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### **Introduction:**

To understand the financial performance and condition of a firm, its stakeholders look at three financial statements, viz. the balance sheet, the profit and loss account, and the sources and uses of funds statement. The balance sheet shows the financial position (or condition) of the firm at a given point of time. The profit and loss account (also referred to as the income statement) reflects the financial performance of the firm over a period of time—normally, one year. The sources and uses of funds statement portrays the flow of funds through the business during a given accounting period. Now, for the purpose of taking decisions by shareholder, creditors and other concern persons regarding their individual matters it is necessary for them to analyze various financial statements. For the purpose of analysis they use tools like ratio analysis or use common size statements. The analysis of financial statements is a process of evaluating the relationship between component parts of financial statements to obtain a better understanding of the firm's position and performance. The first task of the financial analyst is to select the information relevant to the decision under consideration from the total information contained in the financial statements. The second step is to arrange the information in a way to highlight significant relationships. The final step is interpretation and drawing of inferences and conclusions. A basic limitation of the traditional financial statements comprising the balance sheet and the profit and loss account is that they do not give all the information related to the financial operations of a firm. Nevertheless, they provide some extremely useful information to the extent that the balance sheet mirrors the financial position on a particular date in terms of the structure of assets, liabilities and owners' equity, and so on and the profit and loss account shows the results of operations during a certain period of time in terms of the revenues obtained and the cost incurred during the year. Thus, the financial statements provide a summarized view of the financial position and operations of a firm. Therefore, much may be learnt about a firm from a careful examination of its financial statements as invaluable documents/performance reports. The analysis of financial statements is, thus, an important aid to financial analysis.

## Structure of the Chapter:

- 4.1 Objectives:
- 4.2 Basic Concepts Underlying Financial Accounting
- 4.3 Balance Sheet
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### 4.1 Objectives:

- Basic understanding of financial statements viz. Profit and Loss Account, Balance Sheet and Fund Flow Statement
- Analysis of financial statements through ratios and common size statements

### 4.2 Basic Concepts Under Lying Financial Accounting

The framework of financial accounting is based on several concepts (also referred to as conventions and principles) which have received acceptance by accountants. The important concepts have been briefly described below:

#### Dual Aspect Concept

This is a very basic concept of accounting on which, the whole process of accounting is based on. According to this concept, every transaction has two effects: one, debit effect and the other credit effect. There can not be any transaction with only single effects.

When wages are paid we used to get the services of an workers, which shows that sort of gain is received, so wages account is debited. Secondly, cash is paid and cash account gives the benefit, so cash account is credited.

The effect of these double effects is that the total of all sums debited is equal to the total of all sums credited. Hence, if balances of all accounts are found out by preparing trial balance and a list of debit and credit balances is prepared, then the total of debit balances and the total of credit balances will always be equal. If it is not equal then it is presumed that there must be some error in preparation of monetary statement. This is the reason why both sides of balance sheet, asset side and liabilities side should get tally.

### **Entity Concept**

This concept uses the concept of separation between owners and business only for accounting purpose. According to this concept, it is presumed that the business has distinct identity from its proprietor. On the basis of such concept every person even the real owner of the business is also considered as an outsider in the business.

All the transactions of the business are recorded in the books of the business from the view point of the business and not from the point of view of the owner of the business. One can not make transaction with himself and make entries of it. So, the fact that capital is shown as a liability in the balance-sheet of business, shows that business is separate from its owners. The owner becomes the creditor of business when he brings capital in the business. Legally, there is no difference between money in the business and their personal money. They belong to the one and the same person. Here, only for accounting purpose, it will be presumed that the owner is treated as an outsider of the business and transactions are processed accordingly.

In respect of body corporate, it is easy to make out the limits of 'accounting entity'. The joint stock body corporate itself has a separate legal entity and it is easy to write accounts of this business entity as a body corporate and different from its shareholders. But, in other types of organizations, like sole proprietor firm, where in fact there is no difference in between owner and the business, just for accounting purpose, it will be presumed that both are different.

### **Going Concern Concept**

In fact this concept should be treated as an assumption rather than a concept. This accounting concept is based on the assumption that in the absence of any evidence to the contrary, the business operations are to be carried on for a very long period in future. So, there is even no prediction about the closure of the business.

