AAGMAN GOKHALE

MANAGERIAL ECONOMICS
THEORY AND APPLICATIONS

Managerial Economics: Theory and Applications

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Aagman Gokhale

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Introduction to Managerial Economics and demand Analysis

(*The Learning objective of this Unit is to understand the concept and nature of Managerial Economic s and its relationship with other disciplines, Concept of Demand and Demand forecasting)

Introduction to Managerial Economics and demand Analysis: Definition of Managerial Economics and Scope-Managerial Economics and its relation with other subjects-Concepts of Demand-Types-Determents-Law of Demand its Exception-Elasticity of Demand-Types and Measurement-Demand forecasting and its Methods.

1.1 Definition of Managerial Economics and Scope

The economics is the study of the production and consumption of goods and the transfer of wealth to produce and obtain those goods. This explains how people interact within the markets to get what they want or accomplish certain goals because the economics is a driving force of human interaction, studying it often reveals why the people and governments behave in particular ways.

They are classified int two types :

1. Microeconomics

2. Macroeconomics

Microeconomics will focus on the actions of the individuals and the industries like the dynamics between buyers and sellers, borrowers and lenders.

Macroeconomics takes a much broader view by analyzing the economic activity of an entire country or the international marketplace.

Definition of Managerial Economics:

The definition of managerial economics is explained by many persons are as follows:

Mansfield states that "the managerial economics is concerned with application of economic concepts and economic analysis to the problems of formulating rational managerial decision."

McNair and Meriam states that the "Business Economics consists of the use of economic modes of thought to analyze business situations."

Spencer and Seegelman states that the "Business Economics is the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management."

Haynes, Mote and Paul states that the "Managerial Economics is economics applied in decision making. It is a special branch of economics bridging the gap between abstract theory and managerial practice."
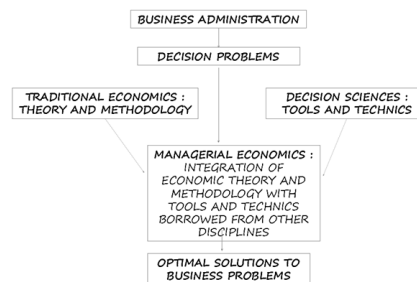
1.1.1 Nature and scope of managerial economics

Nature of Managerial Economics:

• In a business organization, two main primary function of management executive is decision making and forward planning.

• These functions go hand in hand with each other. A process of selecting one action from two or more alternative courses of action is known as decision making. Establishing plans for the future to carry out the decision is known as forward planning.

• The problem of choice arises since the resources at the disposal of a business unit like land, labour, capital and managerial capacity are limited . Hence, the firm has to make the most profitable use of these resources.

• The decision making function is carried by a business executive where he takes the decision that will ensure the most efficient means of attaining a desired objective say profit maximization. When this decision is taken then about the particular capital,output pricing, raw-materials and power etc. can be prepared. Thus, the forward planning and decision-making takes place at same time same time.

• Due to the uncertainty which surrounds business decision-making, the task made difficult for a business executive to complete. Since, nobody can predict the future course of business conditions.

Only best possible plans will be prepared by him for the future depending on past experience and future outlook and yet he has to go on revising his plans in the light of new experience to minimize the failure. Thus, the managers are engaged in a continuous process of decision-making through an uncertain future and the overall problem confronting them is one of adjusting to uncertainty.

• By fulfilling the function of decision-making in an uncertainty framework the economic theory can be pressed into service with a considerable advantage as it deals with a number of concepts and the principles which can be used to solve or at least throw some light upon the problems of business management. For example, cost, profit, pricing,national income, production, demand,competition, business cycles etc. The subject-matter of Managerial Economics constitutes in which way the economic analysis can be used towards solving the business problems.

• Hence, the Managerial Economics is both a science and an art.

Scope of Managerial Economics:

Since it is developing science,the scope of managerial economics is not yet clearly laid out. Though these fields are involved in managerial economics:

1. Cost and Production Analysis

2. Capital Management.

3. Profit Management.

4. Pricing Decisions, Policies and Practices.

5. Demand Analysis and Forecasting.
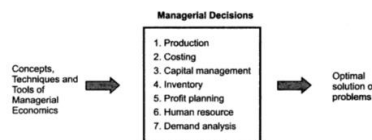
Scope of managerial economics

The above divisions of business economics will constitute its subject matter. Recently, the usage of Operation Research methods like Linear programming, inventory models, Games theory, queuing up theory etc., have increased by the managerial economists. Hence, it has also come to be regarded as part of Managerial Economics.

Cost and production analysis:

Every firm's profitability depends much on its cost of production. The cost estimation with a range of output which identify the factors that causes variations in the cost estimates and choose the cost-minimising output level and also taking into consideration the degree of uncertainty in

production and the cost calculations will be prepared by a wise manager. The production processes are under the charge of engineers. Thus, the business manager is supposed to carry out the production function analysis to avoid wastages of materials and time. The sound pricing practices depend much on cost control.

Capital management:

A firm's problems that are relate to the capital investments are perhaps the most complex and troublesome. The capital management implies planning and control of capital expenditure since it involves a large sum and also the problems in disposing the capital assets off are very complex that they require considerable time and labour.

Profit management:

Generally all business firms will be organized for the earning profit and in the long period it is profit which provides the chief measure of success of a firm. The economics tells us that profits are the reward for uncertainty bearing and risk taking. Business manager who is successful is the one who can form more or less correct estimates of costs and revenues likely to accrue to the firm at different levels of output. Therefore the more successful a manager is in reducing uncertainty, the higher are the profits earned by him. Hence, the profit-planning and profit measurement will constitute the most challenging area of Managerial Economics.

Pricing decisions, policies and practices:

In managerial economics, pricing plays an important role. In fact price is the genesis of the revenue of a firm. The success of a business firm largely depends on the correctness of the price decisions taken by it.

Demand Analysis and Forecasting:

A business firm is an economic organisation that is engaged in transforming the productive resources into goods that are to be sold in the market. A major part of managerial decision making will depend on accurate estimates of demand. The forecast of future sales serves as a guide to management for preparing production schedules and employing resources. This will help management to maintain or strengthen its market position and profit base. The demand analysis also identifies a number of other factors influencing the demand for a product. Hence, demand analysis and forecasting occupies a strategic place in Managerial Economics.

1.2 Managerial Economics and its relation with other subjects

Managerial economics is defined as economics which is applied in decision-making. A distinction between the concepts of economic decision and technical decision can be done using this connection.

The economic decision refers to:

(i) The decision taken by any producer regarding the volume of output to be produced during any particular time period to maximize its profit. The producer either wants to maximize its output given its cost constraint or minimize the cost given the targeted output.

(ii) The decision taken by any consumer regarding the quantities of commodities to be purchased to maximize his/her utility (The want-satisfying power of a commodity is considered as its utility.) The consumer wants to maximize his or her utility subject to his/her budget constraint.

(iii) The decision taken by the government to invest in such activities which maximize social welfare.

The technical decision refers to:

(i) The decision taken by any engineer regarding the application of any particular technique to complete a job or a project work within a given time period.

(ii) The decision taken by any architecture regarding the technicalities of a design-plan for say building a housing complex.

(iii) The decision taken by any entrepreneur (even a farmer) with regard to the proportion in which some inputs are be applied in any production process without any consideration for the prices of those inputs (say the proportion of water and chemical fertilizer to be applied in any cultivation work), etc.

Thus if any engineering firm designs a thermal power project the technical decision of the firm would become relevant in this process. However if the same firm makes a cost benefit analysis with an objective to maximize its profit or minimize its cost the economic decision becomes relevant.

Similarly when a farmer chooses a particular proportion of high yielding varieties of seeds, chemical fertilizers and irrigation-water for carrying out the cultivation process the technical decision becomes relevant. But the market prices of those inputs and the given income of the poor farmer may not allow him to achieve that 'technical decision'. Hence when we take into account the given input prices and the available fund to be invested in the production process the economic decision becomes more relevant.

Differences between Economic and Technical Decisions

Economic decision	Technical decision
1. It is more concerned with the theoretical aspect of a production or consumption decision.	1. It is more concerned with the technical or application aspects of any productive activity.
2. It is concerned with optimization behaviour of	2. It is concerned with achieving a targeted

a firm subject to cost or fund constraint.	output with technologically efficient dose of inputs (disregarding the input prices).

Relationship of managerial economics with other disciplines:

The managerial economics is closely related to other subjects like mathematics, accounting, statistics, operations research, micro economic theory and macro economic theory . The logic of managerial economics is used in mathematics and statistics for providing effective ways of thinking about business decision problems.

Managerial economics and mathematics:

It becomes increasingly mathematical in character. The businessmen deal with different concepts that are measurable. The use of mathematical logic gives clarity of concepts. This also gives a systematic frame-work within where the quantitative relationship might be analyzed. Therefore, mathematics is of great help to managerial economics but the major problem confronting businessmen is to minimize the cost or maximize th profit or optimize sales. In order to find out the solution for the overall problems, the mathematical concepts and techniques are widely used. The mathematical techniques like linear programming, games theory etc help managerial economists to solve many of their problems.

Managerial economics and accounting:

Accounting in managerial economics is concerned with recording the financial operations of a business firm. The accounting information is one of the primary sources of data that is required for managerial economists for the decision-making purpose. The information which is available can be used by the managerial economist to throw some light on the future course of action.

Managerial economics and statistics:

Statistics in managerial economics is a science which is concerned with the classification, collection, tabulation and analysis of the data for some specified purpose. The managerial economics and statistics are closely related as businessmen deal mainly with concepts that are quantifiable.

Example: demand, price, cost of operation.

It is useful to managerial economics in many ways are as follows:

a. Managerial economics requires marshalling of quantitative data for finding out functional relationship involved in decision-making. This is done with the help of statistics.

b. These methods are used for empirical testing in managerial economics.

c. The business executives must work and take decisions in an uncertainty frame-work. The theory of probability evolved by statistics helps managerial economists for taking a logical decision.

Hence, the statistical methods gives sound base for decision-making and help the businessmen to achieve the objective without much difficulty. The statistical tools are extensively used in the solution of managerial problems. The managerial economists make use of different statistical techniques like the theory of probability, regression analysis, co-relation techniques etc. in various business situations.

Managerial economics and operations research:

Managerial economics with Operations research is the, application of mathematical techniques in solving the business problems. It deals with model building where the construction of theoretical-models that help the decision-making process. Although the roots of operations research lies on military studies, it is now largely used in business administration, planning and control. The linear programming and allied concepts of operations research are used in managerial economics.

Managerial economics and micro economics:

Managerial economics is mainly micro economic in character, making use of several of the concepts and tools provided by micro-economic theory. The concept of elasticity of demand, market structures, marginal cost, the theory of the firm and the theory of pricing of micro-economics are fully made use of by managerial economics. Thus, the study of micro economics is necessary for the better understanding of managerial economics. All micro economic theories that can be applied in business are made use of in managerial economics.

Managerial economics and macro economics:

Managerial economics with macro economics is concerned which aggregates and macro economics concepts are used in managerial economics in the area of forecasting the general business conditions. The theory of the firm, pricing policies etc have to be viewed in a broad frame work of the economic system and it is essential that the business executives should have some knowledge of the whole economic system. Macro economic concepts like national income, business cycles, social accounting, managerial efficiency of capital, multiplier, fiscal policies etc have to be studied in managerial economics for forecasting the business conditions.

Both the micro and macro economics are closely related to the managerial economics. The managerial economics draws from the micro and macro economics, so that it can apply these principles to solve the day-to-day problems faced by businessmen.

1.3 Concepts of Demand-Types-Determents-Law of Demand its Exception

Demand

Demand is said to be the aspiration for a commodity of an individual or a group, when they are able to pay for that commodity. That is demand is desire with account to pay.

According to Benham's , "Demand for anything at a given price is the amount of it that will be bought per unit of time at that price."

It can also be defined as " the different quantities of a given commodity or service when the consumers might buy in a market in a given period of time at different prices or at different incomes or at various prices of related goods."

In other words, the quantity of goods or services which is desired by an individual, is backed by the ability and willingness to pay.

Demand Schedule

This represents the relationship between the price and the quantity demanded by using a table of figures. It is categorized in two types say one for the price of a product and another for the quantity demanded at that price. The price column displays the different price levels arrayed from lowest to highest or vice versa while the quantity demanded column displays the quantity of that good or service demanded at each price level. This is used for most products which will show a reduction in quantity demanded as the price increases. This is divided into 2 types as shown in the figure:
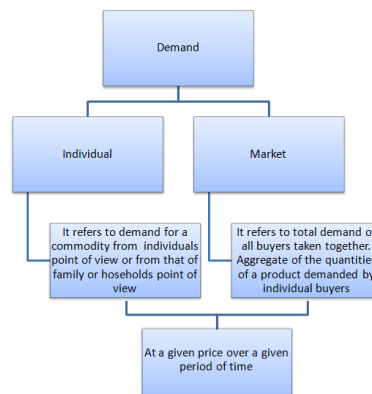
Types of Demand schedules

i. Individual demand schedule:

This refers to a tabular representation of the quantity of products demanded by an individual at different prices and time.

The below table represents the individual demand schedule of product:

Price of Coke (200 ml) In Rupees	Quantity Demanded
50	1
45	2
40	3
35	5
30	7
25	9
20	12
15	15
10	20

Characteristics of individual demand schedule:

a. It demonstrates the effect of changing the price on buying behavior of customers but not change in the demand for a product.

b. It describes the disparity in demand with the difference in the product's price.

c. It represents that at higher prices the quantity demanded will reduce and vice versa.

ii. Market demand schedule:

It shows a tabular representation of the quantity demanded in aggregate by the individuals at different prices and time. Therefore, it demonstrates the demand of a product in the market at different prices. This can be derived by aggregating the individual demand schedules.

The below table represents the market demand schedule prepared through the individual demand schedule of three individuals:

Table-2: Market Demand Schedule

Price of A (per unit in ₹)	Individual Demand (per day)			Market Demand (per day)
	X	Y	Z	
4	1	3	4	8
3	3	4	5	12
2	4	5	6	15
1	5	9	9	23

This also demonstrates an inverse relation between the quantity demanded and price of a product.

Demand Curve:

It is a visual form of the demand schedule. An economist depicts that the demand schedule on a two-dimensional graph consists of a vertical axis representing the price and a horizontal axis

representing quantity demanded. The vertical axis will display different price levels from the highest to lowest, whereas the horizontal axis will display the various levels of demand. An apex of the vertical and horizontal axis will have value of zero for both quantity and price. The demand curve for most products will slope downward indicating an increase in demand as the price declines.
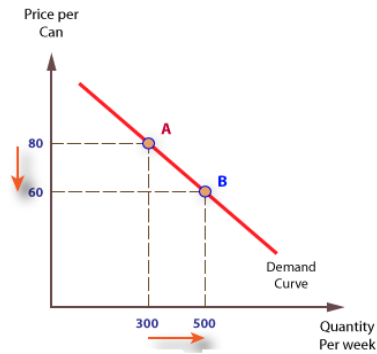
Demand curve

1.3.1 Types Of Demand:

1. Direct and indirect demand:

It is also called as Producers' goods and consumers' goods. The demand for goods which are directly used for consumption by the ultimate consumer is called as direct demand whereas the demand for goods that are used by producers for producing goods and services is known as indirect demand.

Example for direct demand is demand for T-shirts and for indirect demand is demand for cotton by a textile mill.

2. Derived demand and autonomous demand:

When a producer derives its usage from the use of some primary productis called as derived demand whereas autonomous demand is the demand for a product which can be independently used.

Example for derived demand is demand for tyres derived from demand for car and for autonomous demand is demand for a washing machine.

3. Durable and non durable goods demand:

The durable goods are those which can be used more than once, over a period of time whereas non durable goods can be used only once.

Example for durable goods is microwaveoven and for non durable goods is band-aid.

4. Firm and industry demand:

Firm demand is the demand for the product of a particular firm whereas the demand for the product ofa particular industry is industry demand .

Example for Firm demand is dove soap and for industry demand is demand for steel in India.

5. Total market and market segment demand:

A particular segment of the market demands is known as segment demand whereas the sum total of the demand for laptops by various segments in India is the total market demand.

Example for segment demand is demand for laptops by engineering students and for total market demand is demand for laptops in India.

6. Short run and long run demand:

The short run demand refers to the demand with its immediate reaction to the price changes and income fluctuations whereas the long run demand is that which will ultimately exist as a result of the changes in pricing, the promotion or product improvement after market adjustment with sufficient time.

7. Joint demand and Composite demand:

When two goods are demanded inconjunction with one another at the same time to satisfy a single want, this is called as joint or complementary demand whereas a composite demand is one in which a good is wanted for several different uses.

Example for joint or complementary demand is demand for petrol and two wheelers and for composite demand is demand for iron rods for various purposes.

8. Price demand, income demand and cross demand:

The demand for commodities by the consumers at alternative prices is known as price demand. It has the ability and willingness to buy specific quantities of a good at the prevailing price in a given time period.

Income demand

The quantity demanded by the consumers at alternative levels of income is known as income demand. Here, the total quantity of a good or service that people are willing and able to buy at prevailing prices in a given time period. It is the sum of individual demands.

Cross demand

The quantity demanded of commodity 'X' at a price of a related commodity 'Y' which may be a substitute or complementary to X is know as the cress demand. This ha the ability and willingness to buy a commodity or service at the prevailing price of the related commodity. That is, it substitutes or complementary products.

Example: people buy more of wheat when the price of rice increases.

1.3.2 Determinants of demand

1. Price of the good:

It is an important determinant of demand since price and demand are inversely related. When it has higher price, it will have less demand and vice versa.

2. Price of related goods:

They are substitutes and complementary goods which also affect the demand. Here, the substitutes, rise in price of one commodity will lead to increase in demand for its substitute where as complementary goods, there is a fall in the price of one commodity shall lead to rise in demand for both the goods.

3. Consumer's Income:

It is directly related to demand. A change in the income of the consumer will significantly influences his demand for most commodities. When the disposable income increases, the demand will be more.

4. Taste, preference, fashions and habits:

When there is a change in taste, habits or preferences of the consumer, even his demand will change since fashions and customs in society determine many of our demands. These are very effective factors affecting demand for a commodity.

5. Population:

When the size of the population is more, the demand for goods will be more . Thus, the market demand for a commodity will substantially changes if there is change in the total population.

6. Money Circulation:

When there is more money in circulation, the demand is higher and vice versa.

7. Value of money:

It determines the demand for a commodity in the market. If there is a rise or fall in the value of money it can affect in the relative prices of different goods and their demand.

8. Weather Condition:

It determines the demand for certain goods.

9. Advertisement and Salesmanship:

When the advertisement is very attractive for a commodity, the demand will be more. Same as advertising when the salesmanship and publicity is very effective then the demand for the commodity will be more.

10. Consumer's future price expectation:

When the consumers expect that there will be a rise in prices in future, then he may buy more at the present price and so his demand increases.

11. Government policy:

If the high taxes, this will increase the price and reduce demand, whereas if there is low taxes, it will reduce the price and extend the demand.

12. Credit facilities:

By depending on the availability of credit facilities the demand for commodities can change. When there are more facilities the demand will be higher.

13. Multiplicity of uses of goods:

When the commodity has multiple uses then the demand will be more while the commodity is used for a single purpose.

1.3.3 Law of Demand

It states that all the other factors being equal like the price of a good or service increases, the consumer demand for the good or service shall decrease and vice versa. The law of demand states that when the price is higher, the quantity demanded is lower since consumers opportunity cost to acquire a good or service will increases and they should make more trade offs in order to acquire the more expensive product.

Assumptions:

1. The tastes and preferences of the consumer will remain constant.

2. There is no change in the income of the consumer.

3. There is no change in prices of related goods .

4. The consumers do not accept any change in the price of the commodity in the near future.

Breaking Down 'Law Of Demand'

The below chart will explain the law of demand by using a demand curve, where it is always downward sloping. Every point on the curve (A, B, C) will reflect a direct correlation between the quantities demanded (Q) and the price (P). Hence, at point A, the quantity demanded will be Q_1 and the price will be P_1 and as follows.
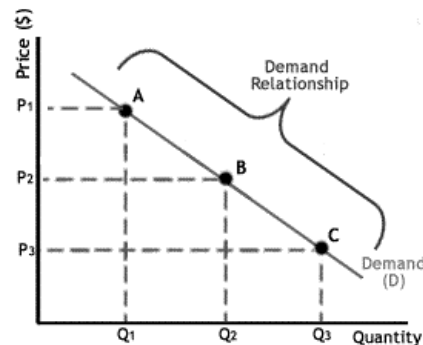
It is so intuitive.

Examples:

If shirts go on sale, we may buy 3 instead of one. The quantity that we demand increases since the price has fallen.

If plane tickets become more expensive, we are less likely to travel by air and we tend to choose the less expensive options of driving or staying home itself. The amount of plane tickets that we demand decreases to zero because the cost has gone up.Thus, it is summarized as the effect price changes have on consumer behavior.

It is one of the most fundamental concepts in economics. This works with the law of supply in order to show how the market economies allocate resources and calculates the price of goods and services.

1.4 Elasticity of Demand-Types and Measurement

Elasticity of Demand

This represents the degree of responsiveness of quantity demanded to the changes in the determinants of demand.

Concept Of Elasticity of demand was introduced by Alfred Marshall in 1890 to measure the magnitude of percentage change in the quantity demanded of a commodity to a certain percentage change in its price or the income of the buyer or in the prices of related goods.The three main determinants of demand are as follows:

1. Price of the good.

2. Income of the consumer.

3. Price of the related goods.

Types of Elasticity Of Demand

Elasticity of demand can be of three types are as follows:

1. Price Elasticity of Demand.

Price Elasticity is the responsiveness of demand to change in price.

2. Income Elasticity of Demand.

Income elasticity means a change in demand in response to a change in the consumer's income

3. Cross Elasticity of Demand.

Cross elasticity means a change in the demand for a commodity owing to change in the price of another commodity.

Price elasticity of Demand:

The sensitivity of demand for a product to a change in the product's own price since Price Elasticity of Demand is predominantly used in economic analysis it is alternatively referred to as Elasticity of Demand.

Definition

The degree of responsiveness of demand to a change in its price is known as price elasticity of demand. In other words, it is the ratio of the percentage change in demand to the percentage

change in price. That is,E_p = Percentage change in quantity demanded/Percentage change in price.it can be represented in mathematical form as:

Ep =(Δq/Δp) (p/q)

From the definition, it says that,

When there is percentage change in the quantity demanded is greater than the percentage change in price then, the price elasticity will be greater than one. So, the demand is said to be elastic.

When there is a percentage change in the quantity demanded is equal to the percentage change in price then the price elasticity can be equal to one. So, demand is said to be unit elastic.

When there is a percentage change in the quantity demanded then it is less than the percentage change in price then, the price elasticity will be less than one. So, the demand is said to be inelastic.

Diagrammatic representation Of Price Elasticity Of Demand:

Perfectly Inelastic
Elasticity = 0
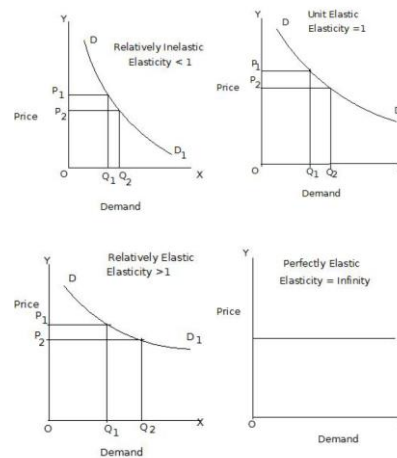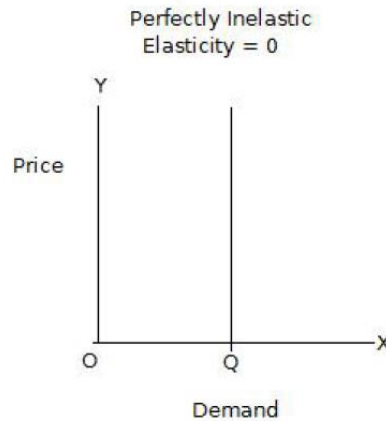
Cross Elasticity of Demand

A measure of the extent to which the demand for a good changes when the price of a substitute or complement changes, the other things are remaining the same is known as the cross elasticity of demand. An economic concept that measures the responsiveness in the quantity demand of one good when a change in price takes place in another good. The cross elasticity of demand can be calculated by using the following formula:

Cross elasticity of demand = $\dfrac{\text{Percentage change in quantity demanded of a good}}{\text{Percentage change in price of one of its substitutes or complements}}$

The cross elasticity of demand for a substitute it is positivewhereas for a complement it is negative.

The measure is calculated by taking the percentage change in the quantity demanded of one good divided by the percentage change in price of the substitute good as follows:

$$E_C = \frac{P_1^A + P_2^A}{Q_1^B + Q_2^B} \times \frac{\Delta Q^B}{\Delta P^A}$$

Where:

P_1^A = The price of good A at time period 1
P_2^A = The price of good A at time period 2
Q_1^B = The quantity demanded of good B at time period 1
Q_2^B = The quantity demanded of good B at time period 2
ΔQ^B = The change in the quantity demanded of good B
ΔP^A = The change in price of good A

In the concept of elasticity of demand is also useful is knowing the different market form.

• When the cross elasticity of demand is infinite, in that case there is perfect competition in the market.

• When the cross elasticity of demand is greater than one (or E_c >1), in that case, there is monopolistic competition or imperfect competition.

• When the cross elasticity of demand is less than 1 (or E_c < 1), in that case there is relative monopoly.

• When the cross elasticity is 0 (or E_c = 0) it is a case of absolute or pure monopoly.

Income Elasticity of Demand

A measure of the extent to that the demand for a good changes when the income changes, other things remaining the same is known as income elasticity of demand. In other words, a measure of the relationship between changes in the quantity demanded for a particular good and a change in real income. It is an economics term which refers to the sensitivity of the quantity demanded for a certain product in response to a change in consumer incomes.

The income elasticity of demand can be calculated by using the following formula:

$$\text{Income elasticity of demand} = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

• For a normal, the income elasticity of demand is positive.

• For an inferior good, the income elasticity of demand is less than 0.

• When the income elasticity of demand is greater than 1. Then the demand is income elastic.

• When the income elasticity of demand is between zero and 1. Then the demand is income inelastic.

Example:

When the quantity demanded for a good increases for 15% in response to a 10% increase in income, then the income elasticity of demand would be 15%/10% = 1.5 and the degree to that the quantity demanded for a good changes in response to a change in income depends on whether the good is a necessity or a luxury.

Methods of Measuring Price Elasticity of Demand:

There are 4 methods of measuring elasticity of demand they are the percentage method, arc method, point method and expenditure method.

(a) The Percentage Method:

The price elasticity of demand is measured by its coefficient (Ep). This coefficient (Ep) measures the percentage change in the quantity of a commodity demanded resulting from a given percentage change in its price. Thus

$$E_p = \frac{\% \text{ change in } q}{\% \text{ change in } p} = \frac{\Delta q / q}{\Delta p / p} = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

Where q refers to quantity demanded, p to price and A to change. If Ep> 1, demand is elastic. If Ep <1 demand is inelastic and if Ep =1, demand is unitary elastic. With this formula, we will compute price elasticities of demand on the basis of a demand schedule.

Demand Schedule

Combination	Price (Rs.) Per Kg. of X	Quantity Kgs. of X
A	6	0
B	5	10
C	4	20
D	3	30
E	2	40
F	1	50
G	0	60

Let us first take combinations B and D.

(i) Assume the price of commodity X falls from Rs. 5 per kg to Rs. 3 per kg and its quantity demanded increases from 10 kg to 30 kg. Then

$$E_p = \frac{\Delta q}{\Delta p} \times \frac{p}{q} = \frac{(30-10)}{(3-5)} \times \frac{5}{10} = \frac{20}{-2} \times \frac{5}{10} = -5 \text{ or } > 1.$$

This shows elastic demand or elasticity of demand greater than unitary.

Note:

The formula will be understood like this:

$\Delta q = q_2-q_1$ where q_2 is the new quantity (30 kg.) and q_2 the original quantity (10 kg.).

$\Delta P = p_2-p_1$ where p_2 is the new price (Rs.3) and p the original price (Rs. 5).

In the formula p refers to the original price (p_1) and q to original quantity (q_1). The opposite is the case in example:

(i) Below where Rs. 3 becomes the original price and 30 kg. as the original quantity.

(ii) Let us measure elasticity by moving in the reverse direction. Assume the price of X rises from Rs. 3 per kg. to Rs. 5 per kg and the quantity demanded decreases from 30 kg. to 10 kg. Then,

$$E_p = \frac{\Delta q}{\Delta p} \times \frac{p}{q} = \frac{(10-30)}{(5-3)} \times \frac{3}{30} = \frac{-20}{2} \times \frac{3}{30} = -1$$

This shows unitary elasticity of demand. Notice which the value of E_p in example:

(i) Differs from that in example

(ii) Depending upon the direction in that we move. This difference in the elasticities is due to the use of a different base in computing percentage changes in each case. Now consider combinations D and F.

(iii) Assume the price of commodity X falls from Rs. 3 per kg to Re. 1 per kg. and its quantity demanded increases from 30 kg. to 50 kg. Then

$$E_p = \frac{\Delta q}{\Delta p} \times \frac{p}{q} = \frac{(50-30)}{(1-3)} \times \frac{3}{30} = \frac{20}{2} \times \frac{3}{30} = -1$$

This is again unitary elasticity.

