
UNIT - 1

INTRODUCTION

Introduction

The word economics originated from the Greek word *oikos* which means house hold management.

Many groups of economics like Physiocrats, Mercantilist defined Economics, followed by Aristotle and Kautilya.

Scientific modern explanation started with classical group of economist, Adam Smith gave wealth definition, Alfred Marshall gave 'Welfare definition' & Lionel Robbins gave 'Scarcity' definition followed by growth definition.

Economic Activities

"Economic activities are those human activities which are concerned with earning and spending of money through exchange of goods & Services and articles".

Definition:

"Economic activity is the activity which is concerned with the consumption, production, exchange and distribution of all goods which possess utility, scarcity, externality transferability & possessiveness"

Cycle of Economic Activities

Wants are unlimited. Economic goods are scarce because of this people have to work hard, make effort and satisfy their wants, this cycle of economic activity continues to boost economic growth.

Objectives of ECO Activities

1. **High standard of living and economic Growth :** Economic activities aim is to satisfy man's wants so that his standard of living is raised. Standard of living is the result of economic growth and equitable distribution of income, which can be achieved by more & more economic activities.

2. **Full Employment :** Every country wants to achieve the goals of full employment and to maintain it at high level. To achieve full employment of resources, it is essential that production and consumption, both must increase by economic activities.
3. **Economic activities must be arranged to bring economic stability :** It's a situation where there is no depression or inflation.

Non Economic Activities :

This are those activities which are not undertaken for earning of wealth. Such activities are inspired by patriotism, family welfare, social service, entertainment, health consciousness, politics, religion, etc.

Distinction between Economic and Non Economic Activities

Basis of Differences	Economic Activities	Non Economic Activities
1. Difference of Objective	Are those whose objective is production, consumption, exchange and distribution of wealth or economic goods.	Are those concerned with love, entertainment, religion or affection, patriotism, etc.
2. Difference of money	Are those which can be measured by measuring rod of money.	Are those which cannot be measured in terms of money like love, affection, patriotism.
3. Difference of legal sanction	These are legal activities and enjoy sanction of law.	These do not, conform to law or violate the law.
4. Examples	(a) A seller selling permitted	(a) A thief selling stealing goods goods at his shop enjoy. It is an illegal act without exchange.
	(b) A teacher teaching in class	(b) A teacher teaching her son.

DEFINITION OF ECONOMICS

1. Wealth Definition

Adam Smith has defined economics as a science of wealth in his book - "An enquiry into the nature and causes of wealth of nations".

Adam Smith has defined "Economics as an art of managing resources of people and of government."

J.S. Mill, “Economics investigates into the nature of wealth and the laws of production and distribution.

J.B. Say, “Economics is the study of laws which govern wealth.”

Main points of the definition:

- (a) Economics is the study of wealth only.
- (b) Only scarce commodities constitute wealth, non material goods and services and free good are not wealth.
- (c) Economics studies the causes of wealth and how wealth can be increased with increase in production by division of Labour.
- (d) He mentions about economic man who is interested in accumulating only wealth or economic goods.
- (e) Economic goods is that good which is having following properties like utility, scarcity, transferability, possessiveness and externality.
- (f) He suggested labour is also wealth of nation and division of labour can be done to increase wealth.

II. Welfare Definition

Marshall’s in his book “Principles of Economics” defined, “Economics is on the one side a study of wealth and on the other and more important side a part of the study of man.”

According to Marshall, “Political economy or economics is the 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 material requisites of well-being.

A.C. Pigou, “the range of our enquiry becomes restricted to the part of social welfare that can be brought directly or indirectly into relation and with the measuring rod of money.”

Characteristics

1. Economics is the study of Economic activities which are concerned with the material welfare of man.
2. Economics study ordinary men and not extra ordinary men.
3. Economics studies the personal and social activities of man which are concerned with material welfare.
4. According to Marshall, economics is a normative science.

5. Wealth is a means of achieving the objective of material welfare.

III. Scarcity Definition

According to Lionel Robbin's, "Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses."

Features

1. Ends mean wants. Wants are unlimited, when one want is satisfied another want crops up.
2. Means implies means of production, income or resource. Most of the means to satisfy wants are limited or scarce.
3. Means have alternative uses instead of one use we can put it to two or more uses.
4. Wants are of different intensity, wants can be graded according to urgency.
5. Man has to make a choice of between his wants he has to decide whether wants to satisfied at present or which in the future. By making a proper choice he can achieve maximum satisfaction.

IV. Growth Definition

Paul Samuelson, "Economics is the study of how people and society end up with or without use of money to employ scarce productive resources that could have alternative uses to produce commodities and distribute them for consumption, now or in the future among person and groups in society. Economics analyses the cost and benefits of improving the pattern of resource use."

Features

1. Samuellsion's definition gave importance to time element, it throws light on the problem of distribution of goods among groups and persons for consumption now or in future.
2. The definition makes it clear that economic problem exist not only in a monetary economy but also in barter economy.
3. He gave importance to economic growth.

Nature of Economics

Is Economics a science or an art?

Is Economics a positive or normative science?

Economics as a Science:

A science is a systematic and comprehensive study of knowledge, which explains the cause and effect relationship.

According to M.Poincare, “science is built of facts as a house is built up of stones, but an accumulation of facts is no more a science than a heap of stones is a house.”

Features

1. A systematized study of a subject.
2. Establishes relationship between cause and effect of a fact.
3. Laws of science are universal.

Prof. Robbin’s, Pro. Briggs and Jordan all consider Economics to be a science. Rebertson also regarded Economics as a science because of letters ‘ics’ present in physics and dynamics.

Argument in favour of economics as a science:

1. **Systematized Study** : Economics is systematically divided into consumption, production, exchange, distribution and public finance.
2. **Scientific Laws** : In economic law we establish cause and effect relationship of economic activities. E.g. Law of demand shows the relationship between change in demand and change in price.
3. **Experiments** : Several experiments are conducted by economics. Capitalism, socialism and mixed economy all are the experiments of economics. Different economic laws have been experimented and tried to get rid of economic evils. The laboratory of these experiments is the world and man is the target of these experiments.
4. **Measuring rod of Money** : Marshall said that the measuring rod of money has made economics, a more certain social science. Economics has the quality of quantitative measurement of a science. Money is a good measuring rod to measure individual as well as commercial activities.
5. **Universal** : Many of the economic laws are universally true. They are applicable to all types of economy. Whether it is capitalist, socialist or a mixed economy, eg. the laws of Diminishing Marginal Utility.

Argument against Economics as a Science :

1. **The laws of economics are not universal :** The applicability of economic laws is limited because of differences in physical, and cultural factors between different countries. The laws of economics are based on the habits and tastes of the people. These differ for different countries.
2. **The Laws of economics are not exact :** Like physical sciences, all economic laws are conditional they use the phrase “other things remaining the same.”
3. **No possibility of laboratory experiments :** In economics, experimentation is not possible, the reason is that the object of study is man. The data available is from real world, which cannot be controlled. Hence not a pure science.
4. **Conflicting views :** Economist differ in their view regarding their explanations. Lack of uniformity of opinion among economist is the sign of lack of development, in economics as a science.
5. **Difficulty in making predictions :** Pure science can predict accurately but economics cannot, like meteorology where forecasting of weather is not accurate. Still meteorology is a science. Man is the central object of its study, so it is a social science.

Economics as an Art : Art is the practical application of knowledge for achieving definite ends. Lord J. M. Keynes defined, “ An art is a system of rules for the attainment of a given end.”

Luigi Cossa, “ A science teaches us to know, an art teaches us to do.”

There is unemployment in India. To achieve full employment government takes fiscal and monetary steps. The study of these measures makes economics an art.

Arguments in favour :

1. **Solution of the problems :** Economics helps to utilize the scarce resource in the best possible way. Pigou, “Economics is not only right giving but also fruit bearing. Thus, economics as an art is the practical application of knowledge, it solves the problem of scarcity and the problems of choice.
2. **Modern Trends :** Modern economists are much concerned with solving the economic problems, they spend a lot of time to find solution to problems of rising prices, depressions, unemployment, economic development etc. economics as an art tries to promote the welfare of human beings.
3. **Verification of Economic Laws :** It is possible only if economics is an art. Art is the practical application of knowledge. Only when we apply the economic laws then we come to know it whether their results are true or false.

4. **Economics Planning :** It has become very popular and to formulate economic plan is an art.
5. It promotes welfare of the citizens by using the economic concepts.

Thus, we can conclude that Economics is a science as well as an art. Prof. Cossa said, "Science requires art; art requires science, each being complementary to the other."

Is Economics a positive or normative science?

Economics as a positive science : Lord J.M. Keynes "A positive science may be defined as a body of systematized knowledge concerning what it is."

The positive science explains the real nature of subject it establishes a cause and effect relationship between events as it happens.

Arguments in favour :

1. **It is based upon logic:** It establishes the cause and effect relationship. It shows us how things are and not what is good or bad. Economics is just an logical analysis of economic activities.
2. **It is based upon the principle of specialization of labour :** An Economist should confine himself to only economic activities.
3. **Fear of confusion :** If economics give their opinions i.e. what ought to be or what is good for bad, then there wil lbe difference of opinion and there will be lot of confusion. For Eg. if they are asked to give their opinion about procuring price, each economist will be differing from the other.
4. **More uniformity :** Different Economists will give different views and hence no uniformity will be there, only when it is a positive science.
5. **More neutrality :** If Economist explains what ought to be then he will give his own suggestion, then the real facts cannot be known. He should be neutral and should not give any value judgements.
6. **Informative :** It gives information of what has happened in the history of economics.

Economics as a normative science

Is one which explains what should be done or should not be done?

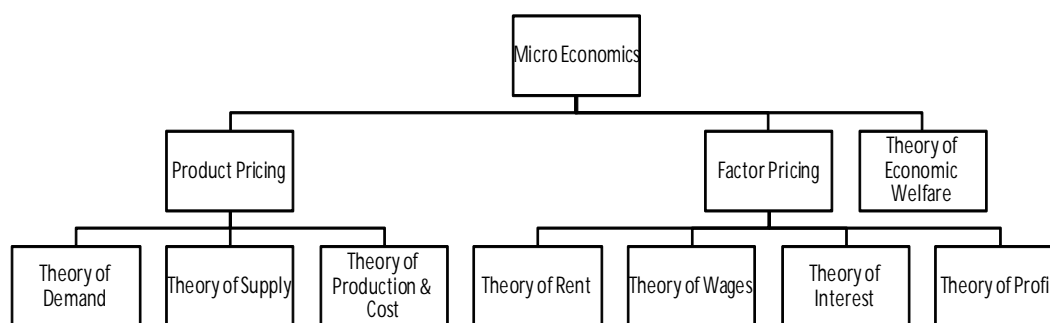
Load J.M. Keynes "A normative science is a body of Systematized knowledge relating to the criteria of what ought to be and concerned with the ideal as distinguished from the actual."

Arguments in Favour

1. **Man is not only logical but also sentimental :** In reality man is both logical and sentimental. So he has the freedom to express his sentiments & judgements.
2. **The principal of division or specialization of labour misunderstood:** Economics can be helpful only if it explains, explore, condemns suggests.
3. **Wrong argument of equilibrium is equilibrium :** According to the classical group o economists, market equilibrium is attained automatically by the forces of Demand & Supply. In India, price has risen so much. Price level is determined by equilibrium between demand and supply. But equilibrium price does not mean it is the best price, the government further tries to reduce the prices. Hence economics is a normative science.
4. **A means of social betterment :** Economist gives different views regarding the welfare of human beings. Economics cannot be separated from ethics. Hence normative. (We can choose the best view among the different views).
5. **Basis of economic Planning :** Many countries have developed through the formulation and implementation of plans. Economics plans are made on suggestions of different economist. Hence Economics is a normative science.

Micro Economics (M.E.)

1. According to Boulding “ micro economics is the study of particular firm, particular household & individual price, wage, income, industry & particular commodity”
2. Leftwich, “Micro economics is concerned with the economic activities of such economic unit as consumers, resource owners and business firms”.



Microeconomics is called as price theory: “Micro” is derived from Greek word micros which means small. It explains about individual commodities, buyers & behavior of buyer & seller in the markets.

Markets:

1. Product (Commodity) market
2. Factor market

The factors of production earn in factor market & spend in product market. Pricing in both the market is the result of demand & supply & their elasticities.

In product market household demand & firm supply is studied. A group of firm is industry.

- (a) In product pricing – is influencing individual demand & also market demand.
- (b) As individual household is in equilibrium if it gets maximum satisfaction from allocation of its resources.
- (c) A firm is in equilibrium when it gets maximum profit. It is obtained depending on Marginal cost (MC) & marginal revenue (MR).
- (d) Industry is in equilibrium if no firm is leaning as entering the industry.

But we study both markets separately the sincere price of product & factor play a critical place, Microeconomics is also called as “Price theory”.

Scope of Micro Economics

1. **Theory of demand :** All economic activities start from a source of demand. Production is done when there is demand & their interrelationship, Elasticity of demand, behavior of consumer, forecasting of demand etc.
2. **Theory of production:** When there is demand, product has to be produced by a firm. Land, labour, capital & Organization are used to produce. We study the laws of production, short run & long run period.
3. **Theory of factory pricing:** Rates of return to the 4 factor of production rent, wages, interest & profits are the income share of the factor of production. The factor Market determine their income.
4. **Allocative efficiency:** Microeconomics studies the efficiency of allocation of resources available to consumers, firm & industry. Consumers try to maximize their satisfaction & firms try to maximize their profits by allocation of resources.
5. **Welfare economics:** Studies the determinants of human welfare, the way the resources are to be used to promote maximum benefit to maximum number of people in society.

Importance & uses of Micro Economics

1. **Operation of an economy:** We get the knowledge about the operation of an economy by micro economics. We get to know whether the units of an economy like firm. Consumer are behaving optimally or not.
2. **Basis of the economy as a whole:** Micro deals with individual units macro deals with total of these units. Aggregates are merely sum of these figures: hence micro is the basis for understanding macroeconomics.
3. **Predictions:** The principle of Micro Economics is based on predictions. It explains if something occurs then a set of result will follow.
4. **Economic policies:** Microeconomics is used while formulation Economic Policies. With the study of Microeconomics we can know the effect of government polices on the allocation of factor or resources. E.g.: when government wants to impose a new tax, it can know the reaction of the people regarding new taxes.
5. **It is helpful in removing difficulties of a particular firm:** Whatever problems are there in the working of individual firm or industry can be removed with the help of micro economics.
6. **It is the base of welfare economics:** It provides base for welfare economics. The ultimate aim of all production is consumption. The main aim is the optimum allocation of scarce resources. Price theory of micro economics helps us to do this. The whole structure of welfare economics available to us is built entirely on the price theory of perfect competition.
7. **Managerial decision:** Business firm also use microeconomics while taking managerial decisions. The cost & demand analysis occupy great significance, it is a base for analyzing problems of the economy as a whole.

Limitations of micro economics:

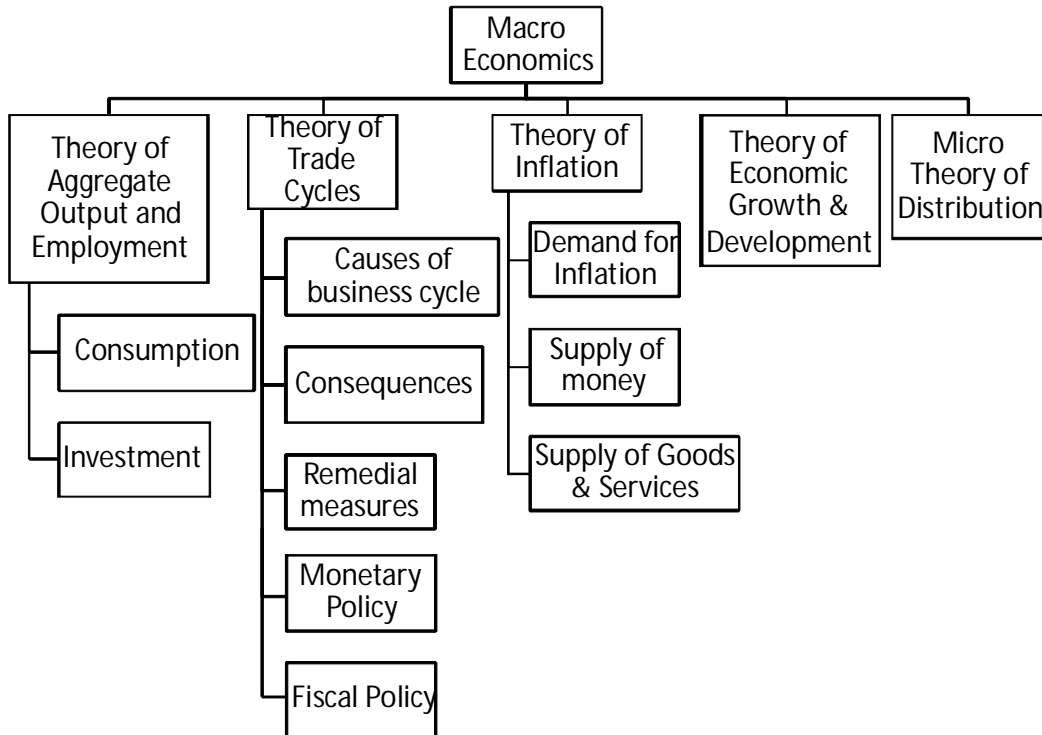
1. **Irrelevance of price theory in practical life :** As the existence or possible prevalence of perfect competition in most markets was questioned. Ever since the usefulness of price theory in the framing of economic policy has been open to doubt.
2. **Abstract nature of price theory:** 2 main criticism of the proposition that price theory has welfare implications useful for public purpose 1) general model of price theory is too abstract to be directly useful 2) wants of the consumers are not in fact independent of production in our society.

3. **Consumption & production are interdependent:** The study of few units & making a generalisation will never give good reliable results. The assumption of the independence of wants & production is not realistic of our present day world: the process of satisfying wants which creates production (advertising) & therefore, consumption is dependent on production & production on consumption which is neglected.
4. **Static nature of welfare economic :** It is now recognized that the optimum conditions of welfare are derived from micro economic models that are statics and also relative. They tell us when total output from given inputs would be maximum, provided we take consumers preferences (wants) as data & assume the distribution of income as unchanged.
5. It is too much preoccupied with individual studying. Summation of individual studies will not always lead to correct Macro picture or aggregates.
6. Macro economic concepts like National income, full employment is not satisfied.

Macro Economics

Macroeconomics is the opposite of micro economics. It is the study of economic system as whole: it studies not one economic unit like a firm, or an industry but the whole economic system. It therefore deals with total or aggregate national income, output & employment, total consumption, saving & investment & the general level of prices. It is also called aggregative economics.

According to Kenneth.E.Boulding: “Micro economics deals not with individual quantities as such but with aggregates of these quantities not with individual income but with national income, not with individual prices but with price levels, not with individual output but with national output.”



Importance & use of macro economics

1. **Helpful in understanding the functioning of an economy:** Modern economic system have become more complex. One cannot get clear & correct picture of the functioning & composition of the economy as whole on the basis of micro economics. The study of macroeconomics is necessary.
2. **Formulation of economic policy:** While making polices, Government depends on the aggregate statistics of economic force like national income, total employment, total investment. Total or aggregate savings, general price level etc.
3. **Solution of economic problems:** Modern government solves many economic problems with the help of macroeconomics for e.g. the problems of employment, production & national income can be studies only with the help of macroeconomics.
4. **Study of trade cycles:** Trade Cycle or economic fluctuations are serious economic problems. Economic fluctuations are very common in the capitalist economics. This comes in the way of healthy working of the economy. Trade

cycles are caused by fluctuations in aggregate income aggregate investments etc. therefore trade cycles can be studied under macroeconomics.

