

From these definitions, it can be seen that:

- The production function is more concerned with physical aspects of production. It is the concern of the engineer rather than that of the manager to know how much can be the production with a given set of inputs.
- Production function is defined at a given stage of technical knowledge. It means that if there is any technological breakthrough, there could be further jump in the volume of production for the given set of inputs.
- Production function is an engineering relation that expresses the maximum amount of output that can be produced with a given set of inputs.
- At any given time, the output from a given set of inputs is always fixed.
- Production function enables us to understand how best we can make use of technology to its greatest potential.

INPUT-OUTPUT RELATIONSHIP OR PRODUCTION FUNCTION

The inputs for any product or service are land, labour, capital, organisation and technology. In other words, the production here is the function of these five variable inputs. Mathematically, this is expressed as

$$Q = f(L_1, L_2, C, O, T)$$

where Q is the quantity of production, f explains the function, that is, the type of relation between inputs and outputs, L_1, L_2, C, O, T refer to land, labour, capital, organisation and technology respectively. These inputs have been taken in conventional terms. In reality, materials also can be included in a set of inputs.

A manufacturer has to make a choice of the production function by considering his technical knowledge, the process of various factors of production and his efficiency level to manage. He should not only select the factors of production but also should work out the different permutations and combinations which will mean lower cost of inputs for a given level of production.

A production function as outlined above depicts the relationship between the inputs and the output in general. In a specific situation, some factors of production may be important and the relative importance of the factors depend upon the final product to be manufactured. For example, in the case of the software industry, land is not an input factor as significant as that in case of an agricultural product.

In the case of an agricultural product, increasing the other factors of production can increase the production; but beyond a point, increased output can be had only with increased use of agricultural land. Investment in land forms a significant portion of the total cost of production for output; whereas, in the case of the software industry, other factors such as technology, capital, management and others become significant. With change in industry and the requirements, the production function also needs to be modified to suit to the situation.

Production Function with One Variable Input and Laws of Returns

The Laws of Returns states that when at least one factor of production is fixed or factor input is fixed and when all other factors are varied, the total output in the initial stages will increase at an increasing rate, and after reaching certain level of output the total output will increase at declining rate. If variable factor inputs are added further to the fixed factor input, the total output may decline. This law is of universal nature and it proved to be true in agriculture and industry also. The Law of Returns is also called the *Law of Variable Proportions* or the *Law of Diminishing returns*.

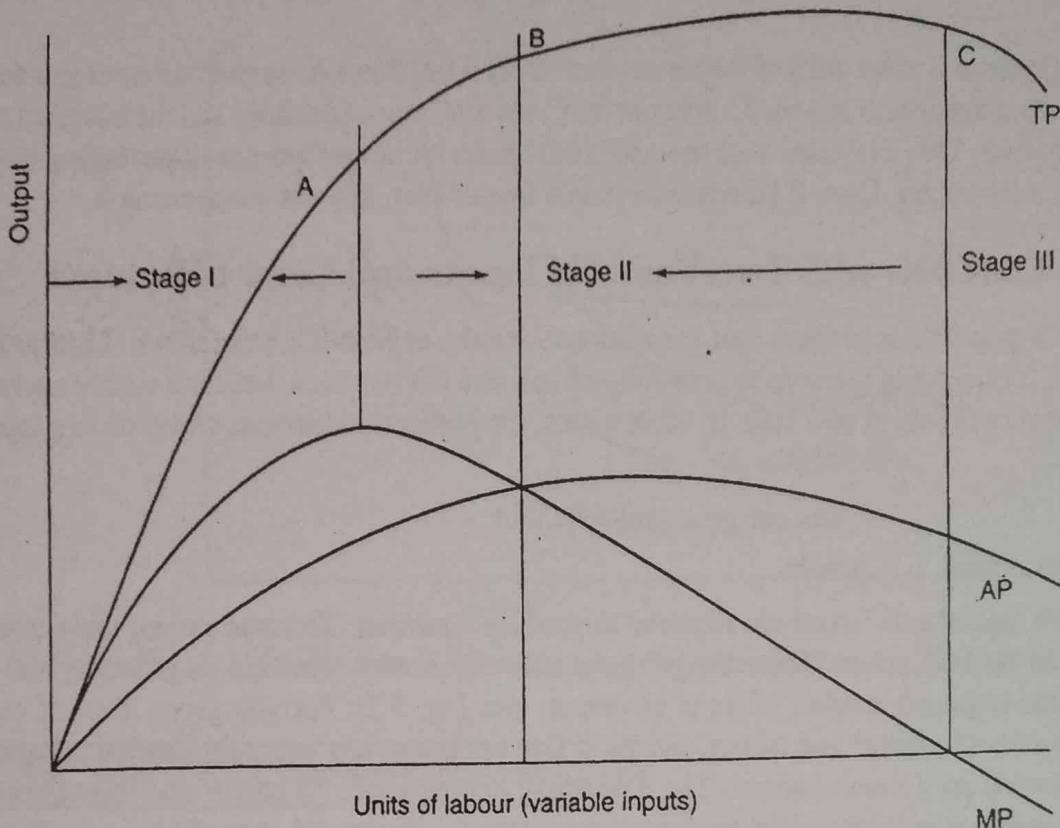


Fig. 5.1 Total Product, Average Product and Marginal Product curves

Table 5.1 Output with Fixed Capital and Variable Labour Inputs

Units of Labour	Total Product (TP)	Marginal Product (MP)	Average Product (AP)	Stages
0	0	0	0	Stage I
1	10	10	10	
2	22	12	11	
3	33	11	11	Stage II
4	40	7	10	
5	45	5	9	
6	48	3	8	
7	48	0	6.85	Stage III
8.	45	-3	5.62	

In the short run, it is assumed that capital is a fixed factor input and labour is variable input. It is also assumed that technology is given and is not going to change. Under such circumstances, the firm starts production with a fixed amount of capital and uses more and more units of labour. In the initial stages, output increases at an increasing rate because capital is grossly underutilised. Productivity will increase up

to point A when more and more units of labour are increased. After Point A, output increases at a declining rate till it reaches maximum at point C. After point C, the total output declines and the marginal product of labour is negative. This indicates that the additional units of labour are not contributing anything positively to the total output. Even if labour is available free of cost, it is not worth using it.

Production Function with Two Variable Inputs and Laws of Returns

Let us consider a production process that requires two inputs, capital (C) and labour (L) to produce a given output (Q). There could be more than two inputs in a real life situation, but for a simple analysis, we restrict the number of inputs to two only. In other words, the production function based on two inputs can be expressed as:

$$Q = f(C, L)$$

where C refers to capital, L is labour.

Normally, both capital and labour are required to produce a product. To some extent, these two inputs can be substituted for each other. Hence the producer may choose any combination of labour and capital that gives him the required number of units of output. (see Fig. 5.2). For any given level of output, a producer may hire both capital and labour, but he is free to choose any one combination of labour and capital out of several such combinations. The alternative combinations of labour and capital yielding a given level of output are such that if the use of one factor input is increased, that of another will decrease and vice versa. However, the units of an input foregone to get one unit of the other input changes, depends upon the degree of substitutability between the two input factors. Based on the techniques or technology used, the degree of substitutability may vary.

ISOQUANTS

'Iso' means equal; 'quant' means quantity. Isoquant means that the quantities throughout a given isoquant are equal. Isoquants are also called isoproduct curves. An isoquant curve shows various combinations of two input factors such as capital and labour, which yield the same level of output.

As an isoquant curve represents all such combinations which yield equal quantity of output, any or every combination is a good combination for the manufacturer. Since he prefers all these combinations equally, an isoquant curve is also called 'product indifference curve'.

The concept of isoquant is explained in Table 5.2 and Fig. 5.2.

Table 5.2 shows the different combinations of input factors to yield an output of 20,000 units of output. As the investment goes up, the number of labourers can be reduced. The combination of A shows 1 unit of capital and 20 units of labour to produce say, 20,000 units of output. All the above combinations of inputs can be plotted on a graph, the locus of all the possible combinations of inputs shows up an Isoquant as shown in Fig. 5.2.

Features of an Isoquant

1. *Downward sloping* Isoquants are downward sloping curves because, if one input increases, the other one reduces. There is no question of increase in both the inputs to yield a given output. A degree of substitution is assumed between the factors of production. In other words, an isoquant cannot be increasing, as increase in both the inputs does not yield same level of output. If it is

COBB-DOUGLAS PRODUCTION FUNCTION

Cobb and Douglas put forth a production function relating output in American manufacturing industries from 1899 to 1922 to labour and capital inputs. They used the following formula:

$$P = bL^a C^{1-a}$$

Where P is total output,

L = the index of employment of labour in manufacturing

C = index of fixed capital in manufacturing

The exponents a and $1-a$ are the elasticities of production. These measure the percentage response of output to percentage changes in labour and capital respectively.

The function estimated for the USA by Cobb and Douglas is

$$P = 1.01L^{0.75} C^{0.25}$$

$$R^2 = 0.9409$$

The production function shows that one percent change in labour input, capital remaining the same, is associated with a 0.75 percent change in output. Similarly, one percent change in capital, labour remaining the same, is associated with a 0.25 percent change in output. The coefficient of determination (R^2) means that 94 percent of the variations on the dependent variable (P) were accounted for by the variations in the independent variables (L and C). It indicates constant returns to scale which means that there are no economies or diseconomies of large scale of production. On an average, large or small scale plants are considered equally profitable in the US manufacturing industry, on the assumption that the average and marginal production costs were constant.

Though Cobb-Douglas production function was based on macro-level study, it has been very useful for interpreting economic results. Later investigations revealed that the sum of the exponents might be very slightly larger than unity, which implies decreasing costs. But the difference was so marginal that constant costs would seem to be a safe assumption for all practical purposes.

RETURNS TO SCALE AND RETURNS TO FACTORS

Returns to scale refer to the returns enjoyed by the firm as a result of change in all the inputs. It explains the behaviour of the returns when the inputs are changed simultaneously. The returns to scale are governed by laws of returns to scale.

Law of Returns to Scale

There are three laws of returns governing production function. They are

(a) **Law of Increasing Returns to Scale** This law states that the volume of output keeps on increasing with every increase in the inputs. Where a given increase in inputs leads to a more than proportionate increase in the output, the law of increasing returns to scale is said to operate. We can introduce division of labour and other technological means to increase production. Hence, the total product increases at an *increasing rate*.

(b) **Law of Constant Returns to Scale** When the scope for division of labour gets restricted, the rate of increase in the total output remains constant, the law of constant returns to scale is said

It is to be noted that the long-run cost curves are called *planning curves* and the short-run cost curves are called *operating curves*. As the factors of production such as plant and equipment are variable in the long-run, the management can plan its capacity better, given an estimated demand function. Operating decisions follow, once the optimal plant has been designed and set up. Operating decisions have little flexibility once the major decisions are taken in respect of plant capacity and size.

Fixed vs Variable Costs

Variable costs are differentiated from fixed costs based on the degree of their variability in relation to the rate of output.

The distinction between fixed and variable costs is based on an assumption that time has a significant role to play in decision-making. Given more time, all the costs are variable. Consider the example of a fixed asset already available in the plant such as machinery. In the short-run, say less than one year; it may not be possible to expand the scale of production. We assume this is not possible because it takes considerable time in planning additional capital, getting new machinery, and getting it installed. Also in the short-run, the demand can change suddenly. Hence, the cost of machinery is referred to as fixed cost. If we assume differently, that it is possible within the given time to find finance to buy new machinery and install it in order to expand the scale of production to meet sudden upsurge in demand (such as meeting an export order), these costs become variable. In other words, in the long-run, all the costs are variable.

Fixed costs are those costs that are fixed in the short-run. Whether production is taken up or not, we have to incur certain expenses such as rent for factory and office buildings, insurance, telephone, electricity and so on. Even if the production is stopped temporarily for a short period, we continue to spend on these fixed costs. In other words, total fixed costs are fixed or constant in the short-run. Fixed cost per unit changes with volume of production. The more you produce, the less is the fixed cost per unit and vice versa.

Variable costs are those costs that vary with the volume of production. Variable costs comprise the cost of raw materials, wages paid to the labour and so on. These costs are incurred only when there is production. If the production is temporarily suspended, there will not be any variable costs. In other words, the more the production, the more are the variable costs and vice versa.

Semi-fixed or Semi-variable Costs

While the variable costs are continuous functions of output, it is assumed that, some costs that remain fixed over considerable ranges of production, increase by jumps discontinuously, at various levels of output. This strange phenomenon gives rise to yet another category of costs: semi-fixed or semi-variable costs.

Semi-fixed or semi-variable costs refer to such costs that are fixed to some extent beyond which they are variable. Telephone charges or electricity charges form good example for this. If we have connection, we have to pay the minimum charges. This is fixed charge. The more you use the facility, the more you have to pay. Semi-fixed or semi-variable costs are not absolutely fixed or absolutely variable.