(iv) Take the reverse order while the price rises from Re. 1 per kg. to Rs. 3 per kg. And the quantity demanded decreases from 50 kg. to 30 kg. Then

$$E_p = \frac{\Delta q}{\Delta p} \times \frac{p}{q} = \frac{(30-50)}{3-1} \times \frac{1}{50} = \frac{-20}{2} \times \frac{1}{50} = -\frac{1}{5} < 1$$

This shows inelastic demand or less than unitary.

The value of E_p again differs in this example than that given in example (iii) for the reason stated above.

(b) The Point Method:

Professor Marshall devised a geometrical method for measuring elasticity at a point on the demand curve. Let RS be a straight line demand curve in figure. If the price falls from PB (= OA) to MD (= OC), the quantity demanded increases from OB to OD.

Elasticity at point P on the RS demand curve according to the formula is:

$E_P = \Delta q / \Delta p \times p/q$.

Where Δq represents change in quantity demanded Δp changes in price level when p and q are initial price and quantity levels.
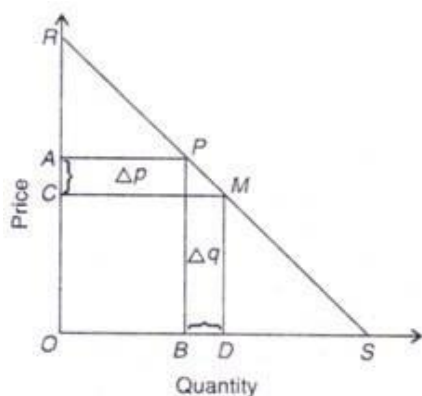
Fig. 2

From figure

$\Delta q = BD = QM$

$\Delta p = PQ$

$P = PB$

$q = OB$

By substituting these values in the elasticity formula:

$E_P = QM/PQ \times PB/OB$

$QM/PQ \times BS/PB$.

[<PQM=<PBS are similar Δs]

$BS/PB \times PB/OB = BS/OB$

Since Δ PBS and ΔROS are similar,

Ep at point p = BS/OB = OA/AR = PS/PR = Lower Segment/Upper Segment.

It is easy to point out elasticity at any point along a demand curve. Assume that the straight line demand curve DC in below figure is 6 centimeters. The five points L, M, N, P and Q are taken on this demand curve. The elasticity of demand at each point can be known by the above method. Consider the point N be in the middle of the demand curve. Thus, the elasticity of demand at point.

N = CN (Lower Segment) / ND (Upper Segment) = 3/3 = 1 (Unity)

Elasticity of demand at point:

M = CM/MD = 5/1 = 5 or > 1. It is greater than unity.

L = CL/LD = 6/0 = ∞ . It is infinity.

P = CP/PD = 1/5 = it is less than unity.

Q = CQ/QD = 0/6 = 0. It is zero.

We arrive at the conclusion at the mid-point on the demand curve the elasticity of demand is unity. Then moving up the demand curve from the mid-point, elasticity becomes greater. When the demand curve touches the Y- axis elasticity is infinity. The factor at any point below the mid point towards the X-axis will show elastic demand. The elasticity becomes zero when the demand curve touches the X -axis.

(c) The Arc method:

The measurement of elasticity at a point on a demand curve is carried in arc method. When the elasticity is measured between two points on the same demand curve, it is known as arc elasticity. Prof. Baumols states that the Arc elasticity is a measure of the average responsiveness to price change exhibited by a demand curve over some finite stretch of the curve.
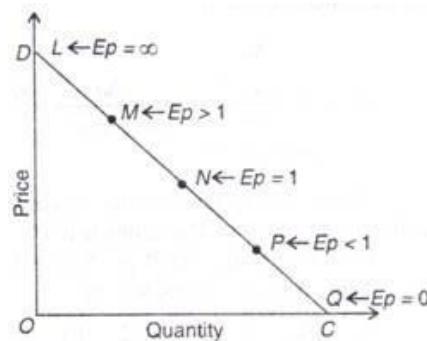
Thus, any two points on a demand curve make an arc. An area between P and M on the DD curve in figure is an arc that measures the elasticity over a certain range of price and quantities. At any two points of a demand curve the elasticity coefficients are likely to be different depending upon the method of computation. Let the price quantity combinations P and M is given in below table.

Demand Schedule:

Point	Price (Rs)	Quantity (Kg)

P	8	10
M	6	12

When we move from P to M, the elasticity of demand is,

EP = ΔQ/ΔP × p/q = (12 – 10) / (6-8) × 8/10 = 2/-2 × 8/10 = 4/5

When we move in the reverse direction from M to P, then

(10-20) / (6-8) × 6/12 = -2/2 × 6/12 = -1/2

Hence the point method of measuring elasticity at two points on a demand curve gives different elasticity coefficients because we use a different base in computing the percentage change in every case.
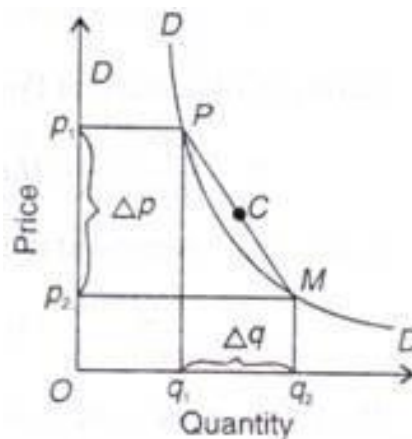
In order to avoid this discrepancy, elasticity for the arc is determined by taking the average of the two prices [(p₁ + p₂)1/2] and the average of the two quantities [(q₁ + q₂)1/2]. Then the formula for price elasticity of demand at the mid-point of the arc on the demand curve is,

$$E_p = \frac{\frac{\Delta q}{(q_1+q_2)^{1/2}}}{\frac{\Delta p}{(p_1+p_2)^{1/2}}} = \frac{\Delta q}{(q_1+q_2)^{1/2}} \times \frac{(p_1+p_2)^{1/2}}{\Delta p} = \frac{\Delta q}{\Delta p} \times \frac{p_1+p_2}{q_1+q_2}$$

On the basis of this formula, we will measure arc elasticity of demand when there is a movement either from point P to M or from M to P.

From P to M at point P, p_1 =8, q_1 = 10 and at point M, p_2 = 6, q_2 = 12.

Applying these values we get,

$E_P = \Delta q/\Delta p \times p_1 + p_2 / q_1 + q_2 = (12\text{-}10) / 8\text{-}6 \times (8 + 6) \times (10+12) = 2/\text{-}2 \times 14/22 = \text{-}7/11$

From M to P at point M, $P_1 = 6$, $q_1 = 12$ and at point, $p_2 = 8$, $q_2 = 10$.

Now we have $E_P = (10\text{-}12) / (8\text{-}6) \times (6+8)/12+10) = \text{-}2/2 \times 14/22 = \text{-}7/11$.

Thus whether we move from M to P or P to M on the arc PM of the DD curve, the formula for arc elasticity of demand gives the same numerical value. The closer the 2 points P and M are the more accurate is the measure of elasticity on the basis of this formula. If the two points which form the arc on the demand curve are so close which its almost merge into each other the numerical value of arc elasticity equals the numerical value of point elasticity.

(d) The Total Outlay Method:

Marshall stated that the total outlay or total revenue or total expenditure method as a measure of elasticity. In comparing the total expenditure of a purchaser each before and after the change in price it can be known whether it is demand for a good is elastic, unity or less elastic. It can be represented as:

Total Outlay = Price x Quantity Demanded.

It is explained with the help of the demand schedule in below table.

Table. 3 : Total Outlay Method

Price Rs. per Kg.	Quantity in Kgs.	TE in Rs	Ep
(1)	(2)	(1×2)=3	(4)
9	2	18	
8	3	24	>1
7	4	28	
6	5	30	
5	6	30	=1
4	7.5	30	
3	8	24	
2	9	18	<1
1	10	10	

(i) Elastic Demand:

The demand is elastic, while with the fall in price the total expenditure increases and with the rise in price the total expenditure decreases where above table shows that when the price falls from Rs. 10 to Rs. 9, the total expenditure increases from Rs. 19 to Rs. 25 and if the price rises from Rs. 8 to Rs. 9, the total expenditure falls from Rs. 29 to Rs. 23. Thus the demand is elastic (Ep>1) in this case.

(ii) Unitary Elastic Demand:

If there is a the fall or rise in price, the total expenditure remains unchanged, the elasticity of demand is unity which is shown in the table with the fall in price from Rs. 6 to Rs. 5 or with the rise in price from Rs. 4 to Rs. 5, the total expenditure remains unchanged at Rs. 30, i.e., Ep =1.

(iii) Less Elastic Demand:

The demand is less elastic if with the fall in price, the total expenditure falls and with the rise in price the total expenditure rises. If the price falls from Rs. 3 to Rs. 2, total expenditure falls from Rs. 24 to Rs 18 and while the price rises from Re. 1 to Rs. 2 and the total expenditure also rises from Rs. 10 to Rs. 18. Thus, the demand is inelastic or less elastic demand, Ep< 1.

Total Outlay Method

Price	TE	Ep
Falls	Rises ⎫	>1
Rises	Falls ⎭	
Falls	Unchanged ⎫	=1
Rises	Unchanged ⎭	
Falls	Falls ⎫	<1
Rises	Rises ⎭	

The measurement of elasticity of demand in terms of the total outlay method is explained in the figure which is divided into three stages by the relationship between price elasticity of demand and the total expenditure:
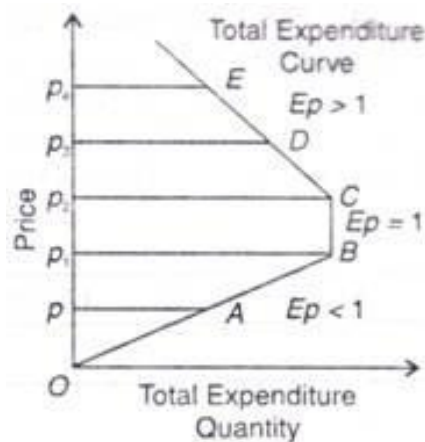
First, if the price falls from OP$_4$ to OP$_3$ and to OP$_2$ respectively then the total expenditure rises from P$_4$ E to P$_3$D and P$_2$C respectively whereas when the price in-creases from OP$_2$ to OP$_3$ and OP$_4$ the total expenditure decreases from P$_2$ C to P$_3$ D and P$_4$ E respectively.

Thus the EC segment of total expenditure curve shows elastic demand (E$_p$> 1).

secondly, if the price falls from OP$_2$ to OP$_1$ or rises from OP$_1$ to OP$_2$ the total expenditure equals, P$_2$ C = P$_1$B and the elasticity of demand is equal to the unity (E$_p$ =1).

Third , if the price falls from Op_1 to Op_2 the total expenditure also falls from P_1 B to PA. Thus with the rise in price from OP to Op_1 the total expenditure also increases from PA to P_1B and the elasticity of demand is less than unity ($E_p < 1$).

Factors Affecting Price Elasticity of Demand:

The elasticity of demand for any commodity is determined or influenced by a number of factors that are as follows:

(1) Nature of the Commodity

(2) Substitutes

(3) Variety of Uses

(4) Joint Demand

(5) Deferred Consumption

(6) Habits

(7) Income Groups

(8) Proportion of Income Spent

(9) Level of Prices

(10) Time Factor

(11) Brand

(12) Recurring Demand

(13) Distribution of Income

Significance of Price Elasticity of Demand

1. It allows the business in general and the monopolists in particular to fix the price.

2. It helps the Finance Minister to levy tax on goods.

3.It is very useful to fix the price of jointly supplied goods.

4. It is of greater significance in the sphere of international trade.

5. It guides the producers to fix wages for laborers.

6. The effect of machines on employment opportunities depends upon elasticity of demand for the goods produced by such machines.

7. It explains the paradox of poverty in the midst of plenty.

8. Incidence of tax lies on the person who ultimately pays the tax.

9. The knowledge of elasticity of demand is very important for the government in such matters as controlling of business cycles will remove inflationary and deflationary gaps in the economy.

10. Rate of exchange between two currencies can be changed through the devaluation or overvaluation of one currency in relation to other currencies.

11. The concept of elasticity of demand plays an important role by determining the price of joint products.

12.The concept of elasticity of demand is also useful in knowing the different market form.

13. The concept of elasticity of demand also plays a significant role in the international trade or in terms of trade.

14. This concept is significant in the determination of the prices of public utility services.

Degrees of Elasticity of Demand:

The different degrees of elasticity of demand with the help of curves are as follows:

(a) Infinite or Perfect Elasticity of Demand:

First, let us take one extreme case of elasticity of demand, where when it is infinite or perfect. The elasticity of demand is infinity when even a negligible fall in the price of the commodity will lead to an infinite extension in the demand for it. The below figure shows the horizontal straight line DD' which is infinite elasticity of demand. Though when the price remains the same, the demand goes on changing.

Infinite Elasticity
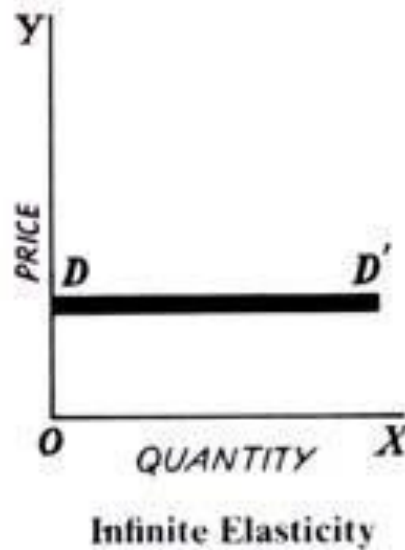
(b) Perfectly Inelastic Demand:

It means that the rise or fall in the price of the commodity in question, its demand remains absolutely unchanged. The another extreme limit is when demand is perfectly inelastic. In the below figure, the vertical line DD' shows a perfectly inelastic demand. In other words in this case elasticity of demand is zero. No amount of change in price induces a change in demand.

Zero Elasticity
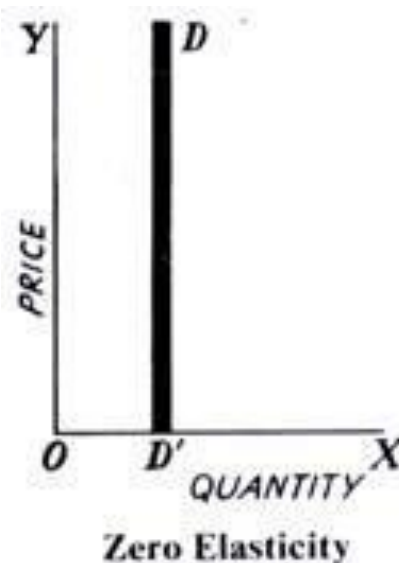
But in real world there is no commodity the demand for which might be absolutely inelastic that is, changes in its price will fail to bring about any change at all in the demand for it. Certain extension or contraction is bound to occur that is why economists say that elasticity of demand is a matter of

degree only. By same way there are few commodities in whose case the demand is perfectly elastic. Hence, in real life, the elasticity of demand of most goods and services lies between the two limits given above where infinity and zero. Some have highly elastic demand while others have less elastic demand.

(c) Very Elastic Demand:

The demand is said to be very elastic when even a small change in the price of a commodity leads to a considerable extension/con-traction of the amount demanded of it. The below Figure shows DD' curve represents such a demand. As a result of change of T in the price the quantity demanded extends/contracts by MM' which clearly is comparatively a large change in demand.

Very Elastic Demand
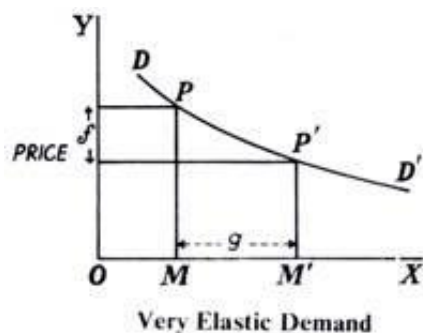
(d) Less Elastic Demand:

If there is even a substantial change in price brings only a small extension or contraction in demand it is said to be less elastic.the below figure DD' represents less elastic demand. The fall of NN' in price extends demand by MM' only which is very small.

Less Elastic Demand
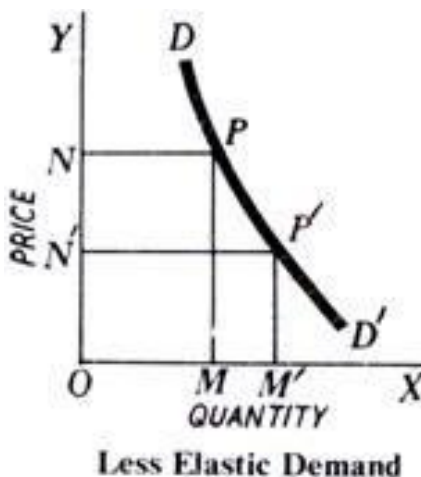
1.4.1 Demand forecasting and its Methods

Demand forecasting seeks to investigate and measure the forces that determine the sales for existing and new products. Generally companies plan their business – production or sales in anticipation of future demand. Thus, forecasting future demand becomes important. The art of successful business lies in avoiding or minimizing the risks involved as far as possible and face the uncertainties in the most befitting manner.

The steps to be followed are as follows:

• Identification of the objectives

• Nature of the product and market

• Determinants of the demand

• Analysis of the factors

• Choice of the technology

Testing the accuracy criteria to choose a method of forecasting are: as follows

• Plausibility

• Accuracy

• Flexibility

• Durability

• Availability

Need for demand forecasting

• Suitable purchase policy

• Appropriate production scheduling

• Setting realistic sales targets for salesmen

• Appropriate price policy

• Business planning

• Forecasting financial requirements

• Planning man-power requirements

• Financial planning

To select the appropriate forecasting technique, the manager or forecaster must accomplish the following:

1. Define the nature of forecasting problem.

2. Explain the nature of data under investigation.

3. Describe the capabilities and limitations of the potentially useful forecasting techniques.

4. Develop some predetermined criteria on which the selection decision can be made.

Methods of Forecasting:

Demand forecasting is the highly complicated process as it deals with the estimation of the future demand. It requires the assistance and opinion of experts in the field of sales management. Demand forecasting, to become more realistic should consider the two aspects in a balanced manner. Application of common sense is needed to follow the pragmatic approach in demand forecasting.

There are two methods of demand forecasting. They are as follows:

1) Statistical methods

2) Survey methods

METHODS OF DEMAND FORECASTING

SURVEY METHODS
1. Consumers interview Method
   a. Survey of buyers' intentions through questionnaire
   b. Direct Interview Method
      i. Complete Enumeration Method
      ii. Sample Survey Method
2. Collective Opinion Method
3. Expert Opinion method
4. End-Use Method

STATISTICAL METHODS
1. Trend projection method
2. Economic Indicators
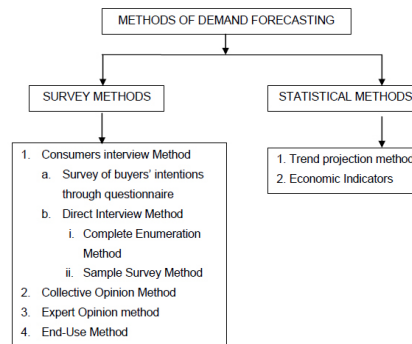
Methods of Demand Forecasting

1) Survey Methods:

Survey methods helps us in obtaining information about the future purchase plans of the potential buyers through collecting the opinions of the experts or by interviewing the consumers. These

methods are extensively used in short run and estimating the demand for new products. There are different approaches under survey methods. They are as follows:

1. Consumers interview method: Under this method, efforts are made to collect the relevant information directly from the consumers with regard to their future purchase plans. In order to gather information from the consumers, number of alternative techniques are developed from time to time. Among them, the following are some of the important ones.

a) Direct Interview Method:

Under this method, customers are directly contacted and interviewed. Direct and simple questions are asked to them.

i. Complete enumeration method:

Under this method, all the potential customers are interviewed in a particular city or a region.

ii. Sample survey method or the consumer panel method:

Under this method, different cross sections of customers that make up the bulk of the market are carefully chosen. Only such consumers selected from relevant market through some sampling method are interviewed or surveyed.

b) Survey of buyer's intentions or preferences:

Under this method, consumer-buyers are requested to indicate their preferences and willingness about particular products. They are asked to reveal their future purchase plans with respect to the specific items.

2. Collective opinion method or opinion survey method:

Under this method, professional experts, sales representatives and the market consultants and others are asked to express their considered opinions about the volume of sales expected in the future.

3. Delphi Method or Experts Opinion Method:

In this method, outside experts are appointed. They are supplied with all kinds of information and statistical data. The management requests the experts to express their considered opinions and views about the expected future sales of the company.

4. End Use or Input – Output Method:

In this method, sale of the product under consideration is projected on the basis of the demand surveys of industries using the given product as the intermediate product.

2) Statistical Method:

This is the second most popular method of demand forecasting. It is the best available technique and most commonly used method in recent years. In this method, statistical, mathematical models, equations etc are extensively used to estimate the future demand of the particular product. They are used for estimating the long term demand. They are highly complex and complicated in nature. Some of them require considerable mathematical background and competence.

1. Trend Projection Method:

An old firm operating in the market for a long period will have the accumulated previous data on production or sales pertaining to different years. If we arrange them in the chronological order, we get "time series". It is an ordered sequence of events over a period of time pertaining to certain variables. It shows the series of values of a dependent variable say, sales as it changes from one point of time to another.

In short, time series is a set of observations taken at specified time, generally at equal intervals. It depicts the historical pattern under normal conditions. It is not based on any particular theory as to what causes the variables to change but merely assumes that whatever forces contributed to change in the recent past will continue to have the same effect. On the basis of time series, it is possible to project the future sales of a company.

2. Economic Indicators:

In this method, few economic indicators become the basis for forecasting the sales of a company. An economic indicator indicates change in the magnitude of the economic variable. It gives the signal about the direction of change in the economic variable. This helps in decision making process of the company.

Production and Cost Analyses

(*The Learning objective of this Unit is to understand the concept of Production function, Input Output relationship, different Cost Concepts and Concept of Cost-Volume-Profit Analysis)

Production and Cost Analyses: Production function-Isoquants and Isocosts-Law of Variable proportions-Cobb-Douglas Production function-Economics of Sale-Cost Concepts-Opportunity Cost-Fixed vs Variable Costs-Explicit Costs vs Implicit Costs-Out of Pocket Costs vs Imputed Costs-Cost Volume Profit analysis-Determination of Break-Even Point (Simple Problem).

2.1 Production and Cost Analyses: Production function-Isoquants and Isocosts

The production function relates the result of a firm to the amount of inputs, typically capital and labor. In a general mathematical form, the production function is expressed as:

$Q = f(X_1, X_2, X_3, ..., X_n)$

Where, Q = quantity of output

$X_1, X_2, X_3, ..., X_n$ = quantities of factor inputs such as capital, labour, land or raw materials.

This general form does not encompass joint production which mean a production process which has multiple co-products or outputs.

Isoquants:

An isoquants is a curve that shows the combinations of certain inputs such as Labor (L) and Capital (K) that will produce a certain output Q also termed as equal quantity. Mathematically, the data that an isoquant projects is expressed by the equation

$f(K, L) = Q$

This equation basically represents that the output that this firm produces is a function of Labor and Capital. Here each isoquant represents a fixed output produced with different combinations of inputs. A new isoquant emerges for every level of output. Isoquants have certain properties that resemble that of indifference curves – convex to the origin, downward sloping and nonintersecting curves.
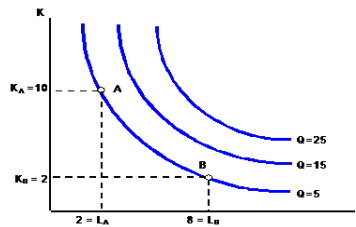
The Marginal Rate of Technical Substitution (MRTS) equals the absolute value of the slope. The MRTS explains us how much of one input a firm can sacrifice while still maintaining a certain output level.

It is also equal to the ratio of Marginal Productivity of Labor (MPL) and Marginal Productivity of Capital (MPK). The mathematical expression in which the Labor (L) can be substituted for Capital (K) in production is :

MRTS (L for K)= -dK/dL = MP_L/MP_K

For Example:

When going from point B to A in Figure above, the Slope = (8 units of Capital)/(-6 units of Labor). The MRTS (L for K) = -(8/-6) = 4/3 between points B and A, which means that 4 units of capital for 3 units of labor will be substituted.

Isocosts:

An isocost line is a total cost of production line which recognizes all combinations of two resources that a firm can use, given the Total Cost (TC) and it also termed as equal-cost line. Moving up or down the line represents the rate at which one input could be substituted for another in the input market. The total cost of production can be given as,

TC = (WL) + (RK)

TC= Total Cost, W= Wage, L= Labor, R= Cost of Capital, K= Capital

Example:

A company producing widgets encounters the following costs where the cost of capital is $25000, the labor cost is $15000 and the total cost the firm is willing to pay is $150,000. Show the isocost line graphically.
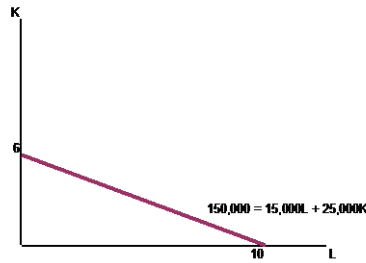
TC = (WL) + (RK)

150,000= (15000)L + (25000)K

Setting L=0,

we shall find the y-intercept to be K=6. Setting K=0, we find the x-intercept to be 10.

2.1.1 Law of Variable proportions

When one factor is constant and the other variable is explained in terms of the isoquant analysis gives the behaviour of the law of variable proportions or of the short-run production function. The capital is a fixed factor and labour is a variable factor. In Figure, OA and OB are the ridge lines and it is in between them that economically feasible units of labour and capital can be employed to produce 100, 200, 300, 400 and 500 units of output.

Fig. 24.10
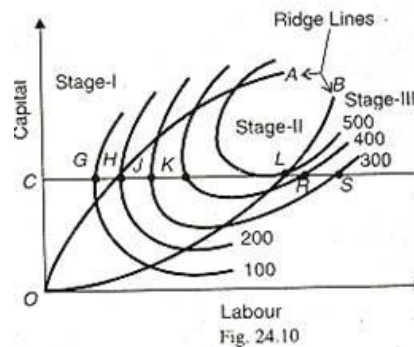
It implies that in these parts of the isoquants, the marginal product of labour and capital is positive. On the opposite hand, wherever these ridge lines cut the isoquants, the marginal product of the inputs is zero. for example, at purpose H the marginal product of capital is zero and at purpose L the marginal product of labour is zero. The portion of the isoquant that lies outside the ridge lines, the marginal product of that issue is negative. For example, the marginal product of capital is negative at G which of labour at R.

The law of variable proportions says that, given the technique of production, the application of material and a lot of units of a variable issue and to a fixed factor such as, labour ,capital will wait

until a certain point is reached, yield more than proportional will increases in output and similarly also less than proportional will increases in output.

Since the law refers to increases in output, it relates to the marginal product. To explain the law, capital is taken as a fixed factor and labour as a variable issue. The isoquants show various levels of output with in the figure. OC is the fixed quantity of capital which therefore forms a horizontal line CD. Along C to D towards the right on this line, the different points show the effects of the combinations of successively increasing quantities of the labour with fixed amount of capital OC.

To begin with, as we have a tendency to move from C to G to H, it shows the primary stage of accelerating marginal returns of the law of variable proportions. once CG labour is utilized with OC capital, output is one hundred. to provide two hundred units of output, labour is multiplied by GH whereas the number of capital is fastened at OC.

The output has doubled but the number of labour employed has not increased proportionately. This observes that GH < CG, which means that smaller additions to the labour force have led to equal increment in output. Hence, C to H is the first stage of the law of variable proportions in which the marginal product will increases because output per unit of labour increases a lot of output is produced.

The second stage of the law of variable proportions is that the portion of the isoquants which lies in between the 2 ridge lines O A and OB. This is a stage of diminishing marginal returns between points H and L. As a lot of labour is employed, output increases less than proportionately to the increase in the labour employed. To raise output to 300 units from two hundred units, HJ labour is employed. Further, JK quantity of labour is required to raise output from 300 to 400 and KL of labour to raise output from 400 to 500.

So, to increase output by 100 units successively,a lot of and more units of the variable issue (labour) are required to be applied along with the fixed factor (capital) , that is KL>JK>HJ. It implies that the marginal product of labour continues to decline with the employment of larger quantities to it. Thus as we move from point H to K, the effect of increasing the units of labour is that output per unit of labour diminishes as more output is produced. This is known as the stage of diminishing returns.

We are outside the lower ridge line OB and enter the third stage of the law of variable proportions. In this region which lies beyond the ridge line OB there is too much of the variable factor (labour) in relation to the fixed factor (capital).The labour is thus being overworked and its marginal product is negative. In other words when the quantity of labour is increased by LR and RS, the output declines from 500 to 400 and to 300. This is the stage of negative marginal returns.

We hit the conclusion that a firm can provide profit solely within the second stage of the law of variable proportions for it'll be uneconomical to provide within the regions to the left or right of the ridge lines that kind the primary stage and therefore the third stage of the law .

2.1.2 Cobb-Douglas Production function

The Cobb-Douglas production function is a particular form of the production function. This is widely used because it has many attractive characteristics.