This assumption has special effects on the accounts mainly on assets of the business. It is due to this concept, that the fixed assets are usually stated in balance sheet at cost less depreciation and its market value is not taken into account. If accounts are written on the assumption that business is likely to be closed, then the fixed assets will be shown at market value. This will show the sum that will be realized from assets, if business is to be closed. Moreover, provisions for depreciation are also made on this assumption. This presumption is not normally required to be disclosed in the books of accounts, when it is followed. But, if it is not followed then it is required to be disclosed the fact that while preparing the accounts the supposition of going concern is not followed.

This concept does not suggest that the business will never be closed or that it will continue indefinitely. It only means that the business will continue for a very long time and the time is uncertain.

## **Cost Concept**

This concept considers the real cost of the assets or services. According to this concept, in accounting all transactions and events are recorded at their real and monetary cost of acquisition. Moreover, accounting should not be affected by the personal views of the people. It means if the asset or service does not cost anything i.e. no money is paid for its acquisition, then such transactions would not be recorded in the books of accounts. All fixed assets like land, building, goodwill, patent, machinery, furniture etc. are shown at their original cost price.

## **Stable Money Value Concept:**

According to this concept, only such transactions and events which can be expressed in monetary terms are recorded. In other words, transactions and events on which money value cannot be put will not be recorded in books of account even though the event may be extremely important from transaction may be extremely important for the business.

Moreover, under this assumption it is also presumed that the value of money remains stable and it does not change in any circumstances. It is not affected by inflation in the general economy.

## **Conservatism Concept:**

According to this concept, considered future losses and do not consider future gains. It suggests that the provisions should be made for all losses and expenses but no credits should be taken for revenues and gains.

Here are some instances of use of conservatism in accounts : Assets like stock and investments are shown at cost or market price whichever is lower. Creating investment fluctuation fund, repairs and renewal reserve etc.

## **Materiality Concept**

According to this concept all material items should be disclosed and it should be disclosed in such a manner so that the reader can perceived the effects of it. So, all the material items should be disclosed, on the basis of which the reader of the financial statement can make decision regarding investments.

Materiality may be considered from two points of view from quantity point of view and quality point of view. In case of quantity point of view, sum of transaction is considered where as from quality point of view, the effect of transaction is considered irrespective of sum involved. An item is considered as material if it is large or sufficient enough to influence the judgment or decision based on accounting reports.

## **Disclosure Concept :**

According to this concept all significant transactions should be disclosed so that the reader can perceived the effect of it. It is only on the basis of such full disclosure of the business transactions the readers of the such statement can make an informed decision related to business. The term disclosure, however, does not mean that all and full information should be disclosed but it means that a sufficient and enough disclosure of an information which may be of material interest to all concerned parties.

Where any material change has been made preparation and presentation of financial statement then such, the nature of such change should be clearly indicated, e.g.

body corporate has changed the technique from straight line to diminishing balance technique of providing depreciation.

The principle of disclosure is very important so that the Companies Act made enough provisions for the full disclosure of information in the Body corporate Accounts. The contents of the Balance Sheet and Profit & Loss Account of a Body corporate are already prescribed in the Schedule VI, Parts I & II of the Indian Companies Act of 1956.

### **Periodicity Concept**

According to this concept, accounts are prepared and results are derived for some specific time period which may be one year, six months etc. Unless the accounts are started somewhere or closed somewhere, it will be difficult to know the results of the business of some specific period. Though the business is going to carry on for long or uncertain time span, the financial statement showing profit and loss of business is prepared at some specific periodic intervals. The period is generally one year. A profit and loss account is prepared at the end of every year to know the profit or loss of business, which shows the results of year's trading. A balance sheet is also prepared at the end of each such period (of one year), which shows the financial position of business. Generally a period of one year is selected, because it mainly covers all types of seasons. It may be a calendar year from 1st January to 31st December or a financial year starting from 1<sup>st</sup> April and ending on 31<sup>st</sup> March or a Vikram Samvat year from 1st of Kartik Sud to Amas of Aso Vad. Various law suggests use of financial year for the purpose of consideration.

### **Objectivity Concept:**

According to this concept the transactions, accounts and books must be written and supported by some evidences usually vouchers. If objectivity of accounts is to be maintained, they must be written not according to the personal opinion of some person but they must be supported by some evidences and such evidence must be available for the purpose of verification for an outsider. Such evidences mainly includes vouchers and other evidences e.g. If money is paid to someone, there must be a receipt given by the receiver and an accounting entry must be based on that receipt. In certain cases, it may be possible that the evidence or receipts cannot be obtained from persons concerned for small such transaction, e.g. no vouchers can be received for rickshaw charges. In such cases, the firm will prepare the vouchers and the signature of the person who has paid money is received on it. In easy words, the accounts prepared by the accountants must be on the basis of some supportive evidences.