5. **Macroeconomics paradoxes:** It is common experience that many economic activities are justified for individuals but they are not justifiable for the economy as a whole. E.g. increasing prices good for firms but not for savings is good for individuals but not for the economy.
6. **Helpful in furthering the scope of micro economics:** Macroeconomics is also helpful in making laws of micro economics e.g. law of diminishing marginal utility came into being from the analysis of consumption habits of aggregates is it's principle is made by obtaining many groups.
7. **Changes in the general price levels:** The rise in general prices level & falling value of money is called inflation. Falling general price level or rising value of money is called deflation. We know that economic fluctuations are an obstacle to proper functioning of the economy. General Price Level is not just the aggregate of price of different product. Macro economics helps us to study how the rise in price of one product influences the other products. Eg. Rise in petrol price. To control these fluctuations, economists have to derive conclusions from macroeconomics.
8. **Study of national income:** National Income reflects the various economic problems of the economy. The economic conditions of different countries can be understood with the study of their national income. National income study has become possible only with the growth economics.

Limitations of Macro Economics

1. **Too much generalization is of no good:** Excessive generalization make Macroeconomics dependable. E.g. Borrowing is good in time of crisis, but today the countries are caught in debt crisis.
2. **All units of the aggregates may not be homogeneous :** It is not possible that all individual units will be homogeneous. Prof. Boulding is of the view that we can add or subtract apples or oranges but not possible to add subtract apples & buildings.
3. **Indiscriminate use of macroeconomics may be irrelevant:** We should take all precautions while using macroeconomics, as an economic model might be suitable for one country but the same might not be suitable for the other.

4. **Statistical & Conceptual difficulties:** While estimating national Income like aggregates we face these difficulties.
5. **Aggregates may not be important always:** A solution found in general might not be applied to all individual units.
6. **Limited applicability:** Macroeconomics also suffers from the problem of limited applicability.

Difference between Micro & Macro Economics

1. **Difference in the degree of aggregation:** Microeconomics studies the individual unit of the economy like a firm, individual saving, individual income, macroeconomics deals with aggregates like national income & aggregate savings. It studies the problem of the economy as a whole.
2. **Difference in objective:** Microeconomics studies the principles, problems & policies concerning the optimum allocation of resources of a firm and individual. Macroeconomics studies the principles, problems & policies relating full employment of resources & growth of resources of a Nation.
3. **Difference of subject matter:** Microeconomics deals with the determination of price, consumer equilibrium, distribution & welfare. Macroeconomics deals with full employment national income, general price level, trade cycle, economic growth etc.
4. **Difference of method of study:** Micro economics establishes relationship between cause & effect of economic phenomenon. Macroeconomics are categorized into aggregate demand, aggregate supply, total consumption, and total investment etc., their independence is studied under macroeconomics.
5. **Macroeconomics paradoxes:** The same thing has different analysis in both micro & macroeconomics. E.g. savings is beneficial for an individual & his family but if entire society starts saving, consumption will decrease leading to decrease in demand, decrease in supply & decrease in income etc.
6. **Different assumptions:** Micro Economics assumes full employment, constant production & income. On this basis we can know how production, factors of production are allocated & distributed among different uses. Macroeconomics assumes how factors of production are distributed and thus how full employment can be achieved.

7. **Difference of the forces of equilibrium:** Micro economics studies the equilibrium between the forces of individual or market demand & supply. Macroeconomic analysis deals with the equilibrium between the forces of demand & supply of the whole economy.
8. **Mortal & immortal subjects:** Microeconomics deals with individuals and individuals are mortal. Micro economics tool is man who is mortal. Macroeconomics is concerned with aggregates. The tool of its study is society. Society never ends, hence macroeconomics is immortal.

Though both are different, micro economics depends on macro economics & macro economics in turn on micro economics.

Business Economics – Nature & Scope

Business Economics is also called as Managerial Economics helps to show how economic analysis can be used to solve business problems. The main function of manager is 1) Decision making & forward planning. The theory of economics which deals with a number of concepts & principles relating to profits, demand, cost pricing, competition, business cycle etc., is Business Economics.

According to Spencer & Siegelman “ Business Economics is the integration of economic theory with business practice for the purpose of facilitating decisions making & forward planning by management”.

According to Joel Dean “Use of economic analysis in formulating policies is known as managerial economics”.

SCOPE & Nature of B.E

SCOPE

- 1) **Demand analysis & forecasting:** Sales of a business firm would depend on the nature of individual & market demand. Before production schedules can be prepared & resources employed. The business man had to estimate demand & forecast future demand. The forecast for future demand for goals produced by the firm can serve as a guide to management for maintaining or strengthening market position & enlarging profits. The important topics covered under this area are demand determinants, demand distinction & demand forecasting.
- 2) **Production & Cost Analysis:** A firm has to decide how much it has to produce in short term & long run? What should be the scale of production? What should be product mix? These questions can be answered through an analysis of

production function of the firm. The firm must analyze the factors causing variations in cost & cost variations occur because the factors determining the cost always are not known controllable. The topic covered under production & cost analysis includes production functions, cost concepts, cost control, cost output relationship, economies & diseconomies of scales.

- 3) **Profit management:** Profit is a central economic objective of any business enterprise. On traditional economic analysis, profit maximization is assumed to be the objective of the firm. In reality firms may not aim at profit maximization but they may have profit policies, therefore the decisions concerning level of profits, rate of profit policies & techniques of profit planning etc.
- 4) **Pricing policies, planning & practices:** The success of a business firm depends on the correctness of the pricing decisions. Pricing is very important aspect of business economics. At what price the product is sold in the commodity market? The important aspects related to this area are pricing methods, differential pricing, product level pricing, price forecasting and analysis of the market structure.
- 5) **Capital management:** investment decisions are the most crucial & critical business decisions. How much to invest? What should be the rate of investment? What should be the proportion of new investment & replacement investments? These decisions imply planning & controls of capital expenditure. The Important aspect under this area are capital budgeting, cost of capital, rate of return & selection of projects.

Nature of Business Economics

- 1) **Micro in nature:** Business Economics is the study of levels of business firms. A business manager is concerned with problems of his own business unit. Price theory applicable in Business Economics is effective to solve business problems.
- 2) **Pragmatic in approach:** It does not involve itself in theoretical controversies. It is the application of economic analysis in decision making.
- 3) **Normative science:** In Business Economics we try to make policies. The law made under economics is applied to the business ethics is a guide to business managers so that no bad quality, no black markets, no artificial scarcities etc. are created.

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- 4) **A scientific Art:** business firms employ scientific methods of observations, reasoning, and verification in analyzing business problems. E.g. Demand forecasting is a scientific analysis.

Business Economics is an art it helps management in the efficient utilization of scarce resources. It includes production costs, demand, price, profit, risk etc. which help management in selecting the best alternative.

- 5) **Study macro environment:** The macroeconomic environment relating to National Income, Business cycles, economic policies of the government relating to business are important to management. The firm has to adjust itself to uncertainties created by environmental factors.

Business Economics is thus both normative and positive study.

UNIT - 2

UTILITY AND DEMAND ANALYSIS

Cardinal Utility

The term utility refers to the capacity of a commodity to satisfy human wants. Utility is subjective it differs from person to person.

Economists have offered their theories of consumer behaviour on the basis of the measurement of utility. There are two major approaches regarding the measurement of utility via. cardinal measurement and ordinal measurement of utility. Accordingly, we have

- i. Cardinal Utility Theory of consumer behaviour
- ii. Ordinal Utility Theory of consumer behaviour

Cardinal Utility

Cardinal measurement is a numerical expression. Marshall believed that utility could be measured in numerical terms in its own units called “utils”. Utility of a commodity is quantifiable, hence measurable numerically. For instance, to a consumer an apple may yield 10 utils of satisfaction, while a mango may yield 30 utils of satisfaction. Thus, utility of a mango is proportionately three times the utility of an apple. Such a numerical measurement is imaginary.

Ordinal Utility

Ordinal measurement implies comparison or ranking without quantification or differences of satisfaction enjoyed by the consumer. Hicks mentions that it is possible to observe from experience and by experiment the preferences which consumers display when choosing between different goods. They can always compare the level of satisfaction yielded by one particular combination of goods with that of another combination. A rational consumer, obviously, prefers that stock or combination of goods which yields a higher level of satisfaction than the one which yields a lower one. For example one can say, I like 5 apples and 5 bananas to 5 mangoes and 5 guavas.

Law of Diminishing Marginal Utility

The law of diminishing marginal utility (DMU) lies at the centre of the cardinal approach. The law is based on the satiability characteristic of human wants, that a single want taken separately at a time can be fully satisfied. This law was propounded by H.H. Gossen.

Statement of the Law :

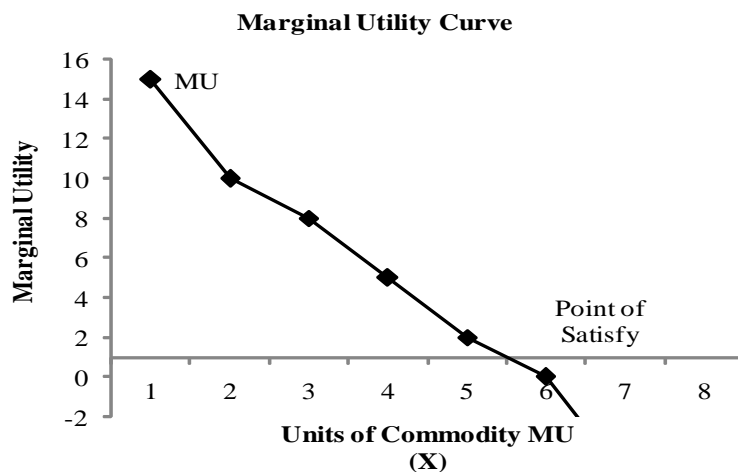
Other things being equal, as the quantity of commodity consumed or acquired by the consumer increases, the marginal utility of the commodity tends to diminish.

It means that the MU of a commodity to the consumer depends upon the volume of the stock of the commodity purchased or possessed by him. The larger is the stock purchased by him, the smaller is the utility delivered from an additional.

1. **Homogeneity** : The law holds true, only if all the successive units taken in the process of consumption are homogeneous in character like quality, size, taste, flavour, colour, etc.
2. **Continuity** : The consumption or acquisition process is continuous at a given time, i.e., units are taken one after another successively without any interval of time.
3. **Reasonability** : The units of consumption should be of reasonable size, of normal standard unit.
4. **Constancy** : The law presumes that there is no change in income, taste, habit, price or preference of the consumer.
5. **Rationality** : The consumer is assumed to be a rational.
6. **Constancy of Marginal Utility of Money** : Throughout the operation of the law, it is assumed that not only the money income of the consumer is given, but its MU remains constant, so that the consumer's preference remains unchanged.
7. **Cardinal Measurement of Utility** : It is assumed that utility can be numerically expressed by the consumer.

Units of Consumption of Commodity X	Total Utility T_{UX} (units)	Marginal Utility M_{UX} (units)
1	15	15
2	25	10
3	33	8
4	38	5
5	40	2
6	40	0
7	35	-5

From the schedule, it appears that as units of the MU from each successive unit tends to diminish commodity X consumed increases the MU implies that is the “point of satisfy” i.e., there is complete satisfaction of a given want when MU is zero. The MU is zero, when the wants intensity is nil, as it is fully satisfied. The variation of MU is not proportionate or uniform. Any further addition to the consumption after zero, MU causes a negative MU. Negative MU indicates dissatisfaction resulting from excessive consumption of a commodity when the MU schedule is plotted on the graph, we have a diagrammatic representation of the law, through the MU curve.



X-axis represents the units of commodity X, and the MU is measured on the Y-axis. The MU curve represents the marginal utility curve. The MU curve slopes downwards from left to right, indicating an inverse relationship between MU and the stock of the commodity.

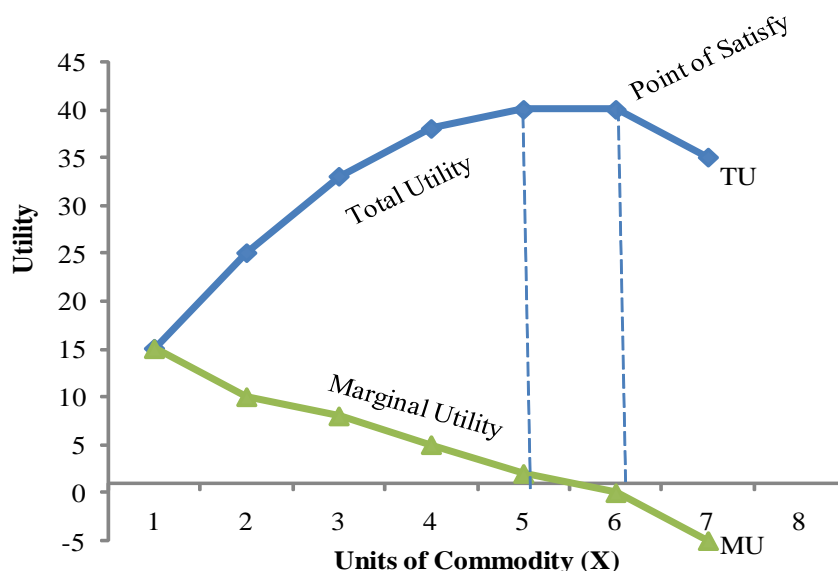
The MU curve intersects at a certain point of X-axis, the intersection point is the point of satisfy, where MU is zero. After this the curve slopes down further denoting negative returns.

Relationship between TU and MU

From the above schedule, the relationship between TU and MU can be seen:

1. With an increase in the units of X, its TU increases but its MU diminishes. However, the increase in TU is at a diminishing rate.
2. When MU is zero, TU is maximum. This shows that the want is totally satisfied, and its intensity is nil.
3. When MU becomes negative, TU starts decreasing due to dissatisfaction.

The relationship can be represented graphically.



From the graph we can say that as the MU curve slopes downwards, TU curve moves upwards, indicating that TU increases at the rate of MU. When the MU curve intersects the X-axis to that extent the TU curve is at its peak, i.e., when MU is zero, TU is at its maximum. When the curve enters the negative quadrant, i.e., -5, TU starts sloping downwards, indicating that TU decreases, when MU is negative.

Exceptions

1. **Hobbies :** In certain hobbies, like stamp collection, collection of antiques, collection of old coins, etc. every additional unit gives more pleasure, i.e., the MU tends to increase. But this is not accepted as homogenous condition of the law is not present.

2. **Drunkards** : The law seems to be inapplicable to drunkards, as his craving increases with every successive dose of liquor. But the rationality condition of the law is violated. This behaviour of a drunkard is abnormal.
3. **Misers** : It is pointed out that greed increases, with every additional acquisition of money. Hence the MU of money does not decrease for him, with more and more money. But when the miser spends his money, his utility of the commodity will be diminishing perhaps more rapidly than in the case of the others.
4. **Music and Poetry** : In case of music and poetry, it is commonly experienced that a repeat hearing gives a better satisfaction than the first one. Hence this law of DMU may not be applicable here. But, there is no limit to it, the repeated hearing of the same music or poetry proved to be monotonous and ultimately yields disutility.
5. **Reading** : Since more reading gives us more knowledge, a scholar would get more and more satisfaction with every additional book. But, here also we may point out that it is not a real exception to the law as the homogeneity condition is violated here.
6. **Money** : It may be felt that with an increase in money our purchasing power increases. Therefore, its utility should correspondingly increase with its stock, so that the law of DMU is not applicable in the case of money. This is an incorrect belief. Money, in fact is subject to the law of DMU. With the increase in the stock of money, its MU would certainly diminish, as money is also a commodity, a liquid asset.

Criticisms

1. **Cardinal Measurement** : The traditional or Marshallian explanation of the law presumes the cardinal measurement of utility. The utility schedule for this assumes that the utility can be measured numerically, added or subtracted. This is not convincing utility is a subjective or introspective phenomenon. It cannot be measured numerically. It is a feeling experienced by the consumer. A feeling cannot be quantified.
2. **Unrealistic Condition** : This law is based on unrealistic assumptions or conditions. It is very difficult to meet the homogeneity, continuity, constancy and rationality conditions simultaneously.
3. **Inapplicability in case of Indivisible Goods** : The application of this law to the assumption of an indivisible bulky commodity seems to be absurd because no one could buy at a time more than one unit of goods like TV, Scooty, House, etc.

4. **Constant Marginal Utility of Money** : The law unrealistically assumes constant MU of money. Critics point out that MU of money never remains constant, so it affects the consumer's preferences.

Despite these drawbacks, the law has some validity. Though utility cannot be measured cardinally it can be compared and measured ordinally. So, the law cannot be discarded outright.

Consumer Surplus

A French Economist and engineer named Aisene Tules Dupit in the year 1844, originated the concept of consumer's surplus. Alfred Marshall in the 19th century popularised it by presenting it in a most refined way. This concept has been introduced to indicate the consumer's gain from the goods he purchases in a market economy.

According to Marshall, "the excess of price which a consumer would be willing to pay rather than go without the thing, over that which he actually does pay, is the economic measure of this surplus of satisfaction. It may be called as Consumer's Surplus."

Definition :

"Consumer Surplus is the difference between the total amount of money the consumer would have been willing to pay for a quantity of a commodity and the amount he actually has to pay for it."

It is thus, measured as the difference between the maximum price the customer is willing to pay for a commodity and the actual price which he pays for the commodity.

Measurement of Consumer Surplus

$$\text{Consumer's Surplus} = \text{Total Utility} - (\text{Price} \times \text{Quantity})$$

Symbolically :

$$CS = TU - (P \times Q)$$

(Or)

$$CS = \text{Price prepared to Pay} - \text{Actual Price paid}$$

Assumptions :

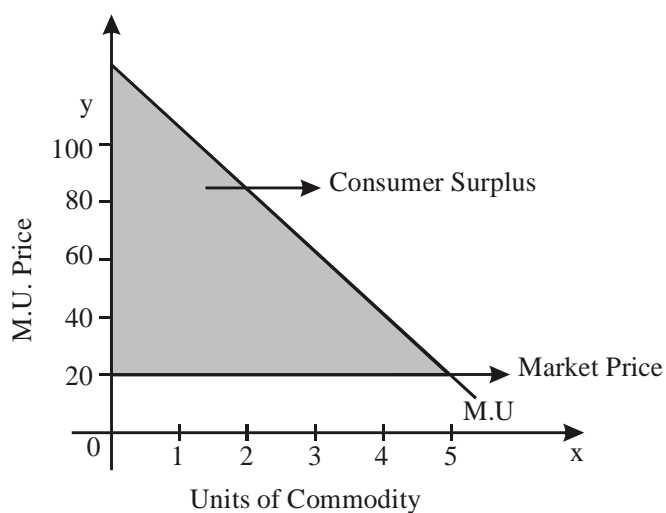
1. **Cardinal Measurement of Utility** : The benefits gained by the consumer from his purchase of a commodity is quantified by Marshall on the assumption of cardinal or numerical measurement of utility.
2. **Diminishing Marginal Utility** : The excess of utility tends to decline when the consumer buys more of a commodity the price remaining the same.

3. **Constant MU of Money :** It is assumed that MU of money remains constant throughout the process of exchange. This is assumed to eliminate the influence of income effect in the measurement of consumer surplus.
4. **Non Availability :** According to Marshall, the commodity in existence has no substitutes. For measuring consumer surplus, each commodity is to be treated as an absolutely independent one and the substitutes should be grouped to form a single commodity.
5. **Specificity of Unity :** Marshall assumed that utility of a commodity depends specifically on the quantity of that commodity consumed alone. Commodity surplus can be explained with the help of an example

Units of Commodity X	Marginal Utility MU _R (in Rupees)	Actual Payment/ Market Price	Consumer Surplus MU - AMP
1	100	20	80
2	80	20	60
3	60	20	40
4	40	20	20
5	20	20	0
Total	300	100	200

Thus,

$$CS = TU - (P \times Q) = 300 - (20 \times 5) = 300 - 100 = 200$$



The consumer surplus is a relative concept, because utility is a relative term. The consumer's surplus of the same commodity may vary from person to person and from time to time. Consumer surplus also differs from commodity to commodity. Some commodities like necessities when available at much lower price would have greater consumer surplus than high priced luxuries.

If OP is price, OQ is the unit purchased MU of OQ = Price OP

Total Money Paid = OP × OQ

(Price paid) = OPQR

Total Utility = OMRQ (Price prepared to pay)

OMRQ - OPRQ = MRP (Consumer's Surplus)

Criticisms

1. Unrealistic Assumptions :

- (a) Utility cannot be measured cardinally, therefore consumer's surplus cannot be measured and expressed numerically.
- (b) MU of money does not remain constant.
- (c) If commodities have substitutes with a rise in prices, he will purchase other goods rather than pay a higher price for the same.