Marginal Cost

Marginal cost refers to '*the additional cost incurred for producing an additional unit*'. It equals the change in the variable cost per unit. This change is due to a change in the level of output. The concept of

can be noted that normal profits are not visible to the naked eye since normal profits are included in the average cost. Long-run average cost includes the opportunity cost of staying in business.

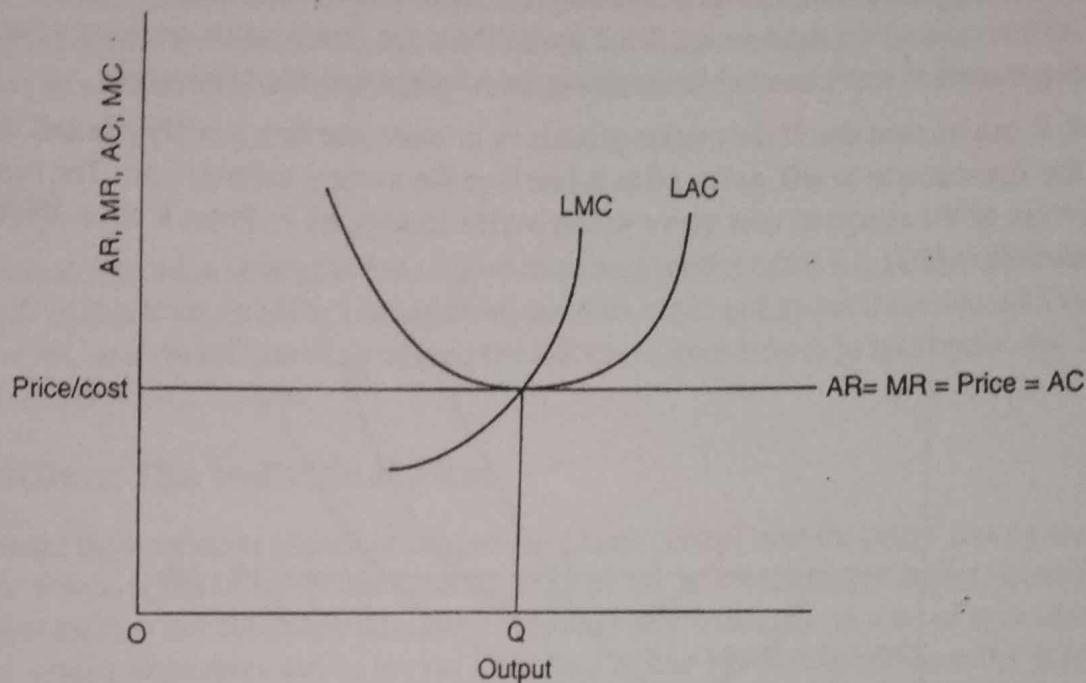


Fig. 8.5 Price-output Determination in Case of Long-run Under Perfect Competition

If the market price is below long-run average cost of the firm, the firm will have to quit the industry since in the long-run, the firms have to recover average costs.

MONOPOLY

Monopoly refers to a situation where a single firm is in a position to control either *supply* or *price* of a particular product or service. It cannot control or determine both price and supply as it cannot control demand. If it decides on the price, it can determine the quantity supplied at the given price. Or if the quantity is decided, the price can be determined.

If the firm sets the price higher, it may have to lose sales, and as such it can either fix the output or price, not both. What it can decide—depends on the prevailing demand and costs.

Monopoly exists where there are certain restrictions on the entry of other firms into business or where there are no close substitutes for a given product or service. These factors determine the degree of hold for the monopolist on the market in terms of influencing the price and ability to earn supernormal profits.

Monopoly can be interpreted in two ways. When there is a sole supplier, it is a case of a *pure monopoly*. In this case, the firm and the industry are one and the same. For instance, the Reserve Bank of India is the sole supplier of currency notes in India. Another context is where the firm supplying a half of the total market *may have a greater market power*, if the rest of the market is shared by a number of small firms. When the remaining firms are equally big, it may face fierce competition from the other firms.

Features of Monopoly

1. There is a single firm dealing in a particular product or service.

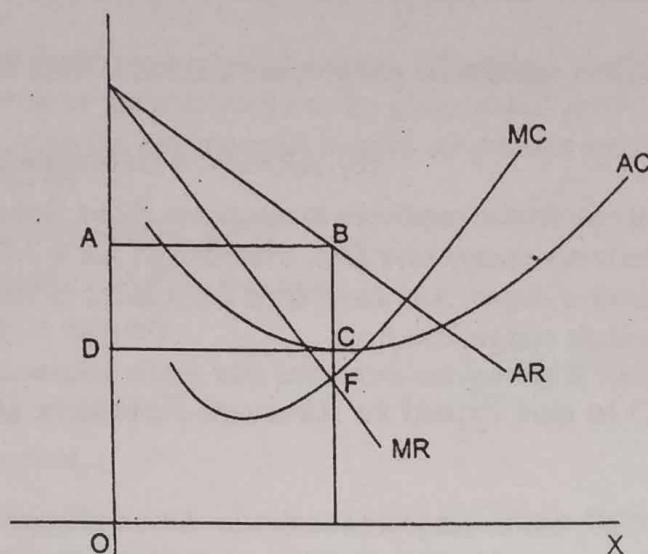


Fig. 8.8 Price-Output Determination in Monopolistic Competition in the Short-run

Box 8.1 Profit Maximisation with Calculus

Activity

1. The XYZ company is perfectly competitive firm that can sell its entire output for Rs. 20 per unit. The company's total cost function is given below.

$TC = 12 + 10Q - 10Q^2 + 3Q^3$ where Q represents units of output. Find out

- what is the firm's total revenue function?
- Write equations for MR , MC and ATC .
- What is the total profit equation.

2. The total cost and demand equations for a monopolist are given by the following equations.

$$TC = 300 + 10Q^2$$

$$P = 500 - 20Q$$

What are the profit maximizing price and quantity?

3. Given that the industry is dominated by a single producer, the demand for its product is

$$QD = 2000 - 50p \text{ and total cost} = 200 + 10Q + \frac{1}{120}Q^2$$

What is the monopolist's profit maximizing price and output?

A firm in monopolistically competitive industry faces the following demand and total cost equations for its product: $D = 80 - \frac{P}{4}$ and $TC = 400 + 10Q + 10Q^2$.

What are the firm's short-run profit maximizing price and output level?

the products. In order to cope with the competition, the firms will have to increase the budget on advertising. The entry of new firms continue till the supernormal profits of the firms completely get eroded and ultimately firms in the industry will earn only normal profits. Those firms which are not able to earn at least normal profits will get closed. Thus in the long-run, every firm in the monopolistic competitive industry will earn only normal profits, which are just sufficient to stay in the business. It is to be noted that normal profits are part of average costs.

In the long-run, in order to achieve equilibrium position, the firm has to fulfil the following two conditions:

$$(a) \text{MR} = \text{MC}$$

$$(b) \text{AR} = \text{AC} \text{ at the equilibrium level of output.}$$

Thus, the firm has to fulfil dual equilibrium conditions as mentioned above. But when compared to long-run equilibrium position of a perfectly competitive firm, even though $\text{AR} = \text{AC}$, AC will not be at its minimum point at equilibrium level of output. And also, MR is not equal to either AR or AC , MR is well below AR in the case of monopolistic competitive firm.

Why Average Cost (AC) is not Equal to Average Revenue (AR) at its Minimum Point?

It is because, the average cost (AC) can be tangential to the downward sloping average revenue (AR) curve only at higher than its minimum point. The average cost (AC) is higher in case of monopolistic competitive firms because of excess or idle capacity and high advertising costs.

Does this Mean that 'Firm' and 'Industry' under Monopolistic Competition are Inefficient?

According to Pappas and Hirschey⁴, the very existence of the downward sloping demand curve implies that consumers value the firm's products than the products of other producers. Monopolistic competitive industry provides a variety of products and more varieties result in greater consumer satisfaction. Consumers will be happy only when they have more choice as variety is the spice of life.

From Fig. 8.9, it can be observed that in the long-run, the average cost (AC) curve will be tangential to the downward sloping average revenue (AR) curve at point E. It can be noted that the average cost curve is tangential to the average revenue curve at higher than its minimum point F. $\text{MR} = \text{MC}$ at point K. OQ is the equilibrium output and OP is the equilibrium price. Thus, in the long-run, a firm under monopolistic competition achieves equilibrium price and output level when both conditions of equilibrium are satisfied.

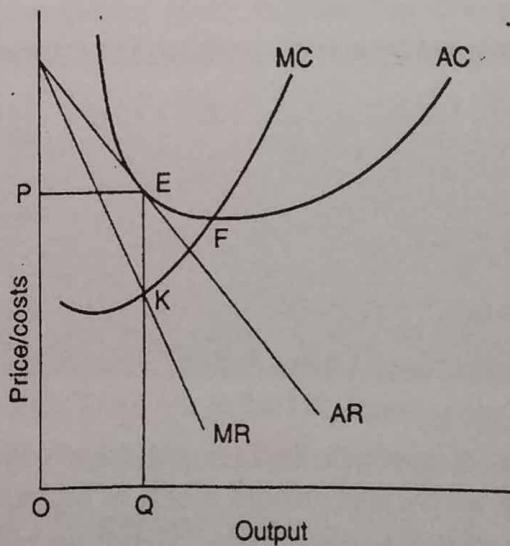


Fig. 8.9 Price-output Determination in Monopolistic Competition in the Long run

⁴ James Pappas and Mark Hirschey, *Managerial Economics*, The Dryden Press, 6th edition, 1990, p. 528

to industrial and household consumers), by nature of product itself (for example original and replacement components of pressure cookers), by geographical areas (domestic and international markets), by income group (in a government hospital the patients are charged a fee based on their income groups) and so on.

The objects of price discrimination are to

- develop a new market including for export,
- utilise the maximum capacity,
- share consumer's surplus along with consumer, not leaving it totally to him,
- meet competition,
- increase market share.

(b) *Perceived value pricing:* Perceived value pricing refers to where the price is fixed on the basis of the perception of the buyer of the value of the product.

4. Strategy-based Pricing

(a) *Market skimming:* When the product is introduced for the first time in the market, the company follows this method. Under this method, the company fixes a very high price for the product. The main idea is to charge the customer maximum possible. This strategy is mostly found in case of technology products. When Sony introduces a particular TV model, it fixes a very high price. When new series of Pentium is released into market, it is priced very high. Initially, all cannot afford except a very few. As the time passes by, the price comes down and more people can afford to buy.

This method can be followed only when (i) the demand for the product is inelastic, (ii) there is no threat from competitors, (iii) a high price is coupled with high technology or quality.

(b) *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. The company attains profits with increasing volumes and increase in the market share. More often, the companies believe that it is necessary to dominate the market in the long-run than making profits in the short-run. This method is more suitable where market is highly price-sensitive. In such a case, a low price stimulates more rapid growth. It will be more appropriate in cases where the costs are likely to fall with increase in output. A low price may not attract significant degree of competition also.

(c) *Two-part pricing:* The firms with market power can enhance profits by the strategy of two-part pricing. Under this strategy, a firm charges a fixed fee for the right to purchase its goods, plus a per unit charge for each unit purchased. Entertainment houses such as country clubs, athletic clubs, golf courses, and health clubs usually adopt this strategy. They charge a fixed initiation fee plus a charge, per month or per visit, to use the facilities. There are also organisations that charge membership fee (equivalent to the consumer surplus) and offer their products and services cost-to-cost basis.

The fixed fee generally equals the consumer surplus each consumer receives at this per unit price. The charge per visit or on monthly basis equals the marginal cost. Under this method, if the membership fee is fixed to equal one's consumer surplus, actual profits can even be higher than in case of monopoly.

(d) *Block pricing:* Block pricing is another way a firm with market power can enhance its profits. We see block pricing in our day-to-day life very frequently. Six Lux soaps in a single pack or five

Maggi noodles in a single pack illustrate this pricing method. By selling certain number of units of a product as one package, the firm earns more than by selling unit wise. The block pricing is a profit maximisation price on each package. It is generally the total value the consumer receives for the package, including consumer surplus.

It works out as follows: Suppose six International Lux soaps are offered, as a single unit along with a elegantly looking soap box, at a price of Rs 100. Here the consumer has to make an all-or-none decision between buying eight units or buying nothing. From the customer point of view, each International Lux soap costs, say, Rs 18, and the soapbox is priced at Rs 25. So the soaps and box together cost the customer $(6 \times 18) + 25 = 108 + 25 = \text{Rs } 133$. As against this, the pack of six International Lux soaps is offered at Rs 100, which is fairly attractive from the customer angle! The consumer surplus is here equal to Rs 33.

Block pricing enhances profits by forcing consumers to make an all-or-none decision to purchase units of a product. This can enhance profits even in situations where consumers have identical demands for a given product.

- (e) **Commodity bundling:** Commodity bundling refers to the practice of bundling two or more different products together and selling them at a single 'bundle price'. The package deals offered by the tourist companies, airlines hold testimony to this practice. The package includes the airfare, hotel, meals, sight seeing and so on at a bundled price instead of pricing each of these services separately. Computer firms offer PCs, assembling as per the customer specifications and offer them at a bundled price. The car companies provide cars with air-conditioning, power steering, automatic transmission, autogear and so forth, and sell them at a special price.