### **Accrual Concept:**

According to this concept, transaction should be recorded in books of accounts at the time of its accrual and no waiting should be made for the cash receipts. Accrual Concept is also known as mercantile concept. There are two systems of accounting : One, cash system and the other mercantile system or Accrual, System. In cash system, revenue is recognized only when it is received in cash. It is recorded in books of account, at that time only when money is received. But in accrual system, revenue is recognized when it accrues, whether received in cash or not. In cash system, expenses are recorded only when they are paid. Usually, businessmen use mercantile system, in which revenue and expenses are recorded, when they are accrued. According to this concept certain year end adjustments are required to be made while preparing Profit and Loss Account. e.g. revenue due but not received, expenses due but not paid.

## Matching Concept or Matching Cost with Revenue

According to this concept, unless the expenses of the year is matched with the revenues of the year, it won't be possible to know the results of the year. When result of year's trading is to be ascertained, then the expenses incurred in order to earn revenue during that period must be recorded (matched) against it. Thus recording expenses against the revenue of a particular period is called 'matching cost with revenue'. During the certain period, when revenue is recognized as being generated, then the expenses or costs incurred in earning that revenue must be debited to it; so that the net income of that period is ascertained. Only revenue expenses of a particular period can be matched with the revenue income of that period to know the profits or the losses of the period.

### Consistency Concept:

According to this concept, accounting policies and principles used in preparation and presentation of financial statements should be consistently followed. If the same accounting principles and procedure are applied consistently from year to year, then accounting statements would be comparable, e.g. It would be improper to value stock-in-trade according to one technique (say FIFO) in one year and according to another technique (say LIFO) in the next year. If any change in principle or technique becomes necessary then such change made and its effect should be clearly stated so that the readers can perceived its effects. If different techniques and methods are used from time to time, the user will have difficulty in comparing the data of two time span.

### Balance Sheet:

In simple words, balance sheet means 'a sheet showing balances of assets and liabilities at a particular date'. The balance sheet shows the financial condition of a business at a given point of time. As per the Companies Act, the balance sheet of a company shall be in either the horizontal form or the vertical form. Following table shows these forms—Part A of this table shows the horizontal form and Part B the vertical form.

#### Forms of Balance Sheet

##### A. Horizontal Form

Liabilities	Assets
• Share capital	• Fixed assets
• Reserves and surplus	• Investments
• Secured loans	• Current assets , loans and advances
• Unsecured loans	• Current assets
• Current liabilities and provisions	• Loans and advances
• Current provisions	• Miscellaneous expenditures



Soham Ltd. is implementing a project with an initial capital outlay of RS. 8000. Its cash inflows are as follows:

Year	Rs.
1	6,000
2	2,000
3	1,000
4	5,000

The expected rate of return on the capital invested is 12% p.a. Calculate the discount payback period of the project.

Computation of present value of cash flows

Year	Cash inflow Rs.	Discount factor @ 12%	Present value Rs.
1	6,000	0.893	5,358
2	2,000	0.797	1,594
3	1,000	0.712	712
4	5,000	0.636	3,180
			Total P.V. = 10,844

The discount payback period of the project is 3 years i.e. the discount cash inflows for the first three years ( Rs. 5,358 + Rs. 1,594 + Rs. 712) is equivalent to the initial capital outlay of Rs. 7,664. In the fourth year the inflow will be 3180 but the amount needed for the pay back is only Rs. 336 (8000-7664) so for the purpose, we have to find the propositante time period and it will be 1.26 months

$$(336 * 12 / 3180)$$

so, the discounted payback period is 3 years and 1.26 months.

## 5.6 Taxation

Tax factor is one of the most important determinant for deciding investment in any project. Tax laws vary from country to country and varying types of allowances can distort the impact of taxation on particular types of projects. However, tax payments represents a cash outflow from the business and therefore, these tax cash flows are a critical part of the project evaluation process. Because taxation causes a change in cash flows it is a factor to be considered in project appraisal. Indeed in some practical situations the taxation implication are dominant influences on the final investment decision. The following paragraphs cover the general impact of taxation on the appraisal process.