2. **Measurement Impossible** : Marshall tries to express the gain of consumer's benefit from a commodity in terms of money through the measurement of difference between what he would be willing to pay and what he actually paid. He further assumed that MU of money would remain unchanged throughout the demand. According to the critics, consumer surplus is a subjective phenomenon, it cannot be measured in terms of money.

3. **Meaning of the concept in certain cases** : It is meaningless to apply the doctrine of consumer surplus to necessities. Because, in the case of necessities like water, a consumer derives infinite utility and would be willing to pay anything demanded, rather than go without it.

4. **It is a Hypothetical and Illusory Concept** : To some extent the concept of consumer surplus is imaginary and illusory. It does not exist in reality. We create a consumer surplus in our imagination. There is no actual realisation of consumer surplus by an ordinary consumer.

5. **No Empirical Test** : Marshall did not provide any data on empirical evidence in support of this concept. It is a purely subjective phenomenon, not capable of empirical testing either.

6. **Impractical Concept** : Critics like little feel that the concept of consumer surplus has no practical utility. “The doctrine of consumer’s surplus is a useless theoretical toy, having no practical significance.” says Prof. M. I. D. Little.

Law of Equi-Marginal Utility

H.H. Gossen, states the law of EMU, and it was refined by Alfred Marshall. Science this is the second law put forth by Gossen, it is also known as Gossen’s second law. It is further known as the Law of Maximum Satisfaction/Law of Substitution/Law of Consumer’s Equilibrium/Equi-Marginal Principle/Law of Equi-Marginal Returns.

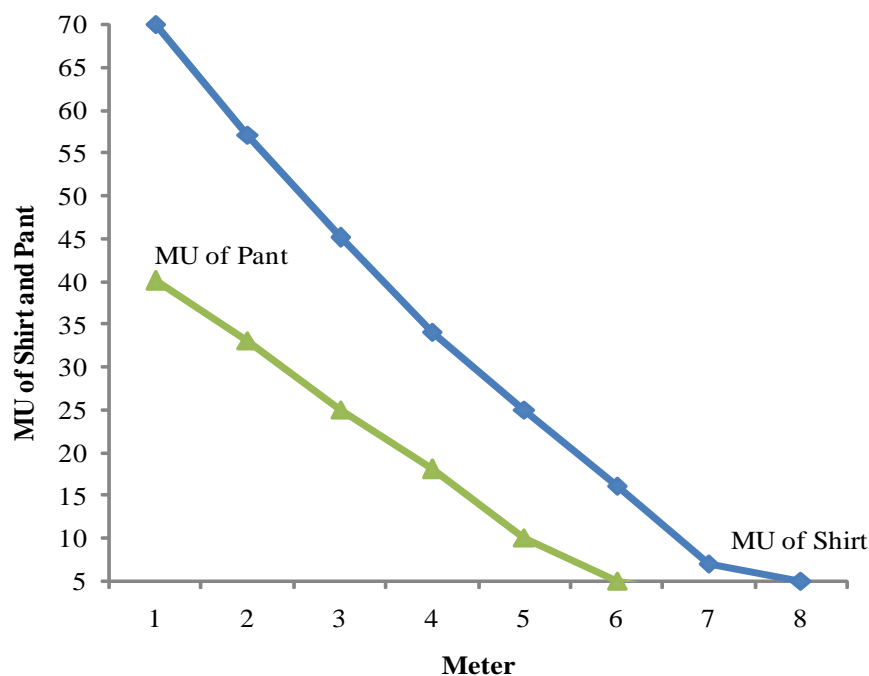
The law has stated by Marshall as “if a person has a thing which can be put to several uses, he will distribute it among these uses in such a way that it has the same MU, for it had greater MU in one use than in another, he would gain by taking away some of it from the second use and applying it to the first.”

The consumer tries to put each unit of the commodity to its most important use. He will in this way spend his income in such a way that the last rupee spent on each of the commodity gives him the same marginal utility.

Assumptions

1. The consumer has limited income or limited stock for a given commodity.
2. The consumer has more than one want to satisfy. This he can do either by purchasing the number of commodities out of a given income or putting a given commodity to various uses to satisfy his different wants.
3. The consumer is rational and seeks maximum satisfaction.
4. He has no control over the prices of the commodity but the prices are given.

Meter	Marginal Utility of Shirt	Marginal Utility of Pant
1	70	40
2	57	33
3	45	25
4	34	18
5	25	10
6	16	5
7	7	3
8	5	2



Explanation of the Graph

In distributing a commodity among various uses, the consumer will secure maximum satisfaction if the marginal utility of the commodity in different uses will maximise his aggregate satisfaction. This is why, this law is known as the Law of Equi-Marginal Utility.

Let us suppose that there is a commodity cloth, which can be put to 2 uses say shirt and pant. Further, suppose that the consumer has 8 meters of cloth which he wants to put to the two uses x and y, where x is shirt any y is pant. The marginal utilities of the various meters of cloth in 2 uses are given below:

Let us suppose that the consumer put 3 meters of cloth to the use of a shirt and 5 meters of cloth to the use of pant. In this arrangement, marginal utility of cloth in the 2 uses is obviously unequal. In used shirt it is 45 units while in pant it is 10 units. Now he transfers one meter of cloth from the pant to the shirt, this will increase his total utility. The consumer will continue this process till the marginal utility in the 2 uses is equalized.

When the consumer puts 5 meters of cloth to the shirt and 3 meters to the pant, the MU in both the cases or uses is equal. It is in this arrangement that the consumer will secure maximum total utility. He will therefore not like to upset the arrangement.

To make comparisons of marginal utility of 2 or more than 2 commodities possible we have to make use of a common medium, i.e., money and speak of the MU's per rupee being equal in all uses. It is only when the MU's per rupees are the same in the cases of all the commodities on which he spends his money income, that the consumer will secure the maximum total satisfaction from his expenditures. The basic condition then for the attainment of consumer's equilibrium is expressed in the following equation.

$$\frac{MU_a}{P_a} = \frac{MU_b}{P_b} = \frac{MU_c}{P_c} = \dots = \frac{MU_n}{P_n}$$

Limitations of the Law

1. The consumer is a rational economic man who seeks maximum total satisfaction.
2. Utility is measurable in cardinal terms.
3. The consumer has a given scale of preference for the goods in consideration. He has perfect knowledge of utilities derived.
4. Price of goods are unchanged.
5. Income of the consumer is fixed.
6. The Marginal Utility of money is constant.
7. The wants and goods are sustainable.

Exceptions

1. The law is based on unrealistic assumptions. It involves all the unrealistic conditions, assumptions, such as homogeneity, continuity, constancy, etc. on which the law of DMU is based.
2. The proportionality rule presumes cardinal measurement of utility, but it is not a realistic approach.
3. The law cannot be applied to indivisible goods.
4. The consumer does not behave rationally all the time. His behaviours is influenced by his habits, social customs, fashions, advertising, propaganda, occasional requirements, etc.
5. It is wrong to assume that the MU of money will constant. When money is spent the remaining units of money will tend to have greater MU.
6. Ignorance on the part of the customers about market prices and utilities.

Demand Definition

“The demand for a commodity refers to the amount of it which will be brought per unit of time at a particular price.”

Demand Function

The functional relationship between the demand for a commodity and its various determinants may be expressed mathematically in terms of a Demand Function.

Thus,

$$D_x = f(P_x, P_y, M, T, A, U)$$

Where,

D_x = Quantity demanded for Commodity X

f = Functional relation

P_x = Price of Commodity X

P_y = Price of Substitutes and complementary goods

M = Money income of the consumer

T = Taste of the consumer

A = Advertisement effects

U = Unknown variables or influences.

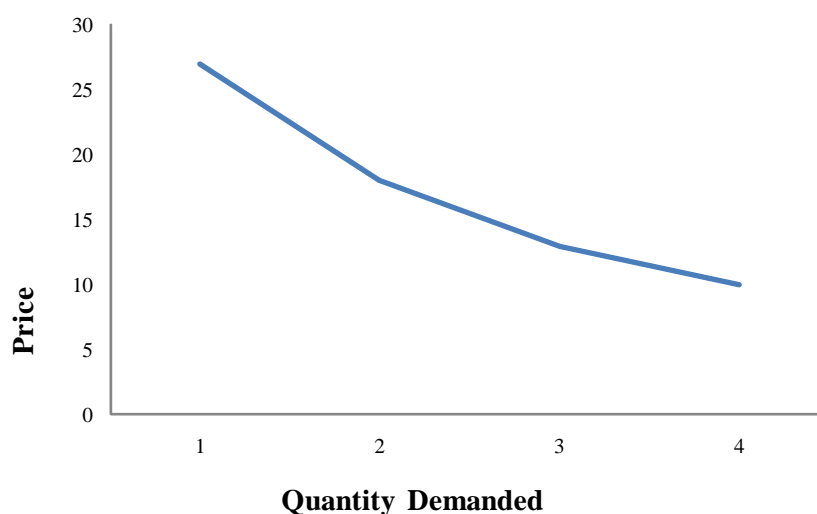
The above stated demand function is a complicated one. Again, factors like tastes and unknown influences are not quantifiable. According to economists, assuming all other variables, except price to be constant. Thus, an over-simplified and the most commonly stated demand functions is : $D_x = f(P_x)$, which notes that the demand for commodity X is the function of its price.

In other words, “the quantity demanded is a function of price” implies that for every price there is a corresponding quantity demanded.

Demand Curve

A demand curve is a graphical representation of a demand schedule when price quantity information is plotted on a graph. Thus, demand curve depicts a picture of a data contained in the demand schedule.

Price	Demand
26	1
18	2
12	3
10	4



Determinants of Demand

Factors influencing individual demand:-

- a) **Price of the Product** : Price is always a basic consideration in determining the demand for a commodity less quantity is demanded at higher price and more of quantity is demanded at a lower price.
- b) **Income** : With increase in income, more goods will be purchased. Rich consumer demand more & poor consumer, demand less because of difference in income.
- c) **Taste & Habits** : People with different tastes & habits have different preferences for different goods. These influence demand.
Eg. : When consumer goes to hotel, he eats according to his taste. People demand icecream or chocolate according to their taste. Smokers demand cigarettes, which has come by habit.
- d) **Relative prices of other goods: Substitutes**: if substitute is costly, then more demand for the commodity will be there and vice versa.

Eg: Tea & Coffee, Til oil & Ground nut oil, peas & beans etc. When price of coffee goes up, demand for tea will increase.

Complementary: Car & Petrol, pen & ink, tea & sugar, shoes & socks, saree & blouses, guns & bullets etc. when price of one commodity is low, the demand for the other is high & vice versa. Fall in price of car, increase in demand for petrol.

- e) **Consumer's expectation** : When consumer expect the price to fall, consumer will tend to buy less at the present prevailing price. When we expect price rise in future, we will demand more at present.
- f) **Advertisement effect** : Preference can be changed from one product to another, by advertisement & sales propaganda. Eg: Demand for boost has been boosted by Sachin Tendulkar, Dhoni. Consumer doesn't say first boost, he says boost is the secret of my energy. Market demand is the addition of individual demand. It is the representation of the society.

Factors Influencing Market Demand

1. **Price of Product** : At Low market price, market demand for the product is high & vice versa.
2. **Distribution of income & wealth in the community** : If there is equal distribution of income & wealth, market demand for many products particularly of necessary consumption tend to be greater, than when there is unequal distribution.
3. **Common habits & scale of preference** : Market demand changes by the change in preference and habits of the society.
Eg: - when large section of population shifts their preference from Non-veg to veg, the demand for non-veg decreases & veg increase.
4. **General standard of living & spending habits of the people**: When people have better standard of living, they will be ready to spend more, so there will be is an increase in demand for... luxuries & comfort goods.
5. **Numbers of buyers in the market and growth of population** : The size of market demand depends on the buyers in the market. Large no of buyer's leads to large demand & vice versa.

High growth of population, leads to bigger size of market which leads to a rise in demand for essential goods & services in general.

6. **Age structure & sex ratio of the population :** Age structure of population determines market demand for many products.

Eg: If teenagers are more, there will be more sales of products which are preferred by them.

Sex ratio: If females are more than males, then more demand for female products than male goods & vice versa.
7. **Future Expectation :** If price of a commodity is expected to rise in future, more market demand will be more. People want to hoard (store) the commodity.
8. **Level of Taxation & Tax Structure :** high tax rate means low demand for goods. Highly taxed commodity will have a relatively lower demand than an untaxed commodity because with tax, price of the product will rise which will lead to low demand.
9. **Inventions & innovations :** Introduction of few goods or substitutes as a result of inventions & innovations in a dynamic modern economy tends to adversely affect demand. Eg: .Introduction of calculators has made the demand for adding machine obsolete.
10. **Fashions :** Market demand for many products is affected by changing fashions
Eg: - demand for jeans, suits, skirts etc. replac dhoti, sarees.
11. **Climatic or weather condition :** Demand for certain goods is determined by climate or weather conditions

Eg: In summer greater demand for cold drinks, ice creams, fans, coolers etc. will be there. Similarly demand for umbrellas & raincoats increase during raining seasons.
12. **Customs:** For certain goods demand is determined by social customs, festivals etc. Eg: - During Diwali there is an increased demand for sweets & crackers, during Christmas increased demand for cakes, etc.
13. **Advertisement & Sales Propogonda:** Market demand for many products in the present day is influenced by the sellers efforts through advertisements and sales propaganda. Demand can thus be manipulated.

Law of Demand

Demand in economics means a desire for a product which is backed/supported by ability to buy and willingness to pay its price. Demand means the various quantities of goods that would be purchased per time period at different prices in a given market.

Statement of the Law

Marshall states the law of demand as :

“The amount demanded rises with a fall in price and diminishes with a rise in price.”

The law can also be stated as “other things being equal, the higher the price of a commodity, the smaller is the quantity demanded and lower the price, larger is the quantity demanded.”

The contraction and extension of demand for a commodity are brought about by a rise or fall in its price. In other words, when the price of a commodity increases, there is a fall in its demand and when its price falls, there is a rise in demand. Thus, there is an inverse relationship between price and demand.

Assumptions of the Law

1. Consumers income must remain same.
2. There should not be any change in tastes and preferences of consumers.
3. The price of related goods should remain unchanged.
4. There should not be any change in fashions, weather conditions, populations, etc.
5. The consumer should also not expect the prices to change in the future.

Explanation of the Law

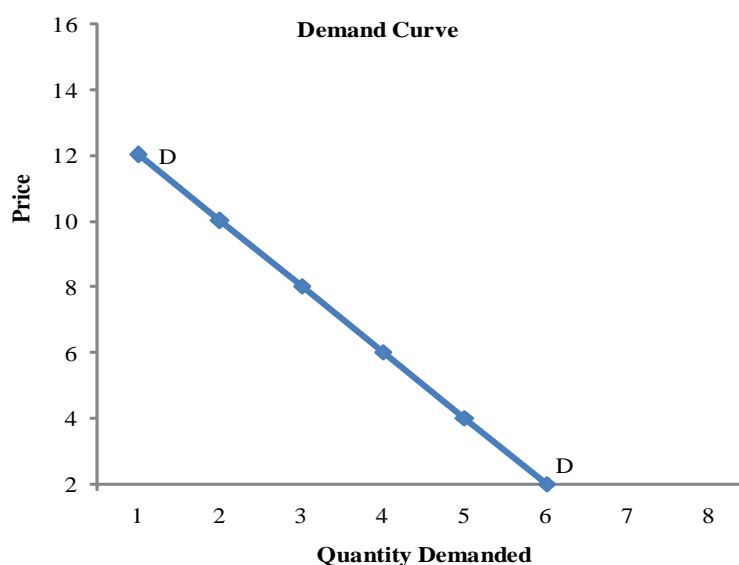
The law of demand can be illustrated through a demand schedule and through a demand curve.

Following is a demand schedule that shows an inverse relationship between price and quantity of a product.

Demand Schedule	
Price (Rs.)	Quantity Demanded (Units)
12	10
10	20
8	30
6	40
4	50
2	60

From the demand schedule, it is seen that when the price of a, say an apple, is Rs. 12 per unit. Mr. X purchases 10 apples. When the price of an apple falls to Rs. 10, he purchases 20 apples, When price falls further, quantity demanded by Mr. X goes on rising until at Rs. 2, the quantity demanded by him rises to 60 apples.

We get the demand curve from demand schedule by graphically plotting the various price quantity combinations.



The quantity demanded is measured on X-axis and price of the commodity on Y-axis. DD is the downward sloping demand curve.

It is seen from both the demand schedules and the demand curve that as the price of the commodity falls, more quantity of it is purchased. Since more is demanded at a lower price and less is demanded at a higher price, the demand curve slopes downwards to the right. Thus, the downward sloping demand proves the law of demand which shows price-demand relationship.

Reasons for Downward Slope of the Demand Curve

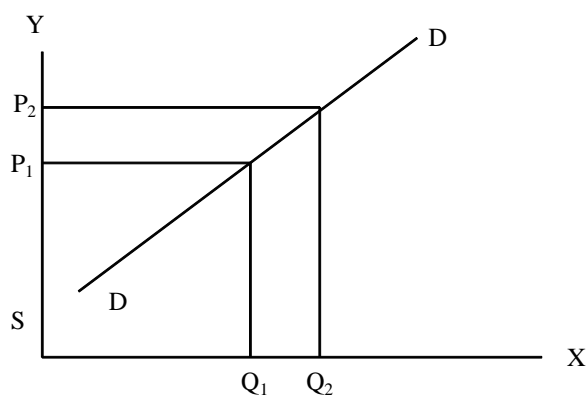
- 1. Income Effect :** A fall in the price of a commodity results in a rise in the consumer's real income. He can, therefore, purchase more of it on the contrary, with a rise in the price of a commodity, there is with a fall in his real income. He is therefore, forced to purchase less of it. Let us suppose that the price of sugar

falls down. After having bought his usual quantity, the consumer is still left with some money, a part of which he is likely to spend on buying additional quantities of sugar.

2. **Substitution Effect** : When the price of a good falls, it becomes relatively cheaper than other products. This induces the consumer to substitute the commodity whose price has fallen.
3. **Multiple Uses** : Some commodities can be put to many uses. When the price of such goods fall in the market, the commodity may be put to use where it was not used earlier. For example, when there is a fall in the price of electricity it will be used also for heating water, cooling, washing clothes in machines etc.
4. **Law of Diminishing M.U.** : Consumer will buy more commodities only when price goes down because additional consumption gives them less utility $M.U. = Price$.
5. **Psychological Effect** : It is the general psychology of the consumers that if the price goes down, they feel like buying more and buy it.
6. **New Buyers** : When the price goes down, many consumers can afford now and so more new buyers will enter the market.

Exceptions to the Law of Demand

It may be observed that though, of course, very rarely, that with a fall in price, demand also falls and with a rise in a price, demand also rises. This situation is referred as exception to the general law of demand



DD is demand curve, which slopes upward from left to right. When OP_1 is the price, OQ_1 is the demand and when the price rise to OP_2 , demand extends to OQ_2 . Thus, the

upward sloping demand curve expresses a direct functional relationship between price and demand.

There are a few exceptions which are as follows :

1. **Veblen Effects** : According to Veblen, the law of demand, does not apply in case of prestigious goods like diamonds, costly cars, etc. These goods are purchased by rich people only because of their 'shop appeal.' As the price the goods becomes unaffordable for the middle class people & so it can be used as a product to show their prestige. So rich people bring more of these products when price hikes. Veblen calls such consumption as 'conspicuous' consumption.
2. **Speculation** : When the price of a commodity is increasing and when people expect a further rise in its price, the demand for it increases. This is contrary to the law of demand.
3. **Consumers Psychological Bias** : When the consumer is wrongly biased against the quality of a commodity both the price change, he may contract his demand for that commodity with a fall in price.
4. **Price expectation** : When they expect price to go up in the future, even with price increase, they will buy more. On the other hand, if the price is falling and if the people expect a further fall in the price, they do not increase their demand even though the price falls.
5. **Demonstration effect** : People in the society may be influenced by demonstration effect. Even when price goes up, when many people buy a product, they increase the demand.