Commodity bundling is a viable pricing strategy to enhance profits when consumers differ with respect to the amounts they are willing to pay for multiple products sold by a firm. It is advantageous for the trader to know how much the consumer is prepared to pay for each of the product offered in the bundle. In case the tourist is prepared to pay any price for viewing Niagara Falls for longer hours, the tourist company can charge better for this customer by allowing him good time!

- (f) **Peak load pricing:** During seasonal period when demand is likely to be higher, a firm may enhance profits by peak load pricing. The firm's philosophy is to charge a higher price during peak times than is charged during off-peak times. The pricing is done in such a way that the business is not lost to the competitors. The firm following such a strategy covers the likely losses during the off-peak times from the likely profits from the peak times.

Where the demand during the peak times is so high that all customers cannot be accommodated at the same price due to capacity constraints, the profitable alternative for the firm is to follow peak load pricing.

Airliners such as Air India, Indian Airlines, Jet Air and so on, keep revising their fares every three months to charge higher fares during festival/holiday seasons. Toll roads/bridges tend to have more traffic during rush hour than at other times of the day; utility companies tend to have higher demand during the day than during the late-night hours.

Peak load pricing is similar to price discrimination. But due to capacity limitations, the firm is unable to fully equate the marginal revenues of those who purchase at different times.

- (g) **Cross subsidisation:** In cases where demand for two products produced by a firm is interrelated through demand or costs, the firm may enhance the profitability of its operations through cross

- you want to be a global player by mobilising large resources across the country/world
- you want to bring all like-minded people to share the benefits of the common enterprise (you want to promote a joint stock company) or
- you want to involve government in the IT business (here you want to suggest government to promote a public enterprise!)

To decide this, it is necessary to know how to evaluate each of these alternatives. This chapter helps you to take a right decision. This chapter deals with the features, advantages and disadvantages of different forms of business organisation based on ownership and suggests where each form fits in.

FACTORS AFFECTING THE CHOICE OF FORM OF BUSINESS ORGANISATION

Before we choose a particular form of business organisation, let us study what factors affect such a choice? The following are the factors affecting the choice of a business organisation:

1. **Easy to start and easy to close** The form of business organisation should be such that it should be easy to start and easy to close. There should not be hassles or long procedures in the process of setting up business or closing the same.
2. **Division of labour** There should be possibility to divide the work among the available owners. The idea is to pool the expertise of all the people in business and run the business most efficiently.
3. **Large amount of resources** Large volume of business requires large volume of resources. Some forms of business organisations do not permit to raise larger resources. Select the one which permits to mobilise the large resources.
4. **Liability** The liability of the owners should be limited to the extent of money invested in business. It is better if their personal properties are not brought into business to make up the losses of the business.
5. **Secrecy** The form of business organisation you select should be such that it should permit to take care of the business secrets. We know that century old business units are still surviving only because they could successfully guard their business secrets.
6. **Transfer of ownership** There should be simple procedures to transfer the ownership to the next legal heir.
7. **Ownership, management and control** If ownership, management and control are in the hands of one or a small group of persons, communication will be effective and coordination will be easier. Where ownership, management and control are widely distributed, it calls for a high degree of professional skills to monitor the performance of the business.
8. **Continuity** The business should continue forever and ever irrespective of the uncertainties in future.
9. **Quick decision making** Select such a form of business organisation which permits you to take decisions quickly and promptly. Delay in decisions may invalidate the relevance of the decisions.
10. **Personal contact with customers** Most of the times, customers give us clues to improve business. So choose such a form which keeps you close to the customers.
11. **Flexibility** In times of rough weather, there should be enough flexibility to shift from one business to the other. The lesser the funds committed in a particular business, the better it is.

12. Taxation More profit means more tax. Choose such a form which permits to pay low tax.

These are the parameters against which we can evaluate each of the available forms of business organisations.

FORMS OF BUSINESS ORGANISATION

The following are the forms of business organisation* based on ownership:

- (a) Sole trader or proprietorship
- (b) Partnership
- (c) Joint stock company
- (d) Cooperative society

Where the government takes part in business, public enterprise is set up.

Now let us see the features, advantages and disadvantages of each of the form of business organisations. We will also see under what conditions, each form fits in suitably.

SOLE TRADER

The sole trader is the simplest, oldest and natural form of business organisation. It is also called sole-proprietorship. 'Sole' means one. 'Sole trader' implies that there is only one trader who is the owner of the business.

It is a one-man form of organisation wherein the trader assumes all the risk of ownership carrying out the business with his own capital, skill and intelligence. He is the boss for himself. He has total operational freedom. He is the owner, manager and controller. He has total freedom and flexibility. Full control lies with him. He can take his own decisions. He can choose or drop a particular product or business based on its merits. He need not discuss this with anybody. He is responsible for himself. This form of organisation is popular all over the world. Restaurants, supermarkets, pan shops, medical shops, hosiery shops, the list of such small establishments are endless. The features of this form of organisation can be described as follows:

Features

- It is easy to start a business under this form and also easy to close.
- He introduces his own capital. Sometimes, he may borrow, if necessary.
- He enjoys all the profits and in case of loss, he alone suffers.
- He has unlimited liability which implies that his liability extends to his personal properties in case of loss.
- He has a high degree of flexibility to shift from one business to the other.
- There are very little legal hassles to be observed by a sole trader. Except in such businesses where license is required for instance, hotels and so on, the sole trader is free to take up any business.

* Joint Hindu family is another form of business organisation where the business is taken care of by the male members of joint family. This form is losing ground because of socio-economic response.

- As he is alone, he has to look after by him/herself all the activities related to purchase, sale, cash, accounts and taking care of the customers. He may take the help of his family members or paid employees in carrying out the business.
- Business secrets can be guarded well.
- There is no continuity. The business comes to a close with the death, illness or insanity of the sole trader. Unless, the legal heirs show interest to continue the business, the business cannot be restored.
- He has total operational freedom. He is the owner, manager and controller.
- He can be directly in touch with the customers.
- He can take decisions very fast and implement them promptly.
- Rates of tax, for example, income tax and so on are comparatively very low.

Advantages

The following are the advantages of the sole trader form of business organisation:

1. *Easy to start and easy to close* Formation of a sole trader form of organisation is relatively easy. Even closing the business is easy.
2. *Personal contact with customers directly* Based on the tastes and preferences of the customers, the stocks can be maintained.
3. *Prompt decision making* To improve the quality of services to the customers, he can take any decision and implement the same promptly. He is the boss and he is responsible for his business. Decisions relating to growth or expansion can be made promptly.
4. *High degree of flexibility* Based on the profitability, the trader can decide to continue or change the business, if need be.
5. *Secrecy* Business secrets can well be maintained because there is only one trader.
6. *Low rate of taxation* The rate of income tax for sole traders is relatively very low.
7. *Direct motivation* If there are profits, all the profits belong to the trader himself. In other words, if he works more hard, he will get more profits. This is the direct motivating factor. At the same time, if he does not take active interest, he may stand to lose badly also.
8. *Total control* The ownership, management and control are in the hands of the sole trader and hence it is easy to maintain the hold on business.
9. *Minimum interference from government* Except in matters relating to public interest, government does not interfere in the business matters of the sole trader. The sole trader is free to fix price for his products/services if he enjoys monopoly market.
10. *Transferability* The legal heirs of the sole trader may take the possession of the business.

Disadvantages

The following are the disadvantages of sole trader form:

1. *Unlimited liability* The liability of the sole trader is unlimited. It means that the sole trader has to bring his personal property to clear off the loans of his business. From the legal point of view, he is not different from his business.
2. *Limited amounts of capital* The resources a sole trader can mobilise cannot be very large and hence this naturally sets a limit for the scale of operations.

3. *No division of labour* All the work related to different functions such as marketing, production, finance, labour and so on has to be taken care of by the sole trader himself. There is nobody else to take his burden. Family members and relatives cannot show as much interest as the trader takes.
4. *Uncertainty* There is no continuity in the duration of the business. On the death, insanity or insolvency the business may come to an end.
5. *Inadequate for growth and expansion* This form is suitable for only small size, one-man-show type of organisations. This may not really work out for growing and expanding organisations.
6. *Lack of specialisation* The services of specialists such as accountants, market researchers, consultants and so on, are not within the reach of most of the sole traders.
7. *More competition* Because it is easy to set up a small business, there is a high degree of competition among the small business men and a few who are good in taking care of customer requirements alone can survive.
8. *Low bargaining power* The sole trader is in the receiving end in terms of loans or supply of raw materials. He may have to compromise many times regarding the terms and conditions of purchase of materials or borrowing loans from the finance houses or banks.

Suitability

Despite the above disadvantages, the sole trader is a suitable form of organisation where

- business is of small size and requires low volume of capital
- business can be managed by one person
- risk is low
- personal attention is necessary to take care of the customers
- products/services need to be provided as per the customer specifications

PARTNERSHIP

Partnership is an improved form of sole trader in certain respects. Where there are like-minded persons with resources, they can come together to do the business and share the profits/losses of the business in an agreed ratio. Persons who have entered into such an agreement are individually called 'partners' and collectively called 'firm'. The relationship among partners is called a partnership.

Indian Partnership Act, 1932 defines partnership as *the relationship between two or more persons who agree to share the profits of the business carried on by all or any one of them acting for all.*

From this definition, the features of partnership can be described to be as follows:

Features

1. *Relationship* Partnership is a relationship among persons. It is a relationship resulting out of an agreement.
2. *Two or more persons* There should be two or more number of persons.
3. *There should be a business* Business should be conducted.
4. *Agreement* Persons should agree to share the profits/losses of the business.

5. *Carried on by all or any one of them acting for all* The business can be carried on by all or any one of the persons acting for all. This means that the business can be carried on by one person who is the agent for all other persons. Every partner is both an agent and a principal. Agent for other partners and principal for himself. All the partners are agents and the 'partnership' is their principal.

The following are the other features:

- (a) *Unlimited liability* The liability of the partners is unlimited. The partnership and partners, in the eye of law, are not different but one and the same. Hence, the partners have to bring their personal assets to clear the losses of the firm, if any.
- (b) *Number of partners* According to the Indian Partnership Act, the minimum number of partners should be two and the maximum number is restricted, as given below:
 - 10 partners in case of banking business
 - 20 in case of non-banking business.
- (c) *Division of labour* Because there are more than two persons, the work can be divided among the partners based on their aptitude.
- (d) *Personal contact with customers* The partners can continuously be in touch with the customers to monitor their requirements.
- (e) *Flexibility* All the partners are likeminded persons and hence they can take any decision relating to business.
- (f) *Joint and several liability* This is a special feature of partnership. The purpose of this feature is to check the behaviour of the partners so that they do not act at the cost of the other partners. All the partners are jointly and severally liable for the debts of the partnership. No one partner can say that he is not liable for the debts of the firm and others alone are responsible. If one partner is responsible for a debt, other partners are also equally responsible for this debt. Similarly, if the creditors absolve one partner from a debt, other partners are automatically freed or absolved from that liability.
- (g) *Implied authority* The partner looking after the affairs of the partnership has certain implied authority. For instance, such a partner is empowered to take decisions of not more than a value of, say, Rs 5,000. Where the decisions of higher value have to be taken, he has to consult others. Each partner binds others through his acts since every partner is the agent of the firm. In other words, the act of every partner is deemed to be an act of the firm and binding on the firm.
- (h) *Transferability of share/interest* The partners cannot transfer their share/interest in partnership in the firm to others without the consent of the other partners.
- (i) *Taxation* In the partnership form of organisation, profits of partnership and individual incomes of partners are taxed separately. The share of profits from the partnership is included in the individual partners' incomes only to find out the tax rate applicable. However, there is relief in the tax on the share from profits from the firm (to avoid double taxation).
- (j) *Dissolution* The closure of partnership is called 'dissolution'. When any of the partners die, becomes insolvent or insane, the partnership is to be dissolved. This means that the duration of the partnership is not certain. The remaining partners can, if they are interested, restart their business with a new name.

Partnership Deed

The written agreement among the partners is called 'the partnership deed'. It contains the terms and conditions governing the working of partnership. The following are the contents of the partnership deed:

1. Names and addresses of the firm and partners
2. Nature of the business proposed
3. Duration
4. Amount of capital of the partnership and the ratio for contribution by each of the partners
5. Their profit sharing ratio (this is used for sharing losses also)
6. Rate of interest charged on capital contributed, loans taken from the partnership and the amounts drawn, if any, by the partners from their respective capital balances
7. The amount of salary or commission payable to any partner
8. Procedure to value good will of the firm at the time of admission of a new partner, retirement or death of a partner
9. Allocation of responsibilities of the partners in the firm
10. Procedure for dissolution of the firm
11. Name of the arbitrator to whom the disputes, if any, can be referred to for settlement.
12. Special rights, obligations and liabilities of partner(s), if any.