The project appraisal should be based on the net, after tax, incremental cash flows arising from the project. It follows that the general treatment of taxation in project appraisal involves estimating the cash outflows or inflows arising in respect of taxation, incorporating them in the project cash flow estimates and discounting in the usual manner. Because of the complexities of the taxation system, the tax cash flows resulting

from a project may have adverse (i.e., cause a cash outflow) or beneficial (i.e., a cash inflow or reduce the outflow) effects on the project.

Taxation effects a project in numerous ways, but probably the most significant three effects are:

- a. Corporate taxes on project profits and losses.
- b. Investment incentives (cash grants and /or capital allowances), where applicable.
- c. The reduction of the WACC because interest payments are allowable against tax.

Where a project produce profits these are taxed at the appropriate ruling rate of Corporate tax and payable some period after the end of the period in which the profits were earned. Because project appraisal deals with both the timing and amount of cash flows it is necessary to allow for this time lag and to bring the taxation cash outflow into the appropriate period. Where a project produces losses, the overall taxation of the firm will be affected as follows:

- a. Where the firm has sufficient profits from other operations, the loss on the project will reduce the overall taxation liability of the firm. This reduction of tax is equivalent to a cash inflow to the project.
- b. Where the project loss causes an overall loss, the resulting cash inflow from the loss can be carried forward to a future profit making year. Similarly the equivalent cash inflow will be shown against the project in the future year when sufficient profits become available.

## 5.7 Investment Incentives

Investment incentives take a variety of forms, including rates relief, rent-free periods for land and buildings, and lump-sum grants towards the costs of an investment projects. The incentives may be offered by either Central or local Government, but the primary purpose which they are intended to serve is to attract investment and, in particular, employment-generating investment, into areas which would otherwise be regarded as unattractive. From the view point of the investing firm, therefore, the effect of such incentives is to change the cash flow pattern of an investment in much the same way as capital allowances do.

— Any reduction in cash outflows resulting from investment incentives can serve to convert a negative NPV into a positive one, and of course this is the purpose behind their being offered. Additionally, because the total sum invested is reduced, and consequently the investment incentives may also serve to encourage the acceptance of a more risky profile of investment opportunities than would otherwise be the case. Although details of investment incentives are altered frequently, the overall objectives say the same, i.e., to encourage investment in fixed assets through the tax system.

In a project, the future cash inflows or outflows are discounted with a factor which normally be weighted average cost of capital which consider the cost of all

type of capital debt as well as owned. Out of which payment of interest on debt capital is allowed as an expenses in calculating income for the tax purposes. So by including debt in the capital mix tax benefits can be generated. So by including debt in the capital mix the overall cost of capital can be reduced.

## 5.8 Social Cost Benefit Analysis

As a business enterprise is working in a society and earning from the society it has its moral obligations towards the society. In earlier years, there was no such concept. Even the large business houses making huge profits from the society were not taking care of their obligations towards the society. An increasing awareness in our society in recent times is that business managers are made increasingly responsible for consequential social and environmental impact. Changing environments and social parameters have compelled them to revalue their social as well as economic obligations towards the needs of society since society provides the requisite working infrastructure and facilities. This has made the enterprise to account and report also the needs of society. Hence, the organization has to present the accounting statements which will reflect the social and economic benefits created by it as well as the costs incurred with which to appraise its contribution towards solving the problems of society. Thus **Social cost-benefit analysis** as actually practiced by governments and inter-governmental agencies around the world usually does not incorporate distributional concerns

### Social Cost and Social Benefit –

'Social Cost' is a sacrifice or detriment to society whether economic, internal or external, social costs are the sacrifices of the society for which the business firm is responsible like air-pollution, water pollution, deficiently due to bankruptcy, depletion and destruction of animal resource, soil corrosion, deforestation, impairment of human factor of production, monopoly and social losses, production of dangerous products and explosives, deterioration in the law and order conditions in the industrial estates, etc. 'Social benefit' is a compensation made to the society in the form of increase in per capital income, employment opportunities, etc.

### Indicators of Social Desirability of a Project –

A project is also assessed from the social angle in addition to assessment of its commercial viability. The following social desirability factors will be considered in accept or reject decisions of a project.

- **Capital-output ratio:** If the value of expected output in relation to the capital employed is high, the project is given priority over the others.
- **Social cost-benefit analysis:** A project with net benefits to the society over the costs to the society is preferred.
- **Foreign exchange earnings:** A project with potential to earn foreign exchange to the country or an import substitution project which saves the country's foreign exchange reserves is highly desirable.