Importance of Demand

The demand analysis and the demand theory are of crucial importance to the business enterprises. They are the source of many useful insights for business decision making. The success or failure of business firms depend primarily on its ability to generate resources by satisfying the demand of consumers. The firms unable to attract consumers are soon forced out from the market.

The importance of demand and analysis in business decisions can be explained under following headings.

1. **Sales forecasting** : The demand is the basis of sales of a firm's production of a firm. Hence sales forecasting can be made on the basis of demand. For

example, if demand is increasing, sales will be high and if demand is decreasing, sales will be low. The firms can make different arrangements to increase or reduce production or push up by advertisement.

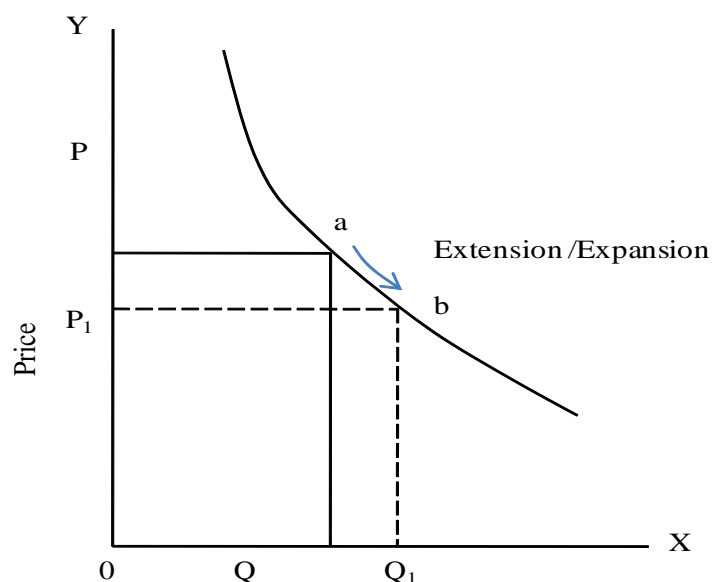
2. **Pricing decision :** The analysis of demand is the basis of pricing decisions of a firm. If the demand for the product is high, the firm can charge high price, other things remaining the same. On the contrary, if the demand is low, the firm cannot charge high price. The demand analysis also helps the firm in profit budgeting.
3. **Marketing decisions :** The analysis of demand helps a firm to formulate marketing decisions. The demand analysis analyses and measure the forces that determine demand. The demand can be influenced by manipulating the factors on which consumers base their demand on attractive packing.
4. **Production decisions :** How much a firm can produce depends on its capacity. But how much it should produce depends on demand. Production is not necessary if there is no demand. If the demand is less than the quantity of production, new demand should be created by means of promotional activities such as advertising.
5. **Financial decisions :** The demand condition in the market for firm's products affects the financial decisions as well. If the demand for firm's product is strong and growing, the needs for additional finance will be greater. Hence, the financial manager should make necessary financial arrangement to finance the growing need of the capital.
6. **Government :** Government can tax a product according to demand when the demand is growing. Taxing will be beneficial to government.

Expansion of Demand and contraction of Demand

A variation in demand implies "extension" or "contraction" of demand. Increase and decrease in demand are expressed as changes in demand.

The terms "extension of demand" should however be distinguished from "increase in demand." When the demand rises only due to price, it is called as extension of demand, when the demand rises due to factors other than price like income, taste, etc., it is called as increase in demand. This term extension of demand can be explained as follows :

Extension of Demand



From the above graph, extension is shown by the movement along the demand curve. A downward movement from one point to another on the same demand curve implies extension of demand for us. The movement from a to b in the graph, shows that when the price reduces from OP to OP_1 , the demand extends from OQ to OQ_1 , this downward movement along the demand curve from left to right implies extension of demand.

Contraction of Demand

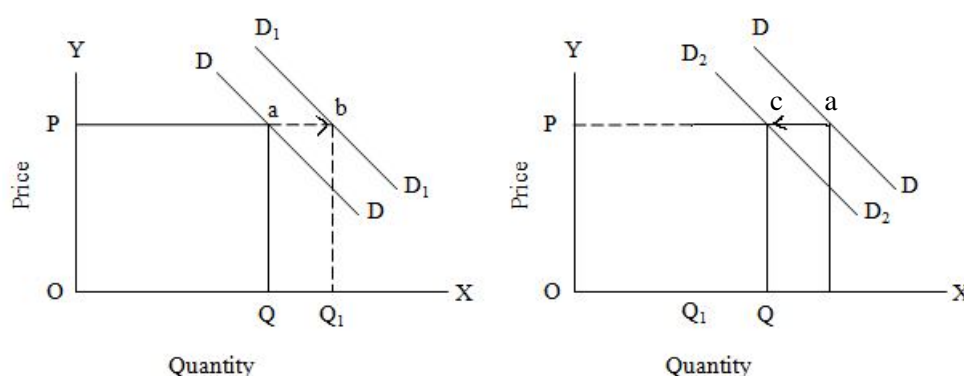
In the above graph when the point moves from b to a, it is called as contraction of Demand. When the price rises from P_1 , to P , Demand contracts from Q_1 to Q .

Increase in Demand and Decrease in Demand

The two terms increase and decrease in demand are used to express the changes in demand changes in demand are a result of the change in the conditions or factors determining demand, other than the price. A change in demand thus implies, an increase or decrease in demand. When more of a commodity is bought than before at any given price, there is an increase in demand. For example, suppose a consumer yesterday purchased 2 kgs. of apples at price Rs. 10 per kg. If today at the same price of Rs. 10, he buys 3 kgs. then it means there is an increase in demand (by 1 kg) in his demand for apples. Similarly, when with price remaining unchanged, less of a commodity is bought than before, there is a decrease in demand. In the same previous example if the consumer now buys only 1 kg at the same price of Rs. 10 per kg, it means there is decrease in his demand.

In other words, an increase in demand signifies either that more will be demanded at the given price or same will be demanded at a higher price. Thus an increase in demand means that more is demanded than before at each and every price. A decrease in demand signifies either that less will be demanded at a given price or the same quantity will be demanded at a lower price.

The terms increase and decrease in demand are graphically expressed by the shift from one demand curve to another demand curve.



The change in demand is shown by the shift of the demand curve. In case of an increase in demand, the demand curve shifts to right. Thus, the shift of demand curve from DD to D_1D_1 shows an increase in demand. In this case the shift from a to b shows that even though the price remains the same at OP more quantity OQ_1 is demanded instead of OQ . So, the increase in demand is OQ_1 . Similarly a decrease in demand is depicted by shifting the demand curve towards the left. In the figure, the movement of the demand curve from DD to D_2D_2 shows a decrease in demand. In this case the movement from a to c indicates that the price is the same at OP , but less quantity (i.e.,) OQ_2 is demanded than OQ . So the decreased demand is OQ_2 .

In short, a change in the quantity demanded other determinants other than price. An increase or decrease in demand occurs due to changes in types of demand occurs due to changes the other determinants other than price.

Types of Demand

There are many types of demand, few of them are :

1. Individual Demand
2. Market Demand
3. Company Demand.

4. Industry Demand

5. Derived Demand

1. **Individual Demand :** Individual demand refers to the demand for a commodity from the individual point of view. That quantity of a good a consumer would buy at a given price during a given period of time is his individual demand for that particular good. Individual demand comes from an individual or household's point of view. Individual demand is a single consuming entity's demand.

2. **Market Demand :** This refers to total demand of all buyers taken together. How much quantity the consumer in general would buy at a given period of time constitutes the total market demand for the product at a given price.

Under market mechanism, resources would be automatically channelised in producing those goods which have a greater demand and consequently, prices will increase and profit will be more. It serves as a guide in adjusting their supply in a market.

3. **Industry Demand :** It refers to the total demand for the commodity produced by a particular industry. **Example :** The total demand for cars in India is the demand for entire automobile industry's output. A firm is a business unit. Industry is a group of firms producing similar products. Maruthi Suzuki is a firm in automobile industry.

4. **Company Demand :** In demand analysis, it should be noted that within the industry, products of one company or firm can be substituted for another according to their similarities. Therefore, company or firms demand is fairly elastic. It is the demand of a particular firm.

5. **Derived Demand :** When demand for a product is derived from depends on the demand for some other commodity, it is called Derived Demand. According to Joel Dean, "When demand for a product is tied to the purchase of parent product, its demand is called derived." Generally demand for the factors of production fall under this category. For Eg. When the demand for Hyderabad Biryani or Haleem increases, the demand for cooks who are specialised in cooking that will increase. The cook's demand is derived from the demand of Biryani.

Sugar, milk tea bags etc. are derived from the demand for tea.

UNIT - 3

ELASTICITY OF DEMAND & SUPPLY ANALYSIS

Elasticity of Demand

According to Marshall, “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 the price and diminishes much or little for a given rise in price.”

Stonier and Hague defined Elasticity of demand as a technical term used by the economist to describe the degree of responsiveness of the demand for a commodity to a change in its price.

Price Elasticity of Demand : It is the ratio of proportionate changes in the quantity demanded of a commodity to a given proportionate change in its price. It is the ratio of a relative change in quantity, to a relative change in price.

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

E_p is also called as the co-efficient of price elasticity of demand.

There are 4 methods to calculate price elasticity of demand

- 1. Ratio Method :** To measure coefficient of price elasticity, we know that,

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

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

It is also known as percentage method, when we measure the ratio as :

Where,

$$e = \frac{\% \Delta P}{\% \Delta Q}$$

Where,

$\% \Delta P$ = Percentage change in demand

$\% \Delta Q$ = Percentage change in price

3. **Point or Geometric Method** : Marshall also suggested the point elasticity method or geometric method for measuring price elasticity at a point on the demand curve.

The simplest way of explaining the point method is to consider a linear (straight line) demand curve. Let the straight line demand curve be extended to meet the two axes, as in the graph. When a point is plotted on the demand curve C like point P in the graph), it divided the curve into two segments.

The point elasticity is thus measured by the ratio of the lower segment of the curve below the given point to the upper segment of the curve above the point

$$\text{Point Elasticity} = \frac{\text{Lower Segment of the demand curve below the given point}}{\text{Upper Segment of the demand curve above the point}}$$

(Or)

$$e = \frac{L}{U}$$

where e stands for elasticity, L stands for lower segment and U for the upper segment.

In the above graph, AB is the straight line demand curve and P is a given point. Thus PB is the lower segment and PA, the upper segment.

$$\therefore e = \frac{L}{U} = \frac{PB}{PA}$$

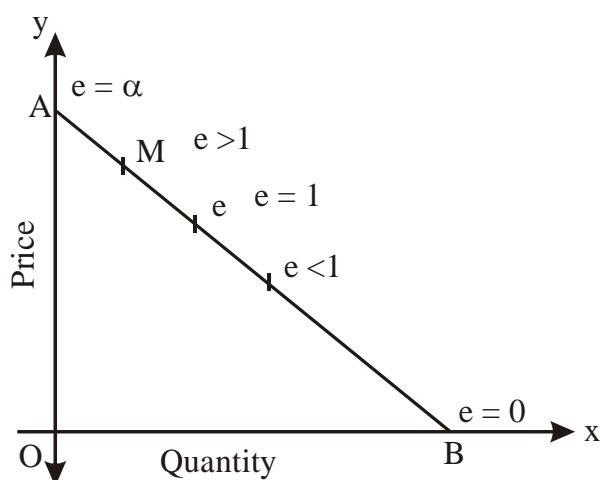
If the demand curve is non-linear, then draw a tangent at the given point, extending it to intercept both the axes, as in graph.

Point elasticity is measured by the ratio of the lower point of the tangent below the given point to the upper part of the tangent above the point.

Then elasticity at point P can be measured as $\frac{PB}{PA}$

Point elasticity is different at different points on a given demand curve. This can be proved in two ways. Firstly by the formula $e = \frac{L}{U}$, we can also measure price elasticity at different points of a given demand curve, from the new graph.

for eg. Let $\overline{AB} = 6$ cm



On a straight line demand curve, price elasticity will be different at different points, since a demand curve, represents the demand schedule and the demand schedule has different elasticities at various price. It can also be proved in the other way as by Prof. Lipsey.

$$e = \infty, \text{ Point B, at point B } e_B = \frac{L}{U} = \frac{0}{6}$$

$$\text{let } LB = 1 \text{ cm } L = U : PB = PA = e = 1, \text{ at point L, } e_L = \frac{LB}{LA} = \frac{1}{5} = < 1$$

$$\text{let C be the mid point } e_C = \frac{CB}{CA} = \frac{3}{3} = 1 \text{ } e = 1$$

$$\text{let } MA = 1 \text{ cm } e_M = \frac{MB}{MA} = \frac{5}{1} = 5 > 1$$

$$\text{at A, } e_A = \frac{AB}{0} = \frac{6}{0} = \infty$$

Price Elasticity of Demand

Definition

The extent of response of demand for a commodity to a given change in price, other demand determinants remaining constant, is termed as the price elasticity of demand. It may thus be defined as the ratio of the relative change in price.

$$e = \frac{\text{Proportionate Change in Quantity Demanded}}{\text{Proportionate Change in Price}}$$

Since, the relative change in variables can be measured either in terms of % change or proportional change, the price elasticity coefficient can be measured alternatively as:

Symbolically,

$$e = \frac{\Delta Q/Q}{\Delta P/P}$$

Alternatively,

$$e = \frac{\Delta Q}{Q} \times \frac{P}{\Delta P} \text{ or } e = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} = \frac{Q_1 - Q_2}{P_1 - P_2} \times \frac{P_1}{Q_1}$$

Where,

Q = Original Demand (Q_1)

P = Original Price (P_1)

ΔQ = the change in demand. It is measured as the difference between the new demand (Q_2) and the old price demand (Q_1)

Thus,

$$\Delta Q = Q_2 - Q_1$$

ΔP = the change in price. It is measured as the difference between the new price (P_2) and the old price (P_1)

Thus,

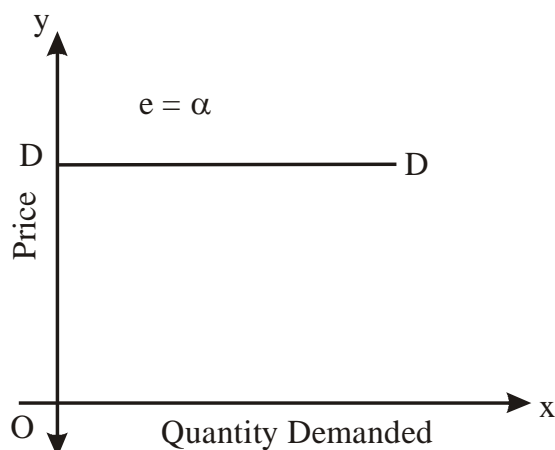
$$\Delta P = P_2 - P_1$$

Types of Price Elasticity of Demand

Modern Economists have elaborated and further stated five kinds of price elasticity.

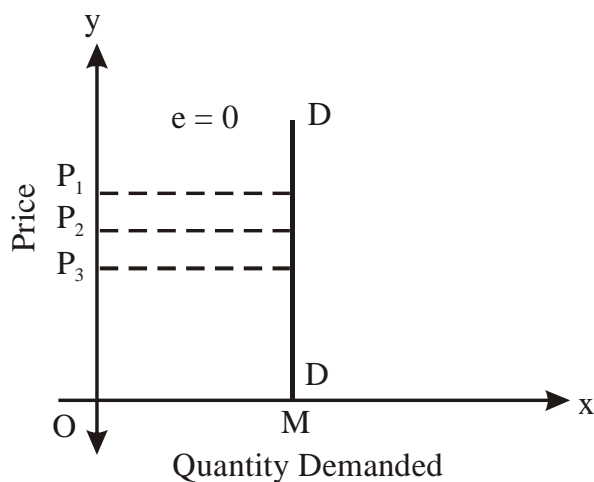
1. **Perfectly Elasticity Demand** : An endless demand at the given price is the case of perfectly elastic demand. When demand is perfectly elastic, with a

slight or infinitely small rise in the price of a commodity, the consumer stops buying it. The numerical co-efficient or perfectly elastic demand is infinity ($e = \infty$)



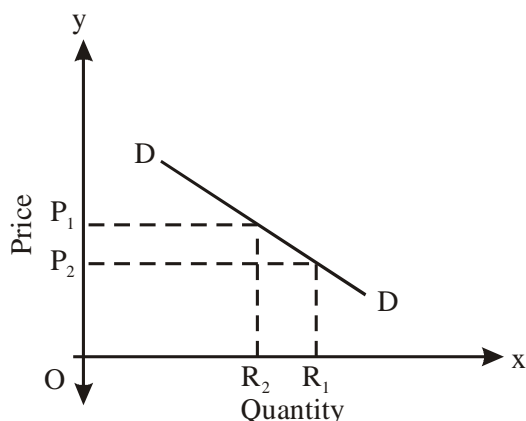
In a broad sense, in case of perfectly elastic demand, the demand curve will be a horizontal straight line parallel to x axis. Thus, the demand curve as in the graph implies that at the ruling price OP, the demand is infinite, is even with very small there will be vast demand quantity DD.

2. **Perfectly Inelastic Demand :** When the demand for a commodity shows no response at all to a change in price, that is, whatever may be change in price, the demand remains the same, it is called a perfectly inelastic demand.



Here elasticity of demand is equal to 0 ($e = 0$). In this case the demand curve is a vertical straight line, which indicates that whether the price moves from OP_2 to OP_1 or OP_3 , the quantity demanded remains the same, OM only.

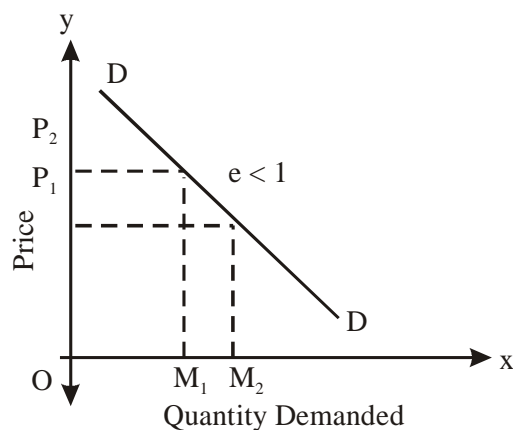
3. **Relatively Elastic Demand** : When the proportion of change in quantity demanded is greater than that of price, the demand is said to be relatively elastic.



The numerical value of relatively elastic demand lies between one and infinity. A relatively sloping represented by a gradually sloping, i.e., a rather flatter, demand curve as shown in the graph. When the price falls from OP_1 to OP_2 the demand rises to OM_2 which is relatively large in proportion to the change

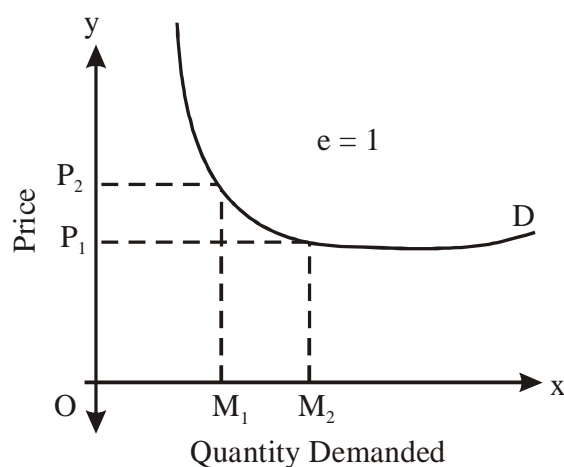
$$\frac{\Delta Q}{Q} > \frac{\Delta P}{P}, \text{ hence elasticity is greater than one, } e > 1.$$

4. **Relatively Inelastic Demand** : When the proportion of change in the quantity demanded is less than that of price, the demand is considered to be relatively inelastic.



The numerical value of relatively inelastic demand and lies between zero and one. will be flattened as in the graph. When the price falls by P_1 to P_2 , the demand is extended just from M_1 to M_2 , which is relatively very much less in proportion to the change in $\frac{\Delta Q}{Q} < \frac{\Delta P}{P}$; Hence, elasticity is less than one, $e < 1$.

