept population down:

1. **Positive means:** He spoke of famine (hunger), disease or war, pestilence and vicious customs about women.
2. **Negative means:** He explicitly demanded artificial means of birth control and suggested as an alternative that birth rate be decreased through preventive measures such as late marriage (postponing marriage until later age), moral restraint and chastity (abstinence). He contended that without such restraints the world would face widespread hunger, poverty and misery.

The 'positive' and 'preventive' checks which occur in human population to prevent excessive growth relate to practices affecting mortality and fertility respectively. Malthus saw the tension between population and resources as a major cause of the misery of much of the humanity. He was not, however, in favour of contraceptive

methods, since their use did not generate the same drive to work hard as would a postponement of marriage. Malthus argued that the positive and preventive checks are inversely related to each other. In other words, where positive checks are very effective, the preventive checks are relatively less effective and vice versa.

However, in all societies, some of these checks are in constant operation although in varying magnitude of effectiveness. Malthus believed that despite these checks, the inability of increased food supply to keep abreast of population increase always results in some kind of a situation of overpopulation.

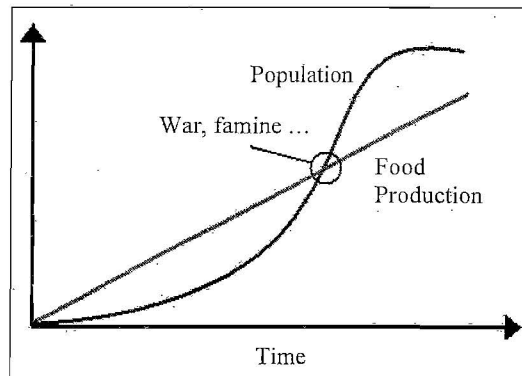


Figure 9.4: Neo-Malthusians Theory

9.3 CRITICISM OF THE MALTHUS THEORY

Malthus' views have been widely challenged on many grounds. The main criticisms about his theory are as under:

1. **Theory of mathematics was wrong:** The mathematical formulation of Malthus' doctrine that food supply increases in arithmetical progression and population increases in geometrical progression in 25 years have not been proved empirically. Rather, the food supply has increased more than in the arithmetical progression while population growth has not been in geometrical progression so as to double the population in 25 years. But this criticism is beside the point because Malthus used his mathematical formulation to make his principle clear in the first edition of his essay and deleted it in its second edition.

The validity of his two sets of ratios has been questioned by his critics. It is argued that population has rarely grown in geometrical proportion and means of production have rarely multiplied in arithmetic progression.

2. **Manpower aspect was ignored in population:** One of the principal weaknesses of Malthus' thought has been that he neglected the manpower aspect in population growth. He was a pessimist and dreaded every increase in population. He forgot, according to Cannan, that "a baby comes to the world not only with a mouth and a stomach, but also with a pair of hands."

This implies that an increase in population means an increase in manpower which may tend to increase not only agricultural but also industrial production and thus makes the country rich by an equitable distribution of wealth and income. As pointed out by Seligman "The problem of population is not merely one of mere size but of efficient production and equitable distribution." Thus the increase in population may be necessary.

Malthus overemphasized the 'positive' checks and did not visualise the role of 'preventive' checks like contraceptives and family planning. Neo-Malthusians argued for the adoption of birth control within marriage. Human inventions in the

fields of birth control, health and nutrition and agriculture have helped to a great extent to strike a balance between human reproduction and food supply.

3. ***Role of technology was not considered:*** Malthus was also severely criticised for ignoring the role of changing technology and the consequent transformation in socio-economic set-up of a society. He did not fully appreciate the extent to which improved agricultural technology and crop fertilisation could sustain large population.

Neo-Malthusians agree that there are absolute limits on food supply, energy and other resources. Furthermore, they suggest that the problem is intensified by the disproportionate consumption of such resources by so-called developed or industrialised nations. This formulation has been challenged by other researchers. Yet none would deny that starvation is a very real fact even in 2012.

According to International Food Policy Research Institute, out of 79 countries 65 come under the category of alarming level of hunger. Barundi, Ethiopia, Chad, Eritrea and Timor have been categorised as the five hungriest countries in the world. Around the world, we read many reports of starvation death and malnutrition. With such images in mind, a representative of the World Bank stated in 1981 that the 'ghost of Malthus is not buried yet'. It was seen that gains in food supplies do not always lead to progress in the fight against starvation. It puts pressure on food prices that makes it more difficult for the poor to buy the food they need.

4. ***Decline in death rate was the cause of increase in population:*** The Malthusian theory is one sided. It takes the increase in population as the result of a rising birth rate, whereas population has grown considerably the world over due to a decline in death rate. Malthus could not foresee the great advancements in the field of medical sciences which have controlled fatal diseases and made human life longer. This has been particularly so in underdeveloped countries like India where the Malthusian theory is said operate.

Both the positive checks of hunger and disease referred to by Malthus do not operate today, except the terrible disaster sometimes caused by Tsunami, Katrina, Rita and floods or rains in desert areas like Banner and Jaisalmer in August 2006. But catastrophe of this nature in any part of the world is immediately rushed to the affected place from surplus areas from other parts of the world. A marked decline in the death rate even in the developing countries is a significant factor in the context of the population spurt.

5. ***Theory wrong due to the empirical evidence:*** Empirically, it has been proved by demographers that population growth is a function of the level of per capita income. When per capita income increases rapidly, it lowers the fertility rate and the rate of population growth declines. Dumont's "social capillarity thesis" has proved that with the increase in per capita incomes, the desire to have more children to supplement parental incomes declines.