The basic form of the Cobb-Douglas production function is :

$Q(L,K) = A\ L^{\beta}\ K^{\alpha}$

Where, Q -is the quantity of products

A- is a positive constant

L -is the quantity of labor

α and β are constants between 0 and 1

K -is the quantity of capital
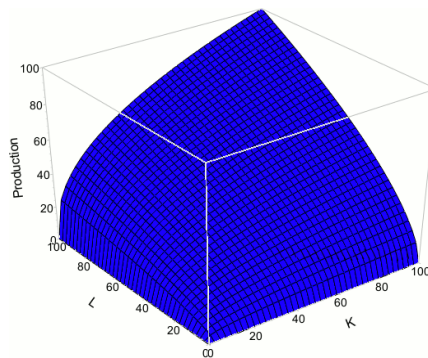
Marginal Product

It is the change in total production, when there is an infinitesimal change in the inputs. Marginal product is the first derivative of the production function with respect to an input.

$\partial Q/\partial L$

If taken as Cobb-Douglas production function will be:

$\partial Q/\partial L = A\beta\ L^{(\beta-1)}\ K^{\alpha}$

We can see that if L or K increases, the total output will increase, where the marginal product is positive. In the following plots, the marginal product is decreasing.
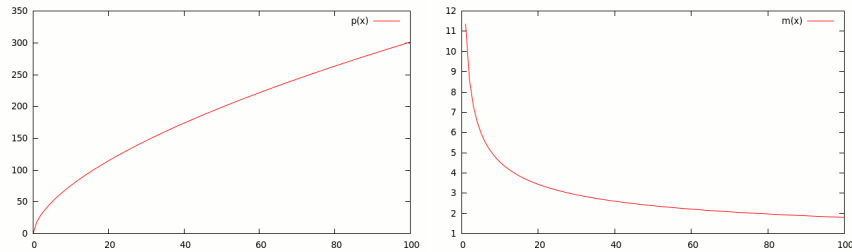
Output Elasticity

It is defined as the percentage change in output in response to a change in levels of either labor or capital. It is represented as,

$$(\partial Q/Q) / (\partial L/L) = (\partial Q/\partial L) / (Q/L)$$

If output elasticity is greater than 1, the production function is elastic and vice versa. The output elasticity can be measured easily in the case of the Cobb-Douglas production function:

$$(\partial Q/Q) / (\partial L/L) = (\partial Q/\partial L) / (Q/L)$$

$$= [A\beta L^{(\beta-1)} K\alpha] / [A L^{\beta} K^{\alpha} / L]$$

$$= [A\beta L^{(\beta-1)} K^{\alpha}] / [A L^{(\beta-1)} K^{\alpha}]$$

$$= \beta$$

The output elasticity with respect to the labor is constant and equal to β. If β is 0.2 and labor increases in 10%, output will increase 2%. The α and β are output elasticities of capital and labor and are constant.

Production Optimization

Benefits

1. An accurate forecast of future cash flows and associated risks.

2. Cost savings by avoiding unnecessary attention to the areas which are non-critical and improved focus on areas of higher value.

3. Discovery of enhancement opportunities is done during the conceptual and design phase, but not later in the project's life-cycle, when the cost of change is considerably higher.

4. Systematic identification of key technological risks for a specific concept and setting of priorities for qualification, further technology development and testing in order to reduce and manage these risks.

5. Improved insight into technical and managerial issues that may cause critical failures and production losses.

6. A road map on how to improve production capacities and production availability based on risk and cost benefit assessments. Important parameters includes:

a. Production capacity profiles.

b. Demand profiles and product prices.

c. Physical asset layout and design.

d. Equipment reliability performance.

e. Maintenance and repair activities including spare part strategies.

f. Operation and mobilisation activities.

Managerial uses of production function:

1) To find the most profitable rate of operation of the firm.

2) To determine the optimum quantity of output to be produced and supplied.

3) To determine in advance the cost of business operations.

4) To locate weak points in production management to minimize costs.

5) To fix the price of the product.

6) To decide what sales channel to use.

7) To have a clear understanding of alternative plans and the right costs involved in them.

8) To have clarity about the various cost concepts.

9) To decide and determine the very existence of a firm in the production field.

10) To regulate the number of firms engaged in production.

11) To decide about the method of cost estimation or calculations.

12) To find out decision making costs by reclassifications of elements, reprising of input factors etc, so as to fit the relevant costs into management planning, choice etc.

2.2 Economies of Scale-Cost Concepts

Economies of Scale: v

Economies of scale are the reduction in the per unit cost of production as the volume of production increases. Also, the cost per unit of production decreases as volume of product increases.
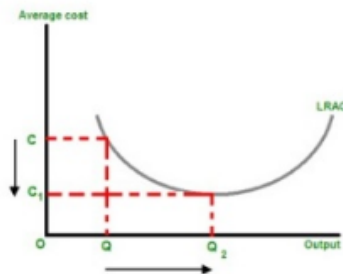
Economies of Scale

It is defined as the cost advantages that a firm obtains due to expansion whereas diseconomies is the opposite. v

A new firm might sell only Q_2 and face higher average costs than the incumbent. This means that if the monopoly keeps price lower than profit maximization it can also discourage new firms entering.

Economies of scale is the cost advantage that arises with increased output of a product. This arises due to the inverse relationship between the quantity produced and per-unit fixed costs. That is, if greater the quantity of a good is produced, then lower the per-unit fixed cost will be because these costs are spread out over a larger number of goods. This also reduce variable costs per unit because of operational efficiencies and synergies.

Example:

Assume a small business say printing a marketing brochure where the printer quotes a price of $5,000 for 500 brochures and $10,000 for 2,500 copies. While 500 brochures will cost you $10 per brochure, 2,500 will only cost you $4 per brochure. So, the printer is passing to the part of the cost advantage of printing a larger number of brochures . Hence, this cost advantage arises due to the printer has the same initial set-up cost regardless of whether the number of brochures printed is 500 or 2,500. When these costs are covered, then there is only a marginal extra cost for printing each additional brochure.Thus, it can arise in several areas within a large enterprise whereas the

benefits of this concept in areas such as production and purchasing are obvious and it can also impact areas like finance.

Economies of scale can be classified into two main types:

• **Internal** which arises within the company

• **External** which arises from extraneous factors such as industry size.

Diseconomies:

The largest companies often have a lower cost of capital than small firms because they can borrow at lower interest rates. therefore, it is often cited as a major rationale when two companies announce a merger or takeover.But, there is a finite upper limit where if it is large an organization will be able grow in order to achieve economies of scale. Once reaching a certain size, it becomes increasingly very expensive for managing a huge organization for a number of reasons, including its bureaucratic nature, complexityand operating inefficiencies. This undesirable phenomenon is referred to as "diseconomies of scale".

1. Internal Economies:

It is a condition which brings about a decrease in the LRAC of the firm because of the changes that happening within the firm.

E.g. As a company's scope increases, it is must to distribute its goods and services in progressively more dispersed areas. This can actually increase average costs resulting in diseconomies of scale.

2. External Economies:

It is a condition which brings about a decrease in LRAC of the firm because of changes happening outside the firm.

E.g. Taxation policies of Government.

Cost Concept: v

It is used for analyzing the cost of a project in short and long run.

Types of Cost: v

• Total fixed costs (TFC) v

• Average fixed costs (AFC) v

• Total variable costs (TVC) v

• Average variable cost (AVC) v

• Total cost (TC) v

• Average total cost (ATC) v

• Marginal cost (MC)

Fixed Costs(FC)

They are costs that do not change per unit of output. The only way to avoid these payments is to go out of business. This is not considered in making a short-run operating decision, but considered in making long-run, entry or exit decisions. It denotes the costs which do not vary with the level of production. It is independent of output. In other words, even if no crops are grown on a piece of land, the bank will insist on a mortgage payment from the farmer even if no output is produced by a corporation, its bondholders will legally insist on payments of interest.

Eg: Depreciation, Interest Rate, Rent, Taxes.

TFC: All costs associated with the fixed input.

AFC (Average fixed cost per unit of output):

AFC = TFC /Output

Variable Costs(VC)

It is said to be the rest of total cost, the part which varies as you produce more or less. This depends on output. Variable cost is the sum of marginal costs . This is the total expenditure on all variable factors of production. It is also known as operating cost . For instance, when the marginal cost of producing the first unit of output is 10, and the marginal cost of the second item of output is 20, then the variable cost of producing two items is 30.All costs associated with the variable input. v

Eg: Increase of output with labour,materials and energy.

AVC (Average variable cost- cost per unit of output):

It the total variable cost divided by the output.

AVC = TVC/ Output

Total costs(TC)

It is the sum of total fixed costs and total variable costs. It is represented as,

TC = TFC + TVC

ATC (Average Total Cost Average total cost per unit of output): It is represented as,

ATC =AFC + AVC ATC = TC/ Output

Marginal cost

This is the extra cost of one more item of output or the change in total cost divided by change in output . The additional cost incurred from producing an additional unit of output

Marginal cost is the type of cost to consider in short-run output decisions .The firm is in short-run equilibrium .

1. If MC > P, decrease output.

2. If MC < P, increase output.

3. If MC = P, leave output unchanged.

It is represented as,

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

MC = Δ TC Δ Output

MC = Δ TVC Δ Output

Average Cost

Average cost is total cost per unit of output, or it plays a major role in long-run, entry and exit decisions.

1. If AC < P, the industry is profitable. ENTER

2. If AC > P, the industry is unprofitable. EXIT

3. If AC = P, the industry yields zero profit. That is it remain at same placewhere firms neither enter nor exit the industry, so this zero profit condition is characteristic of industry equilibrium .

It is represented as,

AC = TC/Q

when costs are calculated to include opportunity costs . The firms always have the option of auctioning off their factory and machinery and putting their money in the bank or government bonds. Once if they decide to stay in business, they are incurring an opportunity cost which is equal to the interest they could have earned on a bank deposit or on bonds.

Economic Cost = Accounting Cost + Opportunity Cost

Economic Profit = Revenue - Accounting Cost - Opportunity Cost

Typical Total Cost Curves v

Typical total cost curves.
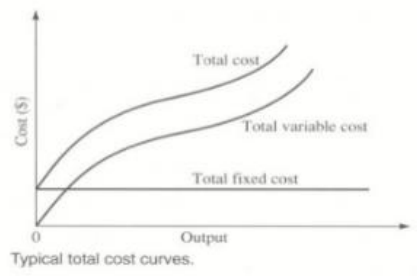
TVC,TC is always increasing.

Typical Average & Marginal Cost Curves
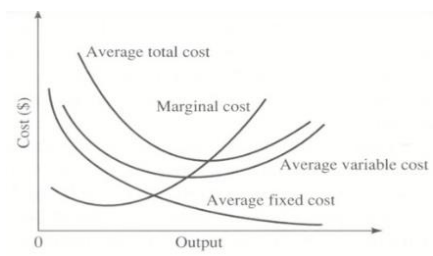
Production Rules for the Short-Run

• When expected selling price < minimum ATC but > minimum AVC: (which implies TR > TVC but < TC). Minimize loss by producing where MR = MC.The loss will be between 0 and TFC.

• When expected selling price < minimum AVC (which implies TR < TVC): Minimize loss by not producing. The loss will be equal to TFC.

• When expected selling price > minimum ATC (which implies TR > TC): Maximize profit by producing where: MR = MC.
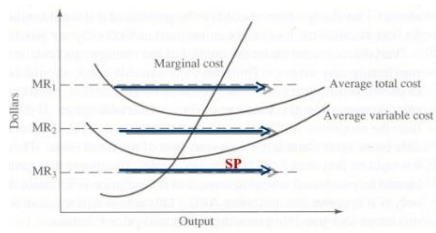
Short Run Production Decisions

Long Run Costs Curve:
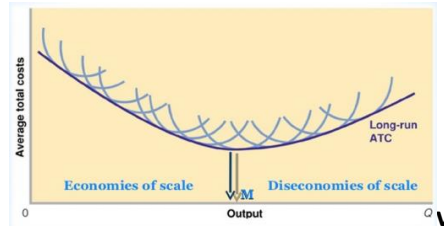
All costs are variable in the long run. There is only AVC in LR, since all factors are variable. This is also called as Planning Curve or Envelope or scale curve.

Production Rules for the Long-Run

• When selling price < ATC (or TR < TC):Sell the fixed assets to eliminate fixed costs. Reinvest money is a more profitable alternative.

• When selling price > ATC (or TR > TC): Maximize profit by producing where MR = MC.

Cost Determinants

The cost of production of goods and services depends on many input factors which is used by the organization and it differs from firm to firm. So the determinants are as follows:

1. Level of output:

If the size of production is large then the cost of production will also be more. The cost of production varies according to the quantum of output.

2. Productivities of factors of production:

If the productivity of the input factors is high then the cost of production will fall.

3. Price of input factors:

When there is a rise in the cost of input factors will increase the total cost of production.

4. Size of plant:

It will be low in large plants due to mass production with mechanization.

5. Lot size:

When the size of production is larger per batch then the cost of production will come down because the organizations enjoy economies of scale.

6. Output stability:

The overall cost of production is low if the output is stable over a period of time.

7. Laws of returns:

The cost of production will increase when the law of diminishing returns applies in the firm.

8. Time period:

During long run cost of production will be stable.

9. Levels of capacity utilization:

When the capacity utilization is higher, lower the cost of production.

10. Technology:

If the organization follows advanced technology in their process then the cost of production will be low.

2.2.1 Opportunity Cost

Since the resources of any firm operating in the market are limited and the investment options are many. Therefore the firm has to decide or select only those investment opportunities or options which will provide the firm with the best return or best income on investment. It means that if a firm can invest money or resources only in one investment option then the firm will select the investment option which will promise the best return on investment to the firm.

In same way, the firm gives up or rejects the next best option for investing the funds. Thus, the opportunity cost of a company is income or return which the firm could have earned on the next best investment alternative.

Example:

Let us assume that an individual has two job offers in hand. One job offer is ensure a salary of Rs. 40,000 per month whereas the other job offer ensures a salary of Rs. 35,000 per month. When the job profile and other factors related to the job offers are more or less same then it can be easily expected that the individual will select the job offer that will provide him with higher salary that is salary of Rs. 50,000 per month. In this case, the opportunity cost is the return involved in the next best alternative i.e. Salary of Rs. 35,000 in the next best job offer.

This is closely related to the concept of Economic profit or Economic Rent. The firm earns or makes economic profit besides covering different costs of operation, a firm is also able to earn more than its opportunity cost. This is also termed as Implicit Cost.

The economic profit is earned only when following is true:

Income of a Firm > Various Costs of Operations + Opportunity Cost

or

Economic Profit = Earnings or Revenue of Firm - Economic Costs.

Where the economic cost is various expenses of the business plus the opportunity cost.

Methods of Costing

Every industries follow different methods in order to establish the cost of their product. It differs by the nature and specifics of each business. It has different principles and procedures for performing the costing. But, the basic principles and procedures of costing remain the same. Some of the methods are mentioned below:

• **Job costing**

• **Batch costing**

• **Unit costing**

• **Process costing**

• **Contract costing**

• **Operating costing**

• **Uniform costing**

• **Multiple costing**

Different Methods of Costing

Job costing:

This method of costing is the costs are ascertained for each work order separately as each job has its own specifications and scope. They are used in car repair, painting, decoration and building repair.

Batch costing:

It is used where units produced in a batch are uniform in nature and design. In this costing, each batch is treated as an individual job or separate unit. The industries like bakeries and pharmaceuticals usually use this method of costing.

Process costing:

It is used for products which go through different processes like the manufacturing of clothes that involves many processes. Here, the first process is spinning. Then the output of that spinning process, yarn, is a finished product that can either be sold on the market to weavers or used as a raw material for a weaving process in the same manufacturing unit. For finding out the cost of the yarn, the cost of the spinning process should be determined.

Then the output of the weaving process, cloth, can also be sold as a finished product in the market. Such case, the cost of cloth needs to be evaluated. Third process is converting the cloth to a finished product say a shirt or pair of trousers. So, every process that can result in either a finished good or a raw material for the next process should be evaluated separately. The multi-process industries, the process costing is used to ascertain the cost at each stage of production.

Unit costing:

It is also called as "single output costing." They are used for products which can be expressed in identical quantitative units. It is suitable for products that are manufactured by continuous manufacturing activity such as brick making, cement manufacturing, mining, flour mills or flour mills dairy operations. These costs are ascertained for convenient units of output.

Contract costing:

This is performed for the big jobs involving a heavy expenditure, long periods of time and often different work sites. Every contract is treated as a separate unit for costing. It is also known as terminal costing. The projects requiring contract costing includes construction of roads, bridges and buildings.

Operating costing or service costing:

This is used to ascertain the cost of particular service-oriented units, such as in nursing homes, buses or railways. Every service is treated as a separate unit in operating costing. In nursing home, a unit is treated as the cost of a bed per day, whereas for buses, the operating cost for a kilometer is treated as a unit.

Uniform costing:

It is not a separate method of costing, but rather a system in which a number of firms in the same industry which use the same method of costing, using the agreed-on principles and standard accounting practices which helps in setting the price of the product and in inter-firm comparisons.

Multiple costing or composite costing:

If the output is comprised of many assembled parts or components like with television, motor cars or electronics gadgets, the costs have to be ascertained for each component, as well as with the finished product. In this case, the costing may involve different methods of costing for different components. Thus, this type of costing is called as composite costing or multiple costing.

2.2.2 Fixed vs Variable Costs

Fixed Cost

This is a cost, which does not vary in the short term, irrespective of changes in production or sales levels or other measures of activity. It is a basic operating expense of a business which cannot be avoided, such as a rent payment. This concept is used in financial analysis to find the breakeven point of a business, as well as to find product pricing.

Another example is that the rent on a building will not change until the lease runs out or is re-negotiated, irrespective of the level of business activity within that building. Other examples are depreciation, insurance and property taxes. This tends to be incurred on a regular basis and they are considered periodic costs and amount charged to expense tends to change little from period to period.

If a company has a large fixed cost component, this should generate a significant amount of sales volume in order to have sufficient contribution margin to offset the fixed cost. After that sales level has been reached, this type of business generally has a relatively low variable cost per unit and they can generate out sized profits above the breakeven level. This is used an oil refinery, which has

massive fixed costs related to its refining capability. When the cost of a barrel of oil drops below a certain amount, the refinery loses money. But, the refinery can be wildly profitable if the price of oil increases beyond a certain amount. Likewise, if a company has low fixed costs, it probably has a high variable cost per unit. Such case, a business can earn a profit at very low volume levels, but does not earn out sized profits as sales increase. Example, a consulting business has few fixed costs, while most of its labor costs are variable.

They are allocated under the absorption basis of cost accounting. This arrangement, fixed manufacturing overhead costs are proportionally assigned to the units which produce in a reporting period and so are recorded as assets. After the units are sold, the costs are charged to the cost of goods sold. Therefore, there can be a delay in the recognition of those fixed costs that are allocated to inventory.

Variable Cost

This is a cost that varies in relation to changes in the volume of activity. This variable cost concept can be used to model the future financial performance of a business, as well as to set minimum price points.

In direct materials, the cost of materials are charged to expense when their associated products are sold. In billable labor, wages associated with billable hours are charged to expense when their associated sales transactions are completed. In commissions, since the sales staff earns commissions when the sales transactions are completed. In credit card fees, where a fee is not incurred unless a customer uses a credit card to pay for a purchase. In piece rate labor, where employees are paid based on the number of units produced.

In direct labor might not be a variable cost if labor is not added to or subtracted from the production process as production volumes change. In such situation, this arises when a production line should be staffed, irrespective of the amount of production volume. An overhead is not a variable cost, since overhead costs will be incurred, irrespective of production levels. For instance, both the rent and machine depreciation, which are overhead costs, will be incurred even if there is no production activity. Thus company with a high proportion of variable costs can usually generate a profit at a relatively low sales level because there are few fixed costs that should also be paid for in each accounting period.

2.2.3 Explicit Costs vs Implicit Costs

Explicit Costs: They are paid directly in money - money costs. A firm incurs explicit costs when it pays for a factor of production at the same time it uses it. This is represented as,

Explicit Cost = The payments by a firm to purchase the service of productive resources (wages, interest, rent, capital)

A cost that is diagrammatic by lost chance within the use of a company's own resources, excluding money. The implicit price for a firm are often thought of because the cost associated with

enterprise a precise project or call, like the loss of interest financial gain on funds or depreciation of machinery used for a capital project.

Implicit Costs:

It is measured in units of money, but are not paid for directly in money. The costs of non purchased inputs, to which a cash value should be imputed because the inputs are not purchased in a market transaction. Business firm will incur implicit costs when it uses capital, inventories or owner's resources. This is represented as,

Implicit Costs = Opportunity costs associated with a firm's use of resources that it owns (wages foregone by owner, interest rates loss through purchases)

It can also be thought of as intangible prices that aren't simply accounted for. For instance, the time and energy that associate degree owner puts into the upkeep of the corporate, instead of engaged on enlargement, are often viewed as associate degree implicit price of running the business. In finance choices, implicit prices should be thought of once coming back to a call on a way to allot resources.

Economic Cost: The monetary value of all inputs which are used in a particular activity or enterprise over a given period. It reflects the opportunity cost of resources.

Accounting Costs: It measures the explicit costs of operating a business . That is, the results from purchases of input services.

Economic Profit:

It is the difference between the total revenue and the cost of all inputs used by a firm over a given period. It is the TR - OC. The OC are the explicit and implicit costs of the best alternative actions.

2.2.4 Out of Pocket Costs vs Imputed Costs

Out of Pocket Costs

The out-of-pocket costs are actual expenses we incur. If we buy land for $100,000 and lose the opportunity to buy discounted machinery we will require to buy later at a price that will be $50,000 higher, our out-of-pocket costs on the land purchase is $100,000.

The out-of-pocket costs do not include any future repairs, improvements, depreciation, lawsuits or other expenses associated with our purchase. If we buy something on credit, the interest on the money we borrowed to create the purchase can be considered an out-of-pocket cost over the life of the loan.

Imputed Costs

Imputed or Notional cost - CIMA defines notional cost as "the value of benefits where no actual cost is incurred". Hence, imputed cost is that cost which does not involve any cash outlay. Though it is a

hypothetical cost, it is relevant for decision making. The interest on capital, the payment for which is not actually made, is an example of imputed cost.

Also, it can be defined as, a cost that is incurred by virtue of using an asset instead of investing it or undertaking an alternative course of action. Thus, it is an invisible cost that is not incurred directly, as opposed to an explicit cost, which is incurred directly.

2.3 Cost Volume Profit analysis-Determination of Break-Even Point (Simple Problem)

Cost-Volume-Profit Analysis

CVP Analysis is a way to for answering about the profitability of a company's products or services. This can be used with either a product or service. Examples will usually involve businesses which includes service businesses such as health care, accounting, barbers & beauty shops, auto repair, etc. that produce products, because they are often more complex situations.

It mainly involves of three elements:

Cost: It is the cost of making the product or providing a service.

Volume : It is the number of units of products produced or hours/units of service delivered.

Profit: It is the selling Price of product/service - Cost to make product/provide service = Operating Profit.

The cost and volume are the information available to business managers, about their own business, products and services. This information is not generally available to those outside the business. Hence, they constitute important operating information which can help the managers to plan for the future, assess the past performanceand monitor current progress. The profit, can't stay in business very long without profits.It is important to know whether the company is profitable as a whole. Also, it is important to know if a particular product is profitable.

CVP Relationships

Cost: It consists of product cost, labor,consisting of materials, overhead, etc.

Volume: It consists of number of units of product sold in a given period of time.

Profit: It consists of selling price minus cost, per unit or in total.

The greater the volume, the greater the TOTAL profit.

For example, a business that sells 100 or more different products may lose sight of a single product. When that product becomes unprofitable, the company will lose money on each and every sale of that product. Then, the company might raise the selling price, cut production costs or discontinue the product entirely. By building a business with 100 products we know which are profitable is good management. The CVP & variable costing provide the tools to make this happen in a real business.

Therefore a successful business can be built around a single profitable product. This can also be built around a hundreds or thousands of profitable products. Most of the businesses start small and grow over time, by adding products as they gain experience and are able to identify or develop new markets and products. It does not matter the size of the business or the number of products, the same rules apply. So, each product should carry its own weight for the business which needs to be profitable.

By using CVP Analysis we can be able to analyze a single product, a group of products, or evaluate the entire business as a whole. Thus, the ability to work across the entire product line in this way will give us a powerful tool to analyze financial information. This provides us with day-to-day techniques that are easy to understand and easy to use. This concepts is parallel in the real world, so they are easy to visualize and use. The math is very simple where there isno complex formulae or techniques only simple formulae which can be easily modified to analyze a large variety of situations.

2.3.1 Determination of Break-Even Point

Break-even analysis is to find the point at which revenue received equals the costs associated with receiving the revenue. It calculates a margin of safety, the amount that revenues exceed the break-even point. It is the amount that revenues can fall while still staying above the break-even point.

Assumptions:

• All the costs are classified as either fixed or variable. Dividing the costs into the variable and fixed cost elements is an extremely difficult job. It is attributable to the inherent nature or characteristics of the cost perse.

• The behavior of total revenues and total costs will be linear over the relevant range, that is it will appear as a straight line on the BE chart.

• The fixed costs remain constant within the relevant range and also remain unchanged at any level of activity within the relevant range, even at the zero level. Hence, drawn as a straight horizontal line on the graph within the relevant range and that selling price is constant.

• The behavior of total revenues and total costs will be linear over the relevant range, that is it will appear as a straight line on the BE chart.

• The selling prices, costs and proportion of units sold will not change. Selling prices of the individual products may change due to popularity , competition and salability of the products and so on.

• It has no significant change in the inventory levels during the period under review.

The Break-Even Chart

The break-even chart is a graphical representation of costs at different levels of activity shown below as the variation of income , sales or revenue with the same variation in activity. Thus, the point at which neither profit nor loss is made is known as the "break-even point" . It is represented on the chart below by the intersection of the two lines:
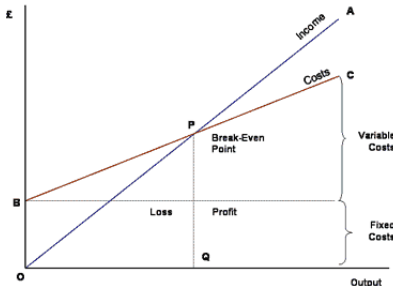
The line OA represents the variation of income at varying levels of production activity and OB represents the total fixed costs in the business. While the output increases, even the variable costs are incurred, the meaning that total costs (fixed + variable) also increase. During low levels of output, the costs are greater than Income. During the point of intersection, P, the costs are exactly equal to income and hence neither profit nor loss is made.

Managerial Uses of Break-Even Analysis:

The utility of the break-even analysis lies in the fact which it presents a microscopic picture of the profit structure of a business enterprise. It not only highlights the area of economic strength and weakness in the firm but also sharpens the focus on certain leverages that can be operated upon to enhance its profitability. This guides the management for taking effective decision in the context of changes in government policies of taxation and subsidies.

Purposes for break even analysis:

(i) Safety Margin:

It supports the management to know at a glance the profits generated at the various levels of sales. This is defined as the extent to which the firm can afford a decline before it starts incurring losses. The formula to determine is:

Safety Margin= (Sales – BEP)/ Sales x 100

(ii) Target Profit:

This can be utilized for the purpose of calculating the volume of sales that is necessary in order to achieve a target profit. If a firm has some target profit, this analysis will help in finding out the extent of increase in sales . The formula to determine is:

Target Sales Volume = Fixed Cost + Target Profit / Contribution Margin per unit

(iii) Change In Price:

There is always a problem of whether to decrease prices or not. So, before taking a decision on this question, the management will have to consider a profit. The reduction in price leads to a reduction in the contribution margin which means that the volume of sales will have to be increased even to maintain the existing levels of profit. Thus, higher the reduction in the contribution margin, the higher is the increase in sales required inorder to ensure the previous profit.

Introduction to Markets, Theories of the Firm & Pricing Policies

(*The Learning Objective of this Unit is t understand the Nature of Competition, Characteristics of Pricing in the different market structure and significance of various pricing methods).

Introduction to Markets, Theories of the Firm & Pricing Policies: Market Structures: Perfect Competition, Monopoly and Monopolistic and Oligopoly – Features – Price, Output Determination – Managerial Theories of firm: Maris and Williamson's models – Methods of Pricing: Limit Pricing, Market Skimming Pricing, Internet Pricing: Flat Rate Pricing, Usage sensitive, Transaction based pricing, Priority Pricing.

3.1 Market Structures: Perfect Competition, Monopoly and Monopolistic and Oligopoly

The economists is generally recognized in four major types of market structures :

• **Perfect Competition**

• **Monopoly**

• **Monopolistic competition**

• **Oligopoly**

Perfect Competition

In perfect Competition where "p" stands for perfect, pure or price.

A p-competitive structure is defined by four characteristics. For an industry to have a p competitive structure, it should have all 4 of these characteristics, which are as follows:

• Many buyers and sellers

• A homogeneous product

• Sufficient knowledge

• Free entry These all are characteristics that favor price competition.

Many Buyers and Sellers

The idea is that the sellers and buyers are small relative to the size of the market, thus no one of them can fix the price. When there is large group of small sellers, it creates an environment where it is harder for any seller or group of sellers to rig the price. In same way, when there is large group of small buyers then there is little opportunity for buyers to rig the price in their own favor.

Homogeneity

If the product of one seller is varied significantly from one to another seller, then each seller would probably be able to retain at least some of the customers, even at a very high price. This would be the customers who just prefer this seller's product to that of someone else. The assumption of the homogeneous products will serve to rule that out.

Knowledge

Certain versions of the perfectly competitive structure includes the perfect knowledge as one of its characteristics. But, of course, perfect knowledge never exists in reality. Perfect information is little less clear than the other assumptions we can hardly assume that people know everything that has to be known.