5. **Unitary Elastic Demand :** When the proportion of change in demand is exactly the same as the change in price, the demand is said to be unitary elastic.



The numerical value of relatively elastic demand and is exactly 1. In the case of unitary elastic demand, the demand curve would be rectangular hyperbola curve, as in the graph. When the price falls from P_1 to P_2 , the demand is extended from M_1 to M_2 , which is the same proportion to change in price $\frac{\Delta Q}{Q} = \frac{\Delta P}{P}$, hence elasticity is equal to unity/unitary, $e = 1$.

Types of Elasticities of Demand

According to Marshall, “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 the price, and diminishes much or little for a given rise in price.”

There are, thus as many kinds of elasticity of demand as its determined. In view of its major determinants, Economists usually consider three types of elasticities of demand. They are:

1. Price Elasticity of Demand
2. Income Elasticity of Demand
3. Cross Elasticity of Demand

1. **Price Elasticity of Demand :** The extent of response of demand for a commodity to a given change in price, other demand determinants remaining constant, is termed as the price elasticity of demand.

It may thus defined as the ratio of the quantity demanded to change in price. The coefficient of price elasticity (e) can be measured as :

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

Since relative change in variables can be measured in terms of % change or proportionate change, the price elasticity coefficient can be measured alternatively as :

$$e = \frac{\text{Proportional Change in Quantity Demanded}}{\text{Proportionate Change in Price}}$$

$$\text{i.e., } e = \frac{\Delta Q / Q}{\Delta P / P}$$

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

$$\text{by rearranging } e = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

Here Q = Original Demand (Q_1)

P = Original Price (P_1)

ΔQ = The change in demand. It is measured as the difference between the new demand (Q_2) and old demand (Q_1)

Thus,

$$\Delta Q = Q_2 - Q_1$$

P = The change in price. It is measured as the difference between the new price (P_2) and old Price (P_1)

Thus,

$$\Delta P = P_2 - P_1$$

The formula can, thus be written as

$$\frac{Q_2 - Q_1}{P_2 - P_1} \times \frac{P_1}{Q_1}$$

Using the above formula, the numerical co-efficient of price elasticity can be measured.

2. **Income Elasticity of Demand** : Income is a major determinant of demand for a number of goods. We may have an income demand function as:

$$D = f(M)$$

Where

M = Refers to the money income of the buyer.

It suggests that the demand may change due to a change in the consumer's income.

The income elasticity is defined as a ratio percentage or proportional change in the quantity demanded to the percentage or proportional change in income.

$$\text{Income Elasticity} = \frac{\% \text{ Change in Quantity Demanded}}{\% \text{ Change in Income}}$$

$$EM = \frac{\Delta Q}{Q} \times \frac{M}{\Delta M} = \frac{\Delta Q}{\Delta M} \times \frac{M}{Q}$$

Where,

ΔQ = Change in Demand

ΔM = Change in Income

Q = Initial Demand

M = Initial Income

$$e_M = \frac{\% \Delta Q}{\% \Delta M}$$

$\% \Delta Q$ = % change in Demand

$\% \Delta M$ = % Change in Income

There are 5 types of elasticity of demand, $e_y = 0, > 1, = 1, < 1$ and $-ve$. e_y cannot be ∞ , e_m $-ve$ for inferior goods.

3. **Cross Elasticity of Demand :** In cross elasticity, we take into account the change in price of a commodity y and its effect on the demand for commodity x. This concept is important in the case of commodities which are substitutes and complementary. Eg. Tea and Coffee - Substitutes, Pen and Ink, Car and Petro - Complementary. The cross elasticity of demand refers to the degree of responsiveness of demand for a commodity to a given change in the price of some other related commodity.

The cross elasticity of demand between any two goods X and Y is measured by dividing the proportionate change in quantity demanded of X by the proportionate change in price of Y.

$$\text{Cross Elasticity of Demand} = \frac{\text{Proportionate or \% Change in Demand of X}}{\text{Proportionate or \% Change in Price of Y}}$$

$$\therefore e_{XY} = \frac{\Delta QX}{QX} \div \frac{\Delta PY}{PY}$$

(or)

$$\therefore e_{XY} = \left(\frac{\Delta QX}{\Delta PY} \right) \times \left(\frac{PY}{QX} \right)$$

$$\therefore e_{XY} = \left(\frac{dQX}{dPY} \right) \times \left(\frac{PY}{QX} \right)$$

Where,

e_{XY} = Cross Elasticity of Demand- (Demand for X in relation to the Price of Y)

ΔQX = Change in quantity demanded for commodity X

QX = Initial Demand for Commodity X

PY = Initial Price of Commodity Y

ΔPY = Change in Price of Commodity Y (d instead of Δ is to represent a point)

The above formula can also be written as :

$$\frac{Q_{x_i} - Q_x}{P_{y_i} - P_y} \times \frac{P_y}{Q_x}$$

Income Elasticity of Demand

Income elasticity of demand as a ratio percentage or proportional change in the quantity demanded to the percentage or proportional change in income.

$$\text{Income Elasticity} = \frac{\% \text{ Change in Quantity Demanded}}{\% \text{ Change in Income}}$$

$$EM = \frac{\Delta Q}{Q} + \frac{M}{\Delta M} = \frac{\Delta Q}{\Delta M} \times \frac{M}{Q}$$

Where

ΔQ = Change in demand

Q = Initial demand

M = Initial Income

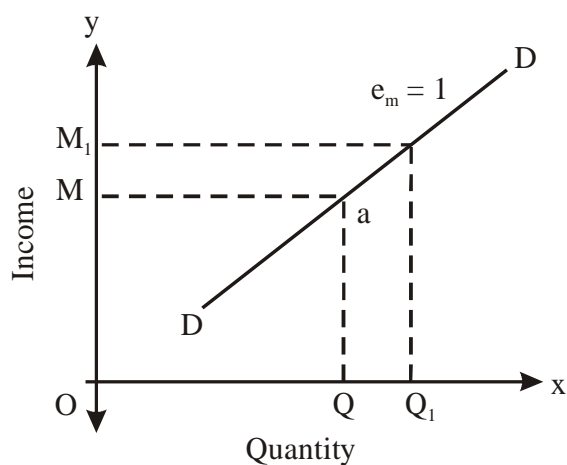
ΔM = Change in Income

$$em = \frac{\% \Delta Q}{\% \Delta M}$$

Types of Income Elasticity

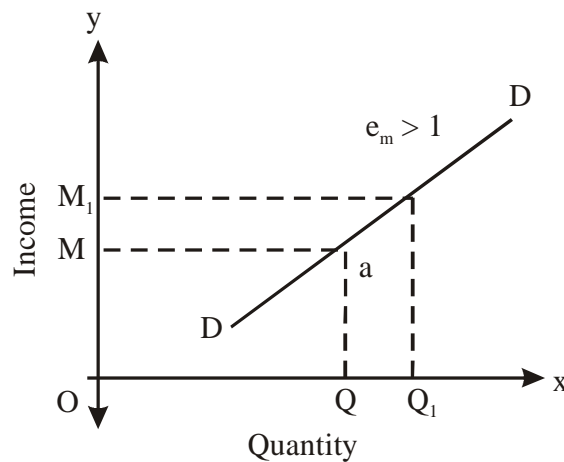
Income elasticity on the basis of its coefficients (e_m) may thus be classified as follows :

1. Unitary Income Elasticity of Demand



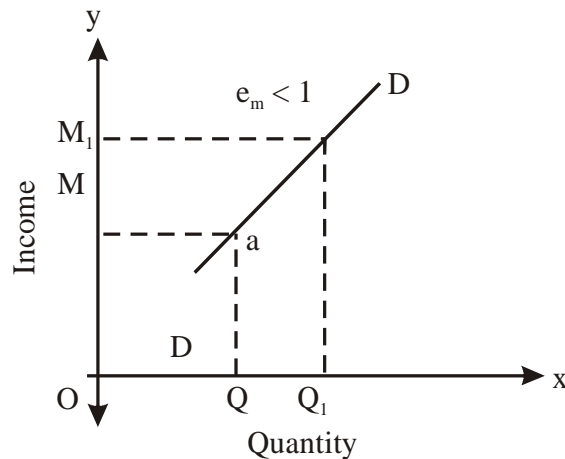
When the Percentage change in demand is equal to the percentage change in income, the demand is unitary income elasticity of demand. Thus the demand curve will have an upward sloping curve, and it will be at 45° angle, as shown by the DD curve.

2. Income Elasticity Greater than Unitary :



When the percentage change in quantity demanded is greater than the percentage change in income, the income elasticity of demand is greater than unitary. Thus $e_m > 1$. The demand curve will be flatter.

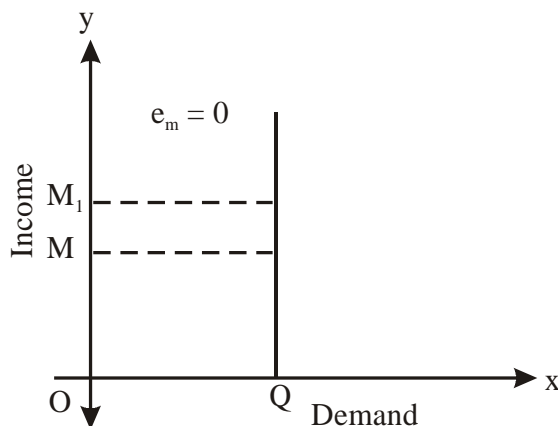
3. Income Elasticity Less than Unitary :



When the percentage change in demand is less than the percentage change in income,

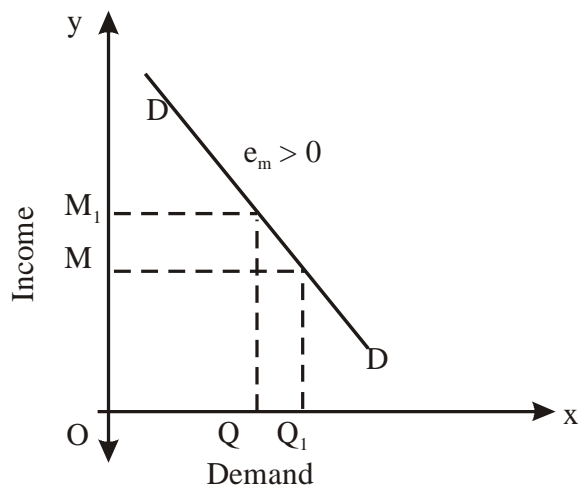
the income elasticity demand is less than unitary. Thus $e_m < 1$. The demand curve is steeper in this case.

4. Zero Income Elasticity of Demand :



When the income changes in any directions or in any proportion, but carries no effect on demand so that the quantity demanded remains unchanged, it is referred to as zero income elasticity of demand. Thus $e_m = 0$. The demand curve is a vertical straight line.

5. Negative Income Elasticity



When an increase in the incomes causes a decrease in demand for a commodity, the demand is said to be negative income elasticity. Thus $e_m > 0$. The demand curve in this case will be downward sloping.

Factors Influencing Elasticity of Demand

Whether the demand for a commodity is elastic or inelastic will depend on a variety of factors. The major factors affecting elasticity of demand are :

1. **Nature of Commodity** : According to the nature of satisfaction, the goods given may be classified into luxury, comfort or necessary goods. Luxury and comfort goods are price elastic, while necessary goods are price inelastic.
2. **Availability of Substitutes** : Where there exists a close substitute in the relevant price range, its demand will tend to be elastic. But for the commodities having no substitutes, their demand will be inelastic.
3. **Number of Uses** : Single use goods will have generally less elastic demand as compared to multi use goods, but for commodities like electricity with a fall in price these commodities may be demanded greatly for various uses.
4. **Consumer's Income** : Larger the income, the overall demand for commodities tends to be relatively inelastic.
5. **Height of Price and Range of Price Change** : There are certain goods like costly luxury items or indivisible goods such as T.V sets, refrigerators etc., which are highly priced. A small change in price will have an insignificant effect on their demand. The demand will be inelastic.
6. **Proportion of Expenditure** : Items that constitute a smaller amount of expenditure in a consumer's family budget tend to have a relatively inelastic demand.
7. **Durability of the Commodity** : In the case of durable goods, the demand generally tends to be inelastic in the short run, example : Furniture, bicycle etc., In the case of perishable commodity demand inelastic example : Milk.
8. **Influence of Habit and Customers** : There are certain articles which have a demand on account of conventions, customs or habits and in these cases elasticity is less, example: Cigarettes to a smoker, have inelastic demand.
9. **Complementary Goods** : Goods which are jointly demanded have less elasticity. Example : Ink, Petrol have inelastic demand.
10. **Time** : In short period, demand will be less elastic, while in the long period it becomes more elastic.
11. **Recurrence of Demand** : If the demand for a commodity is of a recurring in nature, its price elasticity is higher than that of a commodity.

- 12. Possibility of Postponement :** When the demand for a product is postponable, it will tend to be price elastic. In the case of consumption, goods which are urgently and immediately required, their demand will be inelastic.

Importance of Elasticity of Demand

- 1. To Businessmen :** In business decision-making, the concept of elasticity of demand is of utmost practical use, for while taking a decision for pricing policy, the businessman has to know the likely effect of price changes on the demand for his product in the market.
- 2. To the Government and Finance Minister :** In determining fiscal policy the concept of elasticity of demand is very important to the government. The finance minister has to consider the elasticity of demand, while selecting commodities for taxation.
- 3. To International Trade :** The concept is also useful in formulating export and import policies of a country. In determining terms in the sphere of international trade, the relative elasticities of demand for commodities in the two countries are very important.
- 4. To Policy Makers :** The concept is useful in solving the mystery of how farmers remain poor despite of a bumper crop. Since agricultural products have an inelastic demand. Thus, for policy makers, it implies that higher farm income depend upon the restriction of the supply of food grains and other farm products.
- 5. To Trade Unionists :** For them it is useful in wage bargaining. The union leaders, when they find that demand for their industry's product is fairly elastic, will ask for higher wage to workers and induce producers to cut the price and increase sales, which will compensate for his loss in total profit.

Supply

Supply during a given period of time means the quantity of goods which are offered for sale at particular prices. Thus, the supply of a commodity may be defined as the amount of that commodity which the sellers are able and willing to offer for sale at a particular price during a certain period of time.

Supply Function

It is the function between the commodities supplied to market and the various factors which are influencing it.

$$S_x = f(P_x, P_r, P_y, \dots, P_x, O, T, t, S)$$

S_x = Supply of commodity

f = functional relationship

P_x = Price of x

P_f = Set of prices of factors of production employed in producing x.

O = Other factors outside the economic sphere

T = technology used

t = commodity taxation

S = subsidy

Factors Determining Supply of Commodity

Supply depends on several factors which are as follows.

1. **Cost of Factors of Production :** The cost of production of a commodity depends on the price of various factors of production. If cost of production increases keeping the price constant, supply decreases and if they cost of production decreases supply increases.
2. **State of Technology :** The supply of a commodity depends upon the methods of production, advances in technology and sciences have greatly contributed to increased supply of commodities at lower costs.
3. **Factors outside Economic Sphere :** Weather conditions, floods and droughts, epidemics etc., do causes fluctuation in the supply of goods. Fire, war and earthquakes may destroy productive assets of a commodity and curtail future supplies.
4. **Tax and Subsidy :** A tax on a commodity or a factor of production raises to cost of production consequently production is reduced. A subsidy on the other hand, provides an incentive to production and arguments supplies.

Law of Supply

The law of supply reflects the general tendency of the sellers in offering their stock of a commodity for sale in relation to the varying prices. It describes seller supply behaviour under given conditions. It has been observed that usually sellers are willing to supply more with a rise in prices.

Statement of Law

“Other things being equal or other things remaining unchanged, the supply of a commodity expands with a rise in its price and contracts with a fall in its price”.

The law suggests that the supply varies elasticity directly with the change in price, so a large amount is supplied at a higher price than at a lower price in the market.

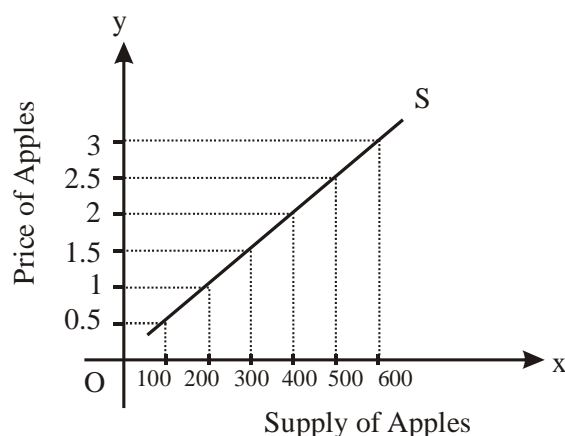
Assumptions of the Law

1. Cost of production is unchanged.
2. No changes in techniques of production
3. Tasks remain unchanged.
4. Price of factors of production remain unchanged.
5. Natural calamities doesn't occur.

Law of Supply

The law of supply is parallel to the law of demand. It expresses the relationship between price and supply. The law of supply can be stated as follows. Other thing remaining the same the supply of a commodity extends with a rise in price and contracts with the fall in its price. It can be noted that the relationship between the price and supply is direct whereas between price and demand is in inverse. The law of supply is explained with the help of a numerical example. We observe from the table that when the price is 50 paise the apple supplied to market is 100 when the price increases to Rs. 2 the supply the apple increase to 400 i.e. if price increases supply also increases i.e. price and supply have direct relationship. This can be represented in the graph. In the x-axis we represent supply and in the yaxis, we represent price of apple when points are plotted we observe the curve is sloping upwards from left to right.

Price of Apples	Supply of Apples
0.50	100
1.00	200
1.50	300
2.00	400
2.50	500
3.00	600



UNIT - 4

COSTS & REVENUE ANALYSIS

Introduction

Every business compares between cost and returns. Rent, Interest, wages and profits are cost for the firm. Number of factor units required depends on the techniques of production and the efficiency of the factors units.

Cost Function

Is the determinant of costs. Factors like prices of inputs, rate of inputs, size of plant, state of technology are the determinants of cost of production.

$$C=f(F,O,P,T)$$

Where :

- C = Cost
- f = Functional relationship
- F = Size of Plant
- O = Rate of output
- P = Size of Plant
- T = Technology.

For simplicity sake only the factors inputs prices and the output is taken into consideration. This cost output relationship is there in the short as well as long run also.

Cost of Production of a given output is the amount of money spent or prices paid to the inputs used for it production.

1. Cost of raw material and rent of building
2. Wage of daily labour and salaries of officers.

3. Interest on capital and preparing charges of capital equipment and depreciation of plants and machines.
4. The expenses like coal, electricity, oil, gas etc.
5. Normal profits of entrepreneurs.

Types of Cost

1. Outlay cost and Opportunity Cost :

- (a) Outlay cost refers to the actual financial expenditure of the firm. It is recorded in the firm's book of accounts for example: payment of wages, interest, cost of raw material, cost of machineries etc. It is the actual cost.
- (b) **Opportunity cost is a notional idea :** It is not the actual expenditure incurred by the firm. It is measured in terms of opportunity cost. It represents sacrificed alternative. It is measured in terms of profit from the next best alternative venture that has been foregone by the firm by using the available resources for a particular business.

Definition : The opportunity cost of a given economic resource is the foregone benefits from the next best alternative use of that resource.

2. **Explicit and Implicit Money Cost :** Money cost is the monetary expenditure on inputs of various kinds of raw material, labourers, etc. required for the output, i.e. the money spent on purchasing the different units of factors of production needed for producing the commodity.

(a) Explicit or Out of Pocket Cost :

Definition : Explicit costs are direct contractual monetary payment incurred through market transactions.

It refers to the actual money outlay or out of pocket expenditure of the firm to hire the productive resources it needs in the process of production. It is the amount of money paid by the entrepreneur to others in the process of production, e.g.

- i. Cost of raw material
- ii. Wages and Salaries
- iii. Power charges
- iv. Rent of business or factory premises
- v. Interest payment on capital invested
- vi. Insurance premium

- vii. Taxes like property tax, license fee, etc.
- viii. Miscellaneous business expenses like marketing and advertising expenses and transport cost.

They are the actual monetary expenditure of the firm.