Kinds of Partners

The following are the different kinds of partners:

1. Active Partner Active partner takes active part in the affairs of the partnership. He is also called working partner.

2. Sleeping Partner Sleeping partner contributes to capital but does not take part in the affairs of the partnership.

3. Nominal Partner Nominal partner is partner just for namesake. He neither contributes to capital nor takes part in the affairs of business. Normally, the nominal partners are those who have good business connections, and are well placed in the society. The partnership derives benefit from such contacts in terms of business growth and increase in profits.

4. Partner by Estoppel Estoppel means behaviour or conduct. Partner by estoppel gives an impression to outsiders that he is the partner in the firm. In fact he neither contributes to capital, nor takes any role in the affairs of the partnership. Because he has misled the outsiders, partner by estoppel is held liable for the claims, if any, of the outsiders.

5. Partner by Holding out If partners declare a particular person (having social status) as partner and this person does not contradict even after he comes to know such declaration, he is called a partner by holding out and he is liable for the claims of third parties. However, the third parties should prove they entered into contract with the firm in the belief that he is the partner of the firm. Such a person is called *partner by holding out*.

6. Minor Partner Minor has a special status in the partnership. A minor can be admitted for the benefits of the firm. A minor is entitled to his share of profits of the firm. The liability of a minor partner is limited to the extent of his contribution of the capital of the firm.



4.6.1 Marris' Managerial Theory of Firm

R. Marris has put forward an important theory of the firm according to which managers do not maximize profits but instead, according to him, they seek to maximize balanced rate of growth of the firm. Maximization of balanced rate of growth of the firm means maximization of the rate of growth of demand for the products of the firm and rate of growth of capital supply. If G stands for balanced growth, G_d for the growth rate of demand for the product, G_C for the rate of growth of the capital supply, then the goal of the manager is to maximize G . Thus,

$$G = G_d = G_C$$

In seeking to maximize the balanced growth rate, a manager faces the following two constraints:

1. Managerial Constraint
2. Financial Constraint

Managerial constraint refers to the strength of the managerial team and their skills.

Financial constraint refers to the following three financial ratios:

1. Ratio of debt (D) to total assets (A) which is simply called debt ratio (D/A).
2. Liquidity ratio which is the ratio of liquid assets of the firm to the total assets (L/A).
3. Retention ratio (π_r/π) which refers to the ratio of retained profits to the total profits.

It is important to note that these financial variables determine the job security of the managers, if these financial ratios set by the manager crosses prudent limits, they expose the firm to the risk of being taken over by others or the managers can be dismissed which can endanger their job security. Therefore, financial constraints are associated with job security. Managers take into account job security while making business decisions.

Some variables in Marris' model particularly in the manager's utility function such as salaries, status, and power are strongly correlated with the rate of growth of demand for the products. Therefore, managers' salaries will be higher and they will have more power and esteem. The higher the salaries, and power, the faster the rate of growth of the firms. Besides, the higher growth of a firm also ensures better job security to the managers.

Therefore, utility of function of managers can be written as:

$$U_M = f(G_D, S)$$

U_M = utility of managers

G_D = rate of growth of demand for output of the firm

S = measure of job security of managers

On the other hand, utility of owners depends on the growth of capital supply which is positively correlated with the growth of profits. Thus, owner's utility function can be written as

$$U_{\text{owners}} = f(G_C)$$

Where G_C = rate of growth of capital supply

According to Marris, the rate of growth of capital is subject to the constraint set by the decision making capacity of the managerial team. Also the job security of the manager is determined by the weighted average of three financial ratios, viz., (a) debt-asset ratio, i.e., D/A , (b) the liquidity ratio (L/A) and (c) profit retention ratio ($\pi_r - \pi$). These financial ratios reflect the financial policy of the managers. Further, there is a saturation level for job security. Whereas after this saturation level marginal utility from the extra job security is zero, below this level, marginal utility from extra job security is infinite. With this constraint of job security, managerial utility function becomes:

$$U_m = (G_D) \bar{S}$$

Where bar (-) on the job security variable S shows it acts as a constraint for utility maximization of managers. Managers maximize their utility, i.e., growth of demand for output subject to this job security constraint. Financial constraint is reflected in the job security constraint of a manager.

Under the Marris model, a manager works under two constraints: (i) managerial constraint set by the decision making capacity of the managerial team and (ii) financial constraint determined by three financial ratios which are reflected in the job security of the managers.

It is usually argued by managerial theorists that the division of ownership and management allows the managers to set goals which do not necessarily coincide with those of owners. The utility function of managers includes variables such as salaries, status, power and job security, while the utility function of owners includes variables such as profits, size of output, size of capital, share of the market and public image. Thus, managers want to maximize their own utility.

$$U_m = f^*(\text{salaries, power, status, job security})$$

While the owners seek the maximization of their utility

$$U_o = f^*(\text{profits, capital, output, market share, public esteem}).$$

Marris argues that the difference between the goals of managers and the goals of the owners is not so wide as other managerial theories claim, because most of the variables appearing in both functions are strongly correlated with a single variable: i.e., size of the firm. There are various other measures (indicators) of size: capital, output, revenue, market share and there is no consensus about which of these measures is the best.

Furthermore, Marris argues that the managers do not maximize the absolute size of the firm (however measured), but the rate of growth (= change of the size) of the firm. The size and the rate of growth are not necessarily equivalent from the

point of view of managerial utility. If they were equivalent we would observe a high mobility of managers between firms: the managers would be indifferent in choosing between being employed and promoted within the same growing firm (enjoying higher salaries, power and prestige), and moving from a smaller firm to a larger firm where they would eventually have the same earnings and status. In the real world the mobility of managers is low.

Hence, managers aim at the maximization of the rate of growth rather than the absolute size of the firm.

There is no need to distinguish between the rate of growth of demand (which maximizes the U of managers) and the rate of growth of capital supply (which maximizes the U of owners) since in equilibrium these growth rates are equal.

The utility function of owners can be written as follows:

$$U_{\text{owner}} = f(G_c)$$

where G_c = rate of growth of capital.

It is not clear why owners should prefer growth to profits, unless G_c and profits are positively related.

Furthermore, from Marris' discussion of the nature of the variables of the managerial utility function assumes that salaries, status and power of managers are strongly correlated with the growth of demand for the products of the firm: managers will enjoy higher salaries and will have more prestige the faster the rate of growth of demand. Therefore, the managerial utility function may be written as follows:

$$U_m = f(G_D, s)$$

where G_D = rate of growth of demand for the products of the firm

s = a measure of job security.

Furthermore, Marris suggests that ' s ' can be measured by a weighted average of three crucial ratios, the liquidity ratio, the leverage debt ratio and the profit-retention ratio, which reflect the financial policy of the firm. As a first approximation Marris treats ' s ' as an exogenously determined constraint by assuming that there is a saturation level for job security: above the saturation level the marginal utility from an increase in ' s ' (job security) is zero, while below the saturation level the marginal utility from an increase in ' s ' is infinite. With this assumption the managerial utility function becomes

$$U_m = f(G_D, s)$$

where ' s ' is the security constraint.

Thus, in the initial model there are two constraints - the managerial team constraint and the job security constraint - reflected in a financial constraint.

The managerial constraint

Marris adopts Penrose's thesis of the existence of a definite limit on the rate of efficient managerial expansion. At any one time period the capacity of the top management is

given: there is a ceiling to the growth of the firm set by the capacity of its managerial team. The managerial capacity can be increased by hiring new managers, but there is a definite limit to the rate at which management can expand and are *mainly* competent (efficient). Penrose's theory is that decision-making and the planning of the operations of the firm are the result of teamwork requiring the co-operation of all managers. Co-ordination and co-operation require experience. A new manager requires time before he is fully ready to join the teamwork necessary for the efficient functioning of the organization. Thus, although the 'managerial ceiling' is receding gradually, the process cannot be speeded up.

Similarly, the 'research and development' (R&D) department sets a limit to the rate of growth of the firm. This department is the source of new ideas and new products which affect the growth of demand for the products of the firm. The work in the R&D department is 'teamwork' and as such it cannot be expanded quickly, simply by hiring more personnel for this section: new scientists and designers require time before they can efficiently contribute to the team work of R&D department.

The managerial constraint and the R&D capacity of the firm set limits both to the rate of growth of demand (G_D) and the rate of growth of capital supply (G_c).

The job security constraint

The desire of managers for security is reflected in their preference for service contracts, generous pension schemes, and their dislike for policies which endanger their position by increasing the risk of their dismissal by the owners (that is, the shareholders or the directors they appoint). Marris suggests that job security is attained by adopting a prudent financial policy. The risk of dismissal of managers arises if their policies lead the firm towards financial failure (bankruptcy) or render the firm attractive to take-over raiders. In the first case, the shareholders may decide to replace the old management in the hope that by appointing a new management the firm will be run more successfully. In the second case, if the take-over *raid* is successful, the new owners may well decide to replace the old management.

The risk of dismissal is largely avoided by (a) Non-involvement with risky investments. The managers choose projects which guarantee steady performance, rather than risky ventures which may be highly profitable, if successful, but will endanger the managers' position if they fail. Thus, managers become risk-avoiders (b) Choosing a 'prudent financial policy'. The latter consists of determining optimal levels for three crucial financial ratios, the leverage (or debt ratio), the liquidity ratio, and the retention ratio.

The leverage or debt ratio is defined as the ratio of debt to the gross value of total assets of the firm.

$$\text{Leverage or Debt Ratio} = \frac{\text{Value of debts}}{\text{Total Assets}} = D/A$$

The managers do not want excessive borrowing because the firm may become insolvent and be proclaimed bankrupt, due to demands for interest payments and repayment of loans, notwithstanding the good prospects that the firm may have.

The liquidity ratio is defined as the ratio of liquid assets to the total gross assets of the firm.

$$\text{Leverage or Debt Ratio} = \frac{\text{Liquid Assets}}{\text{Total Assets}} = L/A$$

Liquidity policy is very important. Less liquidity ratio increases the risk of insolvency and bankruptcy. On the other hand, too high a liquidity ratio makes a firm attractive to take-over raids, because the raiders think that they can utilize the excessive liquid assets to promote the operations of their enterprises. Thus, the managers have to choose an optimal liquidity ratio neither too high nor dangerously low. In his model, however, Marris assumes without much justification, that the firm operates in the region where there is a positive relation between liquidity and security: an increase in liquidity increases security.

The retention ratio is defined as the ratio of retained profits (net of interest on debt) to total profits.

$$\text{Retention Ratio} = \frac{\text{Retained profits}}{\text{Total profits}} = \pi_R/\pi$$

Retained profits are, according to Marris, the most important source of finance for the growth of capital.

The three financial ratios are combined (subjectively by the managers) into a single parameter \bar{a} which is called the 'financial security constraint'. This is exogenously determined, by the risk attitude of the top management. It is stated that it is not a simple average of the three ratios, rather a weighted average; the weights depending on the subjective decisions of managers.

Two points should be stressed regarding the overall financial constraint \bar{a} . First, let

$$a_1 = \text{liquidity ratio} = L/A$$

$$a_2 = \text{leverage ratio} = D/A$$

$$a_3 = \text{retention ratio} = \pi_R/\pi$$

Marris postulates that the overall \bar{a} is negatively related to ' a_1 ', and positively to ' a_2 ', and ' a_3 '. That is, \bar{a} increases if either the liquidity is reduced, or the debt ratio is raised by increasing external finance (loans), or the proportion of retained profits is increased. Similarly, \bar{a} declines if the managers increase the liquidity of the firm, or reduce the proportion of external finance (D/A), or reduce the proportion of retained profits (that is, increase the distributed profits), or a combination of all three.

Secondly, Marris implicitly assumes that there is a negative relation between job security' (s) and the financial constraint \bar{a} : if \bar{a} increases (either by reducing ' a_1 ' or increasing ' a_2 ' or increasing ' a_3 ') clearly the position of the firm becomes more vulnerable to bankruptcy and/or to take-over raids, and consequently the job security of managers is reduced. Thus, a high value of \bar{a} implies that the managers are risk-takers, while a low value of \bar{a} shows that managers are risk-avoiders.

The financial security constraint sets a limit to the rate of growth of the capital supply, G_c , in Marris model.

The model: equilibrium of the firm

The managers aim at the maximization of their own utility, which is a function of the growth of demand for the products of the firm (given the security constraint)

$$U_{\text{managers}} = f(G_D)$$

The owners-shareholders aim at the maximization of their own utility which Marris assumes to be a function of the rate of growth of the capital supply (and not of profits, as the traditional theory postulated).

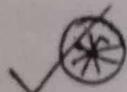
$$U_{\text{owners}} = f(G_c)$$

The firm is in equilibrium when the maximum balanced-growth rate is attained, that is, the condition for equilibrium is

$$G_D = G_c = G^* \text{ maximum}$$

The first stage in the solution of the model is to derive the 'demand' and 'supply' functions, that is, to determine the factors that determine G_D and G_c .

Marris establishes that the factors that determine G_D and G_c can be expressed in terms of two variables, the diversification rate ' d ' and the average profit margin ' m '.