**Value addition per unit of capital employed:** A project with high value addition per unit of capital employed is given priority.

- **Employment potential:** The employment potential of a project is looked into. A project with high employment potential is considered highly desirable.

## 5.9 Capital Rationing

Capital Rationing in corporate finance means capital rationing occurs any time there is a budget ceiling, or constraint, or the amount of funds that can be invested during a certain period of time, such as year. Such constraints, are particularly prevalent in firms that have a policy of financing all capital expenditures internally. Another example is when a division of a large company is allowed to make capital expenditures only up to a specific budget ceiling, over which the division usually has no control. By imposing the capital rationing constraint, the firm attempts to select the combination of investment proposals that will provide the greatest profitability.

In other words, Capital rationing is a situation where a constraint or budget ceiling is placed on the total size of capital expenditures during a particular period. Often firms draw up their capital budget under the assumption that the availability of financial resources is limited. It is a situation in which one or more investment proposal will be selected from available many investment proposal due to limited financial resources.

Capital rationing refers to a situation where a company cannot undertake all positive NPV projects it has identified because of shortage of capital. Under this situation, a decision maker is compelled to reject some of the viable projects having positive net present value because of shortage of funds. It is known as a situation involving capital rationing. In terms of financing investment projects, the following important questions are to be answered.

- How to assign the available funds to the acceptable proposals which require more funds than are available?
- How much quantum of funds available for capital investment?
- What would be the requirement of funds for capital investment decisions in the forthcoming planning period?

The answers to the first and second questions are given with reference to the capital investment appraisal decisions made by the top management. The third question is answered with specific reference to the appraisal of investment decisions from the angle of capital rationing.

## 5.10 Practical Problems

1. John Ltd. has a proposal of investing in Machine costing Rs.120000 which generates cash inflows of Rs.25000, Rs.35000, Rs.45000, Rs.50000 in first, second, third and fourth years respectively. Find Pay Back Period.

**Solution:**

Since the amount of cash earning is not constant every year, we have to find the period by which cumulative (total) cash flows are just equal to the original investment.

Year	Cash flow (Rs.)	Cumulative Cash flow (Rs.)
1	25000	25000
2	35000	60000
3	45000	105000
4	50000	155000

As is obvious from the table, the total cash recovered by way of cash earning is Rs.105000 up to third year and Rs.155000 up to fourth year. We want the period by which cumulative cash flow is Rs.120000, the amount of initial investment. Hence, it is clear that PB period will be after third year but before completion of 4<sup>th</sup> year. By third year, amount recovered is Rs.105000 leaving Rs.15000 still to be recovered in 4<sup>th</sup> year.

Assuming Rs.50000 is evenly earned during the fourth year, the fraction of year to recover Rs.15000 in fourth year is equal to  $10000/50000 = 0.3$  years.

Hence, the pay-back period for the above project is 3.3 years.

Or  $0.3 \text{ years} \times 12 \text{ month} = 3.6 \text{ months}$ .

Hence pay-back period is 3 years and 2.4 months.

2. Calculate the average rate of return for project 'X' and 'Y' from the following data of Smita Ltd.

	Project X	Project Y
Initial Investment (Rs.)	42000	55000
Expected life in year	4	5
Estimated Salvage Value (Rs.)	4000	3000
Estimated Profit after tax (Rs.)		
Year 1	8000	10000
2	10000	20000
3	20000	20000
4	14000	6000
5	-	8000
	<u>52000</u>	<u>64000</u>

**Solution:**

	Rs.	Rs.
Average Annual Profit after tax	10500	12800
$X = 52000/4$ ; $Y = 64000/5$		
Average Investment	23000	29000

$$X = \frac{42000 + 4000}{2}$$

$$Y = \frac{55000 + 3000}{2}$$

Average rate of return

45.65%

44.13%

$$X = \frac{10500 \times 100}{23000}$$

$$Y = \frac{12800 \times 100}{29000}$$

3. Alpha Ltd. is considering two development projects. Each requires an investment of Rs.520000. The net profits (before depreciation) of both the projects are projected as follows:

At the end of year	Project No. 1	Project No. 2
	Rs.	Rs.
1	130000	260000
2	185000	250000
3	187500	65500
4	125000	62500

Determine with the help of net present value method which of the two projects is preferable. Calculate profitability on the basis of the present value of the cash flows at 5% rate of discount.