(b) Implicit Cost or Book Cost or Computed Cost :

Definition : Implicit costs are the use of factors which a firm does not buy or hire but already owns. Unlike out of pocket cost they do not require current cash expenditure.

They are not directly incurred by the firm through market transaction, but are to be added in the total money cost of production;

Implicit costs are payments which are not directly or actually paid out by the firm. Such cost arises, when the owners or entrepreneur uses the products which are owned by him. E.g. land.

The implicit money costs are :

1. Wages of labour rendered by entrepreneur himself.
2. Interest on capital supplied by him.
3. Rent of land or premises belonging to the entrepreneurs himself and used in his production
4. Normal returns (profit) of entrepreneurs, compensation needed for his management and organizational activity.
5. Depreciation

Book cost are similar to implicit cost, but they are taken into consideration in determining the legal divided payment during a period.

E.g. Unpaid salary of the owners, unpaid interest, depreciation, etc.

In economic sense however, both explicit and implicit cost is considered, as their total is the economic cost.

Economic Cost = Account (Explicit) Cost + Implicit Cost

3. Fixed and Variable Costs (or prime and supplementary cost)

In short run we have both fixed and the variable factors, and the prices paid to the fixed and variable factors is called Fixed and Variable Cost.

(a) Fixed Cost (or supplementary costs) :

Definition : Are those costs that are incurred as a result of the use of fixed factors inputs. They remain fixed at any level of output in the short run.

They remain fixed because the firm does not change its size and amount of fixed factors employed. They are called as “supplementary costs” or “overhead costs.”

- i. Payment of rent for building
- ii. Interest paid on long term capital
- iii. Insurance premium
- iv. Depreciation and maintenance allowance
- v. Administrative expenses like salaries of managerial and office staff etc.
- vi. Property and business taxes, license fees etc.

These are to be incurred whether the firm is shut down temporarily or there is not production.

Fixed Cost are of two types.

1. **Recurrent Costs :** These are those costs which give rise to cash output like rent, interest on capital, general insurance premiums, salaries of permanent irreducible staff etc.
2. **Allocable Costs :** Implicit money cost like depreciation which do not have any direct cash outlay but have to recognize with the passage of time rather than usage.

Variable Costs : Variable costs are those costs that are incurred by the firm as a result of the use of variable factors inputs. They are dependent upon the level of output. They are also called direct costs or prime cost. They are regarded as avoidable contractual cost, when the output is nil. Short run variable costs include :

- i. Prices of raw materials
- ii. Wages of labour
- iii. Fuel and power charges
- iv. Excise duties, sales tax
- v. Transport expenditure etc.

Variable Costs are of two types :

1. **Fully variable costs :** They change more or less with the change in output. E.g. cost of raw material, power, etc.

-
2. **Semi Variable Costs** : These do not change with output, but eliminated with nil output.
4. **Replacement and Historical Cost** :
- (a) **Historical Costs** : It is the original price of plant and material incurred by the firm. In accounting books the value of the asset of the firm is recorded at their historical cost. They are of the past.
 - (b) **Replacement Cost** : It is the price for the same plant and material currently prevalent in the market. The historical cost needs to be readjusted with replacement costs for sound business decision-making and for measurement of true profits.
5. **Incremental and Sunk Costs** :
- (a) **Sunk Costs** : The cost which is incurred once and will not be altered by the change in business activity is described as sunk cost. They are historical cost and irrelevant with regard to the business decision of the future e.g. capital, machines.
 - (b) **Incremental Costs** : These are the added costs resulting from a change in the level of business activity, i.e. adding a new product, adding new machinery changing distribution channel.
6. **Increment and Marginal Cost** :
- (a) **Marginal cost** is the unitary change in output. It is the cost of producing an additional unit of output.
 - (b) **Incremental Cost** is variation in cost caused by a change in the business activity. It is the added cost caused by a change in introduction of new products, changing the production system, etc. Instead of 1 unit practically few or group of units will be uncreated which is called incremental cost.
7. **Controllable and Non Controllable Cost** :
- (a) **Controllable Costs** : They are identifiable and subject to regulation by the business executive. Direct labour costs, raw material costs, etc. are controllable.
 - (b) **Non Controllable Costs** : Certain costs cannot be controlled. E.g. Property Tax.
1. **Short Run and Long Run Costs** :
- (a) Short run are operating costs associated with the change in output along with the fixed plant size. In short run, we have the fixed factor inputs

and the variable factor inputs. In short run cost varies in relation to only the variable inputs.

- (b) **Long Run Costs** : These are the operating costs, due to change in the scale of output and the alterations in the size of plant. In the long run factors inputs are variable.

Behavioural costs and their measurement

1. Total Cost (TC)
2. Total Fixed Costs (TFC)
3. Total Variable Cost (TVC)
4. Average Fixed Cost (AFC)
5. Average Variable Cost (AVC)
6. Average Total Cost (ATC or AC)
7. Marginal Cost (MC)

1. **Total Cost (TC)** is the aggregate expenditure incurred by a firm in producing a given level of output. TC is measured in relation to the production function by multiplying the factor prices with the quantities of input used.

If production function is $Q = f(a, b, c, \dots, n)$ then TC is $TC = f(Q)$ which means TC varies with output.

TC includes all types of money cost i.e. explicit and implicit. Thus normal profit is also included in TC normal profit is a normal reward made to the entrepreneur for his organisational services. If this normal return is not realised by the entrepreneur in the long run he will stop his present business and shift his resources to some other industry.

In short run TC is divided into Total Variable and Total Fixed Cost. Therefore $TC = TFC + TVC$ at each level output.

2. **Total Fixed Cost** : These are in relation to the fixed inputs in the short run production function. It is obtained by adding up quantities of fixed factors multiplied by their respective unit prices.
3. **Total Variable Cost** : In the short run production with corresponding variable inputs, is the total variable cost. It is obtained by adding up the product of quantities of inputs multiplied by their prices $TVC = f(Q)$
4. **Average Fixed Cost (AFC)** : It is the total fixed cost divided by total units of output.

$AFC = TFC/Q$, Q = number of units of the product. AFC is the fixed cost per unit of output.

5. **Average Variable Cost (AVC)** : It is the total variable cost divided by total units of output.

$$AVC = TVC/Q$$

AVC is variable cost per unit of output.

6. **Average Total Cost (ATC) or Average Cost** : It is total cost divided by total units of output.

$$ATC \text{ or } AC = TC/Q$$

Short run, since $TC = TFC + TVC$

$$ATC = \frac{TC}{Q} = \frac{TFC + TVC}{Q} = \frac{TFC}{Q} + \frac{TVC}{Q} = ATC = AFC + AVC$$

7. **Marginal cost (MC)** : It is the addition made to the total cost by producing one more unit or output.

Definition

Marginal cost is the costs of producing an extra unit of output. It is the change in the TC associated with one unit change in output. It is also called an “extra unit cost”. It can also be calculated by dividing the change in TC by one unit change in output.

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

$$MC = \frac{\delta TC}{\delta Q}$$

MC is independent of the size of the fixed cost in the short run, since fixed cost are independent of output and remain constant, hence MC consist of variable cost only. The change, in TVC for producing an additional unit of output determines the MC .

Short Run Total Cost Schedule of a Firm

A cost schedule is a statement of variation in cost resulting from variations in level of output. They vary from short period to long period.

Short run total cost :

- i. Total Fixed Cost (TFC)
- ii. Total Variable Cost (TVC)
- iii. Total Cost i.e. $TC = TFC + TVC$

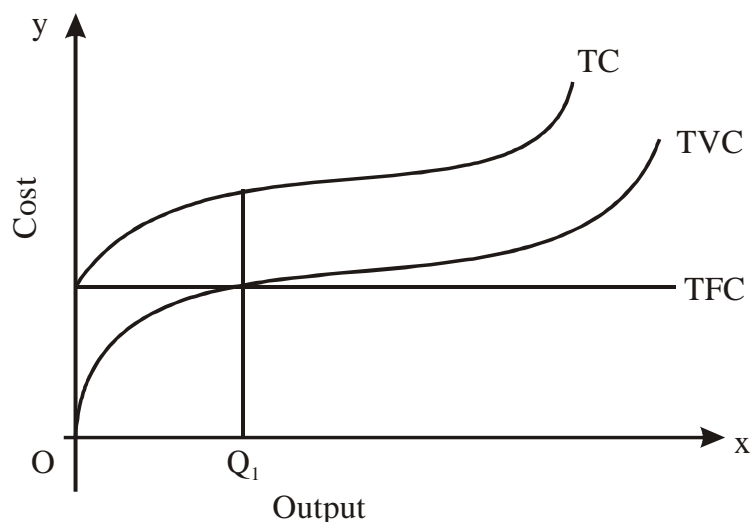
Assumptions

1. Labour and capital are the two factor inputs.
2. Labour is the variable factor.
3. Capital is the fixed factor.

TP (Q)	TFC	TVC	TC
0	100	0	100
1	100	25	125
2	100	40	140
3	100	50	150
4	100	60	160
5	100	80	180
6	100	110	210
7	100	150	250
8	100	300	400
9	100	500	600
10	100	900	1000

Behaviour of Total Costs :

1. TFC remains constant at all levels of output. It remains same when there is nil output.
2. TVC varies with output, nil when no output, VC is direct costs of the output.
3. TVC does not change in the same proportion. Initially increases at a decreasing rate. This is due to Law of Variable Proportions, which suggest that initially to obtain a given amount of output relatively, variations in factors are needed in less proportion, after a point when the diminishing phase operates, variable factors are to be employed in a greater proportion to increase in the same level of output.
4. TC varies in the same proportion as the TVC.



Explanation of Graph

1. TFC is the curve of Total Fixed Cost. It is a horizontal straight line parallel to x-axis.
2. TVC represents total variable cost; it rises initially; eventually becomes steeper, denoting a sharp rise in TVC. The upward rising TVC are related to the size of output.
3. The curve TC represents Total Cost. It is derived by vertically adding up TVC and TFC curves. It is easy to see that the shape of TC is largely influenced by the shape of TVC. When TVC curve becomes steeper, TC also becomes steeper, distance between TVC and TC is equal and TFC is constant throughout. The distance between TVC and TC is amount of fixed factors.

Short Run per Unit Cost of a Firm

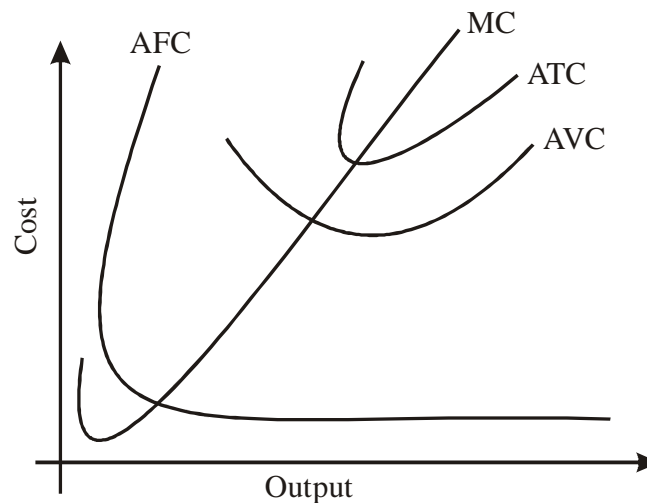
Per unit cost is the average cost. It refers to the cost per unit of output.

TP (Q)	TFC	TVC	TC	AFC(TFC/Q)	AVC (TVC/Q)	AC	MC = $TC_n - TC_{n-1}$
0	300	0	300	-	-	-	-
1	300	300	600	300	300	900	300 (600 - 300)
2	300	400	700	150	200	350	100 (700 - 600)
3	300	450	750	100	150	250	50 (750 - 700)
4	300	500	800	75	125	200	50 (800 - 750)
5	300	600	900	60	120	180	100 (900 - 800)

TP (Q)	TFC	TVC	TC	AFC(TFC/Q)	AVC (TVC/Q)	AC	MC = $TC_n - TC_{n-1}$
6	300	720	1020	50	120	170	120 (1020 - 900)
7	300	890	1190	45	127	170	70 (1190 - 1020)
8	300	1100	1400	37.5	137.5	175	210 (1400 - 1190)
9	300	1350	1650	33.33	150	183.33	250 (1650 - 1400)
10	300	2000	2300	30	200	230	(2300 - 650)

1. AFC decreases as the output increases. Since TFC remains constant, AFC declines. It is the result of spreading the overhead cost over more units (Q). Hence, AFC diminishes.
2. AVC first decrease and then increases as the output increases.
3. ATC also decrease initially. It remains constant at a point then goes on increasing as output increases.
4. MC also decreases initially, but with increase in output it increases.
5. MC is determined by the rate of increase in TVC, hence for 1st unit $AVC = TVC$.

Behaviour of short run average cost curves



1. **AFC Curve** : As output increases, TFC spreads over larger and larger output and therefore AFC goes on progressively declining. AFC curve slopes downwards from left to right. It is close to x and y-axis but goes not touch them. It is rectangular hyperbola.
2. AVC curve decreases at the initial stage as the firm expands and approaches. After the firm reaches the optimum level of output, AVC begins to rise. Thus AVC curve declines, reaches minimum and then begins to rise. It is slightly U

shaped. 3 phases (i) Decreasing phase (ii) Constant phase (iii) Increasing phase. This happens because, in the short run in the initial stage till the firm's capacity is reached, an increase in output reduces the variable cost, but as the output continues to increase, only by increasing in output reduces the variable cost, but as the output continues to increase, only by increasing the amount of those factors of production which are variable, these factors like workers suffer from over strain, machine break down, etc. The AVC rises, when diminishing returns set in.

3. ATC is the summation of $(AFC + AVC)$ or $TFC/Q + TVC/Q$. Hence, ATC curve is greater (higher) than AFC or AVC curve. It is U shaped, at low level of output as AFC is falling rapidly as output increases, ATC decreases, at high levels of output AVC will rise quite rapidly and this increase in AVC is greater than fall in the AFC. So, the average total cost rises after the optimum output.

This happens because, in the initial stages ATC is influenced by AFC curve and hence falling, even though AVC starts rising the effect of AFC curve is more and hence ATC falls further, but then as the firm expands and more inputs of variable factors are added, ATC is U shaped.

4. **Marginal Cost Curve (MC Curve)** : The MC curve is U shaped indicating the beginning MC declines as output expands, then remains constant (minimum) and then starts rising upwards. MC is the rate of change in the total cost when output is increased by one unit. MC at any output is the slope of the TC curve at the corresponding point.

In short run MC is independent of FC and hence related to variable costs. Hence, MC curve can be derived from TVC curve and AVC is also derived from TVC curve.

Relation between AC and MC is important for in price theory.

Relation between AC and MC

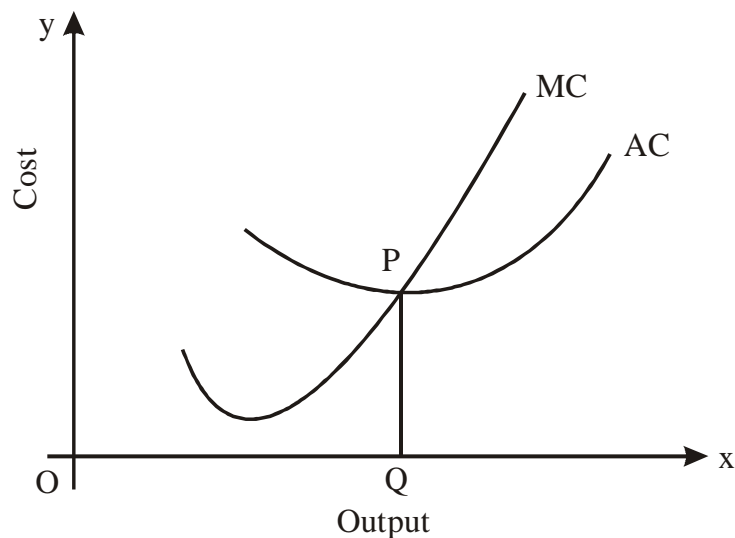
Units Output	Total Cost (Rs.)	Average Cost (AC)	Marginal Cost (MC)
1	10	10	10
2	18	9	8
3	24	8	6
4	28	7	4
5	35	7	7
6	48	8	13
7	63	9	25
8	80	10	17

$$AC = \frac{TC}{\text{Total Output}}$$

$$MC = \frac{\text{Change in total cost}}{\text{Change in output}}$$

Relationship

1. When AC is minimum, $MC = AC$, thus MC curve must intersect at the minimum point of ATC.
2. When AC is falling MC is also falling initially, after a point MC start rising, AC continues to fall, but MC is less than AC. MC reaches minimum and then starts rising. $AC > MC$.
3. When $MC = AC$, then with an increase in output AC start rising and MC continues to rise, but now MC is greater than AC. MC is above AC, $MC > AC$.



1. Initially both MC and AC are sloping downwards, then AC is falling MC curve lies below it. ($AC > MC$)
2. When MC curve is rising after intersection, AC lies below MC. ($MC > AC$)
3. AC and MC curve pull each other, till they become equal, hence when AC is minimum, MC cuts AC. Hence MC curve always cuts both AVC and ATC curve (since AVC and ATC curves are interrelated).

4. MC curve crosses the AC curve at point 'P'. Here OQ is output and average cost is PQ or BO which is minimum. This output is optimum output because $MC = AC$.

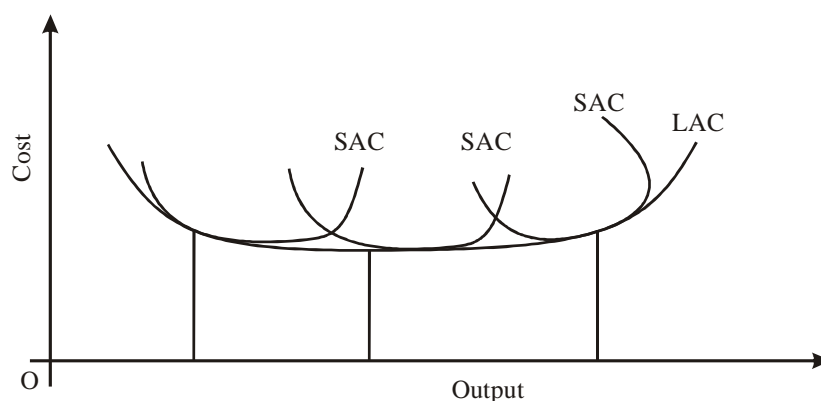
Long Run Costs

Characteristics of Long Run Costs

1. Varying plant size.
2. Variable cost or direct cost is equal to the total cost in long run.
3. In the long run we do not have any fixed cost; therefore average variable cost is equal to average cost and hence only average cost and marginal cost curve are there in the long run.
4. Planning from the short run all choices are taken and best is adopted for long run.

Relation between LAC Curve & SAC Curve

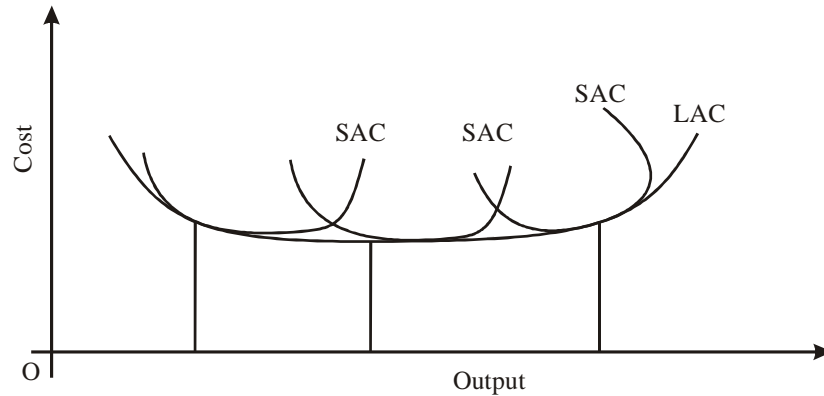
It is the tangent to variable short run average cost curve. It is an envelope of various short run ACC. LAC curve is tangent to various SAC's curve.