4.6.2 Williamson's Managerial Theory of the Firm

A full-fledged managerial theory of the firm has been put forward by O.E. Williamson who emphasizes that managers are motivated by their self-interest and they maximize their own utility function. Again, the objective of utility maximization by the managers is subject to the constraint that after-tax profits are large enough to pay acceptable dividends to the shareholders and also to pay for economically necessary investments.

It may, however, be pointed out that utility maximization by the self-interest seeking managers, like sales maximization model of William Baumol is possible only in a corporate form of business organization where there exists separation between ownership and management.

Managerial utility function

According to Williamson, utility function of the self-seeking managers depends on the following factors:

1. *Salaries and other forms of monetary compensation* Such compensations which the managers obtain from the business firms. This is a major factor determining the utility of the managers since salary and other monetary rewards received by the manager from the firm determine his private expenditure and standard of living. However, according to Williamson, salary and other monetary compensations are not the total reward received by the managers from their firms and also these are not the only factor determining the utility of the managers.

2. *Number of staff under the control of a manager* The greater the number of staff under the control of a manager, the greater the status and prestige of a manager and also the greater the power wielded by him. That is, the greater the number of staff under the control of a manager, the greater the salary and the amount of other monetary rewards. Since, according to Williamson, there is a close positive relationship between the number of staff and the manager's salary, he takes a single variable "monetary expenditure on the staff" in his formal model of utility maximization by the manager rather than the two separate variables of salary and the number of staff.
3. *Management slack* This consists of those non-essential management prerequisites such as lavishly furnished offices, luxurious company cars, and large expenses accounts, etc. which are not necessary for the efficient and effective operation of the firm. The management slack also enters into the cost of production of the firm.
4. *Magnitude of discretionary investment expenditure by the manager* This refers to the amount of resources which manager can spend according to his discretion. It should be noted that discretionary investment does not include those investment expenditures (such as periodic replacement of capital equipment) which are economically necessary for the survival of the firm. The magnitude of discretionary investment expenditure by a manager indicates the command over resources which he enjoys.

Williamson's managerial discretionary model: Concepts of actual discretionary and reported profits

Williamson has distinguished between three concepts of profits (1) Actual profits (π), (2) Reported profits (π_r) and Minimum profits (π_o)

Actual profits are the difference between total revenue earned less the production costs C and expenditure on staff (S). Thus,

$$\text{where } \pi = R - C - S$$

R = Total sales revenue

C = Production cost

S = Staff expenditure

Reported profit (π_r) is the difference between actual profits and nonessential managerial expenditure as represented by management slack. Thus,

$$\pi_r = \pi - M$$

where M represents management slack

Since $\pi = R - C - S$

$$\pi_r = R - C - S - M$$

Minimum profits (π_o) are the amount of profits (after tax) which are required to be paid as acceptable dividends to satisfy the shareholders who are the owners of the

firm. If the shareholders do not have reasonable dividends, they may sell their shares, thereby exposing the firm to the risk of being taken over by others. Or alternatively, they will vote for the dismissal of the top management. Both of these actions by the shareholders will reduce the job security of the top managerial team. Hence, managers must give some minimum profits in the form of dividends to keep the shareholders satisfied so as to promote their job security. To meet this objective the reported profits must be large enough to be equal to minimum profit (π_o) plus the tax to be paid to the government. Thus,

$$\pi_r \geq \pi_o + T$$

Discretionary profits (π_D) are the actual profits minus minimum profits and tax to be paid. Thus,

$$\pi_D = \pi - \pi_o - T$$

π_D = Discretionary profits

π = Actual profits

π_o = Minimum profits

T = Tax to be paid to the government

Discretionary profits should be carefully distinguished from discretionary investment. Whereas discretionary profits are the amount left after minimum profits (π_o) and tax (T) are deducted from actual profits (π_D) = $(\pi - \pi_o - T)$, the discretionary investment equals reported profits minus minimum profits and tax. Thus,

$$\text{Discretionary Investment } I_D = \pi_R - \pi_o - T$$

π_R = reported profits

π_o = minimum Profits

T = Tax amount to be paid

Since difference between reported profits (π_R) and actual profits (π) arises due to management slack, discretionary profits can be stated as under:

$$\pi_D = I_D + \text{expenditure due to management slack}$$

Thus, if management slack is zero

$$\pi_R = \pi \text{ and } \pi_D = I_D$$

Managerial utility maximization

As stated above, Williamson clubs the first two variables, namely (1) salary and other monetary compensations received by the manager and (2) number of staff under his control into a single variable. Utility of a manager in his model is a function of the following three variables:

$$U = U(S, M, I_D)$$

where, U denotes utility function.

'S' stands for monetary expenditure on staff including salaries of managerial team.

'M' stands for management slack.

' I_D ' stands for amount of discretionary investment.

Maximization of above utility function is subject to the minimum profit constraint. This means level of profits must be such so as to pay satisfactory profit to shareholders and pay for economically necessary investment (not included in discretionary investment).

In Williamson's managerial model, price is regarded as a function of output, the expenditure on staff and a demand shift parameter. Thus,

$$P = P(X, S, e)$$

where, P stands for the price function

' X ' stands for the output level in a period

' S ' stands for the expenditure on staff

' E ' stands for a demand shift parameter

Graphic representation of Williamson's managerial discretionary model

In order to present a simplified Williamson's managerial model we assume that expenditure on account of managerial slack (M) is zero. Given this, managerial utility function becomes:

$$U_M = f(S, I_D)$$

When management slack (M) is zero, then reported profits equal actual profits, then

$$I_D = \pi - \pi_o - T$$

Substituting this formulation in managerial utility function we have:

$$U_M = f\{S, (\pi - \pi_o - T)\}$$

Thus, we have the following simplified model of managerial function which has to be maximized subject to a constraint. Thus,

$$\text{Maximize: } U_m = f\{S, (\pi - \pi_o - T)\}$$

$$\text{Subject to: } \pi \geq \pi_o + T$$

According to Marris, the manager of firm, instead of maximizing profits, tries to maximize the rate of growth of the firm. The ability of the manager will be judged by his performance regarding the successful growth and expansion of the firm and his rewards will reflect this. Further, he argues, the growth of the firm can be best achieved by diversification.

Williamson in his model lays stress on the managerial discretion in determining not only output and price but also the level of staff expenditure and managerial emoluments. He distinguished between desire of manger for discretionary action and the opportunity for managerial discretionary action. Thus, according to Koutsoyiannis, 'It seems that the distinction between the desire of managers and the opportunity of managers for discretionary behavior cannot be disentangled'.



4.7 Pricing Policies

4.7.1 Methods of Pricing

Marginal cost pricing

Social welfare is maximum or, in other words, economic efficiency in resource allocation is achieved when price is set equal to marginal cost. It has been suggested that non-profit enterprises should pursue marginal cost pricing policy so as to achieve economic efficiency in resource allocation. However, marginal cost pricing does not ensure positive profits when the enterprise is enjoying very large economies of scale. To induce the enterprise to continue producing the product as it is socially beneficial, subsidies should be paid to the enterprise or else the government should itself undertake the production of the product and meet its losses from the budgetary resources. Thus, in such enterprises where large economies of scale occur, marginal cost pricing is non-viable.

Limit pricing

Limit pricing refers to the pricing by incumbent firm(s) to deter or inhibit the entry or the expansion of fringe firms.

Limit pricing implies that firms sacrifice current profits in order to deter entry of new firms and earn future profits. It is not clear whether this strategy is always superior to one where current prices (and profits) are higher, but decline over time as an entry occurs.

Limit pricing thus involves charging prices below the monopoly price in order to make entry appear unattractive (to limit entry). A low price would discourage entry if prices had a commitment value. But they do not, because prices can be changed quickly. Hence, if a potential entrant has complete information about the incumbent, limit pricing would be useless.

It is the policy adopted by firms already in a market to reduce their prices so as to make it unprofitable for other firms to try to enter the market. The price so established is called an *entry forestalling price*.

Market skimming pricing

Skimming is adopted where a new product is launched and the seller has little information on the acceptable price in the market. The seller, therefore, starts by setting a high price on the launch of the product and then, over a period of time, lowers the price to meet the varying price elasticities of demand. This enables gradual

4.7.4 Internet Pricing Models

The traditional pricing scheme of putting a postage stamp on every letter does not work with Internet. The pricing models relevant in the context of the new economy in general and the Internet in particular are described as follows.

Flat-rate pricing

The Internet user is required to pay a fee to 'connect' for a fixed period during which one is not charged on the basis of the 'bits' sent or received each time.

Usage-sensitive pricing

This model looks like a two-part tariff that utilities have—a part of the bill is for the connection and the other part is a price per unit of bit sent or received. We could have the peak user paying both parts and the off peak user paying only one part. The variable part could also be based on connection time, speed of connection, etc. Pricing based on the number of minutes of connection is a popular basis of pricing and assumes that usage, in terms of packets sent and connection time are correlated, but they need not be. The only disadvantage of basing price on packets sent is that the cost of implementing such a system is very high.

Transaction-based pricing

This model is a variant of the usage-sensitive pricing. In this model, the pricing is 'transaction' based and not usage based. The advantage of this pricing model is its efficient administering. However, we cannot distinguish between different qualities of service (quality of service being gauged by band width).

Priority pricing

In this model, the users pay according to the quality of service chosen by them. This comes close to the price-discrimination model of the old economy. Another variant of this is the increasing block tariff used in electricity pricing, wherein the user pays a fixed amount for the first block of units, a higher amount for the next block, and so on.

Charging on the basis of social cost

This is similar in principle to the rationale behind peak-load pricing. The users during the peak period pay for imposing a congestion cost on the network. This system of pricing, paradoxically, makes the congestion actually happen because it is in the interest of the ISPs to create shortage by reducing capacities, where ISPs are private parties, this congestion will be created in all likelihood.

Precedence model

Under the precedence model, the existing users are protected by determining the priority of different applications. The criteria that determine the priority will be reflected in the precedence field of the different data packets. Network priority would be assigned to packets based on their precedence numbers. When there is congestion, the sequence of sending the packets is decided by the priority assigned. This model was developed by Bohn (1994). Under this model, the role of the authority who sets the priority is critical.

Smart market mechanism model

Varian and Mackie-Mason (1995) proposed the smart market mechanism model, wherein there is a dynamic bidding system whereby the price changes by the minute depending on the degree of network congestion. Each user specifies the bit price on each packet and at the time of congestion, the highest bidder will get the top priority. This model is a form of congestion pricing and is, therefore, subject to the abuse of the service, by the ISPs that can artificially create congestion. This necessitates the creation of an objective and powerful regulatory authority.

All pricing models require e-commerce to be pervasive on the Internet. Unless this happens, procedures of billing and settlement processes cannot be developed; without this, no pricing model can be implemented.



I Multiple Choice Questions

1. Market means
 - (a) Business
 - (b) Where goods are sold and purchased
 - (c) Economic activity
 - (d) Where sellers and buyers are there
2. Where a large number of buyers and sellers available in a larger number is called
 - (a) Perfectly competitive
 - (b) Imperfectly competitive
 - (c) Monopolistic
 - (d) Perfect market
3. The profit maximization condition of the firm can be expressed algebraically
 - (a) $\pi = R - C$
 - (b) $\pi = C - R$
 - (c) $C = R - \pi$
 - (d) $R - C = \pi$
4. Example for perishable commodities
 - (a) Building
 - (b) Sun
 - (c) Milk
 - (d) Water

Interpretation and Analysis of Financial Statement

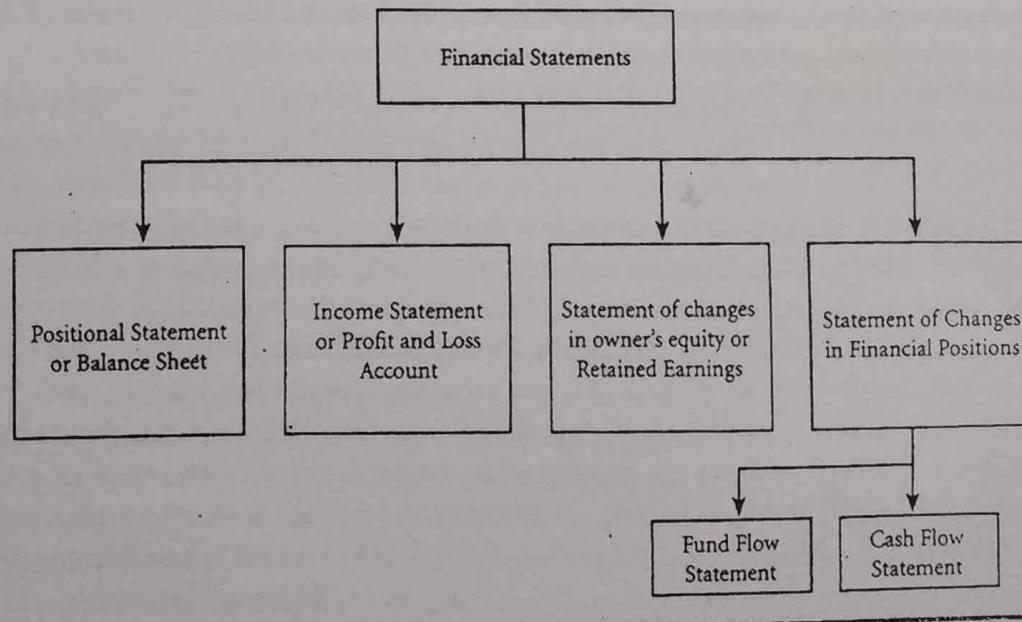
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7.1 Introduction

A financial statement is an organized collection of data as per the logical and consistent accounting procedures. It involves recording, classifying, and summarizing various business transactions. It conveys an understanding of some financial aspects of a business firm. It shows a position of a firm at a moment of time, as in the case of balance sheet, or may reveal a series of activities over a given period of time, as in the case of an income statement. Thus, the term "financial statements" generally refers to the two statements: (1) the position statement of balance sheet, and (2) the income statement or the trading and profit and loss account (P&L a/c). However, Generally Accepted Accounting Principles (GAAP) specify that a complete set of financial statements must include: (1) a balance sheet, (2) an income statement, (3) a statement of changes in owner's accounts, and (4) a statement of changes in financial position.