When people are accustomed to a high standard of living, it becomes a costly affair to rear a large family. Population tends to become stationary because people refuse to lower their standard of living. This has actually happened in the case of Japan, France and other western countries. Moreover, natural calamities referred to above have occurred in under-populated areas also and thus there was no causal relationship between positive checks and overpopulation.

6. ***Population was connected to total wealth and not to food supply:*** The Malthusian theory rests on a weak relationship between population and food supply. In fact, the right relationship is between population and total wealth of the

country. This is the basis of the optimum theory of population. The argument is that if a country is rich materially and even if it does not produce enough food for its population, it can feed the people well by importing food stuffs in exchange for its products or money.

The classic example is of Great Britain which imports almost all its food requirements from Holland, Denmark, Belgium and Argentina because it concentrates more on the production of wealth rather than on food products. Thus the very basis of the Malthusian doctrine has been proved wrong.

7. ***Ignored the opening up of new areas:*** Malthus had a narrow vision and was particularly influenced by local conditions in England. He failed to foresee the opening up of new areas of Australia, the United States and Argentina where extensive farming of virgin lands led to increased production of food.

As a result, countries like England on the continent of Europe have been provided with abundant supplies of cheap food. This has been made possible with rapid improvements in the means of transport, a factor almost overlooked by Malthus. No country needs to fear starvation and misery if it does not produce sufficient for its increasing population these days.

8. ***Static economic law was applied to a period of time:*** The Malthusian notion that the food supply increases in arithmetical progression is based on a static economic law at any one time, i.e., the law of diminishing returns. Malthus could not foresee the unprecedented increase in scientific knowledge and agricultural inventions over a period of time which has stayed with the law of diminishing returns. Consequently, the food supply has increased much faster than in arithmetical progression. Malthus has been proved wrong not only in the advanced countries but also in developing countries like India with the 'green revolution'.
9. ***Moral restraint did not pertain to preventive checks:*** Malthus was essentially a religious man who laid emphasis on moral restraint, celibacy, late marriage, etc. to control population. But he could not visualise that human beings would invent contraceptives and other family planning devices for birth control. This was perhaps due to the fact that he could not make any distinction between sexual desire and the desire to have children.

People have sexual desire but they do not want to have more children. Thus, moral restraint alone cannot help to control the increase in population which Malthus suggested. Family Planning is essential as a preventive check.

10. ***Population was not due to superstitions or beliefs:*** Malthus' pessimism and religious education led him to believe that over-population was a heavy burden on the earth which was automatically lessened by God in the form of misery, wars, famines, floods, diseases, pestilence, etc. But all these are natural calamities which are not peculiar to over-populated countries. They visit even those countries where the population is on the decline or stationary such as France and Japan.
11. ***Malthus proved to be a false prophet:*** The Malthusian theory is not applicable to countries for which this was propounded. In the western European countries, the bogey and pessimism of Malthus has been overcome. His prophecy that misery will stalk these countries if they fail to check the growth of population through preventive checks has been proved wrong by a decline in birth rate, adequacy of food supply, and increase in agricultural and industrial production. Thus Malthus has proved to be a false prophet.

9.4 MARX'S RESPONSE TO MALTHUS' THESIS

The debate about the Malthusian theory has continued down to the present. Economists such as J.S. Mill and J.M. Keynes supported his theory whereas others, especially, sociologists, have argued against it.

- According to them, the widespread poverty and misery of the working class people was, not due to an eternal law of nature as propounded by Malthus but to the misconceived organisation of society.
- **Karl Marx** went one step further and argued that starvation was caused by the unequal distribution of the wealth and its accumulation by capitalists. It has nothing to do with the population. Population is dependent on economic and social organisation. The problems of overpopulation and limits to resources, as enunciated by Malthus, are inherent and inevitable features associated with the capitalist system of production.
- Marx's contention that food production could not increase rapidly was also debated when new technology began to give farmers much greater yields. French sociologist E. Dupreel (1977) argued that an increasing population would spur rapid innovation and development to solve problems, whereas a stable population would be complacent and less likely to progress.
- During the depression of the 1930s, the debate changed somewhat because the birth rate fell sharply in industrial (western) nations. Some predicted that human species would die out. Schemes were proposed to encourage families to have more children by giving them allowances for each child born. The birth rate rose sharply after World War II, especially in the underdeveloped nations like India, Africa and Bangladesh. Birth control programs were instituted to control the population so as to eliminate starvation.

Despite the criticisms, the Malthusian thesis gained widespread currency during his lifetime. His ideas had profound effects on public policies on the classical and neo-classical economists, on demographers and evolutionary biologists led by Charles Darwin.

His principle of population has been successful in highlighting the urgency to maintain a balanced relationship between population growth and means of subsistence. The critics of Malthus failed to realise that it was because of a large measure of truth in Malthusian principle of population that men today feel the need of resorting to contraception to keep their families within reasonable limits. Another main contribution of Malthus was to give a new line of thinking whereby the dynamics of population growth were viewed in the context of man's welfare.

9.5 APPLICABILITY OF THE MALTHUSIAN THEORY

Despite these weaknesses, the Malthusian doctrine contains much truth.

- The Malthusian doctrine may not be applicable to the Western Europe and England but its principal tools have become the part and parcel of the people of these countries. If these lands do not face the problems of over-population and misery, it is all due to the bogey and pessimism of Malthusianism.
- In fact, the people of Europe were made wiser by Malthus who forewarned them of the evils of over-population and they started adopting measures toward it off. The very fact that people use preventive checks, like late marriage and various contraceptives and birth control measures on an extensive scale proves the vitality of the Malthusian law.