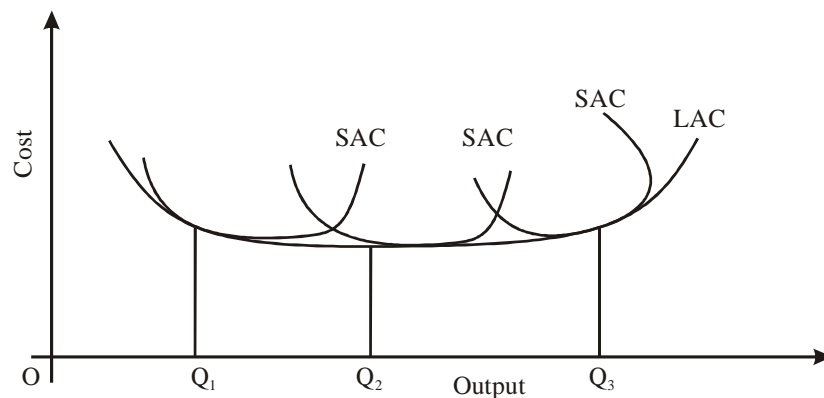
Thus, LAC is flatter "U" Shaped curve.

Features of LAC curve

1. Tangent curve by joining the loci of various plant curves of the different short run phase, we get a LAC curve drawn tangent. LAC curve is the locus of all the short run average cost curves which have taken place in the firm by small changes in the capacity of the firm.
2. **Envelope Curve** : Since it is an envelope of group of short run average cost curves of different levels of output, it is called an Envelope Curve.



3. **Planning Curve :** LAC is a planning device, as it denotes the least unit cost of producing each possible level of output. The entrepreneur determines his course of expansion of output and the size of plant in relation to the LAC curve. The optimum size is that plant size at which SAC is tangent to LAC.



Explanation of Graph : Here at OQ_2 level, SAC and LAC give us optimum level of output, Q_1 and Q_3 are not optimum because even though they are tangent to LAC, SAC_1 and SAC_3 and LAC are not at minimum point. This is selected by firms in perfect competition not in monopoly or monopolistic competition.

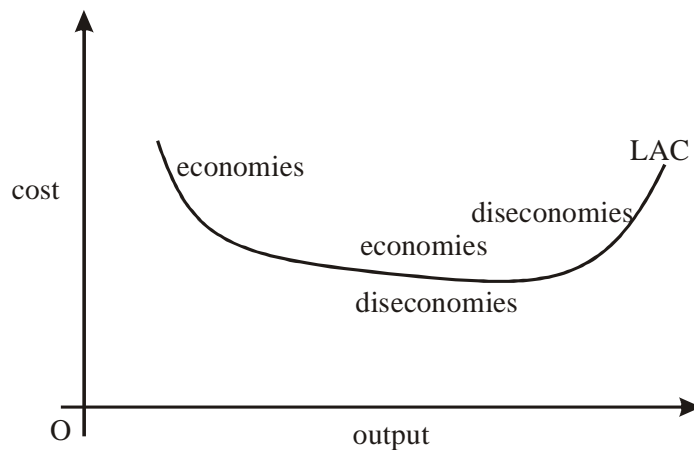
4. Minimum cost combination since LAC is derived as tangent to various SAC curves, the cost levels represented by LAC curve at different costs of output reflect, minimum cost combination of resource inputs adopted by the firm at each long run level of output.
5. **Flatter U Shaped :** In the beginning it gradually slopes downwards, then after a certain point gradually slopes upwards. In the long run, the long run average cost declines, then remains constant and then rises.

Economies of Scale and LAC

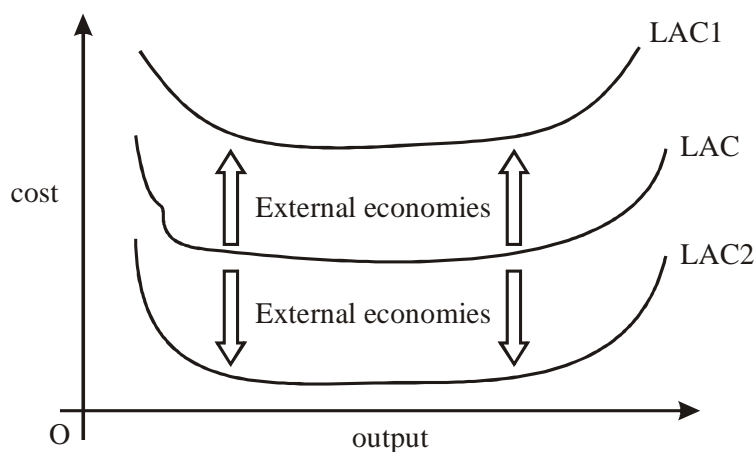
LAC curve is an image of return to scale. It hence shows internal economies and diseconomies of scale. The economies of scale explain the falling segment of LAC curve i.e. decreasing cost in long run is due to economies and increasing cost is due to diseconomies and the horizontal slope of LAC curve is because of balance between internal economies and diseconomies.

A shift in LAC curve may be due to external economies and diseconomies. Downward shift in the LAC may be caused due to external economies and upward shift due to external diseconomies.

Internal Economies and Diseconomies



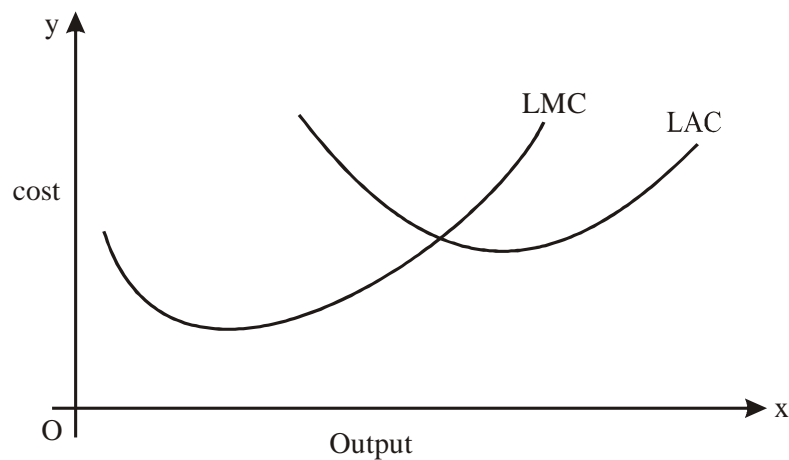
External Economies



Long run Marginal Cost Curve (LMC Curve)

Like short run MC curve, long run MC curve is also divided from the slope of total cost curve at various points relating the given output each time. The shape of LMC is flatter U shaped - showing as output expands initially LMC declines, after a certain stage LMC starts rising.

Relationship between LAC & LMC



Explanation of Graph:

1. When LAC curves decrease LMC also decreases, $LAC > LMC$
2. At a certain stage LMC rises, but LAC continues to fall, but $LMC < LAC$
3. When LAC is minimum $LMC = LAC$. Thus LMC intersects at the minimum point of LAC.
4. LAC and LMC slope upwards but $LMC > LAC$.

Revenue Analysis

The sale proceeds that a firm gets from the sale of its product is called Revenue.

Total Revenue : It is the total sales receipts of the output produced over a given period of time. It depends on 2 factors.

- i. Price of Product
- ii. Quantity of Product

Average Revenue : It is the revenue per unit of output sold. It is TR divided by the number of units of output sold.

$$\text{Therefore, } AR = \frac{TR}{Q} = \frac{P \times Q}{Q} = P \text{ (P = Price)}$$

The AR is always equal to price, if the seller sells all the units of goods at same price, but if the seller sells it at different prices AR will be different.

Marginal Revenue : It is the addition made to total revenue by the sale of an additional unit of the product in the market.

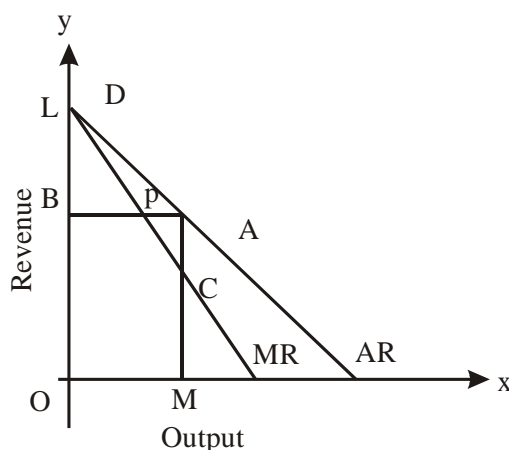
$$Mr = TR_n - TR_{n-1} \text{ (or) } MR = \frac{\Delta TR}{\Delta Q}$$

As we have to sell more and more, we have to reduce the price, hence the MR falls as more product is sold and a stage comes when the market is saturated with the output and the MR is reduced to zero, i.e., there is no addition to TR.

i. Relationship between AR and MR

Under Monopoly or Imperfect Competition

Quantity	AR = P	TR = AR x Q	MR (Rs.)
1	10	10	10
2	9.5	19	9
3	9	27	8
4	8.5	34	7
5	8	40	6
6	7.5	45	5



AR curve has a downward slope the MR curve too slopes downwards. Again the MR curve lies below or left of demand or AR curve. This implies that the MR of any monopoly output is less than its price.

A perpendicular from any point on an average revenue is bisected by the marginal revenue AR = MR.

$$TR = AR \times P = AM \times OM = OBAM$$

Also TR = Area lying under the MR curve = LPCMO

Therefore, OBAM = LPCMO

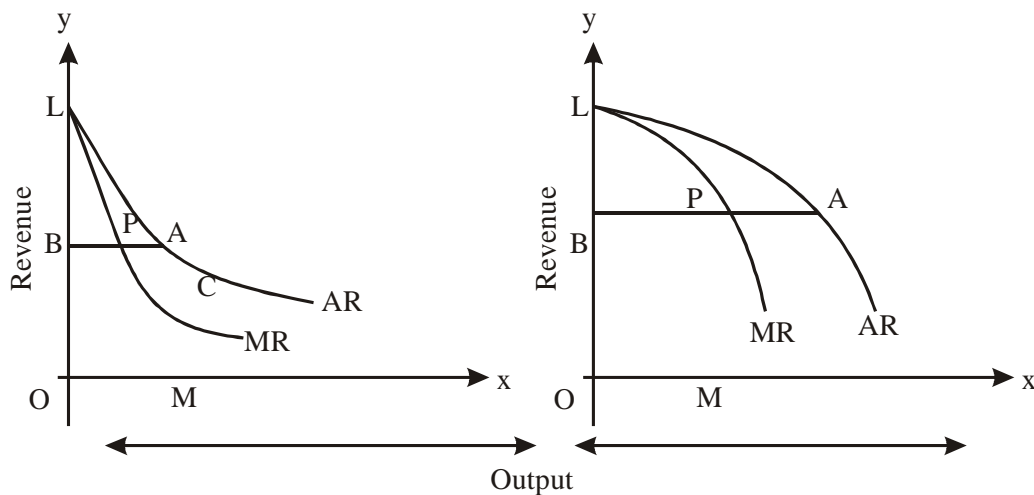
Substituting BPCMO from both sides as common

$$\Delta PAC = \Delta LPB$$

They are similar Δ 's being angle LPB = angle CPA. (Vertically opposite angles) and they also have right angle each. Hence equal.

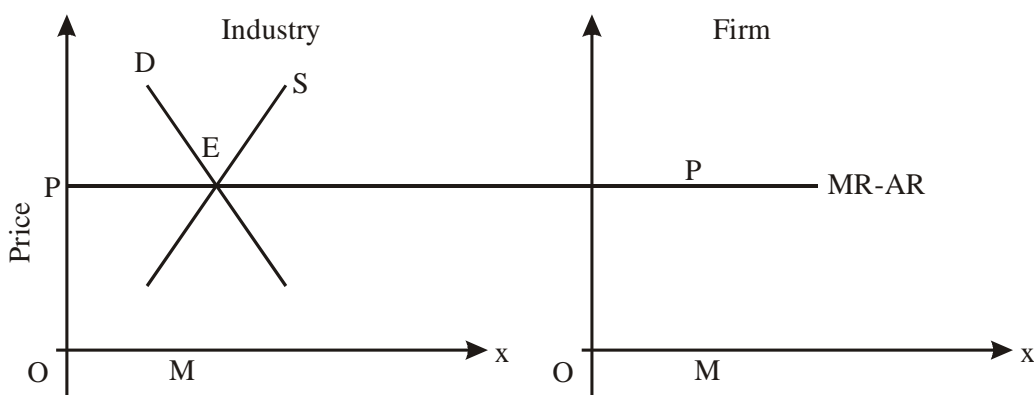
Therefore, PA = PB

- ii. When AR points trace a curve, the corresponding MR points also trace a curve. When AR is convex, MR will lie at less than half way from the price axis to the AR curve P lies at the centre of the BA line; MR is in left of P in 1st case and right in 2nd case.



2. **Under Perfect Competition :** The AR curve is a horizontal straight line parallel to x-axis and MR curve coincides with it; this is because under pure or perfect competition, the number of firms selling an identical product is very large. The price is determined by the market price i.e. intersection of supply and demand so that only one price tends to prevail for the whole industry.

Quantity	AR = P	TR = (AR x Q)	MR (Rs.)
2	20	20	20
2	20	40	20
3	20	60	20
4	20	80	20
5	20	100	20
6	20	120	20



Since the demand curve is the firms AR curve - Horizontal straight line to x-axis at OP price and MR curve coincides with it.

- Under Oligopoly :** The AR and MR curve are not smooth. They have a bend, because the no. of sellers under oligopoly is small, the effect of price cut or price increase on the part of the seller will be followed by some change in the behaviour of other firms. With an increase in price, there is no change in the price of other firm, hence his demand falls, but with a decrease in price, other firms also decrease their price, hence no increase in his demand.

UNIT - 5

PRODUCTION

Meaning

Production is outcome of economic activity, its aim is satisfaction of human want.

Definition

Production means creating utility in different forms to the matter. “Matter” can neither be created or destroyed, man only changes its shape or form or place, so that want of a utility is of different types like.

Form utility

Form utility is created by changing the form or shape of materials.

Eg. furniture made of wood.

Place utility

Place utility is created by transporting goods from one place to another i.e., transferring goods from factory to market place, thus creating place utility.

Time utility

Hoarding, storing and preserving certain goods over a period of time may lead to creation of time utility for such good.

Eg. Hoarding good grains at the time of bumper harvest and releasing their stocks for sale at time of scarcity.

Service utility

Rendering personal services to the customers by various professions, such as lawyers, doctors, teachers, bankers, actors etc.

Production Function

A production function refers to the functional relationship, under the given technology, between physical inputs and outputs of a firm, per unit of time.

$$Q = f(a, b, c, d, \dots, n, \bar{T})$$

Q = physical quantity of output (commodity produced)

f = functional relationship

a, b, c, d, n = quantities of various inputs per time period.

\bar{T} = prevailing date of technology

'-' on T represents technology is constant

Economist assume a simple production function assuming 2 factor model.

$$Q_x = f(K, L)$$

Q_x = rate of commodity produced per unit of time

K = units of capital used per unit of time and

L = labour units employed per unit of time.

Short Run Production Function

Short run is defined as a period of time over which some inputs or some factors of production cannot be varied. In short run some factors are fixed and some are varied. In fixed inputs like land, building cannot be varied whereas variable inputs like raw materials labour can be changed.

In short run-output is produced with a given scale of production i.e. size of plant or firm remains unchanged

$$T_p = f(\bar{K}, L)$$

T_p = total product

f = functional relationship

\bar{K} = fixed capital input

L = variable labour input

Long Run Production Function

Long run is defined as a period of time to permit variations in all the factors of production employed by a firm. In long run all factors are variable, there is no difference between fixed and variable factors in longrun, as all are variable, size of firm also varies in longrun.

$$Q = f(a, b, c, n, \bar{T})$$

a, b, c, n are variable factors

\bar{T} given technology

Factors of Production

Factors needed for production are many, economist, in order to make it simple, divided the factors of production into four namely Land, Labour, Capital and Organisation.

Land

According to Marshall “Land means the material and the forces which nature gives freely for man’s aid, in land and water, in air and light and heat”.

Land does not mean just agricultural land i.e. soil but all natural resources like weather, minerals, water, river, climate, etc.

Features

1. Land is a free gift of nature. It has no cost of production. It is not made by man.
2. Land is limited in quantity (Area). Land area can neither be increased nor decreased. (For eg. if the land is very costly in Jubilee hills, some land from remote colony cannot be shifted there).
3. Land lacks geographical mobility. It can’t be moved from one place to another.
4. Land is permanent and undestructable. Except land all will have its natural death.
5. Land is heterogenous. Different units of land, have different degrees of fertility.
6. Law of diminishing Marginal Utility is applicable to land.

Labour Definition

A.H. Smith remarks : “Labour includes all the efforts made by man to earn a living. Thus not only a factory worker but even such people a teachers, lawyers, doctors and other office workers also put in labour”.

Labour means both physical and mental labour.

Features or characteristics of Labour

As a factor of production labour has the following distinguishing characteristics.

1. **A human factor** : The main peculiarity of labour is that it is a human factor. It has a will power of its own. If the employer does not treat the workers well, then labourers will not be faithful to the employer. A labourer has human feelings and therefore must be treated humanly and with dignity.
2. **An active factor** : Other factors of production depend upon labour for their productivity. It is through labour that other factors are brought into the production process. Therefore, labour is an active factor of production.

3. **Labour cannot be separated from the labourer :** It is in the factor labour that the agent and the factor of production are the same. A labourer has personally to go and put in labour. While capital can be separated from the capitalist, a labourer cannot separate his labour from his person. Therefore, labour supply is limited to the number of hours a labourer can be present for work.
4. **A perishable factor :** Labour is more perishable than other factors of production. If a worker does not work for a day, then his labour hours are lost for ever. Labour cannot be stored. As such it is a perishable factor.
5. **Weak bargaining power :** Labourers are generally poor people. They have no savings to demand upon during periods of unemployment. Therefore, labourers have to accept whatever the employer gives them. It is because of their poverty and weak bargaining power, that workers are exploited.
6. **A labourer sells his labour, not himself :** A labourer is a citizen of the country. He is free to sell his labour anywhere at the available price. He does not become a slave thereby. If he does not find his work according to his interest, he leaves and finds work somewhere else.
7. **A mobile factor :** Labour is mobile. It can go from one place of occupation to another. It is less mobile than capital. But it is more mobile than land.
8. **Variable supply of labour :** Supply of labour has two peculiarities :
 - (a) supply of labour can be increased only in the long period. Children take time to become workers;
 - (b) in some industries the supply of labour may be inelastic or even negatively responsive at higher wage levels. In the short period overall supply of labour may be taken to be given.
9. **Differences in efficiency :** All workers are not equally efficient. Some workers have better training and higher efficiency. Their wages are accordingly higher.
10. **Both a means and an end :** A labourer is both a means of production as well as the end of it. He produces goods and consumes them. The demand for goods is mostly linked with the level of wages.
11. **Capital can be invested in labour :** In order to increase the efficiency of labour, capital can be invested on a worker's education and training. Trained workers are also called human capital. This human capital is a very important factor in the progress of a country.

12. **Labour's cost of production is not measurable :** Labour is a factor whose economic cost of production cannot be estimated. It has a social-cost. Unlike capital, wages cannot be related to the cost of production of labour.
13. **Indirect nature of demand :** Labour is not directly demanded like goods and services of consumption. The demand for labour is derived demand. The services of a labourer is demanded only when there is demand for the goods he produces.

Definition and Features of Capital

Capital is anything produced by man which can be used for further productions. Thus, Chapman has remarked, "Capital is wealth which yields an income or aids the production of an income or it intends to do so". It is the produced means of production

Features of Capital

1. **A man-made factor :** Capital formation takes place through the savings done by man. Therefore, capital is also called stored up labour. Since it takes lot of labour to create a capital asset, it is also called crystallized labour. It has a cost of production
2. **A secondary factor of production :** Capital is a man-made factor whose supply is increased or diminished by the efforts of man. Thus, it is a secondary factor. Some people say that capital is nothing but transformed land and labour.
3. **Depreciation :** When capital is used for production it depreciates depending on the durability of the capital asset. Therefore, provision must be made for replacing it.
4. **A mobile factor :** Capital is the most mobile factor of production. It is easily transferable from one place to another.
5. **A passive factor :** Capital is unable to produce without land and labour. Therefore, it is a passive factor.
6. **Elastic supply :** The supply of capital assets can be increased through higher saving. When the remuneration for capital is more, supply is more and vice versa. On the other hand capital supply is diminished when there is no provision for depreciation.
7. **Formation of capital involves a cost and time :** Capital is not a free gift of nature. The formation of capital starts with savings. Savings must be invested to produce the required capital assets. All saving is the result of non-consumption of income. Savers sacrifice their present consumption in favour of the future. Thus, capital becomes a link between present and the future.