FIGURE 7.1 Financial Statements



The meaning and significance of each of these statements is as follows:

1. *Balance sheet* It is a financial statement prepared as on a particular date, explaining the financial position of a business. It represents the assets of the firm at a particular moment of time and the owner's equity and the outside liability against those assets at that time. The American Institute of Certified Public Accountants defines balance sheet as "a tabular statement of summary of balances (debits and credits) carried forward after an actual and constructive closing of books of accounts and kept according to principles of accounting." This is one of the important statements depicting the financial strength of the concern. It is in a way a snapshot of the financial condition of the business at that time.
2. *Income statement (or P&L a/c)* The income statement is generally considered to be the most useful of all financial statements. It explains the results of business operations between two balance sheet dates. This statement is prepared to determine the operational profits of a concern. It is a statement of revenues earned and the expenses incurred for earning that revenue. Whenever there is excess of expenditure over revenue, it indicates loss; and an excess of revenue over expenditure shows profit of a business concern. This statement is prepared for a particular period, generally one financial year; all the revenues and expenditures falling due in that year are taken into account irrespective of their receipt of payment. (i.e., all receipts due in that year, whether received or accrued, and all expenses incurred, whether paid or outstanding, will be considered).
The income statement may be prepared in the form of a manufacturing account to find out the cost of production, in the form of trading account to determine gross profit or gross loss, in the form of P&L a/c to determine net profit or net loss.
3. *Statement of changes in owner's equity/retain earnings* The term owner's equity refers to the claims of the owners of the business (shareholders) against the assets of the firm. It consists of two elements: (1) paid up share capital representing the initial investment made by the owners, and (2) retained earnings/reserves and surplus indicating the undistributed profits of a business concern. The statement of changes in owner's equity simply shows the beginning balance of each owner's equity account, the reasons for increases and decreases in each and its ending balance. However, in most cases, the only owner's equity account that changes significantly are retained earnings and hence the statement of changes in owner's equity becomes merely a statement of retained earnings. This statement is also known as profit and loss appropriation a/c. This account will have the previous years' balance, which is first brought forward and the net profit during the current year is added to this balance. On the debit side, appropriation like interim dividend, proposed dividends on preference and

equity share capital, transfer to debenture redemption fund, capital redemption fund, general reserve, etc, are shown. The balance in this account shows the amount of profit retained in hand and carried forward to the next year.

4. *Statement of changes in financial position (SCFP)* The balance sheet shows the financial position of a business concern as on a particular period of time; the income statement discloses the results of the operations of the business concern over a period of time. However, for various business decisions, it is necessary to study the movement of working of capital and cash of a business. The inflows and outflows of working capital/cash are available in the statement of changes in financial position. The statement may emphasize any of the following aspects relating to change in financial position of the business.
 - (a) Funds flow statement—The funds flow statement is prepared to analyze the changes in the financial condition of a business between two accounting periods. The term "fund" in this statement indicates working capital. Working capital is the excess of current assets over current liabilities. This statement explains and identifies the movement of funds, i.e., the sources of funds and their uses for various purposes. This statement helps the management in policy formulation and performance appraised.
 - (b) Cash flow statement—A statement of changes in the financial position of a firm on cash basis is called cash flow statement. This summarizes the cash position of a business enterprise between dates of two balance sheets. This statement is very much similar to funds flow statement, but emphasizes on cash transactions only. It explains the sources and uses of cash.



7.2 Analysis and Interpretation of Financial Statements

Financial statements are indicators of the two significant factors, namely, (1) profitability and (2) financial soundness. Analysis and interpretation of financial statements, therefore, refers to the process of determining the financial strengths and weaknesses of the firm by establishing strategic relationship between the items of balance sheet, P&L a/c and other operative data. "Analyzing financial statements," according to Metcalf and Titard, "is a process of evaluating the relationship between component parts of a financial statement to obtain a better understanding of a firm's position and performance."

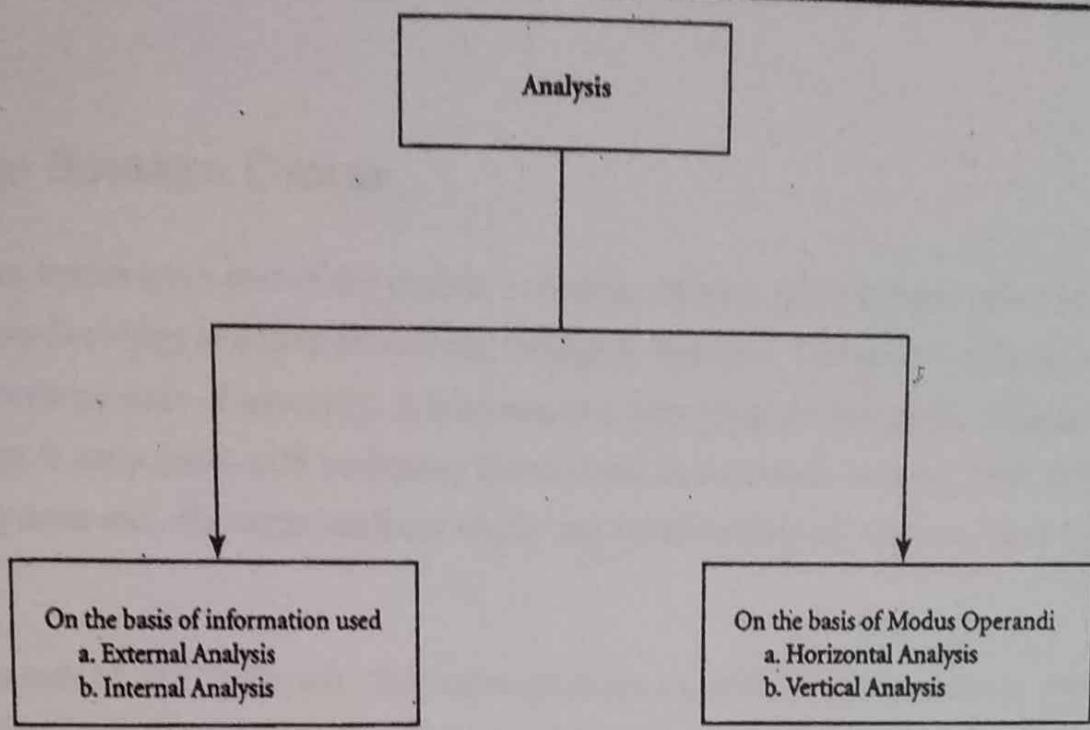
The term analysis means methodical classification of the data given in the financial statements. The financial statements alone cannot help unless they are put in a simplified form. The term interpretation means explaining the meaning and significance of the data so simplified. According to Myres, "Financial statement analysis is largely a study of relationship among the various financial factors in a business as disclosed by a single set of statement and a study of the trend of these factors as shown in a series of statements."



7.3 Types of Financial Analysis

The process of analysis may broadly be classified into different categories on the basis of information used and on the basis of modus operandi. The classification is presented here.

FIGURE 7.2 Financial Analysis



7.3.1 On the Basis of Information Used

Financial analysis can be of the following two types:

1. *External analysis* This type of analysis is generally done by the outsiders of the business, as they do not have access to the detailed internal accounting records of the business firm. These outsiders include investors, creditors, government agencies, potential investors/creditors, and the general public. The external parties mainly depend on the published financial statements. External analysis, thus, serves only a limited purpose. However, the recent changes in the government regulations requiring business firms to make available more detailed information to the public, through, audited published accounts have considerably improved the position of external analysis.
2. *Internal analysis* This type of analysis is done by persons who have access to the books of accounts and other information related to the business. Most often the analysis is done by executives and employees of the organization as well as government agencies, which have statutory powers vested in them. The analysis is done depending upon the objective to be achieved through this analysis.

7.3.2 On the Basis of Modus Operandi

According to this, financial analysis can also be of two types:

1. *Horizontal analysis* In this type of analysis, financial statements for a number of years are reviewed and analyzed. The current year's figures are compared with the figures of standard or base year. The analysis statement usually contains the figures of two or more years and the changes are shown regarding each item from the base years, usually in the form of percentage. This method gives the management considerable insight into the levels and areas of strengths and weaknesses. Since this type of analysis is based on the data from year to year rather than on one data, it is also termed as "dynamic analysis." The horizontal analysis makes it possible to focus attention on items that have changed significantly during the period under review. Comparison of an item over several periods with a base year shows a trend developing. Comparative statements and trend percentages are two tools employed in horizontal analysis.
2. *Vertical analysis* This type of analysis is a study made on the quantitative relationship of the various items in the financial statements on a particular date, for example, the ratios of different items of costs for a particular period may be calculated with the sales for that period. This type of analysis is useful in comparing the performance of several companies in the same group, or divisions/departments in the same company. Vertical analysis is also called as "static analysis" as it is frequently used for referring to ratios developed on one date or for one accounting period. Common-size financial statements and financial ratios are the two tools employed in vertical analysis. Since this type of analysis depends on the data for one period, it is not very conducive to a proper analysis of the company's financial position. However, it may be used along with horizontal analysis to make it more effective and meaningful.
3. *Ratio analysis* An analysis of financial statements with the help of ratio may be termed as "ratio analyses." It implies the process of computing, determining, and presenting the relationship of items and group of items of financial statements. It also involves the comparison and interpretation of these ratios and the use of them for future projections.

Alexander Wall is considered to be a pioneer of ratio analysis. He presented, after a serious thinking, a detailed system of ratio analysis in 1909. He is of the opinion that the work of interpretation can be made easier by establishing quantitative relationships between the facts given in the financial statements.

Ratio analysis is one of the techniques of financial analysis where ratios are used as a yardstick for evaluating the financial condition and performance of a firm. Analysis and interpretation of various accounting ratios gives a skilled and experienced analyst a better understanding of the financial condition and performance of the firm than what he could have obtained only through a perusal of financial statements.

11

BUSINESS CYCLES

MEANING OF BUSINESS CYCLES

Business cycles are a part of the capital economic system. An economy never runs smooth. There are upwards swings and then downward swings in business. The period of business prosperity alternates with periods of adversity. A business is a very complex economic phenomenon. The business cycles is associated with sweeping fluctuations in economic activity such as production prices employment etc., the term business cycle has been defined in various ways by different ecumenists.

In the words of W.C. Mitchell, "Business cycle are a species of fluctuations in the economic activities if organized communities. According to Keynes" a trade cycle is composed of periods of good trade characterised by rising prices and low unemployment parentages altering with periods of bad trade characterized by falling price s and high unemployment percentages.

In the words of Fredric Benham "A trade cycle may be defined rather badly as a period of prosperity followed by a period of depression. It is not surprising that economic process should be irregular trade being good at some time and bad at other"

According to prof. Huberler "The business cycles in the general sense may be defined as an alternative expression and contractions in overall business activity as evidenced by fluctuations in measures of aggregate economic activit y such as the gross product, the index of industrial production and employment and income..

PHASES OF BUSINESS CYCLES

Depression : Depression is characterized a sharp reduction of production, mass unemployed, low employed, falling prices, falling profits, low wages, contraction of credit, a high rate of business failures and an atmosphere of all around pessimism. The general decline in economic activity leads to a fall in bank deposits. Credit expansion stops because the business community is not willing to borrow bank rate falls considerably. A decline in output is accompanied by a reduction in the volume of unemployment.

Recovery : But the things are not going to continue to be in a depressed state forever. Recovery implies an urge in business activity after a lowest point of the depletion has been reached. During recovery phase, there is a slight improvement in economic activity so that the entrepreneur begin to feel the economic situation was not so bad and it was in the proceeding stage. Pessimism given place to optimism. This leads to further expansion of business activity the industrial production picks up slowly and gradually. The volume of employment also steadily increases. There is a slow, but sure rise in prices accompanied by a small rise in profits. The wages also rise, though they do not rise in the same proportion in which the prices rise. Attracted by rising profits, new investments take place in capital goods industries. The banks expand credit. The business investments start rising slowly. Ultimately revival enters the prosperity business investments start rising slowly. Ultimately revival enters the prosperity phase.