- Even famous economists like Marshall and Pigou and sociologists like Darwin were influenced by this principle when they incorporated it in their theories. And Keynes, initially overawed by the Malthusian fears of over-population, later wrote about "Some Economic Consequences of Declining Population." Is it not the fear of Malthusianism which has created the problem of declining population in France?
- The Malthusian doctrine may not be applicable now to its place of origin, but its influence spreads over two-third of this universe. Excluding Japan, the whole of Asia, Africa and South America come under its purview. India is one of the first countries to adopt family planning on state level to control population. Positive checks like floods, wars, droughts, diseases, etc. operate. The birth and death rates are high. The growth rate of population is about 2 per cent per annum.
- The real aim of population policy is, however, not to avoid starvation but to eliminate poverty so as to raise output per head in an accelerated manner. Thus the Malthusian theory is fully applicable to underdeveloped countries like India. Walker was right when he wrote: "The Malthusian theory is applicable to all communities without any consideration of colour and place. Malthusianism has stood un-shattered, impregnable amid all the controversy that has raged around it."

9.6 THEORY OF DEMOGRAPHIC TRANSITION

Demographic transition is a term, first used by **Warren S. Thompson** (1929), and later on by **Frank W. Notestein** (1945), referring to a historical process of change which accounts the trends in births, deaths and population growth that occurred in today's industrialised societies, especially European societies. This process of demographic change began for the most part in the later 18th century.

The theory of demographic transition is based on the actual population trends of advanced countries of the world. According to this theory, every country passes through three different stages of population growth. In the first stage, the birth rate and the death rate are high and the growth rate of population is low. In the second stage, the birth rate remains stable but the death rate falls rapidly.

Demographic transition should not be regarded as a 'law of population growth', but as a generalised description of the evolutionary process. In simple terms, it is a theory which attempts to specify general laws by which human populations change in size and structure during industrialisation. It is frequently accepted as a useful tool in describing the demographic history of a country.

The theory postulates a particular pattern of demographic change from a high fertility and high mortality to a low fertility and low mortality when a society progresses from a largely rural agrarian and illiterate society to a dominant urban, industrial, literate and modern society.

As a result, the growth rate of population increases very swiftly. In the last stage, the birth rate starts falling and tends to equal the death rate. The growth rate of population is very slow. These three stages are explained in the figure.

In the figure, the time for different stages is taken on the horizontal axis and annual birth and death rates per thousand on the vertical axis. In the first stage, before the 19th century, birth rates in Western Europe were 35 per thousand and death rates fluctuate around 30 per thousand. Thus, the growth rate of population was about 5 per thousand.

In the second stage, death rates began to decline gradually from 30 per thousand to 20 per thousand from the middle of the 19th century to the end of the century. In the third

stage, beginning with the 20th century, birth rates began to decline from 20 per thousand and have continued for about a century now, nearing 15 per thousand. Death rates also continued to decline but seem to have stabilised in Western Europe in between 10 to 55 per thousand.

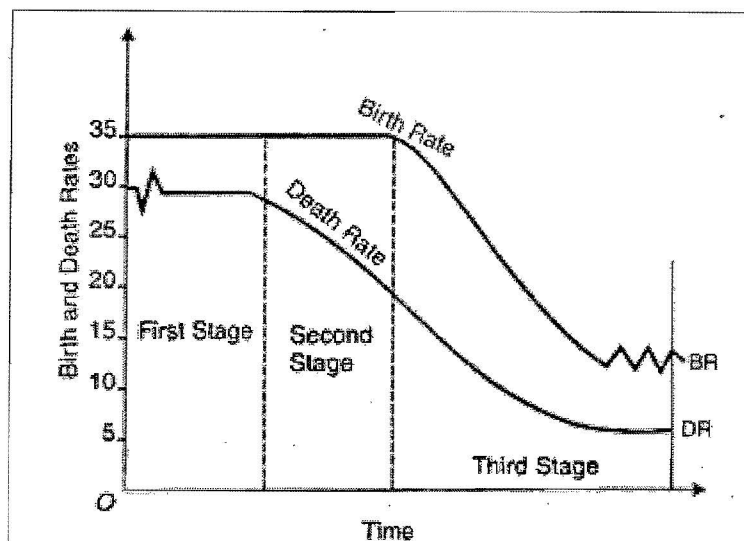


Figure 9.5: Demographic Transition of Birth Rate

It is typically viewed as a three-stage process.

1st Stage

In this stage, the country is backward and is characterised by high birth and death rates with the result that the growth rate of population is low. People mostly live in rural areas and their main occupation is agriculture which is in a state of backwardness. There are a few simple, light and small consumer goods industries.

The tertiary sector consisting of transport, commerce, banking and insurance is underdeveloped. All these factors are responsible for low incomes and poverty of the masses. Large family is regarded as a necessity to augment the low family income. Children are an asset to the society and parents. There being mass illiteracy, the society is not expected to educate them and thus burden itself. The existence of the joint family system provides employment to all children in keeping with their ages. Thus, a child becomes an earning member even at the age 5 when he becomes a helping hand to his parents in domestic affairs. More children in a family are also regarded as an insurance against old age by the parents.