Free Entry

Free entry means that new companies can set up in business for competing with established companies whenever the new competitors feels that the profits are high enough to justify the investment. This is, the first and foremost, legal condition in a perfectly competitive market, where there is no government restrictions on the entry of new competition.

Characteristics of p-competition:

1. Many small sellers

The more the sellers, the more substitutes the consumer has.

2. Homogeneous products

If the product is homogeneous, then the substitutes are said to perfect substitutes.

3. Sufficient knowledge

If the customers know the prices offered by other sellers, then they will be better able to switch, increasing elasticity further.

4. Free entry

In the long run, companies may even enter the market to provide still more substitutes.

Other Market Forms

The other 3 market structure models can be defined in terms of the ways in which they deviate from the characteristics of p-competition. In a monopoly, there is only one seller of a good or service and there is also no close substitute whereas in an oligopoly, there are two or more, but only in few firms. Compared to monopoly and oligopoly in monopolistic competition, the products are not homogeneous but they are differentiated. The standard model for insufficient knowledge, in some cases seems to work similarly to product differentiation.

Monopoly

It is a market structure in which there is only one producer or seller for a product. In other words the single business is the industry. An entry into such a market is restricted due to the high costs or other impediments, which might be economic, social or political.

When a government can create a monopoly over an industry like it needs to control such as electricity. Another reason for the barriers against an entry into a monopolistic industry is that, one entity will have exclusive rights to a natural resource.

Example:

In Saudi Arabia, the government has a sole control over the oil industry. A monopoly can also be formed when a company has a copyright or patent which prevents others from entering the market where Pfizer for instance had a patent on Viagra.

Key characteristics:

The monopolies can maintain a super normal profits in the long run. Along all firms the profits are maximized when MC = MR. Generally the level of profit depends upon the degree of competition in the market where a pure monopoly is zero. During profit maximisation MC = MR the output is Q and price P. Given that the price (AR) is above ATC at Q supernormal profits are possible (area PABC).
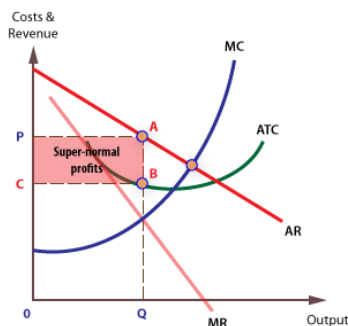
A monopolist with no close substitutes can derive super-normal profits area PABC and also would be able to derive the greatest monopoly power.

Advantages of monopolies:

• The domestic monopolies can become dominant in their own territory and then penetrate overseas markets by earning a country valuable export revenues. It is certainly the case only with Microsoft.

• It can benefit from the economies of scale and may be 'natural' monopolies. Hence it might be argued that it is best for the remaining monopolies in order to avoid the wasteful duplication of infrastructure that would happen if new firms were encouraged to build their own infrastructure.

• This has been consistently argued by some economists that the monopoly power is needed to generate the dynamic efficiency that is technological progressiveness.

An Austrian economist Joseph Schumpeter states inefficient firms including monopolies would eventually be replaced by a more efficient and effective firms through a process called creative destruction.

Disadvantages of monopoly to the consumer:

• Reducing consumer surplus and economic welfare.

• Charging a higher price than in a more competitive market.

• Restricting output onto the market.

• Reducing consumer sovereignty.

• Restricting choice for consumers.

Oligopoly

Oligopoly is defined as the market situation between perfect competition and monopoly. In an oligopolistic markets, independent suppliers can effectively control the supply and thus the price, thereby creating a seller's market.

It offers largely similar products, differentiated mainly by the heavy advertising and promotional expenditure and it can also anticipate the effect of one another's marketing strategies.

Examples: Airline, automotive, banking and petroleum markets.

There are only a few firms that make up an industry in an oligopoly. This select group of firms have taken control over the price. Thus, like a monopoly, an oligopoly has high barriers to entry. The products which is produced by the oligopolistic firms are often nearly identical and therefore, the companies, that are competing for the market share, are interdependent as a result of the market forces.

For example, assume, that an economy requires only 100 widgets. If company X produces 50 widgets and its competitor, Company Y, produces the other 50. Then the prices of the two brands will be interdependent and same. Therefore when company X starts selling the widgets at a lower price, it will get a greater market share, thereby forcing Company Y to lower its prices as well.

Monopolistic competition

Monopolistic Competition is defined as a market structure in which many sell the products that are similar but not identical.

Characteristics of monopolistic competition:

1. Many Sellers. Hence firms compete.

2. Product Differentiation. So, each rm faces downward sloping demand curve.

3. Free Entry. Thus, the economic will be zero.

Examples of monopolistic competition: CDs, Books, movies, computer software, restaurants, furniture etc.

Monopolistic competition in the short run:

During profit maximisation MC = MR and the output is Q and price P. Given that price (AR) is above ATC at Q, supernormal profits are possible (area PABC).
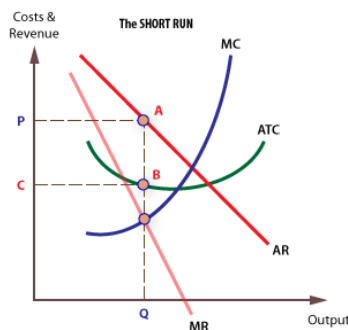
Monopolistic competition in the short run

When the new firms enter into the market demand for the existing firm's products becomes more elastic and the demand curve shifts to the left driving down price. Though all super normal profits are eroded away.

Monopolistic competition in the long run:

The super-normal profits will attract in new entrants that shifts the demand curve for the existing firm to the left. The new entrants will continue until only normal profit is available. In this point the firms would have reached their long run equilibrium.
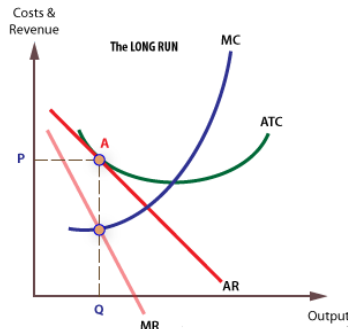
Monopolistic competition in the long run

Advantages of monopolistic competition:

• The differentiation creates diversity, choice and utility.

• Example: A typical high street in any town will have a number of different restaurants from which to choose.

• It does not have any significant barriers to entry therefore markets are relatively contestable.

• The market is more efficient than monopoly but less efficient than perfect competition, less allocated and less productively efficient. But they may be dynamically efficient, innovative in terms of new production processes or new products.

Example: Retailers often constantly have to develop new ways to attract and retain local custom.

Disadvantage of monopolistic competition:

• Certain differentiation does not create utility but generates unnecessary waste such as excess packaging.

An advertising might also be considered wasteful though most is informative rather than persuasive.

• As the diagram above illustrates assuming profit maximization there is allocated inefficiency in both the long and short run.

3.1.1 Features – Price, Output Determination

Features

1. Differentiation in products

The firms producing same products in this imperfectly competitive world cannot raise the price of product much higher than their rivals. If they do so, they will lose much of their sale, but not all the sale. In case, they lower the price, the total sale can be increased to a certain extent. How much will the sale increase or decrease by lowering or raising the price will depend upon the product differentiation of the different firms.

Product differentiation might be real or imaginary. Real differentiation is done through differences in the materials used, design, color etc. Imaginary differences might be created through advertisement, brand name, trade marks etc.

2. A fairly large number of sellers

Every firm produces or sells a close substitute for the product of other firms in the product group or industry. The product differentiation is thus the hallmark of monopolistic competition.

3. Nature of demand curve

If the number of firms is fairly large and the product of each firm is not very similar, then the demand curve of a firm will be quite elastic whereas there is close competition among the rival firms for the sale of same products, the demand curve of a firm will be less elastic.

4. Advertisement and propaganda

Each firm tries to create difference in its product by using propaganda oradvertising, When this succeeds in its object, the firm occupies almost the position of a monopolist. Hence, it is in a position to raise-the price of the product without losing its customers.

5. Sales efforts

The sale of the products by the firms will no longer be taken for granted sale depends upon sale efforts.

6. Non-price competition

The firms create every effort to win over the customers but other than price cutting, the firms might offer after a gift scheme, sale service,, discount not declared in the price listand so on.

7. Freedom of entry and exit of firms

There are no barriers of the new firm for entering the product group or leave the industry in the long run.

Price, Output Determination

Pricing Strategies In Times Of Stiff Price Competition

1. Pricing matching:

It is a strategy in which a firm promises to match alower price offered by any competitor, while announcing its own price.

2. Promoting brand loyalty:

It is an advertising strategy where the customers are frequently reminded by the brand value of given product or services.

3. Time to time:

It is also known as randomized pricing strategy where the firm variesits prices form time- to –time, say hour –to –time, hour –to –hour or day –to –day.

4. Promotional pricing:

It is used in order to promote a particular product, at time, the firm may offer theproduct at the most competitive price.

5. Target pricing:

Here the company operates with a particular targeted profit in mind.

Price Output Determination Of Perfect Competition

Short Run:

In this method, the price and output of the firm are determined, under perfect competition, based on theindustry price and its own costs. Then, the industry price has greater say in this process because the firm own sales are very small and insignificant. This process of price output determination in case of perfect competition. Thus, the firm demand curve is horizontal at the price determined in the industry (MR = AR price). This demand curve is also known as average revenue curve. Since all the units are sold at the same price, on an average, the revenue to the firm equal its price.
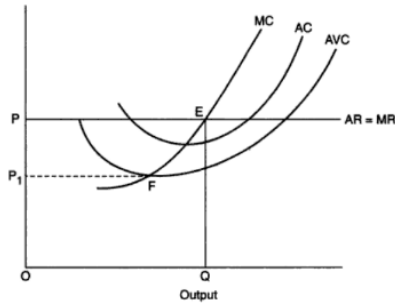
Short Run under Perfect Competition
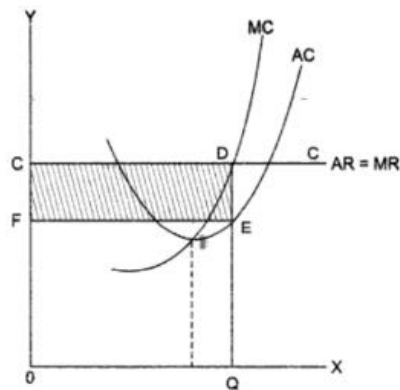
Short Run under Perfect Competition in equlibirum

Long Run under Perfect Competition

Since been attracted by supernormal profits, more and more firms enter the industry. While the result, will be a scramble for scarce inputs among the competing firms pushing the input prices. Thus, the average cost increases. Then the entry of more and more firms will expand the supply pulling down the market price and the entry of the firms into the industry continues till the supernormal profit is completely eroded. Here, the firms will be in the position to enjoy only normal profits but not supernormal profit.
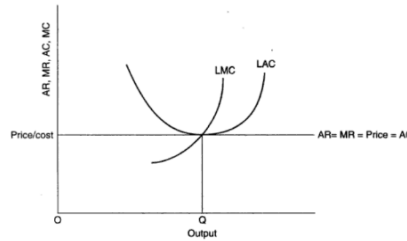
Long Run under Perfect Competition

Price Output Determination In Monopoly

The average revenue curve for a firm is a downward sloping one. Since, the monopolist reduces the price of his product, the quantity demanded increase and vice versa. The marginal revenue is less than the average revenue in monopoly. The monopolist always wants to maximize his profits. In order to achieve maximum profits, it is necessary that the marginal revenue should be more than the marginal cost.
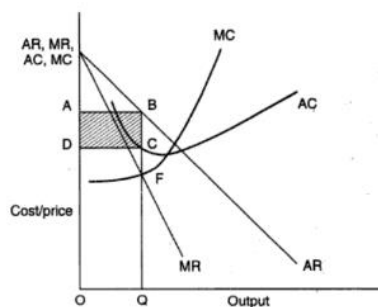
Price output dtermination under Monopoly

3.2 Managerial Theories of firm: Maris and Williamson's models

The managerial theories of the firm are the economic theories of how the behaviour of modern management affects the working of the economic system. Those theories have been the subject of considerable research in business and management literature.

The managerial theories of the firm are classified into three categories:

1. Discretionary theories

2. Growth oriented theories

3. Bureaucratic theories

Discretionary theories

In this theory, it is assumed that managers, without direct stake in the firm and free from strict supervision by the owners, will take decisions based mainly on price and cost

Growth oriented theories

In this theory, it starts from the same basis but assume the long-term objective of managers is the growth of the enterprise.

Bureaucratic theories

In this theory, they assume that the owners of the firm also control it and seek strategies which reduce risk.

The theories mentioned above are the managerial theories that stand in opposition to neo-classical theories of the firm, which implies the management-managed firms which are directed in the sole interests of their shareholders.

Maris and Williamson's models

Williamson has developed a managerial-utility-maximization theory against the profit maximization. This is also called as the 'managerial discretion theory'. In large modern firms, the shareholders and managers are two separate groups. The shareholders will want the maximum return on their investment and hence there is maximization of profits. On the other hand, the managers have a consideration other than profit maximization in their utility functions. Therefore the managers are interested not only in their own emoluments but also in the size of their staff and expenditure on them.

Hence, Williamson's theory is related to the maximization of the manager's utility that is a function of the expenditure on staff and emoluments and discretionary funds. In other words, it is a extent where the pressure from the capital market and competition in the product market is imperfect. Therefore the manager has discretion to pursue goals other than profits and derive the utility from a wide range of variables.

For this a concept of expense preferences is introduced by Williamson's which means that managers will get satisfaction from using some of the firm's potential profits for unnecessary spending on items from which they personally benefit.

For pursuing the objective of utility maximization, the manager directs the firm's resources into three ways are as follows:

1. The manager has the goal to expand his staff and also for increasing their salaries. Many staff is valued because they lead to the manager getting more salary, more prestige and more security. Those staff expenditures by managers are denoted by S.

2. In order to maximize his utility, the manager indulges in featherbedding such as company cars, pretty secretaries, too many company phones, perks for employees, etc. Those expenditures are characterized as management slack and denoted as M by Williamson.

3. The manager can set up discretionary funds for making investments to advance or promote the company projects. This discretionary profits or investments denoted as D. These are what that remains with the manager after paying taxes and dividends to shareholders to retain an effective control of the firm.Thus the manager's utility function is,

 U = f (S, M, D)

where U is the utility function, S is the staff expenditure, M is the management slack and D the discretionary investments. Hence, these decision variables (S, M, D) will yield positive utility and the firm will always choose their values subject to the constraint, S ≥0≥M0, D≥0. Therefore, Williamson assumes that the law of diminishing marginal utility applies so that when the additions are made to each of S, M and D, they will yield smaller increments of utility to the manager.

Moreover, Williamson regards price (P) as a function of output (X), expenditure on staff (S) and the state of environment which he calls 'a demand shift parameter' (E), so that P = f (X, S, E).

3.3 Methods of Pricing: Limit Pricing, Market Skimming Pricing

The various methods of pricing are as follows:

1. Cost Based Pricing

2. Demand Oriented Pricing

3. Competition Oriented Pricing

4. Strategy Based Pricing

Cost –Based Pricing Methods

1. Cost plus pricing(full cost or mark up pricing):

The product unit's total cost and add percentage of profit to arrive at the selling price. It is suitable where the cost keep fluctuating from time to time.

2. Marginal cost pricing :(break even pricing or target profit pricing)

The selling price is fixed in such a way which covers fully the variable or marginal cost andcontributes towards recovery of fixedcosts fully or partly, depending upon the market situations.

Competition –Oriented Pricing:

a. Sealed bid pricing:

Each contracting firm quotes its price in a sealed cover called tender. They are opened on a scheduled date and the person who quotes the lowest prices, where the other things remaining the same, is awarded the contract.

b. Going rate pricing:

A prevailing market price at a given point oftime is the guiding factor. Later the price charged by the firm is in tune with the price charged in the industry as a whole.

Demand –Oriented Pricing

The key to pricing here is the value as perceived by the consumer. Hence, higher the demand, the higher can be the price.

a. Price discrimination:

This is a practice of charging differentprices to customers for the same good and it is also called differential pricing. Here, the firm uses its discretion to charge differently the different customer.

b. Perceived value pricing:

In this case, the price is fixed on thebasis of the perception of the buyer of the value of the product.

Strategy –Based Pricing:

1. Market skimming:

If the product is introduced for the first time in the market, the company follows this method. Here, the company fixes a very high pricefor the product. This to charge the customer a maximum rate. Example Sony introduces a particular TV model, it has a fixed high price and other company.

2. Market penetration:

This is exactly opposite to the market skimming method. Here, the price of the product is fixed so low that the company can increase its market share. Then the company attains profits with increasing volumes and increase in the market share. Generally, the companies believe that it is necessary to dominate the market in the long run making profit in the short-run.

3. Two –part pricing:

A firms with market power can enhance profits by the strategy of two –part pricing. Here, a firm charges a fixed fee for the right to purchase its goods, plus a per unit charge for each unit purchased. Example, entertainment houses such as country clubs, athletic clubs, golf courses,

health clubs usually adopt this strategy where they charge a fixed initiation fee plus a charge, per month or per visit, to use the facilities.

4. Block pricing:

It is another way a firm with market power can enhance its profits. It is used day –to –day life very frequently. Example, like six lux soaps in asingle pack or five magi noodles in a single pack.

5. Commodity bundling

This refers to the practice of bundling two ormore different products together and selling them at a single bundle price like the package deals offered by the tourist companies. Example,airlines hold testimony to this practice. The package includes the airfare, hotel, sight seeing, meals and so on.

6. Peak load pricing:

Around a seasonal period when demand is likely to be higher, a firm may enhance profits by peak load pricing. Firm philosophy is to charge a higherprice during peak times than is charged during off peak times. Examples are Apsrtc, air india, jet air, etc,.

7. Cross subsidization:

In cross subsidization where the demand for two products produced by a firm isinterrelated through demand or costs, this may enhance the firm with profitability.

8. Transfer pricing:

It is an internal pricing technique. This refers to a price atwhich inputs of one department are transferred to another, in order to maximize theoverall profits of the company. Example like kinetic Honda, hero Honda.

Limit Pricing

It is the act of setting prices low in an attempt to eliminate the competition. A predatory pricing is illegal under anti-trust laws, as it makes markets more vulnerable to a monopoly. The companies might engage in a variety of activities which intend to drive out competitors, such as to create barriers to entry for new competitors or unethical production methods to minimize costs.

It is a pricing strategy, a monopolist may use to discourage entry. When a monopolist set its profit maximizing price (where MR=MC) the level of supernormal profit would attract new firms into the market.

Hence, the monopolist might decide to set a price below this profit maximizing level, but still it enables them to make higher profits than in a competitive market. To be effective, the monopolist needs to increase output up to the level where a new firm will not be able to make any profit on entering the market and can also build excess capacity as a threat that if firms enter, it will reduce price even further.

This is the price set by a monopolist with a view to discourage others from entering into a market. Here it is often lower than the average cost of production or just low enough to make entering not profitable. In limit price operation, those entering the market with a view to compete with the monopolist will find it totally unattractive to survive. Every firms use different strategies to keep competition off. Certain strategies include signing a union contract to employ a high level of labor for a long period of time, or building a excess production capacity so as to drive out competition effortlessly. It is illegal in many countries.

Skimming Pricing

This is called as charging high price in initial stages. It can be followed by a firm by charging skimming price for a new product in pioneering stage. If the demand is either unknown or more inelastic at this stage, market is splitted into segments on the basis of different degree of elasticity of demand of different consumers.

It is a short period device for pricing. The demand for new products is likely to be less price elastic in the early stages, which is the initial high price helps to "Skim the Cream" of the market which is relatively insensitive to price.

Its policy is shown in below figure, where the manufacturer of new product initially determines OP price and sells OQ quantity. Hence, it receives KPMN abnormal profit. In this policy, the consumers are distinguished by the producers on the basis of their intensity of desire for a commodity.

If a product is introduced for the first time in the market, the company fixes a very high price for it. The main idea is to charge the customer the maximum possible. Thus, the strategy is mostly found in the case of technology products. Example, when Sony introduces a particular TV model, it fixes a very high price likewise a new series of Pentium is priced very high when it is released into the market. Initially everyone cannot afford to buy it. However along time, the price comes down and more people can afford to the product. This method can be followed only when :

(i) the demand for the product is inelastic

(ii) there is no threat from competition

(iii) high price is coupled with high.

In the beginning the prices of TVs, computers, electronic calculators, etc., were very high but now they are declining every year. If a high initial price together with heavy promotional expenditure might be used to launch a new product if conditions are appropriate.
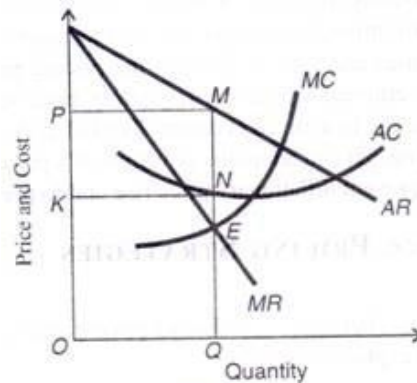
Fig. 1

These conditions are listed below:

(i) The demand is likely to be less price elastic in the early stages than later and the cross elasticity demand should be very low.

(ii) If the demand elasticity is unknown, high introductory price serves as a refusal price during the stage of exploration.

(iii) When launching a new product with a high price is an efficient device for breaking the market into segments that differ in price elasticity of demand.

(iv) If it has high initial prices supports to finance the flotation of the product. In the early stages, the cost of production and organization of distribution are high and also research and promotional investments have to be made.

Price and Cost Relationship

The price policy for any product, price and cost relationship is the basic consideration. The cost conditions determine price. Thus, the cost estimates must be correctly made. Even though a firm should recover its common costs, this is not necessary that prices of each product be high enough to cover an arbitrarily apportioned share of common costs.

A proper pricing does require, but prices at least cover the incremental cost of producing each good. The incremental costs are additional costs that would not be incurred if the product were not produced. Until the price of a product exceeds its incremental costs, the firm can rise total profit by supplying that product.

Thus the decisions must be based on an evaluation of incremental costs. A price that offers maximum contribution over costs is generally acceptable but in multi-product cases, incremental cost will become more essential to make such decisions.

A set of alternative price policies should be considered and they are:

(i) the prices of the multi-products might be proportional to full cost. This price might produce equal per-centage of profit margin for all products. When the full cost for all products are assumed equal then the pricing will be equal.

(ii) The pricing for multi-products might be proportional to incremental cost.

(iii) The prices of multi-product might be fixed differently keeping into consideration market segments.

(iv) The prices of multi-products might be assessed with reference to their contribution margin proportional to conversion cost.

(v) The prices for multi-products may be fixed as per the product life cycle of each product.

3.4 Internet Pricing: Flat Rate Pricing, Usage sensitive, Transaction based pricing, Priority Pricing.

It has been a force for moving today's business and many other business and also pricing models have been designed. In pricing mechanisms, assessing the value in the Internet is complicated owing to its nature. This is an abstract and its value depends on its context, speed, reliability, accessibility and the others which are similar.

Flat Rate Pricing

The flat rate pricing is used for wireless data service. This provides unlimited wireless data transfer for a variety of applications including wireless e-mail, remote LAN and corporate Intranet access for the mobile computing customers. The aggressive new plans can ultimately simplify the wireless data pricing and allow AT & T customers to better anticipate monthly usage costs.

The two new plans include:

• For local Unlimited, a monthly rate of $54.99, it carries an additional $0.20 per kilobyte roaming fee when the users are outside of markets where AT&T operates wireless IP service.

• For National Unlimited, a monthly rate of $64.99 with roaming charges extra.

The wireless IP rates also known Cellular Digital Packet Data have historically used variable charges for each kilobyte of data where the customer transmits over the network. The reason for implementing this is to introduce the "Digital One Rate" service. Hnce, these new plans are designed for customers who use an IP compatible modem with their hand-held computer, laptop, PDA or a specialized portable device.

Thus, the Local Unlimited plan will appeal to customers who use their wireless applications mainly in their local AT&T wireless IP markets, whereas the National Unlimited plan is designed for frequent travelers who need wireless access to information from various locations across the country. So, both plans would benefit customers on average can send and receive at least one MB of information by wireless a month or whose usage levels vary monthly.

But, in other aspect relating to quality of services like transmission, monitoring traffic, congestion and similar to them are not provided. Therefore, Flat Rate Pricing, according to AT&T, will give the user the ability to accurately budget for communication and media needs because the remote access to data is becoming an increasingly vital tool for mobile professionals and AT&T's new data pricing plan will permit the user to utilize their investment in wireless technology without worrying about access costs.

The price is charged at a flat rate or single fixed rate for a particular product or service irrespective of the usage, flat rate pricing is said to exist. For example, internet service providers. We pay a flat

rate to access internet at all hours and days of the year. Especially for internet broad band connections, charging a flat rate is common practice across the world.

Usage-based Pricing

The users pay one portion of their bill for a connection charge and another portion for the bits received or sent. Thus, the marginal monetary cost of sending or receiving another bit is non-zero for part of the time.

In this case, there are two components present that is a charge for getting connected and subsequently marginal charges for using the services, precisely when bit / bytes are received or sent. Hence, this mechanism falls into the category of two-component pricing. For example, we can have usage-based pricing during peak hours and flat rate pricing during off-peak hours.

In other words, the usage-based pricing can be explained as the Service Providers such as internet, electricity companies or mobile communication companies shall offer their customers time sensitive, or time of use, pricing plans. Those plans can reflect the actual cost of providing service at the time it is needed. It is designed to encourage customers to lower their consumption during times when the cost of providing the service is high.

For example, during the peak hours such as 11.00 AM, when all offices and factories work, the electricity charge for consumption of every unit is priced relatively higher than the non-peak period such as morning 6`O'clock. Hence, this type of strategy will enable the consumers to use these services all through the day adjusting to these changing price tariff.

Thus, when demand is low, the utilities can supply electricity drawing from less expensive sources whereas when demand for electricity is high, draw from more expensive sources to supply enough electricity. This is also called peak load pricing.

Transaction-based Pricing

It allows to acquire enterprise-wide case management solution including all the services that will be required in terms of support, maintenance, version upgrades and training . This needs a large capital expenditure. However when these are associated with the main transaction, the charges for all these services could be factored into the price of the main transaction. In today organisations, we have several constraints in terms of budget availability and skillset. Thus, transaction based pricing is viewed as the best alternative in such a case. For example, an annual maintenance contract for a refrigerator or an air conditioner will be cheaper if taken up at the time of purchase of the asset. Then the transaction costs can be kept lower to attract the customers. This allows for immediate profits for the customers also. The unlimited support and new version upgrades offer more attraction for the customers to prefer transaction-based pricing and it is equally profitable for the sellers or service providers also.

In transaction based pricing, this technology is a leading Canadian competitive local exchange carrier (CLEC) which gives high-speed data, voice and Internet services that can be customized for meeting the requirements of small and medium-sized enterprises.

For example, Axxent's success is deeply rooted in its understanding that customers are the greatest asset. 34,000 businesses representing more than 126,000 access lines. Hence, AXXENT is Canada's largest CLEC in terms of the size of its operating footprint.

The Axxent provides Global Internet Roaming in which customers can browse the internet for the price of a local call from anywhere in the world. It caters for customers who frequently travel a lot and use the Internet outside of Toronto.

Benefits :

• Better quality Internet connections.

• One bill for all Internet and roaming charges.

• Roaming charges are extra for local and long distance.

• Roaming also gives the customer proper authentication from any part of the world.

Another service provided by Axxent, which caters for transaction pricing, is that of DSL Internet. It is a high-speed data service offering a fast and reliable service for downloading files or attachments. The DSL stands for Digital Subscriber Line, is a technology that uses existing copper telephone wires to deliver high speed data services.

The customers are actually paying for the quality, speed and reliability of the Internet service offered by Axxent. This is service which is always on, meaning that unlike dial-up connections to the Internet, the DSL connection is always switched on.

Hence, the customers also have the provision to upgrade their service plans. For instance, if the customer values speed of transmission or requires any other service, then they would have to pay a higher monthly rate which is associated with the increased service level.

It also offers a full range of services such as quality of transmission, speed and service at a price that benefits the customer. However monitoring, reducing congestion and trafficking problem in the internet still remains to be seen. These facilities give vital services which are not properly implemented.

Types of Business Organization and Business Cycles

4

(*The Learning objective of this Unit is to know the different forms of Business organization and their Merits and Demerits both public & private Enterprises and the concepts of Business Cycles)

Types of Business Organization and Business Cycles: Features and Evaluation of Sole Trader – Partnership – Joint Stock Company – State/Public Enterprises and their forms – Business Cycles – Meaning and Features – Phases of Business Cycle.

4.1 Features and Evaluation of Sole Trader – Partnership

The business organizations has three forms in the economy today, they are sole proprietorship, the partnership and the corporation.

Each one offers its owners significant advantages and disadvantages.

The most common form of business organization is the sole proprietorship or proprietorship. It means a business owned and run by one person.

Relatively, in most of numerous and profitable of all business organizations, the proprietorships are the smallest in size.

The proprietorships earn almost one-fifth of the net income which is earned by all businesses, even though they make only a fraction of total sales.

Sole Proprietorships

The sole proprietorship is the easiest form of business to start because it involves almost no more requirements except for occasional business licenses and fees.