The present value of a rupee at 5% discount is as follows:

First year	Rs.	.9524
Second year	Rs.	.9070
Third year	Rs.	.8638
Fourth year	Rs.	.8227

**Solution:**

We shall calculate the present value of the cash inflows from both these products at a discount rate of 5%.

Year	Project - 1		Project - 2		Present value
	Discount Factor	Cash flow	Cash flow	Present value	
1	.9524	Rs.130000	Rs.260000	Rs.123812	Rs.247624
2	.9070	Rs.185000	Rs.250000	Rs.167795	Rs.226750
3	.8638	Rs.187500	Rs. 65500	Rs.161963	Rs. 56578
4	.8227	Rs.125000	Rs. 62500	Rs.102838	Rs. 51420
				Rs.556408	Rs.582372

Net present vale	= Present value of cash inflow – P.V. of Investment
Project - 1	= Rs.553914 – Rs.520000
	= + Rs.33914
Project - 2	= Rs.570258 – Rs.520000
	= + Rs.50258

Net present value is positive in both projects. Hence both are acceptable. But if they are mutually exclusive and only one of them is to be selected at a time. Then project-2 should be accepted, because net present value of its cash flow is greater

4. Beta Ltd. Has made investment of Rs.60000 in a project, the cash flow available for 5 years is as follows. Find out Internal Rate of Return.

1 <sup>st</sup> year	Rs.23000	4 <sup>th</sup> year	Rs.16000
2 <sup>nd</sup> year	Rs.16000	5 <sup>th</sup> year	Rs.10000
3 <sup>rd</sup> year	Rs.14000		

**Solution:**

Here the rate of interest is not given. We try to equate the P. V. of investment with P. V. of cash flows firstly at 10%.

Year	Cash flow	Discount factor	Present value Rs.
1	23000	0.909	20907
2	16000	0.826	13216
3	14000	0.751	10514
4	16000	0.683	10928
5	10000	0.621	6210
			61775

$$P. V. \text{ of cash inflow} - \text{Investment} = \text{Rs.}61775 - \text{Rs.}60000 = (+) 1775.$$

As the two values are not equal and the present value of cash inflow has exceeded the investment, we will try to find out P. V. of cash flow with higher rate so that the present value will be low. We take 12 %.

Year	Cash flow	Discount factor	Present value
1	23000	0.893	20539
2	16000	0.797	12752
3	14000	0.712	9968
4	16000	0.636	10176
5	10000	0.567	5670
			59105

$$\begin{aligned} \text{Now, } P. V. \text{ of Cash Flow} - \text{Investment} \\ = \text{Rs.}59105 - \text{Rs.}60000 \\ = - 895 \end{aligned}$$

As the P. V. of cash at 12% is less than the investment, the real rate of interest lies between 10 % and 12 %. We use the following formula:

$$\begin{aligned} \text{IRR} &= A + \frac{C}{C+D} \times (B - A) \\ &= 10 + \frac{1775}{1775 + 895} \times (12 - 10) \\ &= 10 + 1.33 \\ &= 11.33 \% \end{aligned}$$

5. After conducting a survey that cost Rs.250000 Vision Ltd. decided to undertake a project for placing a new product in the market. The company's cut-off rate is 12 %. It was estimated that the project would have a life of 5 years. The project would cost Rs.4050000 in Plant and Machinery in addition to working capital of Rs.1100000. The scrap value of the machinery at the end of 5 years was estimated at Rs.550000 after providing depreciation on straight-line basis. Profits after tax were estimated as follows:

Year	Profit (Rs.)	P. V. factor at 12 % p.a.
1	550000	0.8929
2	850000	0.7972
3	1040000	0.7118
4	640000	0.6355
5	540000	0.5674

Ascertain the Net Present Value of the Project.

**Solution:**

- (i) **Calculation of depreciation:**

	Rs.
Cost of survey	250000
Plant and Machinery	4050000
	<hr/>
	4300000
Less: Scrap value	550000
	<hr/>
Total depreciation for 5 years	3750000

$$\text{Depreciation per year} = \frac{3750000}{5} = \text{Rs.750000}$$

- (ii) **Present value of Cash Outflow:**

Initial Investment at year 'O'	Rs.
Cost of survey	250000



Vertical Form

I Sources of Funds

(1) Shareholders' funds

(a) Share capital

(b) Reserves and surplus

(2) Loan funds

(a) Secured loans

(b) Unsecured loans

II Application of Funds

(1) Fixed assets

(2) Investments

(3) Current assets, loans and advances Less: Current liabilities and provisions Net current assets