People being illiterate, ignorant, and superstitious and fatalist are averse to any methods of birth control. Children are regarded as God-given and preordained. Being childless is regarded as a curse and the parents are looked down upon by the society. All these economic and social factors are responsible for a high birth rate in the country. Along with high birth rate, the death rate is also high due to non-nutritional food with a low calorific value, and lack of medical facilities and of any sense of cleanliness. People live in dirty and unhealthy surroundings in ill-ventilated small houses. As a result, they are disease-ridden and the absence of proper medical care results in large deaths. The mortality rate is the highest among the children and the next among women of child bearing age. Thus unhygienic conditions, poor diet and the lack of medical facilities are the reasons for a high mortality rate in this stage.

This stage continued in Western Europe approximately upto 1840. That the decline in immortality comes before the decline in fertility.

IInd Stage

In the second stage, the economy enters the phase of economic growth. Agricultural and industrial productivity increases and the means of transport develop. There is greater mobility of labour. Education expands, incomes increase. People get more and better quality food products. Medical and health facilities are expanded. Modern drugs are used by the people. All these factors bring down the death rate. But the birth rate is almost stable.

People do not have any inclination to reduce the birth of children because with economic growth employment opportunities increase and children are able to add more to the family income. With improvements in the standard of living and the dietary habits of the people, the life expectancy also increases.

People do not make any efforts to control the size of family because of the presence of religious dogmas and social taboos towards family planning. Of all the factors in economic growth, it is difficult to break with the past social institutions, customs and beliefs. As a result of these factors, the birth rate remains at the previous high level. That the fertility eventually declines to match mortality.

IIIrd Stage

In this stage, the fertility rate declines and tends to equal the death rate so that the growth rate of population declines. As growth gains momentum and people cross the subsistence level of income, their standard of living rises.

The leading growth sectors expand and lead to an expansion in output in other sectors through technical transformations. Education expands and permeates the entire society. Popular education leads to popular enlightenment and opens the way to knowledge. It creates self-discipline, power to think rationally and to probe into the future. People discard old customs, dogmas and beliefs and develop individualistic spirit and break with the joint family.

Men and women prefer to marry late. The desire to have more children to supplement parental income declines. People readily adopt family planning devices. They prefer to go in for a baby car rather than a baby. Moreover, increased specialisation following rising income levels and the consequent social and economic mobility make it costly and inconvenient to rear a large number of children.

All this tends to reduce the birth rate which along with an already low death rate brings a decline in the growth rate of population. The advanced countries of the world are passing through this last stage and the population is increasing at a slow pace in them. That socio-economic transformation of a society takes place simultaneously with its demographic transformation.

The transition from high birth and death rates to low rates can be divided into three stages but some scholars like Haggett, 1975 have divided it into four or five stages:

- i. **Pre-transition stage:** This contained high and fluctuating birth and death rates with little population growth.
- ii. **Stage I:** This stage had high birth rates and declining death rates with rapid population growth.
- iii. **Stage II:** This stage has low birth and death rates with slow population growth.
- iv. **Stage III:** Birth and death rates both decline appreciably leading to zero population growth.
- v. **Stage IV:** The theory holds that pre-industrial societies were characterised by stable populations which had a high death rate and birth rate. It postulates a little and slows population growth. The theory states that the high mortality rates

characteristic of undeveloped areas will decline before fertility rates which are also high.

In the first stage of transition, death rates (especially the infant deaths) begin to fall as a result of advances in public health and sanitation as well as improvements in nutrition and food supply. Since the birth rate continues to remain high relative to the declining death rate, there is a rapid 'transitional' growth as we find in India today.

In the second stage, changes in social attitudes, the introduction of cheap forms of contraception and increase in life expectancy create social pressures for smaller families and for a reduction of fertility.

The diffusion of knowledge and cheap medical technology has brought many non-industrial societies into this stage of the demographic transition however, these societies have been unable to enter the third stage. The result has been very high rates of population growth in countries that are not experiencing corresponding economic growth.

In the last (third) stage of demographic transition, birth and death rates decline appreciably which eventually becomes approximately equal, and in time it will result in zero population growth. Before this stage begins, there can be one more stage in which low birth and death rates lead to slow population growth.

The populations of advanced, urban industrial societies, which have entered the last stage, are now stable with low birth and death rates. In some cases (e.g., Eastern and Central Europe), birth rates have fallen so low that the rate of natural increase was actually zero or negative. In this stage, the technical know-how is abundant, the deliberate controls on family planning are common and the literacy and education levels are also very high.

The growth pattern of human populations is thus held to be S-shaped, involving a transition from one type of demographic stability with high death rates to another type of plateau with low death and birth rates. Among the later demographers, Coale and Hoover further elaborated upon the role of development and modernisation in the process of transition in demographic behaviour, maintained that a society characterised by peasant economy is marked with very high birth and death rates.

Death rates are high because of lack of adequate nutritive food, primitive sanitary conditions and absence of any preventive and curative measures of control over diseases. A high birth rate, on the other hand, is a functional response to high death rates, particularly among infants and children.

In the present-day world, as would be true of any point in time, different countries of the world are at different stages of the demographic transition. In the opinion of Glenn Trewartha (1969), this is largely due to the dual nature of man.

According to him, biologically, man is same everywhere and is engaged in the process of reproduction but culturally man differs from one part of the world to another. It is the cultural diversity of man that gives rise to varying fertility patterns in different areas resulting in different stages of demographic transition discussed above.

9.7 CRITICISMS OF THE DEMOGRAPHIC THEORY

Although the theory of demographic transition has been appreciated widely by the demographers, it has been criticised on many grounds also. There are even critics who have gone to the extent of saying that it cannot be called a theory.