Advantages of a sole proprietorship :

1. Ease of starting up.

2. No separate business income taxes.

3. Relative ease of management.

4. Ease of getting out of business.

5. Psychological satisfaction.

6. Owner enjoys the profits of successful management.

Disadvantages of a sole proprietorship:

1. Owner has unlimited liability.

2. Full and personal responsibility for all losses and debts of the business.

3. Difficulty in raising financial capital.

4. Size and efficiency.

5. Firm ceases to exist when owner dies, quits or sells the business.

6. Limited managerial experience.

7. Difficulty of attracting qualified employees

8. Limited life.

9. The business may have to carry a large inventory or stock of finished goods and parts in reserve.

Partnerships

When a business is jointly owned by two or more persons is known as partnerships.

They are the least numerous form of business organization, which accounts for the smallest proportion of sales and net income.

Types of Partnerships

In partnership, the most common type is a general partnership, the one in which all partners are responsible for the management and financial obligations of the business.

Second is the limited partnership, where at least one partner is not active in the daily running of the business, even though they may have contributed funds to finance the operation.

Since there is more than one owner is involved, the formal legal papers called articles of partnership are usually drawn up to specify arrangements between partners.

Advantages of a partnership :

1. Ease of establishment

2. Ease of management.

3. Lack of special taxes.

4. Attract financial capital easily.

5. Slightly larger size, increased efficiency.

Disadvantages of a partnership:

1. A business might have to file for bankruptcy, a court-granted permission to an individual or business in order to cease or delay debt payments.

2. Each partner is fully responsible for the acts of all other partners.

3. Potential for conflict between partners.

4. Limited partners have limited liability.

5. Limited life.

6. Offer increased access to financial capital, but do not always work out.

Corporation

In a business organization, that has a separate legal personality from its owners is said to be a corporation. The ownership in a stock corporation is represented by shares of stock.

The stockholders enjoys a limited liability but they will also have only limited involvement in the company's operations. The activities of the corporation is controlled by the board of directors, an elected group from the stockholders.

In addition to those basic forms of business ownership, there are some other types of organizations that are common today are as follows:

Limited Liability Company

In USA, they are hybrid forms of business that have characteristics of both a corporation and a partnership. A LLC is not incorporate. Hence, it is not considered a corporation and the owners enjoy limited liability like in a corporation. A LLC may elect to be taxed as a sole proprietorship, a partnership or a corporation.

Cooperative

It cam be a business organization owned by a group of individuals and that is operated for their mutual benefit. The persons who are creating up the group are called members. The cooperatives might be incorporated or unincorporated.

Examples: Water and electricity cooperatives, credit unions, cooperative banking and housing cooperatives.

Types of partnership:

The different kinds of Partners in Partnership Firms are as follows:

1. Active or managing partner:

A active or managing partner is defined as a person who takes active interest in the conduct and management of the business of the firm.

He carries on business on behalf of the other partners. When he wish to retire, he has to give a public notice of his retirement. In case if he did not he will continue to be liable for the acts of the firm.

2. Nominal or ostensible partner:

The one who does not have any real interest in the business but will lends his name to the firm, without any capital contributions and also doesn't share the profits of the business is called as a nominal partner. He also does not usually have a voice in the management of the business of the firm, but he will be liable to outsiders as an actual partner.

3. Sleeping or dormant partner:

The partner who 'sleeps', that is, he does not take active part in the management of the business is called as the sleeping partner. Such a partner only contributes to the share capital of the firm, is bound by the activities of other partners and shares the profits and losses of the business. Unlike an active partner, he does not needed to give a public notice of his retirement. So that, he will not be liable to third parties which acts after his retirement.

4. Sleeping vs Nominal Partners:

A nominal partner is not the same as a sleeping partner. A sleeping partner will contribute the capital shares profits and losses, but is not known to the outsiders.

A nominal partner, is admitted with the purpose of taking advantage of his name or reputation. Since, he is known to the outsiders, although he does not share the profits of the firm nor he take part in its management. However, both are liable to third parties for the acts of the firm.

5. Partner by estoppel or holding out:

If a person, with his words or conduct, will hold out to another that he is a partner, but he can be stopped from denying that he is not a partner. The person who thus becomes liable to third parties to pay the debts of the firm is known as a holding out partner.

Conditions for the principle of holding out are as follows:

(a) The person to be held out must have made the representation, by words written or spoken or by conduct, that he was a partner.

(b) The other party must prove that he had knowledge of the representation and acted on it, for instance, gave the credit.

6. Partner in profits only:

If a partner agrees with the others that he would only share the profits of the firm and that would not be liable for its losses, he is the one in own as partner in profits only.

7. Minor as a partner:

A partnership is created by an agreement. if a partner is incapable of entering into a contract, he cannot become a partner. Therefore, at the time of creation of a firm a minor cannot be one of the parties to the contract. However under section 30 of the Indian Partnership Act, 1932, a minor can be admitted to the benefits of partnership, with the consent of all partners. Thus, a minor partner is entitled to his share of profits and to have access to the accounts of the firm for use of inspection and copy.

But he can't file a suit against the partners of the firm for his share of profit and property until he remains with the firm and his liability in the firm will be limited to the extent of his share in the firm and also private property cannot be attached by creditors.

By attaining majority, he should to decide within 6 months whether he shall become a regular partner of withdraw from partnership. Then the choice in either case is to be intimated through a public notice, failing in which he will be treated for deciding to continue as partner. Then, he becomes personally liable like other partners for all the debts and obligations of the firm from the date of his admission to its benefits and also becomes entitled to file a suit against other partners for his share of profit and property.

8. Other partners:

In partnership firms, several other types of partners are also found, namely, the secret partner who does not want to disclose his relationship with the firm to the general public. An outgoing partner, who retires voluntarily without causing dissolution of the firm. A limited partner who is liable only up to the value of his capital contributions in the firm.

But, the moment public comes to know of it he becomes liable to them for meeting debts of the firm. Generally, an outgoing partner is always liable for all debts and obligations that are incurred before his retirement whereas a limited partner is found in limited partnership only and not in general partnership.

4.1.1 Joint Stock Company

Joint stock Company is a company which has some features of a corporation and some features of a partnership. The company sells fully transferable stock, but all shareholders have unlimited liability.

Characteristics of joint stock company:

a) Perpetual succession:

It means continuous existence. Any company is creation of the law and only by law it can bring it to an end. This is life independent on the life of its members. The death, insolvency or lunacy of a member will not affect the life of the company. This continues to exist even if all of its members dies. The members may come and go but the company goes on till it is wound up.

b) Separate legal existence:

A company which has a distinct and separate legal entity, independent of its members. This means that the company can own property, make contracts and can file suits in it own name. The shareholders are not the joint owners of the company's property. He cannot be held liable for the acts of the company. A creditor of the company will not be the creditor of its members. This is an important characteristics of joint stock companies that has made it very popular form of business.

c) Limited liability:

In separate legal entity, its members cannot be held liable for the debts of the company whereas in liability of every member is limited to the nominal value of the shares bought by him or the amount of the guarantee given by him. For example, when a member has 50 shares of Rs 10 each, the liability is limited to Rs.500 only. Though the assets of the company are found to be insufficient to satisfy the claims of the creditors, no member will be called to pay anything more than what is due to him.

d) Common seal:

Since it is an artificial entity, a company cannot act and sign itself. Hence, it acts through human beings. Thus, all the acts of the company are authorized through its common seal. It is affixed on all important documents as a token of the company's approval. This seal is an official signature of the company. It is valid only if signed by at least two members of the Board of Directors.

Without these features of joint stock companies, this would have been better to call it as a firm rather than a company form of organization.

e) Transferability of shares:

The capital of a company can be divided into parts each part called a share. These shares are generally transferable. When a shareholder is free, he can withdraw his membership from the company by transferring his shares.

Advantages of joint stock company

1. Limited liability:

Generally the liability of members of a company is limited to the extent of uncalled or unpaid shares held by them. Thus, their personal property cannot be seized to meet the company's liability which is beyond the above mentioned liability.

2. Large capital:

The company can gather a huge capital for the business through shares and debentures, loans, public deposits etc. Since it is a huge capital, the company can conduct business on a large scale.

3. Continuity and stability:

The death, insolvency or insanity of any member of the company will not affect its life and existence. People may come and they might go but a company remains forever. This can be wound up under the provision of the act.

4. Economies of scale:

The company will be operated on a high scale and so it enjoys economies in production, distribution, management and financing.

5. Professional management:

A Company appoints experienced, competent and expert to manage the business. Hence, their services lead to managerial and administrative efficiency and accuracy.

6. Bargaining power:

By comparing to other forms of organization, a joint stock company is a strong power in buying as well as in selling of goods because of its large scale production.

7. Large membership:

A Company is owned by a large number of members where maximum of 50 in the case of private limited company and unlimited number of member in the case of public limited company.

8. Legal status:

Though the company is created by law, it will have separate legal existence compared to its members. Thus, the members cannot be personally held responsible for the acts of company and also the company cannot be held liable for the acts of the members.

9. Employment:

The joint stock company gives an employment to a large number of people directly and indirectly which leads to a higher national income for the country and also a higher living standard of living for the people.

10. Transferability of shares:

The shares of Joint Stock Company, especially the public companies, are freely transferable. Any member who wants to sell his shares can easily do so in the stock market. It encourages the public and other to invest in shares.

11. Research and development:

Every Joint Stock Company undertakes R&D continuously. Hence it brings about new and improved products which benefits people.

12. Government revenue:

Every Joint Stock Company will provide revenue to the government in the form of taxes charged directly and indirectly.

13. Economic development:

Due to a Joint Stock Company there is all round development of trade, commerce and industry. Then, the society in general gains the benefit of the industrial development. Hence, the Large capital, economic development, government revenue, etc. are the advantages of Joint Stock Companies.

Disadvantages of Joint Stock Company

1) Lacks flexibility:

The working of a Joint Stock Company is less flexible when compared to other organizations. Every small thing they must either follow a detailed procedure or obtain sanctions from different authorities which results in lack of flexibility.

2) Difficult formation:

The formation of Joint Stock Company is expensive and time consuming process as a number of legal formalities have to be undertaken for registering the company.

3) Excessive government regulation:

A Company is a subject to excessive government control. This has to be followed by the numerous provision of the companies act. Thus, it makes working difficult.

4) No business secrecy:

In this form of organization, it lacks business secrecy because it is compulsory for the company to publish accounts and other records.

5) Delay in decision:

A Joint Stock Company is completely not free to take all decisions and to implement the decisions. Because of excessive government control and democratic set up all decisions that are taken in meetings and some decisions need shareholder's approval. Hence, all this leads to delay in decisions.

6) Lack of contact with customer:

The company cannot be in a position to maintain intimate contacts with customers. This cannot cater to the requirements of each and every customer and there is no personal touch which decreases the competitive strength of the business due to large scale operation.

7) Conflict of interest:

Generally, many persons can be the owners of Joint Stock Company. Thus, there can be misunderstanding and jealousy among them and this might cause problems in operation of business and profit making.

8) Lack of contact with employees:

If the top management do not have contact with their employees that might cause friction and disputes among the management and the employees. This may affect the worker's and employee's morale.

9) Exploitation of shareholders:

Certainly, the BOD might misappropriate the fund and mislead the shareholders by window dress report. Then, the directors may even manipulate the trading on the stock exchange. Hence, the shareholders can be exploited by corrupt directors.

10) Not suitable for all type of business:

This type of organization will not suitable for business where the personalized services are required.

4.1.2 State/Public Enterprises and their forms

State-Owned Enterprise(SOE)

A legal entity which is created by the government in order to take part in commercial activities on the government's behalf. It can be either wholly or partially owned by a government and is typically earmarked to participate in commercial activities.

They are also known as government-owned corporations (GOC), the state-owned entities should not be confused with companies with stocks that are owned in part by a government body, because these companies are truly public corporations which happen to have a government entity as one of their shareholders. These are common across the globe, including in the U.S where mortgage companies Freddie Mac and Fannie Mae are considered government-sponsored enterprises (GSEs).

Public Enterprises

It occupies an important position in the Indian economy. Nowadays they provide the substance and heart of the economy. Thus, the concept of public enterprise in Indian dates back to the era of pre-independence.. It shows investment of over Rs.10,000 crore is in heavy and basic industry, and infrastructure like power, transport and communications.

It is realized byt the government of India that it is through the progressive extension of public enterprises only, the aims of our five years plans can be fulfilled are as follows:

• Dispersal of economic power

• Higher production

• Greater employment

• Economic equality

Need for Public Enterprises

• To accelerate the rate of economic growth by planned development.

To disperse the industries over different geographical areas for balanced regional development.

• To increase infrastructure facilities.

• To increase the opportunities of gainful employment.

• To speed up industrialization, particularly development of heavy industries and to expand public sector and to build up a large and growing cooperative sector.

• To help in raising the standards of living.

• To reducing disparities in income and wealth.

Features of Public Enterprises

1. A departmental undertaking is notan independent organization. This has no separate existence and it is designed to work underclose control of a government department where subject to direct ministerial control.

2. It is almost similar to any other government department.

3. It is more rigid, less flexible, slow in responding to market needs.

4. It has to follow guidelines underlying the budget preparation, maintenance of accounts, and getting the accounts audited internally and by external auditors.

5. It can draw funds from government account as per the needs and deposit back when convenient.

Advantages of Public Enterprises

1. Generally the administration is entrusted to a senior civilservant and administration will be organized and effective.

2. The control is likely to be effective because it is directly under the Ministry.

3. Revenue of the government is on the rise when therevenue of the departmental undertaking is deposited in the government account.

4. The departmental undertaking does not draw anymoney more than is needed, that too subject to ministerial sanction and other controls.So chances for mis-utilisation are low.

Disadvantages of Public Enterprises

1. The control is centralized which results in lower degree of flexibility. The officials in the lower levels cannot take initiative and the decisions cannot be fast and actionscannot be prompt.

2. In case of losses, these are made up by thegovernment funds only. Inorder to make up these, there may be a need for fresh taxes, which isundesirable.

3. Since there is no competition, there is no profitmotive and no incentive to move swiftly to market needs.

4. They are in the control of a civil servant and under the immediate supervision of a government department an therefore the dministration gets delayed substantially.

5. The departmental undertaking does not retain anysurplus with it. So there is no inventive for maximizing the efficiency or earnings.

Public Corporation

It is a 'right mix of public ownership, public accountability and business management for public ends'. This provides machinery, which is flexible, while at the same time retaining public control.

Therefore it can be defined as a 'body corporate create by an Act of Parliament or Legislature and notified by the name in the official gazette of the central or state government. This is a corporate entity having perpetual succession, and the common seal with power to acquire, hold, dispose off property, sue and be sued by its name".

Examples are Life Insurance Corporation of India, , Industrial Finance Corporation of India, Unit Trust of India, Damodar Valley Corporation and others.

Features of Public Corporation

1. This has a separate legal existence. This is a separate company by itself and can raise resources, buy and sell properties, by name sue and be sued.

2. This is relatively free from any type of political interference and enjoys administrative autonomy.

3. These employees of public corporation are notgovernment civil servants and the corporation has absolute freedom to formulate its own personnel policies and procedures, and these are applicable to all the employees including directors.

4. The statute in parliament or state legislature creates it and continues forever and till a statue is passed to wind it up.

5. By the public corporation is fully owned government organization and initial finance are provided by the Government, enjoys total financial autonomy, the income and expenditure are not shown in the annual budget of the government and it enjoys total financial autonomy.

6. Other than certain banks and other financial institutions wherechartered accountants are auditors, in all corporations, the audit is entrusted to thecomptroller and auditor general of India.

7. Until the discharge of functions, the corporationshall act as far as possible on sound business principles.

Advantages of Public Corporation

1. It has an autonomous set up and this is independent, take necessary initiative to realize its goals, and it can be flexible in its decisions as required.

2. It has its ownpolicies and procedures and when necessary it can be simplified to eliminate red tapism andbureaucracy, if any.

3. It can protect the public interest by making its policies more public friendly and the public interests are protected because every policy of the corporation is subject to ministerial directives and board parliamentary control.

4. It can design its own work cultureand train its employees accordingly and can provide better amenities and better terms ofservice to the employees and thereby secure greater productivity.

5. It is a government organization and hence can affordwith minimum margins of profit and it can offer its products and services at competitiveprices.

6. By increasing the size of its operations this can achieve economicsof large-scale production.

7. This is accountable to the Parliament or legislature and it has to submit its annual report on its working results.

Disadvantages of Public Corporation

1. The autonomy is on paper only and in reality.

2. Certainly, in such cases the greater autonomy leads to misuse of power. It takes time to unearth the impact of such misuse on the resources of the corporation. The cases of misuse of power defeat the very purpose of the public corporation.

3. When the public corporation ignores the commercial principles and suffers losses this is burdensome for the government to provide subsidies to make up the losses.

Government Company

A government company is the right combination of operating flexibility of privately organized companies with the advantages of state regulation and control in public interest. It differ in the degree of control and their motive also. Some of them are promoted as industrial undertakings . The promotional agencies to prepare feasibility reports for promoters whowant to set up public or private companies. An agency to promote trade or commerce. For example, state trading corporation, Export.

Features of Government Company

1. The provisions of the Indian Companies Act apply for all matters relating to formation,administration and winding up. But, the government has a right to exempt the application of any provisions of the government companies.

2. The majority of the share are held by the Government, Central or State,partly by the Central and State Government(s), in the name of the President of India.

3. Government may consider the requirements of the company in terms of necessary specialization and appoints the directors accordingly.

4. The government company functions independently with full discretion and in the normal administration of affairs of the undertaking.

5. The concerned minister may act as the immediate boss. It is because the government that nominates the directors, the minister issue directionsfor a company and he can call for information related to the progress and affairs of the company any time.

Advantages of Government Company

1. A Government company can be promoted as per the provisions ofthe companies Act. There is no need for an Act in legislature or parliament to promote a government company.

2. It retains the advantages of public corporation such as autonomy,legal entity.

3. It is free from the rigid rules and regulations.

4. A Government company is more flexible than a departmental undertaking or public corporation.

5. In view of the autonomy, the government company take decision quickly and ensure that the actions and initiated promptly.

6. Government company is the only from providing scope for private participation in the ownership.

Disadvantages of Government Company

1. The government seldom leaves the government company to function on its own.

2. The degree of government control is so high that the government company is reduced to mere adjuncts to the ministry and in majority of the cases, it is not treated better than the subordinate organization or offices of the government.

3. A government company is created by executive action of the government without the specific approval of the parliament or Legislature.

4. The members of the Board of Management of the government companies and from the ministerial departments in their ex-officio capacity.

5. The employees are mostly drawn from the regular government departments for a defined period.

6. The powers of the directors are to be approved by the concerned.

4.2 Business Cycles – Meaning and Features

Business cycles are used to determine business objectives. It has four phase such as Expansion, Recession, Contraction and Revival or Recovery. This is characterized by waves of expansion and contraction.

The movement from peak to trough and again trough to peak is not symmetrical. Keynes states that, the prosperity phase of business cycle comes to end fast but dip is gradual and slow.

These alternating periods of expansion and contraction in economic activity is called as business cycles. They are also known as trade cycles. According to J.M. Keynes, "A trade cycle is composed of periods of good trade which is characterized by the rising prices and low unemployment percentages with the periods of bad trade that are characterized by the falling prices and high unemployment percentages."

A feature about these fluctuations in an economic activity is that they are recurrent and have been occurring periodically in a more or less regular fashion. Thus, these fluctuations have been called business cycles. Since these fluctuations as 'cycles' mean they are periodic and occur regularly, though perfect regularity has not been observed.

Characteristics of Business Cycle

• The fluctuations in business cycle are wave like movement and are recurrent in nature.

• It is self generating.

• In business cycle, every phase has germs of the next phase where the expansion has the germs of the recession in it.

• The period of low income, output and employment is called as contraction, recession, downswing or depression and the period of high income, output and employment is called as the period of expansion, upswing or prosperity.

• The market capitalist countries have shown that the period of the economic prosperity or expansion alternates with the period of contraction or recession.

• It is very costly in the economic sense of the word.

• Though business cycles differ in duration and intensity they have some common features.

The duration of a business cycle has not been of the same length always. It has varied from a minimum of 2 years to a maximum of ten to twelve years, even though in the past it was often assumed that fluctuations of output and other economic indicators around the trend showed repetitive and regular pattern of alternating periods of expansion and contraction.

But, actually there has been no clear evidence of very regular cycles of the same definite duration. Certain business cycles have been very short lasting for only two to three years, while the others have lasted for many years. Moreover, in some cycles there have been large swings away from the trend and in others these swings have been of moderate nature.

During a period of recession or depression several workers lose their jobs and as a result of large-scale unemployment, has caused loss of output that could have been produced with the full-employment of resources, come to prevail in the economy.

Besides, during the depression many businessmen go bankrupt and suffer big losses. It causes a lot of human sufferings and lowers the levels of living of the people. The fluctuations in economic activity can create a lot of uncertainty in the economy which causes anxiety to the individuals about their future income and employment opportunities and involve a great risk for long-run investment in projects.

Even boom when it is accompanied by inflation has its social costs. Inflation erodes the real incomes of the people and creates life miserable for the poor people. It distorts allocation of resources by drawing away the scarce resources from productive uses to unproductive ones. This redistributes income in favor of the richer actions and also when inflation rate is high, it impedes economic growth.

According to Crowtoe, "there is a misery and shame of unemployment with all the individual poverty and also the social disturbances that it may create. However, there is a loss of wealth represented by so much wasted and idle labour and capital."

Several free enterprise capitalist countries such as USA and Great Britain have registered a rapid economic growth during the last two centuries. Moreover the economic growth in these countries has not followed steady and smooth upward trend.

They have a long-run upward trend in Gross National Product (GNP), but periodically there have been large short-run fluctuations in the economic activity, that is, income, changes in output, employment and prices around this long- term trend.

Features of Business Cycles:

1. The business cycles are Synchronic. That is, they do not cause changes in any single industry or sector but they are of all embracing character.

For example, depression or contraction occurs simultaneously in all industries or sectors of the economy.

2. The recession passes from one industry to another. This chain reaction continues till the whole economy is in the grip of recession. Identical process is at work in the expansion phase, the prosperity spreads through different linkages of input-output relations or demand relations between various industries and sectors.

3. The business cycles occur periodically. Since they do not show same regularity, they have some distinct phases such as expansion, peak, contraction or depression and trough. Moreover the duration of cycles varies a good deal from two years to ten to twelve years.

4. It has been observed that fluctuations occur not only in level of production but also consequently in other variables such as employment, investment, consumption, rate of interest and price level.

5. Another important feature of business cycles is that consumption of non-durable goods and services does not vary much during different phases of business cycles. The past data of business cycles will reveal that the households maintain a great stability in consumption of non-durable goods.

6. An investment and consumption of durable consumer goods such as houses, cars, refrigerators are affected most by the cyclical fluctuations. According to J.M. Keynes, an investment is greatly volatile and unstable as it depends on profit expectations of private entrepreneurs.

7. The expectations of entrepreneurs change quite often creating investment quite unstable. Due to the consumption of durable consumer goods can be deferred, it also fluctuates greatly during the course of business cycles.

8. The profits fluctuate more than any other type of income. Thus the occurrence of business cycles can cause a lot of uncertainty for businessmen and makes it difficult to forecast the economic conditions.

9. When there is occurrence of depression period, the profits might even become negative and many businesses go bankrupt. The economy profits are justified on the ground that they are necessary payments if the entrepreneurs are to be induced to bear uncertainty in a free market.

10. An immediate impact of depression and expansion is on the inventories of goods. During depression, the inventories start accumulating beyond the desired level which leads to cut in production of goods. In other words, when the recovery starts, the inventories go below the desired level. It encourages the businessmen to place more orders for goods whose production picks up and stimulates investment in capital goods.

For example, when there is a recession in the USA, which is a large importer of goods from other countries, that will cause a fall in demand for imports from other countries whose exports would be adversely affected causing recession in them too. The depression of 1930s in USA and Great Britain engulfed the entire capital world.

11. Lastly, the business cycles are international in character where once it is started in one country, it will be spread to other countries through trade relations between them.

4.3 Phases of Business Cycle

Business Cycle is divided into four phases are as follows:

Prosperity Phase :

This phase carries out expansion or boom or Upswing of economy.

Recession Phase :

This phase is from prosperity to upper turning point that is recession .

Depression Phase :

This phase is used for contraction or downswing of economy.

Recovery Phase :

This phase is from depression to a lower turning Point that is prosperity .

Phases of Business Cycle

The four phases of business cycles are shown in the following diagram :-

Four Phases of Business Cycle
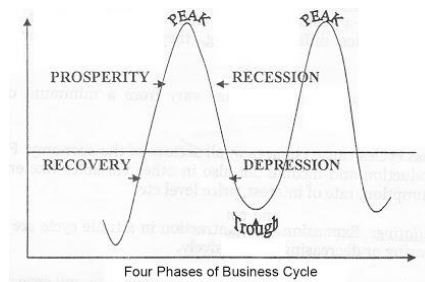
The business cycle begins from a trough which is the lower point and passes through a recovery phase followed by a period of expansion which is a upper turning point and prosperity. After the peak point is reached there is a declining phase of recession that is followed by a depression. Consequently the business cycle continues with ups and downs.

1. Prosperity Phase

During an expansion of output, employment, income, prices and profits, there is also a rise in the standard of living. The period in which ther rise occurs is termed as Prosperity phase.

Features of prosperity :

• High level of output and trade.

• High level of effective demand.

• Large expansion of bank credit.

• High level of income and employment.

• Rising interest rates.

• Inflation.

• A high level of MEC (Marginal efficiency of capital) and investment.

• Overall business optimism.

Because of the full employment of resources, the level of production will be maximum and there is a rise in GNP (Gross National Product). Since there is a high level of economic activity, it will cause a increase in prices and profits. Thus, there is an upswing in the economic activity and economy reaches its Peak. It is also called as a Boom Period.

2. Recession Phase

The turning point from the prosperity phase to the depression phase is termed as Recession Phase.

When recession period sets in, the economic activities will slow down. If the demand starts falling, the overproduction and the future investment plans are also given up. Thus, there is a steady decline in the output, employment, prices and profits.

Hence, the businessmen might lose confidence and become pessimistic . This reduces investment. The banks and the people will try to get greater liquidity, so credit also contracts. An expansion of business stops, stock market falls. The orders might be canceled and the people will start losing their jobs. This will increase in unemployment causes a sharp decline in income and aggregate demand. Usually, the recession lasts for a short period.

3. Depression Phase

During a continuous decrease of output, income, prices, profits and employment, there is also fall in the standard of living and that is where the depression sets in.

Features of depression:

• Fall in volume of output and trade.

• Fall in income and rise in unemployment.

• Fall in interest rate.

• Deflation.

• Overall business pessimism.

• Fall in MEC (Marginal efficiency of capital) and investment.

• Contraction of bank credit.

In this phase, there is under-utilization of resources and fall in GNP (Gross National Product). This aggregates the economic activity which is at the lowest, causing a decline in prices and profits until the economy reaches its Trough that is the low point.

4. Recovery Phase

The turning point from depression phase to expansion phase is termed as Recovery or Revival Phase.

In this period, there are expansions and rise in economic activities. If the demand starts rising, the production will increase and this causes an increase in investment. Thus, there is a steady rise in output, income, employment, prices and profits. The businessmen will also gain confidence and become optimistic and it also increases investments.

The stimulation of investment brings about the revival or recovery of the economy. Therefore, the banks expand credit, business expansion takes place and the stock markets are activated. There is an increase in employment, production, income and aggregate demand, prices and profits start rising and business expands. Revival also slowly emerges into prosperity and the business cycle is repeated.

Hence, during the expansionary or prosperity phase, there is inflation and during the contraction or depression phase, there is a deflation.

Introduction to Accounting & Financing Analysis

(*The Learning objective of this Unit is to understand the different Accounting Systems preparation of Financial Statements and uses of different tools for performance evaluation).

Introduction to Accounting & Financing Analysis: Introduction to Double Entry Systems – Preparation of Financial Statements-Analysis and Interpretation of Financial Statements-Ratio Analysis – Preparation of Funds flow cash flow statements (Simple Problems).

5.1 Introduction to Double Entry Systems

The most important accounting lesson relates to the double entry system. This is vital to build the foundations and understand how the double entry systems works, what are the rules that we will need to follow to accurately record business transactions and to be able to build on that so we have develop the skills to exercise judgment when required.

Double Entry:

It is a system where every business transaction is having a two fold effect of benefits giving and benefit receiving aspects. There is recording made on the basis of both these aspects. The double Entry is an accounting system which records the effects of transactions and other events in at least two accounts with equal debits and credits.

Meaning of Debit and Credit

The term 'debit' is derived from 'debit' and the term 'credit' from 'creditable'. It is represented as 'Dr' which is used for debit and 'Cr' which is used for credit for convenience. The recording of transactions will require a thorough understanding of the rules of debit and credit relating to accounts. Hence, both debit and credit may represent either increase or decrease, depending upon the nature of account.

Steps involved in Double entry system:

(a) Preparation of Journal:

A journal is called the book of original entry. This is used to record the effect of all transactions for the first time. In this step, the job of recording is carried over.

(b) Preparation of Ledger:

A ledger is the collection of all accounts used by a business. This involves the grouping of accounts is performed. A journal is posted to ledger.

(c) Trial Balance preparation:

This step involves of Summarizing. The trial balance preparation is a summary of ledge balances prepared in the form of a list.

(d) Preparation of Final Account:

At the end of the accounting period in order to know the achievements of the organization and its financial state of affairs, the final accounts are prepared.

Advantages of Double Entry System

1. Complete record of transactions : The system will always maintain a complete record of all business transactions.

2. Ascertainment of profit or loss: The profit earned or loss suffered during a period can be ascertained together with the details by preparation of Profit and Loss Account.