(4) Miscellaneous expenditures

**Balance Sheet of Ram Limited as on March 31, 1995**

A. Horizontal Form			Rs	in	
				million).	
Liabilities	1995	1994	Assets	1995	1994
Share capital	14.00	15.00	Fixed assets	32.00	32.20
• Equity 15.00					
• Preference					
Reserves and surplus	11.20	10.60	Investments	1.00	1.00
Secured loans	14.30	13.10	Current assets, loans and advances	23.40	15.60
Unsecured loans	6.90	2.50	Miscellaneous expenditures and losses	0.50	0.50
Current liabilities and provisions	10.50	8.10			
	56.90	49.30		56.90	49.30

Cost of plant & machinery	4050000
Introduction of working capital	1100000
Total cash outflow at year 'O'	<u>5400000</u>

(iii) **Present value of Cash Inflow:**

Year	Profit after tax	Depreciation	Cash Inflow	P. V. factor at 12 %	Present value
1	550000	750000	1300000	0.8929	1160770
2	850000	750000	1600000	0.7972	1275520
3	1040000	750000	1790000	0.7118	1274122
4	640000	750000	1390000	0.6355	883345
5	540000	750000	1290000	0.5674	731946
					<u>5325703</u>

Present Value of operating cash Inflow	Rs.5325703
Add: Present value of scrap realized at the End of fifth year (550000 x 0.5674)	Rs.312070
Add: Recovery of working capital at the end of Fifth year (1100000 x 0.5674)	Rs.624140
Total present value of Cash Inflow	Rs.6261913
<b>Decision Making:</b>	
Present Value of Cash inflow	6261913
Less: Present Value of cash Outflow	5400000
Net Present Value	861913

As the project is generating positive cash flow it should be accepted.

**Note:** Introduction of working capital of Rs.1100000 is assumed to be recovered at the end of 5<sup>th</sup> year.

6. A company wants to implement an expansion project in the year 2002 requiring an outlay of Rs. 20,00,000. It will yield annually a profit of Rs. 3,00,000 after depreciation at 12.5%. Assume tax to be 50%.

Calculate the Pay-back Period.

**Solution :**

The following formula is to be used to calculate the pay-back period.

(This formula is useful only when cash flow is the same every year).

Pay-back Period = Total Investment / Annual Cash Flow (After tax but before depreciation)

Cash flow can be calculated as follows :

	Rs.
Profit before tax	3,00,000
Less : 50% tax	1,50,000
	1,50,000
Add : Depreciation (at 12.5% on Rs. 20,00,000)	<u>2,50,000</u>
Annual Cash Flow	4,00,000

Pay-back period = Total Investment / Annual Cash Flow  
 = 20,00,000 / 4,00,000 = 5 years.

7. Bajaj Steel Corporation purchases a machine costing Rs. 1,10,000. The estimated return is as follows :

Year	Return (in Rs.)	Year	Return (in Rs.)
1	25,000	6	30,000
2	40,000	7	25,000
3	40,000	8	20,000
4	40,000	9	15,000
5	35,000	10	10,000

Economic life : 10 years Salvage value Rs. 10,000

Depreciation : Straight line Assumed Rate of

Method over 10 years Tax : 50%

Calculate the Pay-back Period.

**Solution :**

Calculation of depreciation :

Value of Machine Rs. 1,10,000 - Rs. 10,000 Salvage value

=Rs. 1,00,000 Total depreciation in ten years Annual depreciation Rs.

10,000 on straight line method. Calculation of Cash flow for all years

Year	Profit Rs.	Less Taxes Rs.	Profit after Taxes Rs.	Add Depreciation Rs.	Cash Flow Rs.	Cumulativ e Cash Flow Rs.

1	25,000	12,500	12,500	10,000	22,500	22,500
2	40,000	20,000	20,000	10,000	30,000	52,500
3	40,000	20,000	20,000	10,000	30,000	82,500
4	40,000	20,000	20,000	10,000	30,000	1,12,500
5	35,000	17,500	17,500	10,000	27,500	1,40,000
6	30,000	15,000	15,000	10,000	25,000	1,65,000
7	25,000	12,500	12,500	10,000	22,500	1,87,500
8	20,000	10,000	10,000	10,000	20,000	2,07,500
9	15,000	7,500	7,500	10,000	17,500	2,25,000
10.	10,000	5,000	5,000	10,000	15,000	2,40,000

The above table shows that within four years total investment of Rs. 1,10,000 is recovered. Total cash flow is Rs. 1,12,500. As against this, investment outlay is Rs. 1,10,000. Hence pay-back period is more than three years and less than four years.