The main points of criticism are:

- Firstly, this theory is merely based upon the empirical observations or the experiences of Europe, America and Australia.

- Secondly, it is neither predictive nor its stages are segmental and inevitable.
- Thirdly, the role of man's technical innovations cannot be underrated, particularly in the field of medicine which can arrest the rate of mortality.
- Fourthly, neither does it provide a fundamental explanation of the process of fertility decline, nor does it identify the crucial variables involved in it.
- Fifthly, it does not provide a time frame for a country to move from one stage to another.
- Finally, it does not hold good for the developing countries of the world, which have recently experienced unprecedented growth in population due to drastic decline in death rates.

In spite of these criticisms and shortcomings, the demographic transition theory does provide an effective portrayal of the world's demographic history at macro level of generalisations. As an empirical generalisation developed on the basis of observing the demographic trend in the West, the transition process for any country can easily be understood.

The theory of demographic transition is the most acceptable theory of population growth. It neither lays emphasis on food supply like the Malthusian theory, nor does it develop a pessimistic outlook towards population growth.

It is also superior to the optimum theory which lays an exclusive emphasis on the increase in per capita income for the growth of population and neglects the other factors which influence it. The demographic transition theory is superior to all the theories of population because it is based on the actual population growth trends of the developed countries of Europe.

Almost all the European countries of the world have passed through the first two stages of this theory and are now in the final stage. Not only this, this theory is equally applicable to the developing countries of the world.

Very backward countries in some of the African states are still in the first stage whereas all the other developing countries of the world are in the transitional stage two it is on the basis of this theory that economists have developed economic-demographic models so that underdeveloped countries should enter the final stage and attain the stage of self-sustained growth. Thus this theory has universal applicability.

9.8 THE OPTIMUM THEORY OF POPULATION

The optimum theory of population was propounded by **Edwin Cannan** in his book **Wealth** published in 1924 and popularised by **Robbins**, **Dalton** and **Carr-Saunders**. Unlike the **Malthusian theory**, the **optimum theory** does not establish relationship between population growth and food supply. Rather, it is concerned with the relation between the size of population and production of wealth.

The **Malthusian theory** is a general theory which studies the population problem of a country in keeping with its economic conditions. Thus, the optimum theory is more realistic than the Malthusian theory of population.

Definitions

The optimum population is the ideal population which combined with the other available resources or means of production of the country will yield the maximum returns or income per head. The concept of optimum population has been defined differently by **Robbins**, **Carr-Saunders** and **Dalton**.

Robbins defines it as “the population which just makes the maximum returns possible is the optimum population or the best possible population.”

Carr-Saunders defines it as “that population which produces maximum economic welfare.”

To **Dalton**, “Optimum population is that which gives the maximum income per head.” If we were to examine these views, we find that Dalton’s view is more scientific and realistic which we follow.

Assumptions of the Optimum Theory

This theory is based on the following assumptions:

1. The natural resources of a country are given at a point of time but they change over time.
2. There is no change in techniques of production.
3. The stock of capital remains constant.
4. The habits and tastes of the people do not change.
5. The ratio of working population to total population remains constant even with the growth of population.
6. Working hours of labour do not change.
7. Modes of business organisation are constant.

Optimum Theory

Given these assumptions, the optimum population is that ideal size of population which provides the maximum income per head. Any rise or diminution in the size of the population above or below the optimum level will diminish income per head.

Given the stock of natural resources, the technique of production and the stock of capital in a country, there is a definite size of population corresponding to the highest per capita income. Other things being equal, any deviation from this optimum-sized population will lead to a reduction in the per capita income.

If the increase in population is followed by the increase in per capita income, the country is under-populated and it can afford to increase its population till it reaches the optimum level. On the contrary, if the increase in population leads to diminution in per capita income, the country is over-populated and needs a decline in population till the per capita income is maximised.

This is illustrated in figure given below:

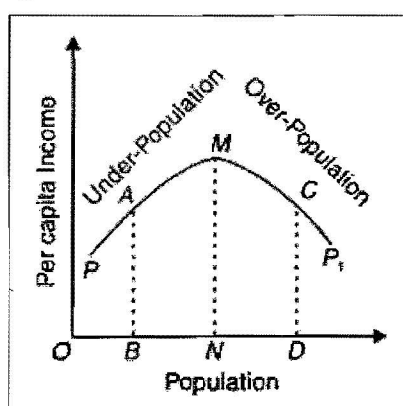


Figure 9.6: Curve Depicting under Population and Over Population

In the figure, OB population is measured along the horizontal axis and per capita income on the vertical axis. In the beginning, there is under-population and per capita income increases with population growth. The per capita income is BA population which is less than the maximum per capita income level NM. The ON size of population represents the optimum level where per capita income NM is the maximum.

If there is a continuous increase in population from ON to OD then the law of diminishing returns applies to production. As a result, the per capita production is lowered and the per capita income also declines to DC due to increase in population. Thus ND represents over-population. This is the static version of the theory. But the optimum level is not a fixed point.

It changes with a change in any of the factors assumed to be given. For instance, if there are improvements in the methods and techniques of production, the output per head will rise and the optimum point will shift upward.

What the optimum point for the country is today, may not be tomorrow if the stock of natural resources increases and the optimum point will be higher than before. Thus, the optimum is not a fixed but a movable point.

According to **Cannan**, "At any given time, increase of labor up to a certain point is attended by increasing proportionate returns and beyond that point further increase of labour is attended by diminishing proportionate returns." The per capita income is the highest at the point where the average product of labour starts falling. This point of maximum returns is the point of optimum population.