Prosperity : In the prosperity phase, demand output employment and income are at a high level. They tend to raise prices. But wages salaries, interest rates, rental and taxes do not rise in proportion to the rise in prices. The gap between prices and costs increases in the margin of profit. The increase of profit and the prospect of its continuance commonly cause a rapid rise in stock market values. The outstanding changes in its stocks that reflection the capitalized values of prospective earnings, register in an exaggerated from the rising profits of enterprise large profit expectation further increases investment which is helped by legend bank credit. They lead to considerable expansion in economic activity by increasing the demand for consumer goods and further raising the price level.

Boom : It is the stage of rapid expansion in business activity to new high marks resulting in high stocks and commodity prices, high profits and overall employment. The continuance on investment even after the stage of full employment results in a sharp inflation may raise of prices. This causes undue optimism among businessmen. Who make additional investments in the vari-

ous branches of the economy. This puts additional pressure on the factors of the production which are already fully employed causing a sharp rise in their prices. Boom is a situation develops in which the number of jobs exceeds the number of workers available in the market. Profits touches the new heights. Attracted by the rising profits the businessmen further increase their capital investment this leads to the rise in the price level. Price rise sky a high. There is an atmosphere of over optimism all around.

Recession : The feeling of our optimism in the boom priod is replaced now by over pessimism characterized by fear on the part of the businessmen. The failure of some business creates panic among businessmen. The Banks also get panicky and begin to withdrawn loans from business enterprises. More business enterprises fall, prices collapse and confidence is rudely shaken. Building contruction slows down and unemployment appears in basic, capital goods industries. The initial unemployment then spreads to other industries. Unemployment leads to fall in income, expenditure, prices and profits. The recession, it should be resembeld has commuttion effect. Once a reasons starts, it goes on gathering momentum nad finally assumes the shape of depression.

ANSWER

Theory Questions

1. Define Business cycles and explain its phases

Capital Budgeting

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8.1 Meaning of Capital Budgeting

Capital budgeting is the process of making investment decisions in capital expenditure. Capital expenditure is an expenditure, the benefits of which are expected to be received over a period of time exceeding one year. Some of the examples of capital expenditure are listed here.

1. Cost of acquisition of permanent assets as land and building, plant and machinery, goodwill, etc.
2. Cost of addition, expansion, improvement, or alteration in the fixed assets.
3. Cost of replacement of permanent assets.
4. Research and development project cost, etc.

Capital expenditure involves non-flexible long-term commitment of funds. Thus, capital expenditure decisions are also called long-term investment decisions, and capital budgeting involves the planning and control of capital expenditure.

Capital budgeting is the process of deciding whether to commit resources to a particular long-term project whose benefits are expected to be realized over a period of time, which is normally longer than one year.

8.1.1 Definition of Capital Expenditure

All expenditure which results in the acquisition of fixed assets and other development projects, the benefits of which are expected to be received beyond one year in the future is capital expenditure. Further, any expenditure incurred which tends to extend or improve existing fixed assets, so as to increase the profitability of a concern by increasing production or reducing cost of production beyond one year may rightly be called capital expenditure.

Thus, amounts of money spent in the acquisition, installation or development of fixed assets and in welfare and research and development projects fall under this category. The specific objectives which necessitate capital expenditure in a concern are as follows:

1. Expanding business through increasing production by acquiring more fixed assets.

2. Improving quality of products with acquiring the up-to-date machinery.
3. Reducing cost of production by improving efficiency.
4. Diversification of products to survive through competitive conditions.
5. Giving more satisfaction to customers through after sales services
6. Welfare facilities to employees of the concern.
7. To comply with certain social objectives like acquisition of a pollution control devices, etc.
8. Reducing expenditure through research and development for reducing cost and making improvement in quality.

Charles T. Horngreen defines capital budgeting as "long-term planning for making and financing proposed capital outlays."

According to Lynch, "Capital budgeting is planning development of available capital for the purpose of maximizing the long term profitability of the concern."

It can be concluded that the important features of capital budgeting decisions are as follows:

1. They involve the exchange of current funds for the benefits to be achieved in future.
2. The future benefits are expected to be realized over a series of years.
3. The funds are invested in non-flexible and long-term activities.
4. They have a long-term and significant effect on the profitability of the concern.
5. They involve, generally, huge funds.
6. They are irreversible decisions.
7. They are strategic investment decisions, involving large sum of money.

8.1.2 Types of Capital Expenditure

The following can be the various types of capital expenditure:

1. The replacement of fixed assets already in use.
2. The purchase of new fixed assets for expansion of the business.
3. Projects to comply with the statutory requirements such as making provision for accident prevention devices, providing crèches and rest-room under the Factory Act, 1948.
4. Welfare projects to motivate the employees.
5. Research and development projects for reducing cost and improving quality of products and finding new uses of the product.
6. Educational and training projects to improve the efficiency of the employees.

7. Prestige value projects to create a favourable effect in the minds of the public such as investment may be made on guest-houses, public relation department, hospitals, schools, colleges, etc.

Capital expenditure can also be classified in another way:

1. *Profit earning projects* Expenditure is incurred on projects with a view to earning profits, e.g., an investment in machinery to increase production or reduce cost. They are of two types, viz., replacement projects and expansion projects.
 - (a) *Replacement Projects* In these projects, the existing fixed assets are replaced by new fixed assets as existing assets are completely worn out or have become obsolete.
 - (b) *Expansion Projects* In these projects, new fixed assets are acquired to augment existing facilities so as to increase the productive capacity.
2. *Non-profit projects* In these projects, the aim is not to earn profit but the expenditure is incurred to meet the requirements of law of the land, contractual obligations of the Government orders or orders of local authorities, such as safety precautions for employees, provision of welfare measures, research and development projects, pollution control, etc.
3. *Profitability of projects which cannot be measured* Some capital projects are taken with a view to increasing profits but the amount of the expected profits from such projects cannot be accurately ascertained. Projects meant for the welfare of the workers and sales promotion and research schemes come under this category.

8.1.3 Capital Expenditure Decisions

Since capital expenditure generally involves large amounts, it is desirable that a proper decision is made in selecting a capital project from amongst a number of alternative proposals. The main factor to be considered at the time of making a choice for a suitable project is the rate of return expected from such a project. Is this return equal to a suitable project? Is the rate of return expected from such a project? Is this return equal to or greater than that required by investors at the margin? If the answer is yes, capital expenditure may be incurred and if the answer is no, proposals of the expenditure should be dropped. The various other factors, in addition to the rate of return, which are required to be considered before a final choice of the capital project is made are listed as follows:

1. *The amount and timing of cash inflows and outflows* The shorter is the periods within which the cost of the project is recovered, the less risky is the project and the greater is its liquidity.
2. *Cost of capital projects* The cost of acquiring the fixed assets, the cash position and the availability of cash either from within or by borrowing should be considered before making a choice of a suitable project. It is futile investing

borrowed funds in a capital project if the rate of interest paid on such funds is more than the return expected from such a project. The working capital required when the project goes into operation should also be assessed.

3. *Product demand* It should be seen whether there will be sufficient demand in future for the increased production because of additional fixed assets. It is not worthwhile to purchase a fixed asset having not sufficient demand for the increased production.
4. *The relative importance of the profit* Sometimes, non-profit projects such as setting up of a hospital or canteen or acquisition of a pollution control device, though not yielding any return on the amount invested, may be given preference over profit earning projects on the grounds of their urgency and essentiality.
5. *Opportunity cost* Opportunity or alternative cost should be considered while making a choice of capital expenditure. The return obtainable from the funds, if utilized somewhere else, should be compared with the return expected from the proposed project.
6. *Cost of production* The ultimate aim of cost accounting is to reduce cost of production by eliminating all types of wastages. So, the effect of the alternative capital projects on reduction of future cost of production should be studied. The project which reduces cost of production should be favored. Cost reduction should not be at the cost of quality.
7. *Other considerations* Besides cost consideration, there are other non-financial factors which influence the choice of a capital project. Sometimes, capital expenditure is incurred to create a favorable image in the minds of the public. For example, investment may be made in schools, colleges, hospitals, and guest houses.

8.2 Need for Capital Budgeting

Capital budgeting means planning for capital assets. They are vital decisions to any organization, which include the following:

- (a) To decide if funds should be invested in long-term projects such as selling of a company, purchase of plant and machinery, etc.
- (b) To analyze the proposal for expansion or for creation of additional capacities.
- (c) To decide for replacements for permanent assets.
- (d) To make financial analysis of various investment proposals and to choose the best out of many alternative proposals.

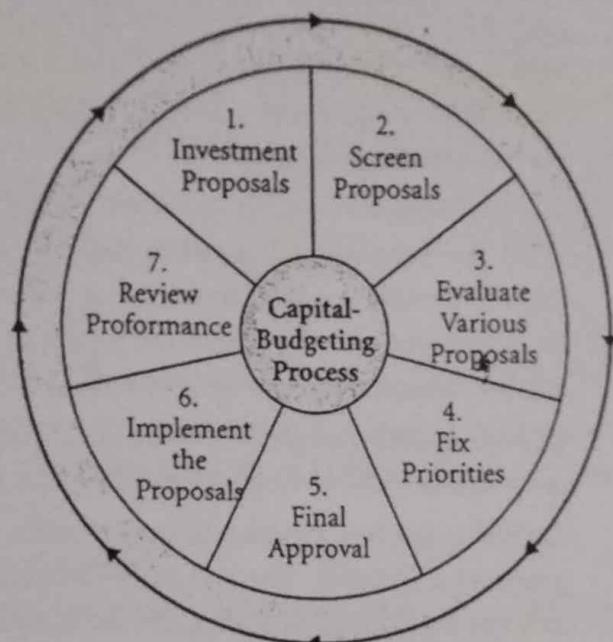
8.3 Capital-Budgeting Process

Capital-budgeting decisions involve the following:

- (a) Evaluating different proposals on the basis of return expected by the investors of the firm and the return promised by the proposal, and
- (b) Applying different techniques to select an alternative with the objective of maximization of value of the firm.

Capital budgeting is a complex process as it involves decisions relating to the investment of current funds for the benefits to be achieved in future; and the future is always uncertain.

FIGURE 8.1 Capital Budgeting Process



8.4 Kinds of Capital-Budgeting Decisions

The ultimate objective of capital budgeting is to maximize the profitability of a firm or the return on investment. It can be achieved by either increasing the revenues or by reducing the costs. The decisions in capital budgeting are broadly classified into two categories.

1. Those that increase revenues
2. Those which reduce costs

The first category includes the decisions to be taken relating to expansion of the production capacity or size of operation by adding a new product line for increasing revenue.

The second category includes the decisions to be taken relating to replacement of obsolete, outmoded, or worn out assets to reduce costs.

Both the categories include the decisions regarding the investment in fixed assets, but the difference between these two is that increasing revenue investment decisions are subject to more uncertainty as compared to cost-reducing investment decision.

Capital-budgeting decisions may also be classified as

1. Accept-reject decisions
2. Mutually exclusive project decisions
3. Capital-rationing decisions
 1. *Accept-reject decision* When the investment projects do not compete with each other, accept-reject decisions are taken. Such decisions are compared with a minimum required rate of return or the cost of capital; the one with the highest rate of return is accepted and others are rejected. The firm invests only in the accepted proposal.
 2. *Mutually exclusive project decisions* When proposals compete with each other, one proposal is accepted at the cost of the other. For example, a firm intends to replace its machinery, it can either buy a new machine or buy a used machine or even hire an old machine. Thus, the firm by deciding on any one option renders other two options/proposals as rejected.
 3. *Capital-rationing decisions* When the firm has several profitable investment proposals but due to limited funds, the firm has to ration them.

Rationing implies selection of combination of proposals that will yield the greatest profitability. The investment proposals are ranked in a descending order as per their profitability, and the limited funds are distributed so as to earn maximum returns.



8.5 Methods of Capital Budgeting

The survival of a business depends upon management's ability to conceive, analyze, and select investment opportunities that are profitable. The firm must select such projects that maximize the returns of the business. Capital budgeting is the allocation of available resources to various proposals. It involves estimation of cost and benefits of a proposal, estimation of required rate of return and evolution of different proposals in order to select one. These cost and benefits are expressed in terms of cash flows arising out of a proposal. The cash flows are estimated and are compared to required rate of return; and the proposal with the optimal return and investment is accepted using the following capital-budgeting techniques. The various commonly used methods are as follows:

1. Traditional methods
 - (a) Payback period or payout or payoff method

- (b) Improvement of traditional approach to payback period method
- (c) Rate of return method or accounting method
- 2. Time-adjusted method or discounted methods
 - (a) Net present value method
 - (b) Internal rate of return method
 - (c) Profitability index method

8.5.1 Traditional Methods

Payback method

This method represents the period in which the total investment in permanent assets is paid back with the additional earnings generated from the investments. The firm prefers making investment in that proposal where the capital invested is recovered as early as possible.