- 8. Capital depends upon technology of production :** The most important characteristics of capital is that its nature depends upon the level of technology employed by a nation. The more progressive is a country's technology, the more capital-intensive is the method of production. Developed nations use huge machines while poor countries mostly use traditional capital assets.

Organisation

This is the fourth factor of production and many times called as entrepreneurship.

According to Schumpeter 'entrepreneur is associated with innovations'.

According to white head "the entrepreneur's are the owners of the business who contribute the capital and bear the risk of uncertainties in business life. They may be sole traders, limited partners and shareholders.

Features

1. The entrepreneur bears a variety of risks which nobody else is prepared to undertake. Knight has classified the risk as insurable and non-insurable. Uninsurable risk are uncertain & profits are given to entrepreneurs.
2. Entrepreneur controls and manages the business. He makes the choice of what to produce, design and quality of the product, size of the plant, scale of production, places of production, etc.
3. Entrepreneur coordinates and combines various factors of production. Correct combination of factors of production reduces cost of production and maximises the output.
4. Entrepreneur supervises and makes assignments of the jobs.
5. Entrepreneur innovates, innovative products fetch high profits. It leads to economic development of a Nation.
6. He has to lead the organisation and make decisions and forward planning for the future. He must make correct prediction about the future.

The Law of Returns of Scale

Introduction

The law of returns to scale was familiarized by Marshall. This law is applicable in the long run. This law describes the relationship between the output and inputs. When all the inputs or when scale of production is changed.

Definition:

When all the inputs are increased in the same proportion in the long run. The marginal output will increase initially. Thus, it will become constant and finally the marginal output will diminish even though the input is increased in the same proportion.

Assumptions

1. The law is applicable in long run.
2. The price of inputs are given and remains constant.
3. The inputs are homogenous.
4. We will be able to calculate the marginal output continuously
5. All the inputs are increased in the same proportion i.e. the proportion of various inputs increased are kept constant.

Explanation :

When all the inputs are increased in the same proportion i.e. when the size of the firm is expanded the marginal output is increased in the 1st stage. This stage is called as “Law of increasing returns to scale.” That is if all the inputs are increased by 10% the output will increase by 20%. The main reason for the applicability of increasing returns to scale is

1. Due to dimensional economies
2. Specialisation
3. Indivisibility of factors of production
4. Economies of large scale production
5. Use of special machinery etc.

When all the inputs are increased further and further in the same proportion the marginal output increase constantly i.e. if the inputs are increased by 10%. The output will also increase by 10% advantages are counter balanced. By disadvantages of large scale production. This is the 2nd stage and also called as constant returns to scale.

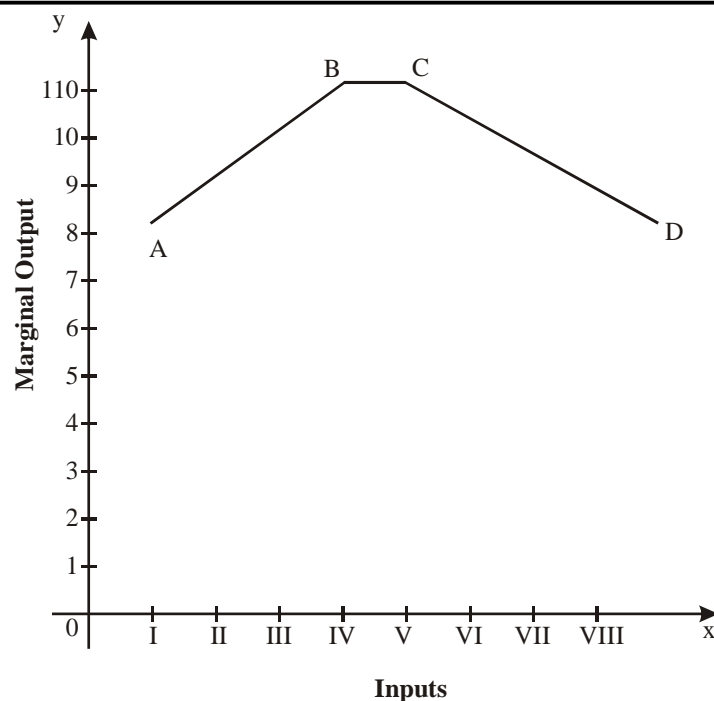
When all the inputs are increased further, the marginal output starts diminishing that is the inputs are increased by 10%, output increases by 2%. This is the 3rd stage of law of returns to scale which is named as law of diminishing returns to scale.

The law of diminishing returns to scale occurs due to :

- (a) Internal and External diseconomies
- (b) Difficulties in the management
- (c) High factor price
- (d) Use of the indivisible factor beyond the limit
- (e) Exhaustible natural resources

Due to the law of returns can be easily understood by the numerical example.

	Inputs	Marginal Output	Stages
I	1l + 2k	8	Law of increasing
II	2l + 4k	9	Marginal returns
III	3l + 6k	10	to scale.
IV	4l + 8k	11	Law of constant
V	5l + 10k	11	Marginal returns to scale
VI	6l + 12k	10	Law of diminishing
VII	7l + 14k	9	Marginal returns
VIII	8l + 16k	8	to scale



From the table, we observe that when the input are increased in the same proportion the I, II III stage of the input increases. The marginal output increases fro 8, 9 to 10 but when IV and V input increase, the marginal output increase at a constant rate. That is, it remains 11 only. When the VI, VII and VIII dose of inputs are applied to the industry the marginal output starts falling as 10, 9, 8

In the graph, are represented inputs on x-axis and output on y-axis. The line segment \overline{AB} represents the 1st stage of returns to scale i.e., the law of increasing returns to scale. The curve slope upwards. \overline{BC} represents the 2nd stage of law i.e. the law of constant returns to scale. \overline{CD} represents the 3rd stage of law that is the law of diminishing returns to scale (the curve slopes downwards).

Causes of increasing Returns to Scales

The increasing returns to scale is the 1st stage when all the inputs are increased the output utility is increased more than proportionately.

There are many reasons for the applicability of increasing returns, which we will study in detail.

1. **Dimensional Economies** : When the dimensional of the firm is increased of the input like capital, machinery, etc.

2. **Specialisation :** When the size of the firm is expanded more and more inputs are demanded. Here the division of labour will become possible.
3. **Indivisibility of factors of production :** Increasing returns to scale arise due to the indivisibility of some factors of production. They can be machinery, buildings, entrepreneurs, etc.
4. **Economy of Large Scale Production :** When the firm is expanded many internal economies like technical economies, marketing economies, managerial economies, financial economies etc. will occur many external economies like economies of concentration, economies of welfare etc. will occur.
5. **When the firm expands it can use specialized machines :** Where the quantity and the quality of the output will be better.

The causes of diminishing Returns to Scale ?

The diminishing returns to scale is the third stage in the law of returns to scale. In this state when all the inputs are increased further and further in the same proportion, the marginal output starts diminishing.

There are many reasons for this :

1. **Internal and External Diseconomies :** When the firm is expanded beyond a limit the economies which the firm gets will not only subside but it will change into diseconomies. For example, marketing the product will become costly. Pollution will increase which will affect the welfare of the labourers, the factor cost will increase too much.
2. **Management and Coordination become difficult :** The entrepreneurs and the manager will not be able to coordinate the factors of production properly and supervise the production properly.
3. **Higher Factor Price :** As they demand more and more factors of production, demand will become more than supply and so then price will increase.
4. Indivisible factors used beyond optimum level
5. Natural resources get exhausted

Economies of Scale

Large scale production is economical in that the cost of production is low. The low cost is a result of what is called "Economies of Scale." The economies of scale may be

classified as :

1. Internal Economies
2. External Economies

1. **Internal Economies :** These are those economies, which are open to an individual firm, when its size expands. They emerge within the firm itself as its scale of production increases.
2. **External Economies :** These are those economies, which are shared by all the firms in an industry or in a group of industries, when their size expands. They are the result of the growth and expansion of any particular industry or a group of industries as a whole.

Types of Internal Economies

According to Caincross, Internal Economies are those which are open to a single factory or a single firm. This results from an increase in a scale of output of a firm and can't be achieved unless output increases.

The word internal is used to denote the limit of this economies only to one firm itself that expands its size. Some internal economies are :

1. **Technical Economies :** These arise from use of better machines and techniques of production. As a result of these economies, there will be an increase in production and decrease in cost of production.

The by-products can be utilised in a useful manner where the cost of production decreases. Big machines bring in better quality and quantity. Thus production increases. Research can be done to decrease cost and risk. Specialization of labours can be adopted by which the cost of production decreases. New linking process can be done and special workshops can be started.
2. **Managerial Economies :** These arise due to better and more elaborate management which only large size firms can afford. A large size firm can do division of powers into different sections and can appoint specially qualified and high paid official to look after each sections like production accounts like advertisements, sales promotion, etc. This will increase efficiency and production.
3. **Marketing Economies :** A large firm purchases various inputs in a bulk and thus it can secure inputs at cheaper rates. It can also secure special transport concessions. It can also have its own sale agency, marketing departments, advertisement programmes, etc.

4. **Financial Economies :** The banks generally prefer to give loans to the large firms. It can get finance in time at cheaper rates of interest. Thus it can acquire large assets and good reputation. It can also mobilise fresh funds by flattening shares and debentures in the capital market easily.
5. **Risk bearing Economies :** A large firm can produce variety of products in different types and sell them in different areas. It can counter balance the loss one product by the gain in the other products. A big firm having an extended market through out the country can balance the fall in demand in one market by increase in demand by another. It can overcome losses due to cyclic fluctuations.

External Economies : External Economies are those benefits which are shared by a large number of firms or industries when the scale of production in any industry or group of firms increases. They arise due to the following reasons :

1. **Economies of Concentration:** Concentration of a particular industry in one area resulting in the development of conditions helpful to other industries like provision of better finance, power, research facilities, opening of ancillary units.. etc., the cost of production is thereby reduced.
2. **Economies of Information :** When many firms are located at one place, they can collectively publish trade and technical journals. The industry can also setup an information centre regarding market conditions, price, etc.
3. **Economies of Specialisation :** When a number of firms are concentrated in a particular area, they can specialise in different processes so that, the industry benefits as a whole. For example when the cotton textiles industry expands, some firms can specialise in manufacturing thread, some in weaving and some in printing.... etc.. As a result, the production efficiency of a firm specialising in different fields increases and cost of production falls.
4. **Economies of Welfare :** When many firms are located in a particular area, the industry is in more advantageous position to provide welfare facilities and also establish institutions etc. Such facilities increase the efficiency of the workers who work for quality and quantity of the products of the industry.
5. **Physical Factors :** If some types of firms are coming up in some areas, then all the firms can have the physical factors benefit. For example coal mines in that area can share the cost of pumping out the water from the mines through which cost levels decrease.

Diseconomies of Large Scale Production

When there is an expansion of the firm beyond an optimum limit, the very internal and external economies, turn out to be diseconomies. Generally, the following factors of diseconomies of scale limit the size of a firm.

1. **Difficulties of Management :** As a firm expands, complexities and problems of management increase. Thus, after a point the manager finds it difficult to control the whole production within an organization. The entrepreneur and management will not be able to maintain contact with each other and check on all the departments of a very large concern.
2. **Difficulties of Coordination :** The task of organization and coordination become progressively more and more difficult with the increase in size of the firm. The management of the firm will gradually face numerous problems of decision-making and organization.
3. **Difficulties in Decision-making :** A large firm cannot take quick decisions and make quick changes and when they are needed, for it has to consult various departments for making any decisions and so urgent matters requiring timely decisions are inevitably delayed.
4. **Increased Risks :** As the scale of production increases, investment also increases, so too the risks of business. The larger the output, obviously the greater will be the loss from an error of judgment or misfortune in business.
5. **Labour Diseconomies :** Extreme division of labour with a growing scale of output results in lack of initiative and drive in the executive personnel. Thus, a large firm becomes more impersonal and contact between management and workers becomes less.
6. **Scarcity of Factor Supplies :** Due to the ease in concentration of firms in a particular locality each firm will find scarcity of available factors.
7. **Financial Difficulties :** A big concern needs huge capital which cannot always be easily obtainable. Hence the difficulty in obtaining sufficient capital frequently prevents the further expansion of such firms.
8. **Marketing Diseconomies :** When the industry expands and the firms grows, competition in the market tends to become stiff. They have to spend more money on sales propaganda attractive packages, etc.
9. **Technical Limits :** There are technical limits to the expanding size of plants. Thus beyond a point, further technical economies cannot be enjoyed and disproportionate expansion would result in technical diseconomies.

Law of variable proportions

Introduction

Law of variable proportion is also called as law of return, law of diminishing marginal return or the law of non-proportional returns. This is one of the fundamental laws of production.

Definition :

This is the basic law of economies. According to Samuelson "An increase in some input related 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 off of extra returns is a consequence of the fact that the new doses of the varying resources will have less and less of the constant resources to work with.

This law is applicable in the short run the studies about the output or returns when the variable inputs are changed, keeping the fixed input as constant. This law proves that output changes in 3 stages. In the first stage when the variable input increases, the marginal output increases. In the 2nd stage when the variable input is increased in the same proportion, the marginal output decreases. In the 3rd stage even though variable input is increased in the same proportion the output becomes negative.

Assumptions :

1. This technique of production remains constant.
2. This law is applicable in the short run.
3. All the variable inputs are homogenous.
4. The ratio of variable inputs to the fixed input can't change.
5. The price of the inputs are given and remains constant.

Explanation :

When the variable input is increased in the short run in the same proportion keeping the fixed input as constant. The output will increase first, then it diminishes and that becomes negative. For example : Suppose a farmer wants to increase number of labourer, variable input. We will see what happens to output which is given in the table formed. The output, he is keeping 10 acres of land and irrigation facilities as constant. It will increase

No. of labour	Marginal Production	Total Production	Average Productivity	Stages	Relations, Structures
0	0	0	0	1 st Stage	MP↑ AP↑ TP↑
1	5	5	5		
2	7	12	6		
3	6	18	6	2 nd Stage	MP↓ AP↓ TP↑
4	2	20	5		
5	0	20	4		
6	-2	18	3	3 rd stage	MP -ve AP↓ TP↓
7	-4	14	2		

Marginal Product is the additional product which is produced by addition of one more unit of the input. For eg. The marginal product of the second input is 7 quintal (that is $MP_n = TP_n - TP_{n-1}$).

The total product is the total amount output which is produced by all the inputs together.

For eg. the total product of all 2 inputs is 12 quintals $\sum_{i=1}^n MP_i$ the

$$A.P. = \frac{T.P.}{\text{No. of Labourers}}$$

A.P. of the 2 units is 6 quintals. It is the product produced per labour

In the first stage marginal product average product and total product (T.P.) with increase. This is the initial (M.P.) stage of production.

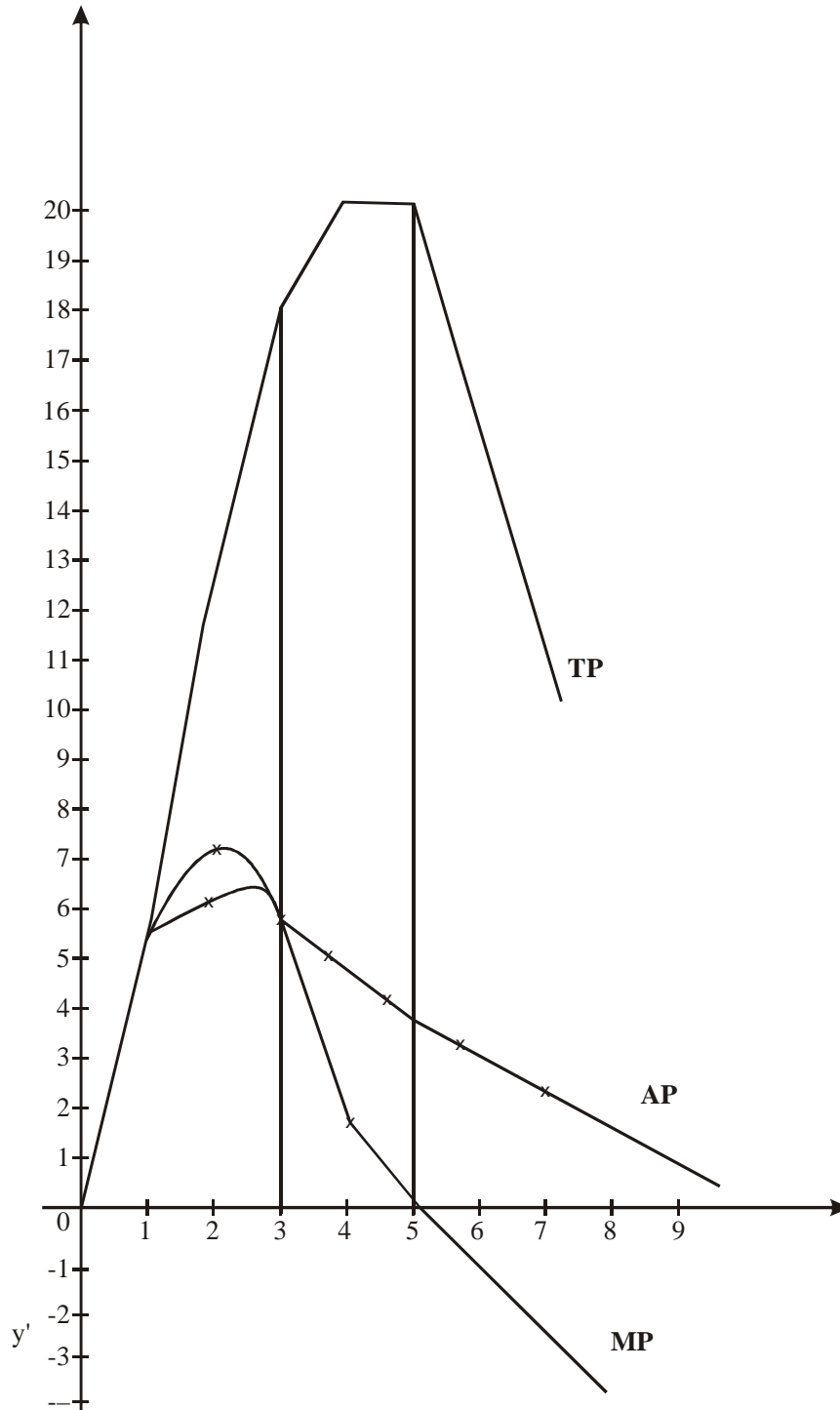
In the second stage the marginal product, average product diminishes the total product increases at diminishing rate. We can observe this from table. This is the most important stage of the law for all the sector, Whether the agriculture or industry, we try to stop the production in this diminishing because once when M.P. becomes zero, total product will be maximum. It will be non-economical to produce after this point. Classical economist consider that this stage is applicable only to agriculture but the modern economist is of the opinion that this is applicable even to industry.

In the third stage marginal product becomes negative. So total product falls. No sector will continue production in this stage.

This can be represented in the diagram.

We observe from the diagram that the first stage the M.P. curve, T.P curve, A.P curve increases and slope upwards which shows that A.P., M.P., T.P. increases. In the second stage M.P. and T.P are sloping downwards whereas T.P. curve is sloping upwards

which shows that the A.P. and M.P. decreases. In this stage where as the T.P. increases at an diminishing rage. It also shows T.P will be maximum when $M_p > P. = 0$.



In the third stage the M.P. lies below the x axis which shows that M.P. is negative in this stage, A.P., T.P. also decreases in this stage.

Limitations : Technology changes often in this modern world with that the law may not be applicable.

1. The prices of input changes
2. The proportion of variable input to fixed input may not be suitable with the change in technology.
3. The law will not be applicable if it is newly cultivated land.
4. The labour and capital are in less than the optimal proportion to land i.e. the output may be increased with the increase in the proportion of labour and capital.