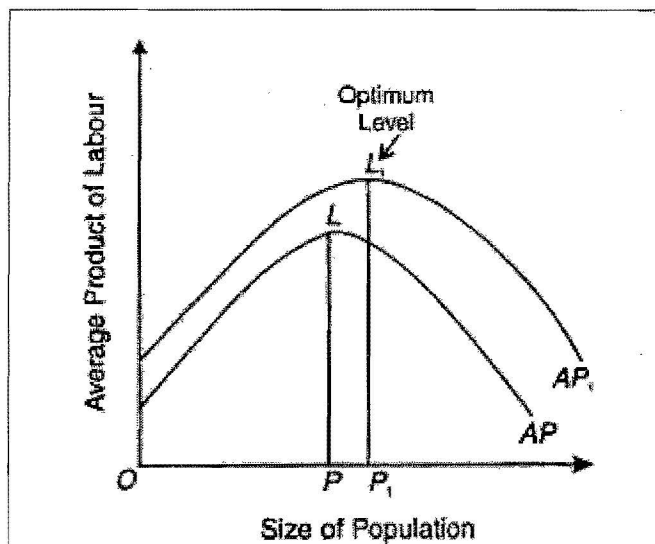


Figure 9.7: Curve Depicting Optimum Level Labour of Population

This is illustrated in Figure 9.7. The size of population is measured on the horizontal axis and the average product of labour on the vertical axis. AP is the average product of labour or income per head curve. Up to OP level, increases in population lead to a rise in the average product of labour and per capita income.

Beyond OP, the average product of labour and per capita income falls. Hence when population is OP, the per capita income is the highest at point L. Thus, OP is the optimum level of population. To the left of OP, the country is under-populated and beyond OP, it is over-populated.

However, OP is not a fixed point. If due to inventions there are improvements in the techniques of production, the average product of labour might increase and push the level of per capita income upward so that the optimum point rises. This is shown in

the figure where the AP_1 curve represents the higher average product of labour and point L shows the maximum per capita income at the new optimum level of population OP_1 .

Dalton's Formula: Dalton has deduced over-population and under-population which result in the deviation from the optimum level of population in the form of a formula. The deviation from the optimum, he calls maladjustment. Maladjustment (M) is a function of two variables, the optimum level of population O and the actual level of population A.

The maladjustment is $M = A - O$.

When M is positive, the country is over-populated, and if it is negative, the country is under-populated. When M is zero, the country possesses optimum population. Since it is not possible to measure O, this formula is only of academic interest.

9.9 SUPERIORITY OF THE OPTIMUM THEORY OVER THE MALTHUSIAN THEORY

The optimum theory of population is superior to the Malthusian theory on the following grounds:

1. The Malthusian law is a general study of the population problem because it is applicable to all countries irrespective of their economic conditions. The optimum theory is superior to the Malthusian theory because it studies the population problem in relation to the economic conditions of a particular country.
2. Malthus had a narrow vision. He related the growth of population to food supply. Cannan, on the other hand, had a much wider outlook. He related the problem of population to the total production of the country, both industrial and agricultural.
3. The Malthusian theory is a static concept which applies to a period of time. The optimum theory is a dynamic one because over a period of time the per capita income may rise with the expansion in output due to improvements in knowledge, skill, capital equipment and other elements in production. This may raise the optimum level of population. Thus, the optimum theory is more realistic.
4. The Malthusian doctrine is simply theoretical and is devoid of all practical considerations. It regards all increases in population bad, for they bring untold miseries to the people. Malthus wrote, "The table of nature is laid for a limited number of guests and those who come uninvited must starve." On the other hand, the optimum theory is very practical because it regards an increase in population not only desirable but also necessary for the maximum utilisation of the country's natural resources.
5. The Malthusian theory of population is based on the unrealistic assumption of the niggardliness of nature. This belief arises from the operation of the law of diminishing returns in agriculture. But the optimum theory takes a realistic view when according to this, the law of diminishing returns does not operate in agriculture immediately but after the optimum point is reached. In other words, first the law of increasing returns operates upto the optimum point and the law of diminishing returns after it.
6. Malthus was so much obsessed by the fear of over-population that he ignored a fundamental fact that a newly born child 'comes not only with a mouth and a stomach but also with a pair of hands'. The optimum population theory allays all such fears of the Malthusians by stressing the fact that increasing population increases the labour force which helps to raise the optimum expansion of the country's natural resources.

So long as the actual population is less than the optimum, the increase in population is safe and good. It is only when the actual population exceeds the optimum that the increase in population needs control. Thus unlike the Malthusian theory which necessitates the use of preventive checks all the time for fear of the country being over-populated, the optimum theory is free from all such taboos and is silent about any type of checks to control population.

7. Malthus was essentially a pessimist who portrayed a gloomy picture about the future of mankind which was full of misery, vice, floods, droughts, famines and other natural calamities. The optimum theory is superior to the Malthusian theory because it does not suffer from any pessimism; rather it adopts an optimist and realistic attitude towards the problem of population when it relates population to the wealth of the country.

9.10 CRITICISMS OF THE OPTIMUM THEORY

Despite the superiority of the optimum theory over the Malthusian theory of population, it has serious weaknesses.