3. Scientific system: It is the only scientific system of recording business transactions in a set of accounting records. This helps to attain the objectives of accounting.

4. Full details for purposes of control: It permits for accounts to be prepared or kept in as much detail as necessary. Therefore, it affords significant information for purposes of control etc.

5. Check on the accuracy of accounts: This system has a accuracy of accounting book that can be established through the device called a Trail balance.

6. Knowledge of the financial position of the business: Here, the financial position of the firm can be ascertained at the end of each period, through the preparation of balance sheet.

7. Helps management in decision making: In this system, the management may be also to obtain good information for its work, specially for making decisions.

8. No scope for fraud: Here, the firm is saved from frauds and misappropriations since full information about all assets and liabilities will be available.

9. Comparative study is possible: The results of one year may be compared with those of the precious year and reasons for the change might be ascertained.

5.2 Preparation of Financial Statements

Preparation of Financial Statements

During the adjusting entries are entered in a worksheet, the financial statements are prepared by using information from the ledger accounts. Since some of the financial statements uses the data from the other statements, the following is a logical order for their preparation are :

• **Income statement**

• **Statement of retained earnings**

• **Balance sheet**

• **Cash flow statement**

Income Statement

This reports revenues, expenses and the resulting net income. It is prepared by transferring the following ledger account balances and taking into account of any adjusting entries that have been or will be made are:

• Expenses

• Capital gains or losses

• Revenue

Statement of Retained Earnings

They represents the retained earnings at the beginning and end of the accounting period. This is created by using the following information are as follows:

• Beginning retained earnings, is obtained from the previous statement of retained earnings.

• Net income, is obtained from the income statement.

• the dividends paid during the accounting period.

Balance Sheet

It reports the assets, liabilities and shareholder equity of the company. This is constructed using the following information:

• using the balances of all asset accounts such cash, accounts receivable, etc.

• Capital stock balance.

• using the balances of all liability accounts such as accounts payable, notes, etc.

• the retained earnings is obtained from the statement of retained earnings.

Cash Flow Statement

This describes the reasons for changes in the cash balance, by showing the sources and the uses of cash in the operating, financing and investing activities of the firm.

Since the cash flow statement is a cash-basis report, it can't be derived directly from the ledger account balances of an accrual accounting system. But, it is derived by converting the accrual information to a cash-basis using one of the following two methods:

• **Direct method:** The cash flow information is derived by directly subtracting the cash disbursements from the cash receipts.

• **Indirect method:** The cash flow information is derived by adding or subtracting the non-cash items from the net income.

To provide more meaningful information to enable the owners, creditors, investors, or users of financial statements for evaluating the operational efficiency of the concern during the particular period. The financial statements requires more useful information to make the purposeful decisions about the profitability and financial soundness. To fulfill the needs of the above, it is essential to consider analysis and interpretation of financial statements.

5.2.1 Analysis and Interpretation of Financial Statements

Analysis is defined as a rearrangement of the data given in the financial statements. That is, it is simplification of data by methodical classification of the data given in the financial statements.

Interpretation is a method of explaining the meaning and significance of the data so simplified. Both analysis and interpretations are inter related as they are complementary to each other. The financial statement analysis and interpretations is a process of evaluating the relationship between the component parts of a financial statement in order to obtain a better understanding of the firm's position and performance.

The facts and figures in the financial statements can be transformed into meaningful and useful figures through a process called "Analysis and Interpretations." It can also be explained where it refers to the process of establishing the meaningful relationship between the items of the two financial statements with the objective of identifying the financial and operational strengths and weaknesses.

Types of Analysis and Interpretations

The analysis and interpretation of the financial statements can be classified into two categories are as follows :

Financial Statement Analysis

On the Basis of Materials Used   On the Basis of Method of operations

External Analysis   Internal Analysis   Horizontal Analysis   Vertical Analysis
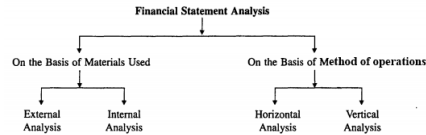
Classification of financial analysis

I. The Materials Used

On the basis of materials used the analysis and interpretations of financial statements may be classified into two are as follows:

(a) External Analysis

(b) Internal Analysis.

External Analysis:

It is used for the outsiders of the business firm. An Outsider can be investors, creditors, suppliers, government agencies, shareholders etc. Those external people have to rely only on these published financial statements for important decision making. It serves only a limited purpose due to non-availability of detailed information.

Internal Analysis:

This is performed by the persons who are internal to the organization. The internal people will have access to the books of accounts and the other informations related to the business. That analysis can be done for the purpose of assisting managerial personnel to take corrective action and appropriate decisions.**II. Methods of Operations**

On the basis of method of operations the analysis and interpretation of financial statements may be classified into:

(a) Horizontal Analysis

(b) Vertical Analysis.

Horizontal Analysis:

It is also termed as Dynamic Analysis. In this type of analysis, the comparison of the trend of each item in the financial statements over the number of years are reviewed or analyzed. This type of comparison will help to identify the trend in various indicators of performance. This type of analysis, the current year figures are compared with base year for figures and they are presented horizontally over a number of columns.

Vertical Analysis:

It is also termed as Static Analysis. In this type of analysis, a number of ratios is used for measuring the meaningful quantitative relationship between the items of financial statements during the particular period. Under this type of analysis is useful in comparing the efficiency, performance and profitability of several companies in the same group or divisions in the same company.

Rearrangement of Income Statements

The financial statements must be rearranged for proper analysis and interpretations of these statements. This enables to measure the performance of operational efficiency and profitability during particular period. The items of operating expenses, nonoperating expenses, operating revenues and non-operating revenues are rearranged into different heads and sub-heads are given below.

Income Statement (Operating Statement)
for the year endings . . . . . .

Particulars	Amount Rs.	Amount Rs.
		. . .
Opening stock of Raw Materials		
Add : Purchases	. . .	
Less : Purchases Returns	. . .	. . .
Freight and Carriage		. . .
Less : Closing Stock of Raw Materials		. . .
		. . .
Raw Materials Consumed (1)		. . .
Add : Direct wages (Factory)	. . .	
Factory Rent and Rates	. . .	
Power and Coal	. . .	
Depreciation of Plant and Machinery	. . .	
Depreciation of Factory Building	. . .	
Work Manager's Salary	. . .	
Other Factory Expenses	. . .	. . .
	. . .	
Add : Opening Stock of working progress	. . .	
Opening Stock of Finished goods	. . .	
	. . .	
Less : Closing Stock of work in progress	. . .	
Closing Stock of Finished goods	. . .	. . .
Cost of Goods Sold (2)		. . .
Less : Net Sales (Less sales return and Sales tax) (3)		. . .
Gross Profit : (4) = (3 – 2)		. . .
(Net Sales – Cost of Goods Sold)		
Less : **Operating Expenses :** (5)		
Office Expenses	. . .	
Administrative Expenses	. . .	
Selling Expenses	. . .	
Distribution Expenses	. . .	. . .
Net Operating Profit : (6) = (4 – 5)		. . .
Add : **Non-Operating Income :** (7)	. . .	
Interest Received	. . .	
Discount Received	. . .	
Dividend Received	. . .	
Income Form Investment	. . .	
Interest on Debenture	. . .	
Any other Non-Trading Income	. . .	. . .
		. . .
Less : **Non-Operating Expenses :** (8)		
Discount on Issue of Shares Written off	. . .	
Interest on Payment on Loan and Overdraft	. . .	
Loss on Sale of Fixed Assets	. . .	. . .
		. . .
Net Profit Before Interest and Tax (9)		. . .
Less : Interest on Debenture (10)		. . .
Net Profit Before Tax (11) = (9 – 10)		. . .
(Net Profit Before Interest and Tax–Interest on Debenture)		
Less : **Tax Paid** (12)		. . .
Net Profit After Interest and Tax (13)		. . .
or Net Loss After Interest and Tax		
(Transferred to Capital Account)		

Income Statement Equations

The rearrangement of operating statements from the above statements, the following accounting equations may be given:

(1) Net Sales = Cost of Sales + Operating Expenses + Non-Operating Expenses

(2) Gross Profit = Net Sales - Cost of Goods Sold

(3) Operating Expenses = Office and Administrative Expenses + Selling and Distribution Expenses

(or)

Gross Profit - Net Operating Profit Cost of Sales

(4) Sales - Net Operating Profit = Cost of Sales + Operating Expenses

(5) Net Operating Profit = Gross Profit - Operating Expenses

(6) Net Profit Before Interest and Tax = Net Operating Profit - Non-Operating Expenses

(7) Sales = Cost of Sales + Operating Expenses + Non-Operating Expenses

(8) Net Profit Rearrangement of Balance Sheet = Net Sales - (Cost of Sales + Operating Expenses + Non-Operating Expenses)

Balance sheet

It is a statement which consists of assets and liabilities that reflects the financial soundness of a concern at a given date. For judging the financial position, it is necessary to rearrange the balance sheet in a proper set of form. The figures in Balance Sheet rearranged in a Vertical Form and given below for the analysis and interpretation.

Balance Sheet as on 31ˢᵗ Dec. . . . .

Particulars	Amount Rs.	Amount Rs.
Cash in Hand	...	
Cash at Bank	...	
Bills Receivable	...	
Sundry Debtors	...	
Marketable Securities	...	
Other Short-Term Investments	...	...
Liquid Assets (1)	...	
Add : Stock in Trade	...	
(Closing Stock of Raw Materials		
Closing Stock of Work in Progress		
Closing Stock of Finished goods)		
Prepaid Expenses	...	...
Current Assets (2)		...
Less : Current Liabilities :		
Bills Payable	...	
Sundry Creditors	...	
Bank Loans (Short-term)	...	
Bank Overdraft	...	
Outstanding Expenses	...	
Accrued Expenses	...	
Trade Liabilities	...	
Other Liabilities Payable within year	...	...
Total Current Liabilities : (3)		...
Add : **Provisions : (4)**		
Provision for Tax	...	
Proposed Dividend	...	
Provision for Contingent Liabilities	...	
Total Current Liabilities and Provisions (5) = (3 + 4)	...	...
Net Working Capital (6) = (2 – 5)		...
(Current Assets – Total Current Liabilities & Provision)		
Add : **Fixed Assets : (6)**		
Goodwill	...	
Land and Buildings	...	
Plant and Machinery	...	
Loose Tools	...	
Furniture and Fixtures	...	
Patents and Copyrights	...	
Live Stock	...	
Investment in Subsidies	...	...
Capital Employed (7) = (5 + 6)		...
(Net Working Capital + Fixed Assets)		
Add : **Other Assets : (8)**		
Investment in Govt. Securities	...	
Unquoted Investments	...	
Other Non-Trading Investments	...	
Advances to Directors	...	...
Company's Net Assets (9) = (7 + 8)		...
(Capital Employed + Other Assets)		
Less : **Long-Term Liabilities (10)**		
Debenture	...	
Long-Term Debt	...	
Long-Term Loan from Bank & Financial Institutions	...	
Long-Term Debt Raised by Issue of Securities & Public Deposits	...	
Other Long-Term Loan payable after a year	...	...
Share Holders Net Worth (11) = (9 – 10)		
(or) Total Tangible Net Assets – Shareholders Net Worth		...
Less : **Preference Share Capital (12)**		...
Equity Shareholders Net Worth (13) = (11 – 12)		...
(Total Tangible Net Worth – Preference Share Capital)		

Balance Sheet Equations :

The accounting equations can be drawn from the above balance sheet:

(1) Liquid Assets = Current Assets - Stock and Prepaid Expenses

(2) Current Assets = Net Working Capital - Current Liabilities

(3) Net Working Capital = Current Assets - Current Liabilities

(4) Capital Employed = Net Working Capital + Fixed Assets (or) (Current Assets - Current Liabilities) + Fixed Assets (or) Total Assets - Current Liabilities

(5) Shareholders' Net Worth = Company's Net Assets - Shareholders' Net Worth

(6) Equity Shareholders' Net Worth = Total Tangible Net Worth - Preference Share Capital

Methods or Tools of Analysis and Interpretations

The various techniques for the analysis and interpretations of financial statements are as follows:

(1) Comparative Financial Statements.

(2) Common Size Statements.

(3) Trend Analysis.

(4) Ratio Analysis.

(5) Cash Flow Analysis.

(6) Fund Flow Analysis.

Comparative Financial Statements

Both the comparative Profit and Loss Account and comparative Balance sheet are covered. This enables to measure the operational efficiency and financial soundness of the concern for analysis and interpretations. The comparative statements wil include:

(a) the figures which is presented in the comparative statements side by side for two or more years.

(b) An absolute data in money value.

(c) The increase or Decrease between the absolute figures in money value.

(d) The changes or trend in terms of percentage.

Example 1:

From the following Profit and Loss Account ABS Ltd., for the years 2002 and 2003, prepare a Comparative Income Statement.

Statements of Profit and Loss Account

Particulars	2002 Rs.	2003 Rs.
Net sales	4,000	5,000
Less : Cost of goods sold	3,000	3,750
Gross Profit	1,000	1,250
Less : Operating Expenses		
Office and Administrative Expenses	200	250
Selling and Distribution Expenses	225	300
Total Operating Expenses	425	550
Net Profit	575	700

Statements of Profit and Loss Account

Particulars	2002 Rs.	2003 Rs.	Increase or Decrease in 2003 Absolute in 2003 Rs.	Percentage (%)
Net sales	4,000	5,000	+ 1,000	+ 25
Less : Cost of Goods Sold	5,000	3,750	+ 1,500	+ 25
Gross Profit	1,000	1,250	+ 250	+ 25
Less : Operating Expenses :				
Office and Administrative Expenses	200	250	+ 50	+ 25
Selling and Distribution Expenses	225	300	+ 75	+ 33.33
Total Operating Expenses	425	550	+ 125	+ 29.41
Net Profit (Gross Profit–Total Operating Expenses)	575	700	+ 125	+ 21.73

Solution:

Interpretation

It is observed that the sales has increased to the extent of 25%. The cost of goods sold and its percentage increased by 25%. The administrative and selling & distribution expenses have been increased by 25% and 33.33% respectively and the rate of net profit is also increased to the extent of 21.73%.It indicates that the overall profitability of the concern is good.

Example 2:

The Following is the Balance Sheet ABC Ltd. for the year 2002 amd 2003. Prepare Comparative

Balance Sheet of ABC Ltd. for the year 2002 and 2003

Liabilities	2002 Rs.	2003 Rs.	Assets	2002 Rs.	2003 Rs.
Current Liabilities	37,000	50,000	Cash in Hand	3,000	5,000
Debenture	50,000	60,000	Cash at Bank	10,000	20,000
Long-Term Debts	2,00,000	2,50,000	Bills Receivable	7,000	10,000
Capital :			Sundry Debtors	10,000	15,000
Preference Share			Stock	20,000	25,000
Capital	1,00,000	1,50,000	Fixed Assets	4,90,000	6,25,000
Equity Capital	1,25,000	1,60,000			
General Reserve	28,000	30,000			
	5,40,000	7,00,000		5,40,000	7,00,000

Balance sheet:

Solution:

Comparative Balance Sheet as on 31ˢᵗ Dec. 2002 & 2003

Particulars	2002 Rs.	2003 Rs.	Increase or Decrease in 2003 Rs.	Percentage of Increase or Decrease in 2003 (%)
Assets :				
Cash in Hand	3,000	5,000	+ 2000	+ 66.66
Cash at Bank	10,000	20,000	+ 10000	+ 100
Bills Receivable	7,000	10,000	+ 3000	+ 42.85
Sundry Debtors	10,000	15,000	+ 5000	+ 50
Total Liquid Assets	30,000	50,000	+ 20000	+ 66.66
Add : Stock	20,000	25,000	+ 5000	+ 25
Total Current Assets	50,000	75,000	+ 25000	+ 50
Fixed Assets	4,90,000	6,25,000	+ 1,35,000	+ 27.55
Total Assets	5,40,000	7,00,000	+ 1,60,000	+ 29.62
Liabilities and Capital :				
Current Liabilities	37,000	50,000	+ 13,000	+ 35.13
Total Current Liabilities	37,000	50,000	+ 13,000	+ 35.13
Long-Term Liabilities :				
Debenture	50,000	60,000	+ 10,000	+ 20
Long-Term Debts	2,00,000	2,50,000	+ 50,000	+ 25
Total Long-term Liabilities	2,50,000	3,10,000	+ 60,000	+ 24
Total Liabilities	2,87,000	3,60,000	+ 73,000	+ 25.43
Capital and Reserve :				
Preference Share Capital	1,00,000	1,50,000	+ 50,000	+ 50
Equity Share Capital	1,25,000	1,60,000	+ 35,000	+ 28
General Reserves	28,000	30,000	+ 2,000	+ 7.14
Total Capital & Reserve	2,53,000	3,40,000	+ 87,000	+ 34.38
Total Liabilities & Capital	5,40,000	7,00,000	+ 1,60,000	+ 29.62

Interpretation

The total current assets of the company is increased by 50% in 2003 as compared to 2002. The current liabilities is increased only to the extent of 33.15 %. It indicates that the company will have no problem to meet the day-to-day expenses and it is also observed that the current financial position of the concern has considerably increased. The fixed assets has been increased by 29.62% compared to 2002. Simultaneously, the long-term liabilities, share capital and the reserve is also considerably increased by 34.38%. This shows that the company exapnd plans in a big way.

Common Size Statements

For avoiding the limitations of Comparative Statement, it is designed. Here, financial statements are analysed jin order to measure the relationship of various figures with some common base. In same way , while preparing the Common Size Profit and Loss Account, the total sa!es is taken as common base and the other items are expressed as a percentage of sales whereas to prepare the Common Size Balance Sheet, the total assets or total liabilities are taken as the common base and all other items are expressed as a percentage of total assets and liabilities.

Example:

From the following Profit and Loss account and Balance sheet, prepare the following:

(a) Comparative Income Statements

(b) Comparative Balance sheet

(c) Common size Income Statement

(d) Common size Balance sheet

Profit and Loss Account

Particulars	2002 Rs.	2003 Rs.	Particulars	2002 Rs.	2003 Rs.
To opening Stock of Materials	25,000	30,000	By Net Sales	2,00,000	2,25,000
To Purchases	1,00,000	1,25,000	By Closing Stock	25,000	30,000
To Direct Wages	15,000	17,000	By Non-Operating		
To Freight and Carriage	2,000	3,000	Income	10,000	15,000
To Other Factory Expenses	1,000	2,000			
To Office & Admi. Expenses	5,000	6,000			
To Selling and Distribution Expn.	7,000	8,000			
To Non-Operating Expenses	5,000	7,000			
To Net Profit c/d	75,000	72,000			
	2,35,000	2,70,000		2,35,000	2,70,000

Balance Sheet as on 31ˢᵗ Dec.......

Liabilities	2002 Rs.	2003 Rs.	Assets	2002 Rs.	2003 Rs.
Bills Payable	5,000	7,000	Cash in hand	3,000	5,000
Sundry Creditors	10,000	15,000	Cash at Bank	10,000	20,000
Provision for Tax	7,000	10,000	Bills Receivable	7,000	10,000
Proposed Dividend	5,000	8,000	Sundry Debtors	10,000	15,000
Bank Overdraft	10,000	10,000	Stock in Trade	20,000	25,000
Debenture	50,000	60,000	Land & Buildings	2,00,000	2,50,000
Preference Share			Goodwill	1,00,000	1,25,000
Capital	1,00,000	1,50,000	Furniture & Fixtures	40,000	50,000
Equity Share Capital	1,25,000	1,60,000	Plant & Machinery	1,50,000	2,00,000
Long-Term Loans	2,00,000	2,50,000			
General Reserve	28,000	30,000			
	5,40,000	7,00,000		5,40,000	7,00,000

(A) Comparative Income Statement
For the year ending . . . .

Particulars	2002 Rs.	2003 Rs.	Increase or Decrease in 2003 Rs.	Percentage of Increase or Decrease in 2003
Opening stock of Raw Material	25,000	30,000	+ 5,000	+ 20%
Add : Purchases	1,00,000	1,25,000	+ 25,000	+ 25%
	1,25,000	1,55,000	+ 30,000	+ 24%
Add : Freight and Carriage	2,000	3,000	+ 1,000	+ 50%
	1,27,000	1,58,000	+ 31,000	+ 24.40%
Less : Closing Stock	25,000	30,000	+ 5,000	+ 20%
Raw Materials Consumed (1)	1,02,000	1,28,000	+ 36,000	+ 35.29%
Add : Direct Wages	15,000	17,000	+ 2,000	+ 13.33%
Other Factory Expenses	1,000	2,000	+ 1,000	+ 50%
Cost of Goods Sold (2)	1,18,000	1,47,000	+ 39,000	+ 33.05%
Net Sales (3)	2,00,000	2,25,000	+ 25,000	+ 12.5%
Gross Profit (3 – 2) = (4)	82,000	78,000	- 4,000	- 4.87%
(Net Sales – Cost of Goods Sold)				
Less : Operating Expenses :				
Office & Administrative Expenses	5,000	6,000	+ 1,000	+ 20%
Selling & Distribution Expenses	7,000	8,000	+ 1,000	+ 14.28%
Total Operating Expenses (5)	12,000	14,000	+ 2,000	+ 16.66%

Solution:

Net Operating Profit (4 – 5) = (6)	70,000	64,000	- 6,000	- 8.57%
(Gross Profit – Net Operating Profit)				
Add: Non-Operating Income	10,000	15,000	+ 5,000	+ 50%
Total Operating Income (7)	80,000	79,000	- 1,000	- 1.25%
Less: Non-Operating Expenses	5,000	7,000	+ 2,000	+ 40%
Net Profit (8)	75,000	72,000	- 3,000	- 4%

(B) Comparative Balance sheet
as on 31st . . . .

Particulars	2002 Rs.	2003 Rs.	Increase or Decrease in 2003 Rs.	Percentage of Increase or Decrease in 2003
Assets :				
Liquid Assets				
Cash in hand	3,000	5,000	+ 2,000	+ 66.66%
Cash at Bank	10,000	20,000	+ 10,000	+ 10%
Bills Receivable	7,000	10,000	+ 3,000	+ 42.85%
Sundry Debtors	10,000	15,000	+ 5,000	+ 50%
Total Liquid Assets (1)	30,000	50,000	+ 20,000	+ 66.66%
Add : Stock-in-trade	20,000	25,000	+ 5,000	+ 25%
Total Current Assets (2)	50,000	75,000	+ 25,000	+ 50%
Fixed Assets :				
Land and Buildings	2,00,000	2,50,000	+ 50,000	+ 25%
Plant and Machinery	1,50,000	2,00,000	+ 50,000	+ 33.33%
Goodwill	1,00,000	1,25,000	+ 25,000	+ 25%
Furniture and Fixtures	40,000	50,000	+ 10,000	+ 25%
Total Fixed Assets (3)	4,90,000	6,25,000	+ 1,35,000	+ 27.55%
Total Assets (2 + 3) = (4)	5,40,000	7,00,000	+ 1,60,000	+ 29.62%
(Total Current Assets + Fixed Assets)				

Particulars	2002 Rs.	2003 Rs.	Increase or Decrease in 2003 Rs.	Percentage of Increase or Decrease in 2003
Liabilities and Capital :				
Current Liabilities :				
Bills Payable	5,000	7,000	+ 2,000	+ 40%
Sundry Creditors	10,000	15,000	+ 5,000	+ 50%
Bank Overdraft	10,000	10,000	—	—
Provision for tax	7,000	10,000	+ 3,000	+ 42.85%
Proposed Dividend	5,000	8,000	+ 3,000	+ 60%
Total Current Liabilities (1)	37,000	50,000	+ 13,000	+ 35.13%
Long-Term Liabilities :				
Debenture	50,000	60,000	+ 10,000	+ 20%
Long-Term Loans	2,00,000	2,50,000	+ 50,000	+ 25%
Total Long-Term Liabilities (2)	2,50,000	3,10,000	+ 60,000	+ 24%
Total Liabilities (2 + 1) = (3)	2,87,000	3,60,000	+ 73,000	+ 25.45%
Capital and Reserve :				
Preference Share Capital	1,00,000	1,50,000	+ 50,000	+ 50%
Equity Share Capital	1,25,000	1,60,000	+ 35,000	+ 28%
General Reserve	28,000	30,000	+ 2,000	+ 7.14%
Total Shareholders Fund (4)	2,53,000	3,40,000	+ 87,000	+ 34.38%
Total Liabilities and Capital (5) = (3 + 4)	5,40,000	7,00,000	+ 1,60,000	+ 29.62%

(C) Common Size Income Statements

Particulars	2002 Rs.	Percentage (%)	2003 Rs.	Percentage (%)
Opening stock of Raw Material	25,000	12.5%	30,000	13.33%
Add : Purchases	1,00,000	50%	1,25,000	55.55%
Freight and Carriage	2,000	1%	3,000	1.33%
	1,27,000	63.5%	1,58,000	70.22%
Less : Closing Stock	25,000	12.5%	30,000	13.33%
Raw Materials Consumed (1)	1,02,000	51%	1,28,000	56.88%
Add : Direct Wages	15,000	7.5%	17,000	7.55%
Other Factory Expenses	1,000	0.5%	2,000	0.88%
Cost of Goods Sold (2)	1,18,000	59%	1,47,000	65.33%
Gross Profit (4)	82,000	41%	78,000	34.67%
Net Sales (3)	2,00,000	100%	2,25,000	100%
Less : Operating Expenses :				
Office & Administrative Expenses	5,000	2.5%	6,000	2.66%
Selling & Distribution Expenses	7,000	3.5%	8,000	3.55%
Total Operating Expenses (5)	12,000	6%	14,000	6.22%
Net Operating Profit (6)	70,000	35%	64,000	28.44%
(Gross Profit – Total Operating Expenses)				
Add : Non-Operating Income	10,000	5%	15,000	6.66%
	80,000	40%	79,000	35.11%
Less : Non-Operating Expenses	5,000	2.5%	7,000	3.11%
Net Profit (7)	75,000	37.5%	72,000	32%
Current Liabilities :				
Short-Term Loan	65,000	12.96%	70,000	13.33%
Bills Payable	12,500	2.50%	—	—
Sundry Creditors	10,000	1.99%	16,000	3.05%
Bank Overdraft	50,000	9.97%	71,500	13.62%
Total Current Liabilities	1,37,500	27.42%	1,57,500	30%
Long-Term Liabilities :				
Long-Term debts	1,00,000	19.94%	87,500	16.66%
Capital and Reserve :				
Share Capital	2,64,000	52.64%	2,80,000	53.34%
Total Liabilities and Capital	5,01,500	100%	5,25,000	100%

(D) Common Size Balance Sheet

Particulars	2002 Rs.	Percentage (%)	2003 Rs.	Percentage (%)
Assets				
Liquid Assets:				
Cash in hand	3,000	0.55%	5,000	0.71%
Cash at Bank	10,000	1.85%	20,000	2.85%
Bills Receivable	7,000	1.29%	10,000	1.42%
Sundry Debtors	10,000	1.85%	15,000	2.14%
Total Liquid Assets (1)	30,000	5.55%	50,000	7.14%
Add : Stock in trade	20,000	3.70%	25,000	3.57%
Total Current Assets (2)	50,000	9.25%	75,000	10.72%
Fixed Assets:				
Land and Building	2,00,000	37.03%	2,50,000	35.71%
Plant and Machinery	1,50,000	27.78%	2,00,000	28.57%
Goodwill	1,00,000	18.50%	1,25,000	17.85%
Furniture and Fixtures	40,000	7.40%	50,000	7.14%
Total Fixed Assets (3)	4,90,000	90.75%	6,25,000	89.28%
Total Assets (2+3) = (4)	5,40,000	100	7,00,000	100%
(Current Assets + Fixed Assets)				
Liabilities and Capital:				
Current Liabilities:				
Bills Payable	5,000	0.92%	7,000	1%
Sundry Creditors	10,000	1.85%	15,000	2.14%
Bank Overdraft	10,000	1.85%	10,000	1.42%
Provision for Tax	7,000	1.29%	10,000	1.42%
Proposed Dividend	5,000	0.92%	8,000	1.14%
Total Current Liabilities (1)	37,000	6.85%	50,000	7.14%
Long-Term Liabilities:				
Debenture	50,000	9.25%	60,000	8.57%
Long-Term Loan	2,00,000	37.03%	2,50,000	35.71%
Total Liabilities (2)	2,87,000	53.14%	3,60,000	51.43%
Capital and Reserve:				
Preference Share Capital	1,00,000	18.51%	1,50,000	21.42%
Equity Share Capital	1,25,000	23.14%	1,60,000	22.85%
General Reserve	28,000	5.18%	30,000	4.28%
Total Share holders Fund (3)	2,53,000	46.85%	3,40,000	48.57%
Total Liabilities & Capital (2 + 3) = (4)	5,40,000	100%	7,00,000	100%

Interpretations

It is observed that the sales have gone up in 2003, which increases the rate to the extent of 34.67% and the cost of goods sold and its percentage increased by 65.33%. The administrative and selling and distribution expenses is increased by 2.66% and 3.55% respectively whereas the rate of net profit is also increased to the extent of 32% which indicates the overall profitability of the concern is good. And the total current assets of the company have increased by 10.72%. Thus the current liabilities have increased only to the extent of 7.14%. Hence, this is an indication of liquidity position of the firm is highly satisfactory and the total fixed assets is increased by 89.28% but at the same time long-term liabilities, the capital and the reserves is increased by 48.57%. This is observed that the overall financial position of the business concern is good.