Payback period is defined as the period required for the proposal's cumulative cash flows to be equal to its cash outflows. The payback period is usually stated in terms of number of years, it is the period for a proposal to "break even" on its net investment.

The payback period can be ascertained in the following manner:

1. Calculate annual net earnings (profits) before depreciation and after taxes; these are called annual cash inflows.
2. Divide the initial cost of the project by the annual cash inflow, where the project generates constant annual cash inflows.
Thus, $PBP = \frac{\text{Cash outlay (cost) of the project}}{\text{Annual cash inflows}}$
3. Where the annual cash inflows are unequal, the cash flows are added up until the total is equal to the initial cash outlay of the project.

ILLUSTRATION 8.1

Where annual inflows are equal

A project requires an initial cash outflow of ₹ 5,00,000 and is expected to generate cash inflows of ₹ 1,00,000 pa for 8 years. In this case, the payback period is 5 years,

$$\text{i.e., } \frac{₹ 50,00,000}{₹ 1,00,000} = \frac{\text{Cash outlay of the period}}{\text{Annual cash inflows}}$$

The payback period in this example is 5 years which indicates that the initial cash outflow shall be recovered within 5 years.

ILLUSTRATION 8.2

Where the annual cash inflows are unequal

There are two projects x and y ; each project requires an investment of ₹ 20,000. Rank these projects according to the payback method.

Years	Project x (Net Profits are Before Depreciation and After Tax)	Project y
1	1,000	2,000
2	2,000	4,000
3	4,000	6,000
4	5,000	8,000
5	8,000	-

SOLUTION

The PBP for project x is 5 years as $(₹ 1,000 + 2,000 + 4,000 + 5,000 + 8,000) = ₹ 20,000$.

While the payback period for project y is 4 years as $(₹ 2,000 + 4,000 + 6,000 + 8,000) = ₹ 20,000$.

Hence, project y should be preferred to project x , thus project y is ranked first.

Merits of payback period

1. It is simple to understand and easy to compute.
2. It is cost effective as compared to other methods.
3. It recommends that project where the PBP is shorter, the loss is reduced due to obsolescence.

Demerits of payback period

1. It ignores cash inflows after the payback period, which may result in incorrect selection of project and does not consider the life time of the asset.
2. It ignores time value of money and does not consider the magnitude and timings of cash inflows.
3. It does not consider cost of capital for taking investment decisions.
4. Decision taken on the basis of payback period may become subjective.

Improvements in traditional approach to payback method: Discounted payback period

To overcome the limitations of the traditional approach, improvements to the method with regard to cash inflows-generated post-payback period and time value of money are made.

Under this method present value of cash outflows and future cash inflows are computed at an appropriate discount rate. The project which gives discounted payback period is accepted.

ILLUSTRATION 8.3

Calculate the discounted payback period from the information given below:

Cost of the project	₹ 60,00,000
Life of the project	5 years
Annual cash inflows	₹ 20,00,000
Cut-off rate 10%	

SOLUTION

Calculation of present values of cash inflows

Years	Inflows ₹)	Present Value at 10% (Discount Factor)	Present Value ₹)	Cumulative Present Value ₹)
1	20,00,000	0.909	18,18,000	18,18,000
2	20,00,000	0.826	16,52,000	34,70,000
3	20,00,000	0.751	15,02,000	49,72,000
4	20,00,000	0.683	13,66,000	63,38,000
5	20,00,000	0.621	12,42,000	75,80,000

Cumulative present value of cash inflows at the end of the 3rd year is ₹ 49,72,000 and is 63,38,000 at the end of 4th year. Hence discounted payback period falls between 3rd and 4th years.

Discounted payback

$$\begin{aligned}
 &= \frac{3 \text{ years} + \text{Difference of cash outflow and cumulative inflows of } 3^{\text{rd}} \text{ year}}{\text{Cash inflow of the } 4^{\text{th}} \text{ year}} \\
 &= \frac{10,00,00 - 1,00,000/5 \text{ years}}{1} = 1 \\
 &= 3 \text{ years} + \frac{60,00,000 - 49,72,000}{13,66,000} \\
 &= 3 \text{ years} + \frac{10,28,000}{13,66,000} = 3 \frac{3}{4} \text{ years approximately}
 \end{aligned}$$

Rate of return method (ARR)

Rate of return method is also known as accounting rate of return or average rate of return. It is based on the concept of rate of return. It measures the return on the project with regard to investment required for the project. The return is measured in terms of the average profit earned by the project over the duration of the project.

$$\text{APR} = \frac{\text{Average annual profit (after tax)} \times 100}{\text{Average investment in the project}}$$

Average profit = Average accounting profit earned over the project duration

$$\begin{aligned}
 &= \frac{\text{Total of annual profit earned over the duration}}{\text{Number of years of project duration}}
 \end{aligned}$$

Average investment It is the average investment/amount of fund that remained invested or blocked in the project over its economic life.

$$= \frac{1}{2} (\text{Initial cost} + \text{Installation expenses} - \text{Salvage value}) + \text{Salvage value} + \text{Additional working capital if required}$$

ILLUSTRATION 8.4

A project ABC costs ₹ 10,00,000 and has a scrap value of ₹ 1,00,000. The profit before depreciation and tax through 5 years is ₹ 2,00,000, ₹ 3,00,000, ₹ 2,50,000, ₹ 3,50,000, and ₹ 4,00,000. Assuming a 35% tax depreciation on straight line basis, calculate the average rate of return.

SOLUTION

- (i) Calculation of average annual profit

PBDT (₹)	Depreciation (₹)	PBT (₹)	Tax (₹)	PAT (₹)
2,00,000	1,80,000	20,000	7,000	13,000
3,00,000	1,80,000	1,20,000	42,000	78,000
2,50,000	1,80,000	70,000	24,500	45,500
3,50,000	1,80,000	1,70,000	59,500	1,10,500
4,00,000	1,80,000	2,20,000	77,000	1,43,000

$$\text{Depreciation} = \frac{\text{Asset cost} - \text{Scrap value}}{\text{Life time of the asset}} = \frac{10,00,000 - 1,00,000}{5 \text{ years}} = 1,80,000$$

$$\text{Average profit (PAT)} = \frac{13,000 + 78,000 + 45,500 + 110,500 + 143,000}{5} = 78,000$$

$$\begin{aligned}\text{Average investment} &= \frac{1}{2} (\text{Initial cost} + \text{Installation expenses} - \text{Salvage value}) \\ &\quad + \text{Salvage value} + \text{Additional working capital} \\ &= \frac{1}{2} (10,00,000 + 0 - 1,00,000) + 1,00,000 + 0 = 5,50,000\end{aligned}$$

$$\text{Thus, ARR} = 78,000 / 5,50,000 = 14.18\%$$

Merits of ARR method

1. It is very simple and easy to operate.
2. It takes the entire earnings of the project in calculating rate of return, hence gives better view of profitability unlike PBP.
3. It is based on the accounting concept of profits, which is readily available hence easy to compute.

Demerits of ARR method

1. It ignores time value of money; it ignores the fact that a rupee earned today is of more value than a rupee earned a year after, or so.
2. It ignores cash inflows which are important as it considers accounting profits.
3. It ignores the period in which the profits are earned.
4. It cannot be applied in projects where investments are made in parts or at different time periods.

8.5.2 Time-Adjusted or Discounted Cash Flow Methods

Time-adjusted methods take into account the profitability and also the time value of money unlike in the traditional methods.

These methods are popular in the modern days and also known as discounted cash flow methods.

The traditional techniques of pay back and ARR cannot be regarded as sound and efficient techniques. These techniques do not consider the total benefits emanating from a proposal. They ignore the time value of money. Investment decision techniques based on discounted cash flows replace accounting income with cash flows. They explicitly consider the time value of money. These techniques are also called the present values techniques and fulfill all the requisites of a good evaluation technique.

Cash flows occurring at different points of time do not have the same economic worth. Cash flows that occur earlier in time are worth more than cash flows that occur later on account of factors such as inflation and interest rates. These cash flows must be discounted with reference to the time gap between different cash flows and a predetermined discount rate.

8.5.3 Time Value of Money

The concept of time value of money refers to the fact that the money received today is different in its worth from the money receivable at some other time in future. For example, if you were offered a choice between receiving ₹ 1000 today and receiving ₹ 1000 after one year, the obvious choice of any person would be to receive ₹ 1000 today. It is a better option as ₹ 1000 received today can be invested in a bank or any other instrument and the value of such investment one year later would be higher. Assuming that you can invest the ₹ 1000 after one year. Thus, the earlier we receive money, the better and more valuable it is. Similarly, money payable today is more valuable than money payable after one year. This preference for current money as against future money is captured by the concept of time value of money.

8.5.4 Reasons for Time Value of Money

There are several reasons for this preference towards current money. They are as follows:

1. *Uncertainty* Money received today is in our hands. One can be sure about it. One cannot be so sure about the money that is receivable after one year. There can be unforeseen developments during the year that may deprive one of receiving the promised money. Current money is more valuable as it comes without any apprehension that the other party (the debtor) may become insolvent or untraceable.
2. *Preference for present consumption* If money is in hand, one has the choice of using it whichever way one likes. If money is receivable in future, even if it is sure to be received, it can be used only after some time. The benefits accruing from spending the money will not be enjoyed if it were in our hands today.
3. *Inflation* It is observed that the prices of almost all products and services go up with the passage of time. This phenomenon of a continuous rise in prices is termed as inflation. Current money is preferred to future money as it is known that on account of inflation lesser things can be bought with the same amount of money in future than can be bought today.
4. *Reinvestment opportunities* Present money is also preferred because it can be reinvested to earn some additional return. This opportunity to get returns will not be available if the money is not invested now. The existence of reinvestment opportunities and the urge to earn a return by investing this current money is one of the strong reasons for the time preference for money.
5. *Frequently encounter situations that cash flows over several periods of time* For example, a fixed asset purchased today will generate cash flows in terms of revenue generated over a number of years. A firm may raise funds today by issuing debentures on which interest will have to be paid for several years together with redemption amount in one or several installments. Decision making in such situations should be based upon the cash flows that are comparable. The absolute cash flows of different time periods can be made comparable by applying the concept of time value of money. The cash flows of different time periods are made comparable by adjusting them with reference to the required rate of return. This is done in such a way so as to express them in the amounts of the same date. These equivalent values can be expressed as future values or as present values.
6. *Future value of money* The future value of an amount may be defined as the value of that amount if it were to be received at the end of a defined period of time. For example, say ₹ 1,000 is deposited in a bank account at 10% interest for a period of one year. This deposit of ₹ 1,000 will become ₹ 1,100 after one year inclusive of interest, ₹ 1,100 is the FV if today's ₹ 1,000 at 10% interest after one year. Similarly, the future of ₹ 1,000 after two years, considering a

required rate of return of 10 % will be $\text{₹} 1,000 \times 1.1 \times 1.1 = 1,210$. The future value of ₹ 1,000 after three years, considering the same required rate of return, will be $\text{₹} 1,000 \times 1.1 \times 1.1 \times 1.1 = \text{₹} 1,331$.

7. *Present value of money* The present value of future money is the present worth of that money. The present value can be calculated by applying the required rate of return to the future value. For example, the present value of ₹ 1,100 receivable at the end of one year, considering a required rate of return of 10% is ₹ 1,000. Similarly, the present value of ₹ 1,331 receivable at the end of three years, considering a required rate of return of 10% also is ₹ 1,000. Thus, present value and future value of money are mathematically related and the relationship can be stated as under:

where r = rate of interest per time period, and

n = number of time periods.

For example, a deposit of ₹ 10,000 is made in a bank for five years with interest at 8% p.a (annually cumulative). The FV of this deposit is

$$FV = PV(1+r)n$$

$$= ₹ 10,000(1+0.08)5$$

$$= ₹ 14,693.28$$

,

Similarly, the present value of ₹ 10,000 receivable after three years and considering the interest at 10% is as follows:

$$PV = FV/(1+R)n$$

$$PV = ₹ 10,000/(1+0.10)^3$$

$$= ₹ 7,513.15$$

The concept of future value and present value is widely applied in capital budgeting process. In evaluating a capital budgeting proposal, the cash outflows and cash inflows of different time periods are made comparable. This can be done by calculating the present value and/or future value of the various cash flows such that they reflect the cash flow of particular chosen time period. The technique used for calculating the future value of a cash flow is called compounding and the technique used for calculating the present value of a cash flow is called discounting.

Net present value method

In this method, return on investments are calculated by introducing the factor of time element. It recognizes the fact that a rupee earned today is worth more than the same rupee earned tomorrow. The net present values of all inflows and outflows of cash occurring during the entire life of the project is determined separately for each year by discounting these flows by the firm's cost of capital or a pre-determined rate.

The steps are to be followed are listed here:

1. Determine the "cut-off" rate or "discount rate." It should be the minimum rate of return below which the investor considers that it does not pay him to invest rather it should reflect the opportunity cost of capital of the investor.