1. **No Evidence of Optimum Level:** The first weakness of the optimum theory is that it is difficult to say whether there is anything like an optimum population. There is no evidence about the optimum population level in any country.
2. **Impossible to Measure Optimum Level:** It is impossible to measure the optimum level quantitatively. As pointed out by 2 Prof. Bye, it is "impossible to calculate it with any semblance of M exactness for any country at any time."
3. **Optimum Level Vague:** Optimum population implies a £ qualitative as well as a quantitative ideal population for the country. The qualitative ideal implies not only physique, knowledge and intelligence, but also the best age composition of population. These variables are subject to change and are related to an environment. Thus the optimum level of population is vague.
4. **Correct Measurement of Per Capita Income not Possible:** Another difficulty pertains to the measurement of per capita income in the country. It is not an easy task to measure changes in the per capita income. The data on per capita income are often inaccurate, misleading and unreliable which make the concept of optimum as one of doubtful validity.
5. **Neglects the Distributional Aspect of increase in Per Capita Income:** Even if it is assumed that per capita income can be measured, it is not certain that the increase in population accompanied by the increase in per capita income would bring prosperity to the country. Rather, the increase in per capita income and population might prove harmful to the economy if the increase in per capita income has been the result of concentration of income in the hands of a few rich. Thus the optimum theory of population neglects the distributional aspect of increase in the per capita income.
6. **Optimum Level not fixed but oscillating:** The concept of the optimum population assumes that the techniques of production, the stock of capital and natural resources, the habits and tastes of the people, the ratio of working population to total population, and the modes of business organisation are constant. But all these factors are constantly changing. As a result, what may be the optimum at a point of time might become less or more than the optimum over a period of time. This is illustrated in Figure 9.8

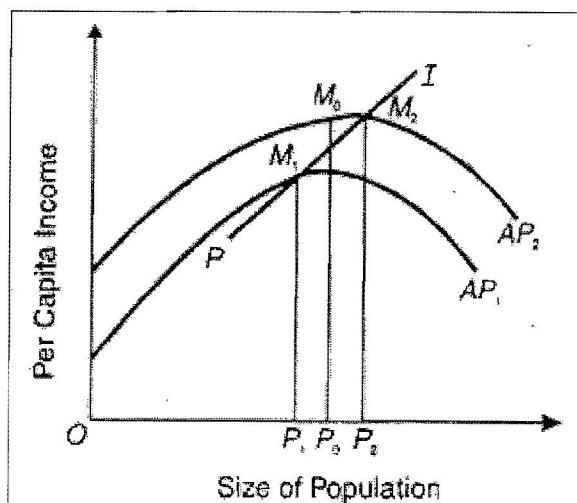


Figure 9.8: Curves Depicting Shifts in Per Capital Income Curve Due to Innovation

AP is the average product of labour or per capita income curve. Suppose there is an innovation which brings a change in the techniques of production. It shifts the per capita income curve to AP_1 . As a result, the optimum level of population rises from OP_1 to OP_2 with the increase in per capita income from P_1M_1 to P_2M_2 . If the per capita income rises further due to a change in any of the above assumed factors, the AP_2 curve will shift upward.

The AP_2 or AP_1 curve can also shift downward if, for instance, the capita income falls due to an adverse change in the given factors. If the locus of all such points like M_1 , M_2 etc., are joined by a line, we have the PI curve which represents the path of the movement of the optimum population as a result of changes in the economic factors.

If, however, the actual level of population is assumed to be OP_0 and the optimum level OP_1 then the country is over-populated. If OP_2 is the optimum level, then the country is under-populated. Thus the optimum is not a fixed level but an oscillating one.

7. **Neglects Social and Institutional Conditions:** The optimum theory considers only the economic factors which determine the level of population. Thus it fails to take into consideration the social and institutional conditions which greatly influence the level of population in a country.

A lower level of optimum population may be justified from the economic viewpoint, but such a level may be harmful keeping into view the defense considerations of the country. For instance, economic consideration may prevent us from having a large population but the danger from foreign aggression may necessitate a very large population to safeguard our territorial integrity. Thus the optimum theory is imperfect and one-sided.

8. **No Place in State Policies:** The concept of optimum population has no place in the policies of modern states. While fiscal policy aims at increasing or stabilising the level of employment, output and income in a country, no reference is made to the optimum level of population. This theory is, therefore, of no practical use and is regarded as useless.
9. **Does not explain Determinants of Population Growth:** It does not explain the reasons for rise or fall in birth and death rates, the influence of urbanisation and migration on population growth, etc.

10. The theory fails to explain about the nature of an optimum path of population growth.
11. It does not explain how the optimum level once reached is maintained.

It may be concluded on the basis of above points that this theory is of no practical use. As pointed out by Prof. Hicks, it is "a notion of extremely little practical interest." Prof. Beveridge regards it "as a speculative construction of little importance for actual situation and not entitled to a place in the corpus of theoretical economics."

Check Your Progress

Choose the correct answer:

1. The author of the book An Essay on Principles of Population is
 - (a) Malthus
 - (b) James Princep
 - (c) Keynes
 - (d) Frank Notenstein
2. The theory that says the level of population at which per capita income is maximum in
 - (a) Theory of population by Malthus
 - (b) Theory of optimum population
 - (c) Theory of demographic transition
 - (d) None of the below
3. In which stage of demographic transition is the population growth rate highest?
 - (a) First
 - (b) Second
 - (c) Third
 - (d) Fourth

Fill in the blanks:

4. Malthus contended that the world's population was growing more rapidly than the available food supply. He argued that the food supply increases in an _____ progression, whereas the population expands by a _____ progression.
5. The theory of demographic transition is based on the _____ population trends of advanced countries of the world.
6. The optimum population is the _____ population which combined with the other available resources or means of production of the country will yield the maximum returns or income per head.