Trend Analysis

An important technique that is used for analysis and interpretations of financial statements. When applying this method, it is necessary to select a period for a number of years in order to ascertain the percentage relationship of various items in the financial statements comparing along the items in base year. During a trend is to be determined by applying this method, an earliest year or first year is taken as the base year and the related items in the base year are taken as 100 which based on this trend percentage of corresponding figures of the financial statements in the other years are concluded. It analysis is useful in framing suitable policies and forecasting in future also.

Example:

Calculate the trend percentage from the following figures of Ram & Co. Ltd. The year 1999 is taken as the base year.

Year	Sales	Cost of Goods Sold Rs.	Gross Profit Rs.
1999	2000	1400	600
2000	2500	1800	700
2001	3000	2200	800
2002	3500	2600	900
2003	4000	3000	1000

Ram & Co. Ltd.,
Trend Percentage

Year	Sale		Cost of Goods Sold		Gross Profit	
	Amount Rs.	Trend (%) Percentage	Amount Rs.	Trend (%) Percentage	Amount Rs.	Trend (%) Percentage
1999	2000	100	1400	100	600	100
2000	2500	125	1800	128.57	700	116.66
2001	3000	150	2200	157.14	800	133.33
2002	3500	175	2600	185.71	900	150
2003	4000	200	3000	214.28	1000	166.66

Solution:

Fund Flow Analysis

A method used for analysis and interpretations of financial statements. It is the statement that acts as a supplementary statement to the profit and loss account and balance sheet. It helps to determine the changes in financial position on working capital basis and on cash basis. This reveals the information about the sources of funds and has been utilized or employed during particular period.

5.2.2 Ratio Analysis

Financial Ratios Analysis

It is the most common form of financial statements analysis. They represent the relationships between different aspects of a company's operations and also provide relative measures of the firm's conditions and performance. This might provide the clues and symptoms of the financial condition and indications of potential problem areas.

This can be an important tool for small business owners and managers for measuring their progress toward reaching company objectives, also toward competing with larger companies within an industry.

They generally hold no meaning unless it is compared against something else, like past performance, another company/competitor or industry average. Hence the ratios of firms in different industries, which face different conditions, are usually hard to compare.

They are also used by bankers, investors and also business analysts to assess the different attributes of a company's financial strength or operating results. It is used to measure the establishment of relationship between the two interrelated accounting figures in financial statements. In addition, tracking different ratios over time is a powerful way for identifying trends. When performed regularly over time, this can also give help the small businesses recognize and also adapt to trends affecting their operations. It helps to Management for decision making. It is an effective tool which is used to ascertain the liquidity and operational efficiency of the concern.

According to the financial aspect of the business which the ratio measures the financial ratios are categorized by:

Market ratios measures investor response to owning a company's stock and also the cost of issuing stock.

Profitability ratios measures the company's use of its assets and also control of its expenses to generate an acceptable rate of return.

Leverage ratios examine the company's methods of financing and also measure its ability to meet financial obligations.

Efficiency ratios measure how quickly a firm can convert non-cash assets to cash assets.

Liquidity ratios investigates the availability of company's cash to pay debt.

5.3 Preparation of Funds flow cash flow statements (Simple Problems)

Funds Flow Statement

This represents the inflow and outflow of funds i.e. sources and applications of funds for a particular period. It is a statement prepared to analyze the reasons for changes in the financial position of a company between two Balance Sheets. It is also prepared to explain the changes in the working capital position of a company. There are two types of Inflows of Funds:-

1. Long term funds raised by debentures , issue of shares or sale of fixed assets.

2. Funds generated from operations.

Difference between Funds Flow Statement & Cash Flow Statement

Funds Flow Statement	Cash Flow Statement
1. Funds flow statement analyses the sources and application of funds which are long term nature and the net increase or decrease in long term funds will be reflected on the working capital of the firm.	It only considers the increase or decrease in current assets or current liabilities by calculating the cash flow of funds from operations.
2. It is more useful for Long Term Financial Planning.	It is more useful for identifying and correcting the liquidity problems of the firm.
3. It is based on the Accrual System of Accounting.	It is based only the transactions effecting Cash or Cash equivalents are taken into consideration.

Steps for Preparing Funds Flow Statement:

1. First, find the change (increase or decrease) in working capital.

2. Second, find the adjustments account to be made to net income.

3. Then, each non-current account on the balance sheet, establish the increase or decrease in that account. Analyze the change to decide whether it is a source (increase) or use (decrease) of working capital.

4. Finally, be sure the total of all sources including those from operations minus the total of all uses equals the change found in working capital in Step 1.

General Rules for Preparing Funds Flow Statement:

Changes in fixed (non-current) assets and fixed (non-current) liabilities affects working capital.

• Increase in current asset and increase in current liability does not affect working capital.

• Decrease in current asset and decrease in current liability does not affect working capital.

• Increase in a current liability will decrease (minus -) in working capital.

Decrease in a current liabilitywill increase (plus +) in working capital.

• Increase in a current asset will increase (plus +) in working capital.

• Decrease in a current asset willdecrease (minus -) in working capital.

Format of Funds Flow Statement:

This can be prepared in statement form or 'T' form. The both the formats are as follows:

Fund Flow Statements (Statement Form)

A. **Sources of Funds:**
   (*i*) Funds from Business Operations
   (*ii*) Sale of Fixed Asset
   (*iii*) Issue of Shares
   (*iv*) Issue of Debentures
   (*v*) Long-term borrowings
        Total Sources
B. **Application of Funds:**
   (*i*) Loss from Business Operation
   (*ii*) Payment of Dividend
   (*iii*) Payment of Tax
   (*iv*) Purchase of Fixed Asset
   (*v*) Payment of Long-term Loans
   (*vi*) Redemption of Debentures
   (*vii*) Redemption of Preference Shares
        Total uses
        Not increase/decrease in Working Capital
        (Total sources minus Total uses)

Fund Flow Statements ('T' Form)

Source of Funds	₹	Application of Funds	₹
(i) Funds from Business Operations		(i) Loss from Business Operations	
(ii) Sale of Fixed Assets		(ii) Payment of Dividend	
(iii) Issue of Shares		(iii) Payment of Tax	
(iv) Issue of Debentures		(iv) Purchase of Fixed Assets	
(v) Long-term Borrowings		(v) Payment of Long-term Loans	
(vi) Decrease in Working Capital		(vi) Redemption of Debentures	
(If application amount is more than the sources amount)		(vii) Redemption of Preference Shares	
		(viii) Increase in Working Capital (if sources are more than the application amount)	
Total		Total	

Funds Flow Statement (Statement Form)

A.   **Sources of Funds:**
     (i)   Funds from Business Operations
     (ii)   Sale of Fixed Asset
     (iii)   Issue of Shares
     (iv)   Issue of Debentures
     (v)   Long-term borrowings
        Total Sources

B.   **Application of Funds:**
     (i)   Loss from Business Operation
     (ii)   Payment of Dividend
     (iii)   Payment of Tax
     (iv)   Purchase of Fixed Asset
     (v)   Payment of Long-term Loans
     (vi)   Redemption of Debentures
     (vii)   Redemption of Preference Shares
        Total uses

        Not increase/decrease in Working Capital
        (Total sources minus Total uses)

Funds Flow Statement ('T' Form)

Source of Funds	₹	Application of Funds	₹
(i) Funds from Business Operations		(i) Loss from Business Operations	
(ii) Sale of Fixed Assets		(ii) Payment of Dividend	
(iii) Issue of Shares		(iii) Payment of Tax	
(iv) Issue of Debentures		(iv) Purchase of Fixed Assets	
(v) Long-term Borrowings		(v) Payment of Long-term Loans	
(vi) Decrease in Working Capital		(vi) Redemption of Debentures	
(If application amount is more than the sources amount)		(vii) Redemption of Preference Shares	
		(viii) Increase in Working Capital (if sources are more than the application amount)	
Total		Total	

Cash Flow Statement

This is one of the major financial statements for a project or business. It can be as simple as a one page analysis or it might involve several schedules that feed information into a central statement. It is a listing of the flows of cash into and out of the business or project. The balance in our checking account is our net cash flow at a specific point in time. The deposits are the cash inflow and withdrawals (checks) are the cash outflows.

The Structure of the CFS

This is varies from the income statement and balance sheet because it does not include the amount of future incoming and outgoing cash which has been recorded on credit. Thus, the cash is not the same as net income, like on the income statement and balance sheet, that includes cash sales and sales made on credit. This is determined by using three components by which cash enters and leaves a company is:

• Core operations

- Investing

- Financing

Operations

By measuring the cash inflows and outflows caused by core business operations, the operations component of cash flow will reflect on how much cash is generated from a company's products or services. usually, the changes made in cash, accounts receivable, depreciation, inventory and accounts payable are reflected in cash from operations. This is determined by making certain adjustments to the net income by adding or subtracting differences in revenue, expenses and credit transactions resulting from transactions that occur from one period to the next. The adjustments are made because non-cash items are calculated into net income and total assets and liabilities . Thus , since not all transactions involve actual cash items, several items have to be re-evaluated when calculating the cash flow from operations.

Example:

The depreciation is not really a cash expense. This is an amount that is deduced from the total value of an asset which has previously been accounted for. So, only it is added back into net sales for calculating cash flow. Then the only time income from an asset is accounted for in CFS calculations is when the asset is sold. The changes in accounts receivable on the balance sheet from one accounting period to the next must also be reflected in cash flow. When accounts receivable decreases, this implies that more cash has entered the company from customers which is paying off their credit accounts that is the amount by which AR has reduced is then added to net sales whereas accounts receivable increase from one accounting period to the next, then the amount of the increase should be deducted from net sales because, even though the amounts represented in AR are revenue, they are not cash. Thus, an increase in inventory, signals that a company has spent more money for purchasing more raw materials. When the inventory was paid with cash, the increase in the value of inventory is deducted from net sales whereas decrease in inventory would be added to net sales. When inventory was purchased on credit, an increase in accounts payable would occur on the balance sheet and the amount of the increase from one year to the other would be added to net sales.

The same logic has the true for taxes payable, salaries payable and prepaid insurance. When something has been paid off, then the variation in the value owed from one year to the next has to be subtracted from net income. When there is an amount that is still owed, then any differences will have to be added to net earnings.

The financing Changes in debt, loans or dividends are accounted for in cash from financing. The changes in cash from financing are "cash in" when capital is increased it is "cash out" when dividends are paid. Hence, when a company issues a bond to the public, the company receives cash financing. But, when interest is paid to bondholders, the company is reducing its cash.

The investing Changes in equipment, assets or investments relate to cash from investing. Usually the cash changes from investing are a "cash out" item, because cash is used to buy new equipment,

buildings or short-term assets such as marketable securities. But, when a company divests of an asset, the transaction is considered as "cash in" for calculating cash from investing.

Analyzing an Example of a CFS

Cash Flow Statement Company XYZ FY Ended 31 Dec 2003		
all figures in USD		
Cash Flow From Operations		
Net Earnings		2,000,000
Additions to Cash		
Depreciation		10,000
Decrease in Accounts Receivable		15,000
Increase in Accounts Payable		15,000
Increase in Taxes Payable		2,000
Subtractions From Cash		
Increase in Inventory		(30,000)
Net Cash from Operations		2,012,000
Cash Flow From Investing		
Equipment		(500,000)
Cash Flow From Financing		
Notes Payable		10,000
Cash Flow for FY Ended 31 Dec 2003		1,522,000

Problems

1. The following are the summarized balance sheets of M/s .Krishna Ltd. as on 31.12.1999 and 2000.

Liabilities		
	1999	2000
10% preference shares	1,00,000	1,10,000
Equity Shares	2,20,000	2,50,000
Share premium	20,000	26,000
Profit & loss a/c	104000	134000
12% debentures	70000	64000

Creditors	38000	46000
Bills Payable	5000	4000
Provision for tax	10000	12000
Dividend Payable	7000	8000
	574000	**654000**

Assets	1999	2000
	$	$
Machinery	2,00,000	2,30,000
Buildings	1,50,000	1, 76,000
Land	18,000	18,000
Cash	42,000	32,000
Debtors	38,000	38,000
Bills receivable	42,000	62,000
Stock	84,000	98,000
	5,74,000	6,54,000

Solution:

Particulars	Amount	Particulars	Amount
$		$	
Issue of preference shares	10,000	Purchase of machinery	30,000
Issue of Equity shares	30,000	Purchase of Building	26,000
Share premium received	6,000	Increase in working capital	14,000
Fund from operation	30,000	Redemption of debenture	6,000
76,000		76,000	

Fund Flow Statement

Workings:

(i) Statement of changes in working capital

	1999	2000
	$	$
Current Assets :		
Cash	42,000	32,000
Debtors	38,000	38,000
Bills receivables	42,000	62,000
Stock	84,000	98,000
Total current assets	2, 06,000	2, 30,000
Current Liabilities :		
Creditors	38,000	46,000
Bills payable	5,000	4,000
Provision for Tax	10,000	12,000
Dividend payable	7,000	8,000
Total current liabilities	60,000	70,000
Working capital	1,46,000	1,60,000

Increase in working capital : $ 14000 (1,46,000 – 1,60,000)

[Transfer to Fund Flow Statement]

(ii) Profit and Loss Account

To Balance b/d (closing)	1,34,000	By Balance c/d	1,40,000
		By Fund from operation	30,000
1,34,000		1,34,000	

2. From the following balance sheets, prepare schedule of changes in working

capital.

Liabilities	Dec 1980	Dec1981	Assets	Dec1980	Dec1981
	$	$		$	$
Share capital	2,00,000	2,50,000	Cash	30,000	47,000
Creditors	70,000	45,000	Debtors	1,20,000	1,15,000
Retained}			Land	50,000	66,000
Earnings	10,000	23,000	Stock	80,000	90,000
	2,80,000	3,18,000		2,80,000	3,18,000

Solution:

Fund Flow Statement

Source of funds	$	Application of fund	$

Fund flow statement

Source of funds	$	Application of fund	$
Issue of shares	50,000	Purchase of Land	16,000
Fund from operation	13,000	increase in working capital	47,000
	63,000		63,000

Workings:(i) Statement of changes in working capital

Current Assets :	Dec. 1980	Dec. 1981
	$	$
Cash	30,000	47,000
Debtors	1,20,000	1,15,000
Stock	80,000	90,000
Total current assets	2,30,000	2,52,000
Current liabilities :		
Creditors	70,000	45,000
Total current Liabilities	70,000	45,000
Working capital	1,60,000	2,07,000
Increase in working capital	(1,60,000 – 2,07,000)	47,000

(ii) Profit and Loss Accounts

To Balance b/d	23,000	By Balance C/D	10,000
		By Fund from operation (B/f)	13,000
	23,000		23,000

3. Let us calculate Fund from Operations from the following Profit and Loss Account

To Salaries	45,000	By Gross Profit b/d	2,00,000
To Rent & Rates	15,000	By Profit on Sale of Plant	10,000
To Office Expenses	15,000	By Dividend received on Investment	4,000
To Administrative Expenses	20,000	By Preliminary Expenses	2,000
To General Expenses	5,000	By Transfer to General Reserve	4,000
To Depreciation on Machinery	25,000		
To Depletion of Natural Resources	10,000		
To Depreciation on Building	5,000		
To Loss on Sale of Building	10,000		
To Good will Written off	10,000		
To Discount Written off	3,000		
To Advertisement Written off	5,000		
To Net Profit	52,000		
	2,20,000		2,20,000

Solution:

Particulars	Amount Rs	Amount Rs.
Net Profit or Retained Earnings (Closing Balance of Profit & Loss A/c)		52,000
Add : Non-fund or Non-Trading items already debited to P & L A/c :		
Depreciation on Plant & Machinery	25,000	
Depreciation on Building	5,000	
Depletion of Natural Resources	10,000	
Loss on Sale of Building	10,000	
Good will Written off	10,000	
Discount Written off	3,000	
Advertisement Written off	5,000	
Preliminary Expenses	2,000	70,000
		1,22,000
Less : Non-Fund or Non-Operating items already credited to P & L A/c :		
Profit on Sale of Plant	10,000	
Dividend received on Investment	4,000	
Transfer to General Reserve	4,000	18,000
Fund From Operations		1,04,000

Calculation of Fund from Operations

Alternatively

Adjusted Profit & Loss Account

Particulars	Amount Rs.	Particulars	Amount Rs.
To Depreciation on Plant and Machinery	25,000	By Profit on Sale of Plant	10,000
To Depreciation on Building	5,000	By Dividend received on Investment	4,000
To Depletion of Natural Resources	10,000		
To Loss on Sale of Building	10,000	By Transfer to General Reserve	4,000
To Good will Written off	10,000	By Fund from Operations (Balancing figure)	1,04,000
To Discount Written off	3,000		
To Advertisement Written off	5,000		
To Preliminary Expenses	2,000		
To Net Profit (Closing Balance)	52,000		
	1,22,000		1,22,000

4. From the following Balance sheet of William & Co. Ltd., we are required to prepare a Schedule of Changes in Working Capital and Statement of Sources and Application of Funds.

Balance sheet:

Liabilities	2002 Rs.	2003 Rs.	Assets	2002 Rs.	2003 Rs.
Capital	80,000	85,000	Cash in Hand	4,000	9,000
P & L A/c	14,500	24,500	Sundry Debtors	16,500	19,500
Sundry Creditors	9,000	5,000	Stock	9,000	7,000
Long-Term Loans	—	5,000	Machinery	24,000	34,000
			Building	50,000	50,000
	1,03,500	1,19,500		1,03,500	1,19,500

Solution:

Particulars	2002 Rs.	2003 Rs.	Changes in Working Capital Increase	Changes in Working Capital Decrease
Current Assets :				
Cash at Bank	4,000	9,000	5,000	—
Sundry Debtors	16,500	19,500	3,000	—
Stock	9,000	7,000	—	2,000
Total (A)	29,500	35,500		
Current Liabilities :				
Sundry Creditors	9,000	5,000	4,000	—
Total (B)	9,000	5,000		
Working Capital (Total A – B)	20,500	30,500		
Net Increase in Working Capital	10,000	—	—	10,000
	30,500	30,500	12,000	12,000

Schedule of changes in working capital

Fund Flow Statement

Sources of Fund	Rs.	Application of Fund	Rs.
Issue of Capital (80000 – 85000)	5,000	Purchase of Machinery (24,000 – 34,000)	10,000
Long-Term Loans	5,000	Net Increase in Working Capital	10,000
Fund From Operations (14,500 – 24,500)	10,000		
	20,000		20,000

5. From the following Balance sheet of RR & Co. Ltd., we are required to prepare (a) Schedule of Changes in Working Capital (b) Fund Flow Statement and (c) Fund From Operations.

Balance Sheet

Liabilities	2002 Rs.	2003 Rs.	Assets	2002 Rs.	2003 Rs.
Equity Capital	1,00,000	1,00,000	Good Will	6,000	6,000
General Reserve	14,000	18,000	Patents	6,000	6,000
Profit & Loss A/c	16,000	13,000	Building	50,000	46,000
Bank Overdraft	3,000	2,000	Machinery	27,000	26,000
Sundry Creditors	5,000	3,400	Investments	10,000	11,000
Bills Payable	1,200	800	Stock	20,000	13,400
Provision for Taxation	10,000	11,000	Bills Receivable	12,000	13,200
Proposed Dividend	6,000	7,000	Debtors	18,000	19,000
Provision for Doubtful Debts	400	600	Cash at Bank	6,600	15,200
	1,55,600	1,55,800		1,55,600	1,55,800

Additional Information

1. Depreciation Charged on Machinery Rs. 4,000 and on Building Rs. 4,000.

2. Provision for Taxation of Rs. 19,000 was made during the year 2003.

3. Interim Dividend of Rs. 8,000 was Paid during the year 2003.

Solution:

Calculation of Fund from Operations

Particulars	Amount Rs.	Amount Rs.
Profit and Loss A/c (Closing Balance of 2003)		13,000
Add : Non-Fund or Non-Trading items already		
Debited to P&L A/c :		
Depreciation on Machinery	4,000	
Depreciation on Building	4,000	
Interim Dividend Paid	8,000	
Transfer to General Reserve	4,000	

Particulars	Amount	Amount
Provision for Tax (See Note 1)	19,000	
Proposed Dividend	1,000	40,000
		53,000
Less : Non-Fund or Non-Trading items already		
Credited to P&L A/c :		
Profit and Loss A/c (Opening balance as per 2002)		16,000
Fund From Operations		37,000

Schedule of Changes in Working Capital

Particulars	2002 Rs.	2003 Rs.	Changes in Working Capital Increase	Changes in Working Capital Decrease
Current Assets :				
Cash at Bank	6,600	15,200	8,600	—
Debtors	18,000	19,000	1,000	—
Stock	20,000	13,400	—	6,600
Bills Receivable	12,000	13,200	1,200	—
Total (A)	56,600	60,800		
Current Liabilities :				
Bank Overdraft	3,000	2,000	1,000	—
Sundry Creditors	5,000	3,400	1,600	—
Provision for Doubtful Debits	400	600	—	200
Bills Payable	1,200	800	400	—
Total (B)	9,600	6,800		
Working Capital (Total A – B)	47,000	54,000		
Net Increase in Working Capital	7,000	—	—	7,000
	54,000	54,000	13,800	13,800

Fund Flow Statement

Sources of Fund	Rs.	Application of Funds	Rs.
Fund From Operations	37,000	Purchase of Machinery	3,000
		Tax Paid (see Note 3)	18,000
		Investment Purchased (10,000 – 11,000)	1,000
		Interim Dividend Paid	8,000
		Net Increase in Working Capital	7,000
	37,000		37,000

Machinery Account

	Rs.		Rs.
To Balance b/d	27,000	By Depreciation	4,000
To Bank	3,000	By Balance c/d	26,000
(Purchase of Machinery balancing figure)			
	30,000		30,000

Building Account

	Rs.		Rs.
To Balance b/d	50,000	By Depreciation	4,000
		By Balance c/d	46,000
	50,000		50,000

Provision for Taxation

	Rs.		Rs.
To Bank	18,000	By Balance b/d	10,000
(Balancing figure)		By Provision for Taxation	19,000
To Balance c/d	11,000		
	29,000		29,000

6. From the following are the comparative Balance Sheet of Gupta & Co., we are required to prepare (a) Schedule of Changes in Working Capital (b) Fund Flow Statement and (c) Fund From Operations.

Balance Sheet

Liabilities	2002 Rs.	2003 Rs.	Assets	2002 Rs.	2003 Rs.
Share Capital	90,000	1,00,000	Goodwill	12,000	10,000
General Reserve	14,000	18,000	Buildings	40,000	36,000
Profit & Loss A/c	19,500	12,000	Machinery	37,000	36,000
Provision for Taxation	16,000	17,000	Stock	30,000	25,400
Sundry Creditors	8,000	5,400	Sundry Debtors	20,000	22,200
Bills Payable	6,200	1,300	Cash at Bank	6,600	15,200
Provision for Doubtful Debts	1,900	2,100	Investments	10,000	11,000
	1,55,600	1,55,800		1,55,600	1,55,800

Additional Information

(1) Depreciation charged on Machinery was Rs. 4000 and on building Rs. 4000.

(2) Interim Dividend paid during 2003 was Rs. 7500.

(3) Provision of Rs. 5000 was made for taxation during the 2003.

Solution:

Particulars	Rs.	Rs.
Net Profit (Closing Balance)		12,000
Add : Non-fund or Non-operating items		
Which already Debited to P & L A/c :		
Good Will Written off	2,000	
Depreciation on Machinery	4,000	
Depreciation on Building	4,000	
Interim Dividend Paid	7,500	

Calculation of Fund From Operations

Particulars	Rs.	Rs.
Transfer to General Reserve	4,000	21,500
		33,500
Less : Non-Fund or Non Operating items		
already Credited to P & L A/c :		
Net Profit (Opening Balance)		19,500
Fund From Operations		14,000

Schedule of Changes in Working Capital

Particulars	2002	2003	Changes in Working Capital	
	Rs.	Rs.	Increase	Decrease
Current Assets :				
Stock	30,000	25,400	—	4,600
Sundry Debtors				
(*Less:* Provision For Doubtful Debts)	18,100	20,100	2,000	
Cash Balances	6,600	15,200	8,600	—
Total (A)	54,700	60,700		
Current Liabilities :				
Sundry Creditors	8,000	5,400	2,600	—
Bills Payable	6,200	1,300	4,900	—
Prevention for Tax	16,000	17,000	—	1,000
Total (B)	30,200	23,700		
Working Capital (Total A – B)	24,500	37,000		
Net Increase in Working Capital	12,500	—	—	12,500
	37,000	37,000	18,100	18,100

Fund Flow Statement

Sources of Funds	Rs.	Application of Funds	Rs.
Issue of Share Capital ⌉		Purchase of Machinery	3,000
(90,000 – 1,00,000) ⌡	10,000	Purchase of Investments	1,000
Funds From Operations	14,000	Interim Dividend Paid	7,500
		Net Increase in Working ⌉	
		Capital ⌡	12,500
	24,000		24,000

Machinery Account

To Balance b/d	37,000	By Depreciation	4,000
To Bank	3,000	By Balance c/d	36,000
(Purchase of Machinery Balancing			
figure)			
	40,000		40,000

Building Account

Capital and Capital Budgeting

(*The Learning objective of this Unit is to understand the concept of Capital, Capitalization, Capital Budgeting and to know the techniques used to evaluate Capital Budgeting proposals by using different methods).

Capital and Capital Budgeting: Capital Budgeting: Meaning of Capital-Capitalization-Meaning of Capital Budgeting-Need for Capital Budgeting-Techniques of Capital Budgeting-Traditional and Modern Methods.

6.1 Capital and capital Budgeting: Meaning of Capital

Capital

It is defined as wealth that is created over a period of time through abstinence to spend. The different forms of capital are cash, property or titles to wealth. This is said to be the aggregate of funds used in the short-run and long-run.

Also, we consider capital as the total amount of finances that is required by the business to conduct its business operations both in the short-run and long-run. An accountant views the capital as the difference between the assets and liabilities whereas an economist sees as the value of total assets available with the business. In many cases such that the probable reasons could be mismanagement of capital or lack of information about the different sources of capital or factors to be considered to estimate the capital requirements. Capital forms is the base for the business. In general, it does not mean only money but it refers to money's worth also. It has different forms. The creativity, innovation or new ideas are considered as one form of capital.

For instance, some people have ideas but they may not have money whereas some others may have only money . The ideal combination for business is to have both. Nowadays, there are different sources of raising finance for many types of the business provided where they have the margin or the base money. There are a number of instances where the business is closed for want of capital.

Significance of Capital

It plays a very significant role in the modern production system. It has a strategic role in enhancing productivity. To imagine the process of production, without capital will be difficult. The capital

accumulation and technological advancement are closely related to each other. It creates and enhances the level of employment opportunities. This is a scarce resource and every country has to utilise the same judiciously. It is necessary not only for the micro-enterprises but also to the governments.

Need for Capital

1. To promote a business at the promotion stage. A large variety of expenses have to be incurred on feasibility studies and reports, project reports, preparation and filing of various documents and for meeting various other expenses in connection with the raising of capital from the public.

2. A firm has to meet its statutory commitments such as income tax, sales tax, excise duty , etc.

3. Business firms needs capital for the purpose of conducting their business operations such as research and development, operating expenses, advertising, distribution and sales promotion .

4. The firm will require a lot of capital for expansion and diversification purposes which also includes the development expense such as purchase of sophisticated machinery and equipment and also payment towards sophisticated technology.

5. The firm needs funds to meet contingencies such as a major litigation, sudden fall in sales, natural calamities like fire, etc.

6. At the time of winding up, the company may need funds to meet the liquidation expenses.

7. The business has to make payment towards dividends and its interests to shareholders and financial institutions respectively.

8. The company can also have to take up social welfare programme such as literacy drive, and health camps. It may have to donate to educational institutions or public service organizations, charitable trusts.

9. Business firm needs to replace its assets like plant and machinery after a certain period of use. Therefore it needs funds to make suitable replacement of assets in place of old and worn-out assets.

Types Of Capital

Capital can broadly be divided into two types:

1. Fixed capital

2. Working capital

Fixed Capital

It is defined as the portion of capital which is invested in acquiring long-term assets such as land and buildings, furniture and fixtures, plant and machinery and so on. It forms the skeleton of the business and also provides the basic assets as per the business needs. These assets are not meant for resale but intended to generate revenues.

Features of fixed assets:

1. It is more or less permanent in nature. Generally, not with-drawn as long as the business carries on its business.

2. Liquidity refers to conversion of assets into cash. The fixed assets cannot be converted into cash quickly.

3. They are the sources of profits but they can never generate profits by themselves. They use the stocks, cash and debtors to generate profits.

4. It is mostly needed at the time of promoting the company in order to purchase the fixed assets or at the time of expansion or modernization. Hence, the need for fixed capital arises less frequently.

5. The amount of fixed capital of a company will depend on a number of factors such as nature of business, size of the company, method of production, etc. For example, a manufacturing company such as steel factory may require relatively large finance when compared to a service organization such as a software company.

Types of Fixed Assets

Fixed assets can be divided into three types are as follows:

 1. Tangible Fixed Assets

Tangible fixed assets are physical items which can be seen and touched. The common fixed assets are land, buildings, furniture, motor vehicles, machinery, etc.

2. Intangible Fixed Assets

Intangible fixed assets do not have physical form. They cannot be seen or touched. But these are very valuable to business. Examples are trademarks, goodwill, brand names, copy rights, patents, etc .

3. Financial Fixed Assets

The investments in shares, government bonds, foreign currency deposits which are held by the business in other companies are said to the financial fixed assets.

Working Capital

It is the flesh and blood of the business. This is a portion of capital that makes a company work. Any business with only fixed assets cannot be carried over a working capital is a must. This is also called circulating capital. Working capital meets the regular or recurring needs of the business. The regular needs refers to the payment of wages and salaries, purchase of materials ,advertising, expenses like rent, power etc.

Working capital is the amount which is needed to cover the cost of operating the business. It takes the form of cash, near cash and other assets in the process of moving towards the cash form in a short period. The other assets are supplies needed for manufacture, stocks of raw materials, stocks of finished goods ready for sale, debtors, semi-processed items or components and other short-term investments if any.

Features of Working Capital

1. Working capital will changes in its form from cash to stock, stock to debtors, debtors to cash. The cash balances will be kept idle for a week or so. The debtors will have a life span of a few months, where the raw materials are held for a short-time until they go into production and finished goods are also held for a short-time until they are sold.

2. The amount of working capital of a business depends on many factors such as size and nature of the business, production and marketing policies, business cycles and so on. These are discussed in detail in the following section.

3.The assets represented by the working capital which can be converted into cash quickly within a short period of time unlike fixed assets.

4. The working capital is used to pay for current expenses such as suppliers of raw materials, payment of wages and salaries, rent and other expenses and so on.

5. Adequate amount of working capital can enable the business to conduct its operations smoothly. Therefore, it is called the 'flesh and blood' of the business.

Components of Working Capital

In view of accounting, it is the difference between current assets and current liabilities.

Current Assets

• **Cash:**

It is required for office expenses, to pay salaries and pay creditors for purchases.

• The stock of raw materials in adequate quantities is ensured for uninterrupted production whereas the stock of finished goods in sufficient quantities is to meet the demand from customers.

• **Debtors:**

The people to whom we sell goods on credit basis for increased sales .

• **Prepaid expenses:**

The expenses paid in advance such as insurance, salaries ,rent, etc.

• **Bills receivables:**

The bills of exchange received for the money lent or to be received for a short period.

 Current Liabilities

• **Creditors**:

The people from whom we purchase on credit basis.

• **Accruals**:

The expenses in respect of which, the liability has arisen. In other words, the expenses have fallen due and hence to be incurred, such as interest, salaries, taxes and so on.

• **Bills payables**:

The bills of exchange against which money is to be paid within a short period.

 6.1.1 Capitalization

It is the recordation of a cost as an asset, rather than an expense. In this approach, it is used when a cost is not expected to be entirely consumed in the current period, but rather over an extended period of time.

For example, when office supplies are expected to be consumed in the near future, they are charged to expense at once. An automobile is recorded as a fixed asset and they are charged to expense over a much longer period by depreciation, since the vehicle will be consumed over a longer period of time than office supplies.

This is also based on the concept of materiality. When a cost of a good is too small, it is charged to the expense at once, rather than bothering with a series of accounting calculations and journal entries to capitalize it and later gradually charge it to expense over time. The specific dollar amount below which items are automatically charged to expense is known as the capitalization limit, or cap limit. This capital limit is used to keep a record keeping down to a manageable level, while still capitalizing the bulk of all items that should be designated as fixed assets. This is used heavily in asset-intensive environments, such as manufacturing, where the depreciation can be a large part of total expenses. But, capitalization might be extremely rare in a services industry, especially while the cap limit is set high enough to avoid the recordation of personal computers and laptops as fixed assets.

Capitalization is used as a tool to commit financial statement reporting fraud. When the costs are capitalized that must have been charged to expense, current income is inflated, at the expense of future periods over which additional depreciation will now be charged. This can be spotted by comparing cash flows to net income where cash flows should be substantially lower than net income.When a company makes fixed assets, the interest cost of any borrowed funds is used to pay for the construction can also be capitalized and recorded as part of the underlying fixed assets. This step is usually only taken for substantial construction projects.

Therefore the term "Capitalization" refers to the market value of a business. It is determined as the total number of shares outstanding, multiplied by the current market price of the stock.

6.1.2 Meaning of Capital Budgeting

It is also known as investment appraisal. Capital Budgeting is the process by which a company determines whether projects are worth pursuing. A project is worth pursuing if it increases the value of the company.

The projects may be of investing in R&D, opening a new branch, replacing a machine etc.

• Cost of replacement of permanent assets.

• Cost of acquisition of permanent asset as land and building, plant and machinery, goodwill.

• Research and development project cost etc.

• Cost of addition, expansion and improvement or alteration in fixed assets.

It is an investment decision-making as to whether a project is worth undertaking. This is normally concerned with the justification of capital expenditures.

The capital expenditures are long-term and are amortized over a period of years are required by the IRS. The large expenditures will include the purchase of new equipment, rebuilding existing equipment, purchasing delivery vehicles, constructing additions to buildings, etc. The large amounts spent for these types of projects are known as capital expenditures.

The current expenditures are short-term and are completely written off in the same year that expenses occur.Capital budgeting is a process used by the firms for evaluating and ranking the potential expenditures or investments which are significant in amount.

Usually, it involves the determination of each project's future accounting profit by the period, cash flow by period, the present value of the cash flows after considering the time value of money, the number of years consumed for a project's cash flow to pay back the initial cash investment, an assessment of risk and other factors.

Therefore, capital budgeting is a tool for maximizing a company's future profits since most ot the companies are able to manage only a limited number of large projects at any one time.

Every organization, irrespective of its nature or size , in the course of its functioning, will generally acquires, upgrades, replaces the assets such as land and buildings, plant and machinery etc. For each of these, there exist two or more alternatives, that needs to be carefully evaluated on the basis of their costs and revenues. In order to improve the quality of our decisions, an understanding of the principles and practices of capital budgeting is essential.

Nature Of Capital Budgeting

Capital budgeting is defined as the long-term planning to make and finance proposed capital outlays. The decisions within capital budgeting will involve long-term planning for the selection and also financing the investment proposals. This, it is the process of evaluating the relative worth of long-term investment proposals on the basis of their respective profitability.

The capital budgets are different from operating budgets from time frame point of view. The operating budgets such as sales budget, purchase budget or overheads budget will show the firm's planned operations or resource allocation for a given period in future, normally one year. Also, the capital budgets are made for long-term period say three years or beyond. The long-term investment proposals involve larger cash outlays. It requires a careful analysis of cash outflows and inflows associated with each of these proposals. When evaluating capital budgeting proposals, the steps to be followed are:

• Generating investment proposals

• Estimating cash flows for the proposals

• Evaluating cash flows

• Selection of projects based on an acceptance criterion

• Monitoring and re-evaluating, on a continuous basis, the investment projects, once they are accepted.

Significance Of Capital Budgeting

1 . Capital budgeting decisions involve substantial capital outlays.

2. Its proposals are of longer duration and hence have long-term implications. For instance, the cash flows for next 5 to 15 years have to be forecast.

3. Once the funds are committed to a particular project, we cannot take back the decision. When the decision is to be reversed, we may have to lose a significant portion of the funds already committed. This may involve loss of time and efforts. Also, the capital budgeting decisions are irreversible or may not be easily reversible.

4. Capital budgeting decision can affect the future of the company significantly as it constitutes the strategic determinant for the success of a company. A right investment decision is the secret of the success of many business enterprises.

Problems in Capital Budgeting Decisions

• since capital Budgeting decisions are complex, thee cash flows occur at different points of time in future. The future cash flows, both inflows and outflows, are to be estimated now for taking a decision whether to commit substantial funds in a project under consideration or not. Though the future is uncertain, the process of estimating future cash flows needs to be a specialized task.

• The cash inflows occurring at different points of time have to be compared with the corresponding cash outflows using the concept of 'time value' of money. This is said to be the time value factor.

6.2 Need for Capital Budgeting

In a business entity, it plays a vital role in maximizing the overall value of a business entity. The capital budgeting is about long term planning of a business entity.

Recently, a business requires to make investments in various projects. The business entity invests the money in the acquisition of fixed assets, such as, machinery, land or building. Though capital budgeting is a long term planning activity, the associated results are to be attained in the future. Hence, it is important to carry out the process of capital budgeting effectively and efficiently, thus the accurate results can be determined in course of time.

Since the results are available only after a period of time, where a constant need of careful assessment in relation to the capital expenditure to be incurred. By this Method, both cash inflows and cash outflows are to be evaluated well. It is used for an effective decision making process in terms of the acquisition of fixed assets, modification of fixed assets and replacement of fixed assets.

This involves a study in relation to capital outlays, as it is a huge investment. Therefore, it is not only important to determine the capital expenditure of a business entity but also evaluate the results when considering the various factors such as economic, social and technological etc.

The decisions relative to capital budgeting process are significant ones in determining an outcome and affecting the stability or profitability or growth of a business entity. Thus it is very important to ensure well before any proposed capital outlays are made in a business.

Large investment

This involves large investment of funds which is important for firm to plan and control capital expenditure. The fund available is limited and the demand for funds exceeds the existing resources.

Irreversible Nature

The capital expenditure decision are irreversible. That is, once the decision for acquiring permanent asset is taken, it will become very difficult to dispose of these assets without heavy losses.

Long-term effect on profitability

The capital expenditure decision is long-term and has effect on profitability of a concern. It is not only depends present earning but also the future growth and profitability of the firm depends on investment decision taken today. Thus, it is needed to avoid over investment or under investment in fixed assets.

Long term commitment of funds

This involves not only large amount of fund but also long term on permanent basis by increasing the financial risk involved in investment decision. It has greater the risk greater the need for planning capital expenditure.

National importance

When an investment decision taken by individual concern of national importance, it determines the employment, economic activities and also economic growth.

Difficulties of investment decision

The long term investment decision is difficult to take because of the following reasons:

i. Decision extends to a series of year beyond the current accounting period

ii. Higher degree of risk

iii. Uncertainties of future

So, it is necessary to reduce costs or increase revenues to maximize profits. Capital budgeting decisions can be classified into the following types:

• Projects that increase revenues

• Projects that reduce costs

The capital budgeting decisions that reduce costs are relatively easier to be handled as full information about their present costs and revenues are available. To reduce the costs further a capital budgeting proposal to be selected should be decided. Regarding the projects that increase the revenues, it may be difficult to select one from the given alternatives because the available data about the future cash flows has its own limitations, such as uncertainty in future, inaccurate estimate of life of the asset and so on.

Capital Budgeting Decisions

• Construction of a new building, or renovation of existing old buildings

• Purchase of technology from a foreign country .

• Interior decoration of a given building.

• Building a production facility.

• Building a bridge or an airline.

• Sponsoring a local football or cricket team for one or more number of years

• Buying a new delivery truck.

• Starting a new business.

• Making a new product.

• Expansion decisions of existing plant and equipment.

• Safety and environmental protection investment decisions necessary to comply with govern-ment directives.

• Replacement decisions for replacing worn out or damaged equipment as well as replacing obsolete equipment.

• Decision to expand into new products or markets such as R& D.

• Advertising for the product or service or undertaking market survey.

• Labour agreements etc.

Limitations of Capital Budgeting

1. Uncertainty in the future

2. In capital budgeting, factors which can be quantified in terms of money are only considered. Those factors such as improved morale of employees as a result of implementation of proposals are not focussed and the other factors in the business environment such as social, economic conditions political, etc. are not reflected here.

3. The factors influencing investment decisions include technological advancement, government policies , sales fore-cast, attitudes of management , estimated cash flows, discount factor and rate of return. Any change in one or more of these factors is going to affect the capital budgeting decisions.

4. It has unrealistic assumptions. They are:

(a) There is no risk and uncertainty in the business environment. This is not correct. The future of the business is full of uncertainty and we apply the management techniques to minimize the risk.

(b) The cost of capital and discount rate are one and the same.

(c) the key variables such as sales revenue, costs, price or investments and so on are taken based on past data. Particularly in times of rising prices, these seldom hold good for future.

(d) The cash flows are received in lump sum at the end of the given period.

6.3 Techniques of Capital Budgeting

This is a decision-making process for investing in long-term assets such as buildings, land and equipments. This process evaluates the strategic viability of fixed-asset investments in terms of costs and benefits to be achieved which includes the discounted cash flow and non-discounted cash flow methods.

The discounted cash flow is the value of future expected cash receipts and the expenditures on a common date. This is used net present value, internal rate of return and the profitability index.

The non-discounted cash flow does not consider the future changes in the value of money. This is used payback period and average rate of return.

Therefore the various techniques used in capital budgeting are:

1. Payback Period

2. Discounted Payback Period

3. Net Present Value

4. Accounting Rate of Return

5. Internal Rate of Return

6. Profitability Index

These techniques are based on the comparison of cash inflows and outflow of a project but they are substantially different in their approach.

Payback Period

It measures the time in which the initial cash flow is returned by the project. The cash flows are not discounted. Always a lower payback period is preferred. It can be represented as,

Payback period = Expected number of years required to recover a project's cost.

Example:

Project L

	Expected Net Cash Flow

Year	Project L	Project S
0	($100)	($100)
1	10	(90)
2	60	(30)
3	80	50

Payback L = 2 + $30/$80 years

 = 2.4 years.

Payback S = 1.6 years.

Weaknesses of Payback:

1.It ignores the time value of money. It can be eliminated with the discounted payback method.

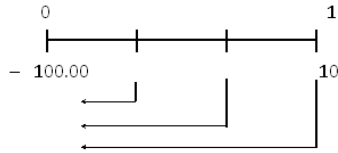2. It ignores the cash flows occurring after the payback period.

Net Present Value (NPV)

This compares the present costs against the present value of benefits where the capital investment can generate through out its economic life. That is, the present value of benefits is less the present value of cost. For PVC, it is the initial cost of a capital investment. For PVB, the projected cash inflows of each year is multiplied by a minimum rate of return, generally the cost of capital, for each year of the economic life of a fixed asset. Then add the PVB of all the years and subtract the PVC from the sum to get the NPV. Next, select the project with a positive NPV for independent capital assets and one with the highest NPV for mutually exclusive capital assets. It is represented as,

$$NPV = \sum_{t=0}^{n} \frac{CF_t}{(1+k)^t}$$

Example:

Project L:

```
       0                    1
    ┝━━━━┿━━━━┿━━━━┿━━━━┥
    − 100.00                10
          └──┐    │    │
         ◄───┘    │    │
       ┌─────────┘    │
      ◄──────────────┘
```

9.09

49.59

60.11

NPVL = $ 18.79

NPVS = $19.98

If the projects are independent, accept both.

If the projects are mutually exclusive, accept Project S since NPVS > NPV

Accounting Rate of Return (ARR)

It is the profitability of the project determined as projected total net income which is divided by initial or average investment and net income is not discounted.

It is a percentage value of the average rate at which a fixed asset can generate benefits over its economic life. The management is responsible for setting the ARR for accepting capital investments. For computing the ARR, divide the average net income of a fixed asset by its average book value, then multiply the result by 100.

Example:

When the potential income of a six-year fixed asset is $901, $1,001, $1,101, $1,051, $991 and $901, its average net income would be $990 whereas the asset's book value in the six-year period is $12,001, $11,001, $10,001, $9,001, $8,001 and $7,001, its average book value would be $9,501. The asset's ARR would be $990/9,500 x 100 = 10.4 percent. Accept the asset if the ARR exceeds the ARR set by the management.

Internal Rate of Return (IRR)

It is the discount rate at which net present value of the project becomes zero. Higher IRR should be preferred. This can be represented as,

$$\text{IRR}: \quad \sum_{t=0}^{n} \frac{CF_t}{(1+\text{IRR})^t} = \$0 = \text{NPV}.$$

Example:

```
        0              1
        |      |       |          |
    −100.00         10
      8.47 ◄── 18.1% ┘
     43.02 ◄──────── 18.1%
     48.57 ◄──────────────── 18.1%
    $  0.06 ≈ $0
```
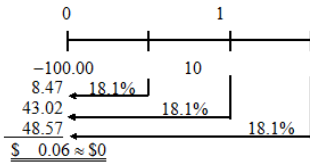
$IRR_L = 18.1\%$
$IRR_S = 23.6\%$

When the projects are independent, accept both because IRR > k.

When the projects are mutually exclusive, accept Project S since $IRR_s > IRR_L$.

IRR is independent of the cost of capital.

k	NPV_L	NPV_S
0%	$50	$40
5	33	29
10	19	20
15	7	12
20	(4)	5
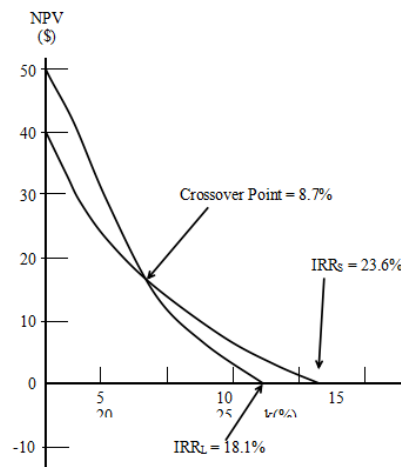
Profitability Index (PI)

It is the ratio of present value of future cash flows of a project to initial investment needed for the project.

6.4 Traditional and Modern Methods

Traditional methods:

i) Pay back period method:

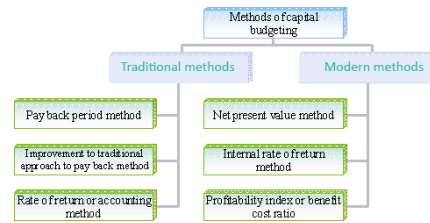It means the period in which the total investment in the permanent assets pays back itself. It is based upon the concept that each of the capital expenditure pays itself back within a certain period of time. Hence, this method measures the period of time means the time taken where the cost of project is recovered from the earning of the project itself.

Pay back period = original cost of asset/ cash inflow

The investment with a shorter pay back period is accepted and the one which has a longer pay back period is rejected is said to be the decision rule for the pay back period.

Advantages of Pay back period method:

1. It saves cost.

2. The riskiness of the project can be tackled by having a shorter payback period as it may ensure guarantee against loss. Hence, easy to calculate, simple to understand.

3. A firm having less funds can select the shorter time period for pay back. That is, it can have more favorable short-run effects on earnings per share by setting up a shorter payback period.

4. As the emphasis in pay back is on the early recovery of investment, it gives an insight to the liquidity of the project.

Disadvantages of Pay back period method:

1. This fails to take in account cash inflow earned after pay back period.

2. Administrative difficulties can be faced in determining the maximum acceptable payback period.

3. It is not an appropriate method of measuring the profitability of an investment project, as it does not consider the entire cash inflows yielded by the project.

4. It does not take into account salvage value of asset.

5. It fails to consider the pattern of cash inflows such as magnitude and timing of cash inflows.

ii) Improvement to traditional approach to pay back method:

It has four method are as follows:

a) Pay back reciprocal method:

In this method, it is used to find out the internal rate of return generated by a project. This is used every year when equal cash inflow is generated . This can be represented as,

Pay back reciprocal = annual cash inflow*100/ total investment.

b) Post pay back profitability method:

The major drawback of pay back method is that it fails to take in account cash inflow earned after pay back period so true profitability of the project can not be ascertained. This method can be done only by taking into account of the return received after the pay back period. This can be represented as,

Post pay back profitability= post pay back profit *100/investment

c) Discounted pay back method:

Since the pay back method ignores the time value of money. Hence, the discounted pay back method is an improvement over this method. Here, the present value of all cash inflow and cash outflow is calculated at an appropriate discount rate. The project with the shorter time period is accepted. This can be represented as the period at which the present value of cash inflow = present value of cash outflow.

d) Post pay back period method:

The limitation of the pay back method is ignored the life of the project beyond the pay back period. Here, it takes into account the life of the project beyond the pay back period. Therefore the project which gives the greatest post pay back period is accepted.

iii) Rate of return method or accounting method:

A method which takes into account of the earning expected from the investment over their whole life. This is known as accounting method because it uses the accounting concept of profit after tax and depreciation.The decision rule here is that the project with higher rate of return is accepted and the project with the lower rate of return is rejected.

a) Average rate of return method:

The average profit after tax and depreciation is calculated and then it is divided by total investment. This can be represented as,

Average rate of return= average annual profit after tax and depreciation*100/net investment

b) Return per unit of investment method:

The total profit after tax and depreciation is divided by total investment. This can be represented as,

Return per unit of investment = total profit after tax and depreciation *100/net investment

c) Average return on average investment:

This is used for finding out rate of return on investment. It can be represented as,

Average return on average investment = Average annual profit after tax and depreciation*100/average investment.

Advantages of rate of return method:

1. It gives better view of profitability.

2. It can be readily calculated using the accounting data based upon the accounting concept where it uses the entire stream of incomes in calculating the accounting rate.

3. It is easy to calculate, simple to understand.

Disadvantages of rate of return method:

1. It uses accounting, profits, not cash flows in appraising the projects.

2. It does not take into time value of money but profits occurring in different periods are valued equally.

3. It does not allow for the fact that the profit can be reinvested.

4. It does not consider the lengths of projects lives.

Modern methods

The major disadvantage of the traditional method is that it gives a equal value to the present and future flow of incomes and does not take into consideration the time value of money where as modern method of capital budgeting takes into consideration the time value of money say rupee earned today has more value than the rupee earned after 5 years.

i) Net present value method:

It takes into account the time value of money that is the return on investment which is calculated by introducing the time element and also realizes the concept that a rupee earned today will have more value than the rupee earned after five years.

The rule for NPV is, when the net present value is positive or zero then the project is accepted or it is rejected.

i.e. NPV is + accepted

NPV is zero accepted

NPV is – rejected

The project which has maximum positive value is accepted among various proposals.

Present value = $1/(1+r)^n$

Steps to find net present value :

• First, determine the appropriate rate of interest selected as minimum rate of return or discount rate.

• Second, compute the present value of cash outflow at determined discount rate.

• Then, compute the present value of cash outflow at determined discount rate.

• Finally, calculate the net present value of each project by subtracting the present value of the cash inflow from the present value of cash outflow.

 Advantages of net present value method:

1. It takes into account maximum profitability.

2. It considers all cash flows over the entire life of the project in its calculations.

3. It gives better view of profitability.

4. It recognizes the time value of money.

5. It is consistent with the objective of maximizing the welfare of the owners.

Disadvantages of net present value method:

1. It is complex to understand i.e. difficult to use.

2. when the projects being compared involve different amounts of investment a satisfactory answer cannot be obtained.

3. It is complex to determine the discount rate.

4. It presupposes that the discount rate which is usually the firm's cost of capital is known. However, to understand cost of capital is quite a difficult concept in practice.

ii) Internal rate of return method:

It is also known as time adjusted rate of return, error method, yield method, discounted rate of return and discounted cash flow and trial . Here, the cash flow of a project is discounted at a suitable rate by hit and trial method. It is the rate where present value of cash inflow which is equal present value of cash outflow.

The rules for IRR are as follows:

IRR < minimum required rate of return than reject the proposal

IRR > minimum required rate of return than accept the proposal

IRR = minimum required rate of return than indifferent

Steps to calculate internal rate of return:

• First, determine the future net cash flow.

• Then, determine the discount rate at which cash inflow = cash outflow.

Advantages of internal rate of return method

1. It is compatible with the firm's maximizing owners' welfare.

2. This takes into account maximum profitability.

3. This will consider the cash flows over the entire life of the project.

4. It gives better view of profitability.

5. Similar to the NPV method, it considers the time value of money.

6. This will satisfy the users in terms of the rate of return on capital.

7. Unlike the NPV method, the calculation of the cost of capital is not a precondition.

Disadvantages of internal rate of return method:

1. This involves complicated computation problems.

2. It is difficult to understand.

 3. It may yield negative rate or multiple rates under certain circumstances. It may not give unique answer in all situations.

4. The result of NPV and IRR differs.

5. This implies that the intermediate cash inflows which is generated by the project are reinvested at the internal rate unlike at the firm's cost of capital under NPV method.

iii) Profitability index or benefit cost ratio:

This method is the relationship between present value of cash inflow and present value of cash outflow.

The rules for PI are as follows:

if PI > 1 accepts the project

if PI < 1 reject the project

if PI = 1 indifferent.

It can be represented as,

Profitability index = present value of cash inflow/ present value of cash outflow

Or

Profitability index = net present value/ initial cash outlay

Net profitability index = profitability index – 1

 Advantages of profitability index method

1. It takes into consideration of all the requirements of sound investment decisions.

2. Like NPV and IRR, it recognizes the time value of money.

Disadvantages of profitability index method

1. It is complex to understand.

2. It does not take into account size of investment.

 Problems

1. Let us calculate the average rate of return for Projects X and Y from the following:

	Project X	Project Y
Investments	Rs.40,000	Rs.60,000
Expected Life	4 years	5 years

Projected net income (after interest, depreciation and taxes)

Year	Project X Rs	Project Y Rs
1.	4,000	6,000
2.	3,000	6,000
3.	3,000	4,000
4.	2,000	2,000
5.	——	2,000
	12,000	20,000

Where required rate of return is 10% an suggest which product should be undertaken.

Solution:

	Project X	Project Y
Investments	Rs.40,000	Rs.60,000
Expected Life	4 years	5 years

Given:

Projected net income (after interest, depreciation and taxes)

Year	Project X Rs	Project Y Rs
1.	4,000	6,000
2.	3,000	6,000
3.	3,000	4,000
4.	2,000	2,000
5.	——	2,000
	12,000	20,000

Rate of return = 10%

Formula to be used:

Average Annual Income =Total income throughout the Project / Life of the Project ϖ

Average Rate of Return = Original Investment / Average Annual Income X100 ϖ

Step 1: To find out the average annual income of the two different projects X and Y

Average Annual Income =Total income throughout the Project / Life of the Project

Average Annual Income (Project X) = Rs. 12,000 / 4 years = Rs. 3,000

Average Annual Income (Project Y) = Rs. 20,000 / 5 years = Rs. 4,000

Step 2: To find out the Average rate of return:

Average Rate of Return = Original Investment / Average Annual Income X100

Average rate of return (Project X) = Rs. 3,000 / Rs.40,000 X100 =7.5%

Average rate of return (Project Y) = Rs.5,000/ Rs. 60,000 X 100 = 8.33%

Both the projects are lesser than the given required rate of return.

Hence, these two projects are not advisable to invest because of lesser accounting rate of return.

2. Let us calculate the NPV of two projects and suggest which of two projects should be accepted assuming a discount rate 10%.

Particular	Project 'X'	Project 'Y'
Initial investment	20000	30000
Estimate life	5 yrs	5 yrs
Scrap value	1000	2000

The profit before dep. & Tax, cash flows are as follows

Year	1	2	3	4	5
Project X	5000	10000	10000	3000	2000
Project Y	20000	10000	5000	3000	2000

Solution:

Given:

Particular	Project 'X'	Project 'Y'
Initial investment	20000	30000
Estimate life	5 yrs	5 yrs
Scrap value	1000	2000

Year	1	2	3	4	5
Project X	5000	10000	10000	3000	2000
Project Y	20000	10000	5000	3000	2000

Discount rate =10%

Formula to be used:

NPV = PV cash of inflow - PV of cash outflows

Project 'X'

S.No.	Cash inflow	PV @ 10%	PV of cash inflows
1	5000	0.909	4545
2	10000	0.826	8260
3	10000	0.751	7510
4	3000	0.683	2049
5	2000	0.620	1240
6	1000 (scrap value)	0.620	620
		Total PV of cash in flows	24224

NPV = PV cash of inflow - PV of cash outflows

= 24224 - 20000 NPV = 4224

	120000	40000	80000	32000	48000		88000

Project Y

S.NO.	Cash in flow	PV@ 10%	PV of cash inflows
1	20000	0.909	18180
2	10000	0.826	8260
3	5000	0.751	3755
4	3000	0.683	2049
5	2000	0.620	1240
6	2000 (scrap value)	0.620	1240
		Total PV of cash inflows	34724

NPV = PV of cash inflow - PV of cash outflows

NPV = 34724 – 30000

NPV = 4724

The NPV of project y is higher than the NPV of project x. Therefore , it is suggested that project y should be selected.

3. Consider the initial outlay as Rs. 50000, life of an asset 5 years Annual cash flow Rs. 12500, let us calculate IRR.

Solution:

Formula to be used:

Given:

Initial outlay = Rs. 50000

5 years Annual cash flow =Rs. 12500

Present value Factor = $\frac{Initial\ outlay}{Annual\ cash\ flow}$

Present value Factor = $\frac{Initial\ outlay}{Annual\ cash\ flow} = \frac{50000}{12500} = 4$

Present value of annuity table 8 % approximately.

IRR = 8 %

4. The annual cash flows over the life of the asset. Initial investment Rs. 60000, Life of the Assets for four years is as follows:

1st year - 15000

2nd year – 20000

3rd year – 30000

4th year -20000

Let us calculate the IRR .

Solution:

Given:

Initial investment= Rs. 60000

1st year - 15000

2nd year – 20000

3rd year – 30000

4th year -20000

Discount 10%				12%		14%		15%	
Year	Annual cash time	PVF	P value	PVF	P value	PVF	P. VALUE	PVF	P Value
1	15000	.909	13635	.892	13380	.877	13155	.869	13055
2	20000	.826	16520	.797	15940	.769	15380	.756	15120
3	30000	.751	22530	.711	21330	.674	20220	.657	19710
4	20000	.683	13660	.635	12700	.592	11840	.571	11420
			66345		63350		60595		59285

Working:

$15\% = 715\ (60000 - 59285)$

$14\% = 595\ (60595 - 60000)$

$14 + \dfrac{595}{715 + 595} \times (15 - 14)$

$14 + \dfrac{595}{1310} \times (1)$

$14 + 0.45\ (1)$

$IRR = 14.45\ \%$