9.11 LET US SUM UP

- The theories about population have remained an important subject since time which is immemorial. Many of the ancient philosophers like Confucius (China), Kautilya (India), Ibn Khaldin (Arab), Plato (Greece) and modern thinkers like

Adam Smith, David Richard and others, either directly or indirectly, have said somewhat significant on population issues.

- Thomas Robert Malthus (1766-1834) was the key figure to analyse the population statistics. His formulation on population was a landmark in the history of population theories. He generalised the relationship between population factors and social change.
- The mathematical formulation of Malthus' doctrine that food supply increases in arithmetical progression and population increases in geometrical progression in 25 years have not been proved empirically.
- Malthus was also severely criticised for ignoring the role of changing technology and the consequent transformation in socio-economic set-up of a society. He did not fully appreciate the extent to which improved agricultural technology and crop fertilisation could sustain large population.
- The debate about the Malthusian theory has continued down to the present. Economists such as J.S. Mill and J.M. Keynes supported his theory whereas others, especially, sociologists, have argued against it.
- Demographic transition is a term, first used by Warren S. Thompson (1929), and later on by Frank W. Notestein (1945), referring to a historical process of change which accounts the trends in births, deaths and population growth that occurred in today's industrialised societies, especially European societies. This process of demographic change began for the most part in the later 18th century.
- Demographic transition should not be regarded as a 'law of population growth', but as a generalised description of the evolutionary process. In simple terms, it is a theory which attempts to specify general laws by which human populations change in size and structure during industrialisation. It is frequently accepted as a useful tool in describing the demographic history of a country.
- Given these assumptions, the optimum population is that ideal size of population which provides the maximum income per head. Any rise or diminution in the size of the population above or below the optimum level will diminish income per head.
- If the increase in population is followed by the increase in per capita income, the country is under-populated and it can afford to increase its population till it reaches the optimum level. On the contrary, if the increase in population leads to diminution in per capita income, the country is over-populated and needs a decline in population till the per capita income is maximised.
- The Malthusian law is a general study of the population problem because it is applicable to all countries irrespective of their economic conditions. The optimum theory is superior to the Malthusian theory because it studies the population problem in relation to the economic conditions of a particular country.
- Despite the superiority of the optimum theory over the Malthusian theory of population, it has serious weaknesses. It is impossible to measure the optimum level quantitatively. As pointed out by Prof. Bye, it is "impossible to calculate it with any semblance of M exactness for any country at any time."
- Even if it is assumed that per capita income can be measured, it is not certain that the increase in population accompanied by the increase in per capita income would bring prosperity to the country. Rather, the increase in per capita income and population might prove harmful to the economy if the increase in per capita income has been the result of concentration of income in the hands of a few rich.

Thus the optimum theory of population neglects the distributional aspect of increase in the per capita income.

- Although the theory of demographic transition has been appreciated widely by the demographers, it has been criticised on many grounds also. There are even critics who have gone to the extent of saying that it cannot be called a theory

9.12 UNIT END ACTIVITY

Make a presentation and explain the various views of different economists about the relationship between population growth and economic development.

9.13 KEYWORDS

Optimum Population: It refers to the size of a population that produces the best results according to chosen end targets. One text from 1926 presented a single end target as being, “the largest per capital income of consumers' goods possible under the given conditions.”

Demographic Theory: A commonly used phrase in the discussion of population growth is demographic transition, which describes a progressive movement from high birth and death rates to low birth and death rates.

Famine: extreme scarcity of food.

Means of Subsistence: The action or fact of maintaining or supporting oneself, especially at a minimal level.

Arithmetic Progression: Arithmetic progression is a sequence of numbers in which each differs from the preceding one by a constant quantity (e.g., 1, 2, 3, 4, etc.; 9, 7, 5, 3, etc.).

Pessimist: A person who tends to see the worst aspect of things or believe that the worst will happen.

Empirical Evidence: It also known as sensory experience is the knowledge received by means of the senses, particularly by observation and experimentation. The term comes from the Greek word for experience.

Moral Restraint: Moral restraint is a restraint upon the actions of a person, not by the exertion of physical power or the giving of directions, orders, or commands, merely by his conformity to wishes or desires of another.

Prophet: A person regarded as an inspired teacher or proclaimed of the will of God.

Sociologists: An expert in or student of the development, structure and functioning of human society.

9.14 QUESTIONS FOR DISCUSSION

1. What was the Malthusian theory and how did he explained the increase in the population ratio?
2. Describe briefly the theory of Demographic Transition. At what stage do most developing countries seem to be? Explain.
3. Explain the optimum theory of population.
4. What were the main areas of criticisms of the Malthusian theory?
5. Explain the superiority of the optimum theory over the Malthusian Theory.

Check Your Progress: Model Answer

1. Malthus
2. Theory of optimum population
3. Second
4. Arithmetic/Geometric
5. Actual
6. Ideal

9.15 REFERENCES & SUGGESTED READINGS

Kaur, R. (2022). Microeconomics: A Textbook for Economics Students. Kalyani Publishers.

Kumar, N. (2023). Principles of Microeconomics. Taxmann Publications Pvt. Ltd.

Mishra, S. K., & Puri, V. K. (2020). Microeconomics. Himalaya Publishing House.

Varian, H. R. (2022). Intermediate Microeconomics: A Modern Approach (10th ed.). W.W. Norton & Company.