Total investment = Rs. 1,10,000 - at the end of third year Rs. 82,500 = Rs. 27,500 remains to be recovered. In the fourth year when Rs. 27,500 is received in cash, the pay-back period is over.

Fourth year =  $2,50,000 / 30,000 = 11/12 = 11$  months.

Pay-back period = 3 years and 11 months.

8. A company is considering to instal two projects involving an investment' of Rs. 5,00,000 each. The net profits before charging depreciation from the projects are as under :

Year	Project No. 1 Rs.	Project No. 2 Rs.
1	1,25,000	2,50,000
2	1,87,500	2,50,000
3	1,87,500	62,500
4	1,25,000	62,500

Calculate Pay-back period of both the projects, with the help of discounted cash flow.

Present value of Re. 1 at 5% rate is as under :

1st year : Rs. .9524 2nd year : Rs. .9070

3rd year : Rs. .8638 4th year : Rs. .8227

**Solution :**

From the figures of profits given above, it is seen that Project No. 2 is more profitable, as its pay-back period is only 2 years. But here payback period is to be calculated on the basis of discounted cash flow, which will be as follows :

	Discount factor	Project No. 1		Project No. 2	
		Cash flow	Present value	Cash flow	Present value
		Rs.	Rs.	Rs.	Rs.
1.	.9524	1,25,000	1,19,050	2,50,000	2,38,100
2.	.9070	1,87,500	1,70,063	2,50,000	2,26,750
3.	.8638	1,87,500	1,61,963	62,500	53,988
4.	.8227	1,25,000	1,02,838	62,500	51,420
		5,53,914			5,70,258

Looking to the discounted cash flow, it seems that Project No. 2 is preferable as its pay-back period is less than 3 years :

The p.v. of total cash flow of Project 2 at the end of 2nd year = 2,38,100 + 2,26,750 = Rs. 4,64,850

Balance amount = Investment Rs. 5,00,000 - 4,64,850 = Rs. 35,150

The present value of cash flow of third year = Rs. 53,988.

In the 3rd year =  $35,150 / 53,988 = 8$  months to recover

Pay-back period = 2 years and 8 months

While in Project No. 1, the pay-back period is more than 3 years.

Cash flow of P.1 of first 3 years = 1,19,050 + 1,70,063 + 1,61,963  
= 4,51,076

So the pay-back period falls in the fourth year.

Project No. 2 is preferable.

9. The Laxmi Trading Company is considering to instal a machine. Two alternatives are open to it either machine A or machine B. The relevant data about both machines are as follows :

	Machine A	Machine B
Cost	Rs. 3,00,000	Rs. 75,000
Useful Life	6 years	17- years
Annual Sales	Rs. 2,00,000	Rs. 1,90,000
Cost of production : Raw materials	Rs. 60,000	Rs. 65,000
Labour	Rs. 20,000	Rs. 60,000
Other expenses	Rs. 45,000	Rs. 40,000

Compute profitability of both these machines with the help of payback period method.  
Tax rate : 50%; Depreciation on straight line method.

Solution :

	Machine A	Machine B
Sales	Rs. 2,00,000	Rs. 1,90,000
Less : Cost of goods sold Annual profit	Rs. 1,75,000	Rs. 1,75,000
	Rs. 25,000	Rs. 15,000
Less : Tax Net Profit	Rs. 12,500	Rs. 7,500
	Rs. 12,500	Rs. 7,500
Add : Depreciation Cash flow	Rs. 50,000	Rs. 10,000
	Rs. 62,500	Rs. 17,500

Payback period = Total Investment / Annual Cash flow

$$= 3,00,000 / 62,500$$

$$= 75,000 / 12,500$$

$$= 12,500$$

Period = 4.8 years = 4.28 years

10. A company is considering to invest Rs. 40,000 in a capital project. Its scrap value is nil. Its useful life is 5 years. Tax rate is 50%. The company adopts the straight line method of depreciation. The cash flow before depreciation and tax is as follows :

First year Rs. 8,000 Fourth year Rs. 12,000

Second year Rs. 8,800 Fifth year Rs. 20,000

Third year Rs. 11,200

On the basis of above information, calculate the Rate of Return on average investment.

**Solution :**

We shall have to calculate first the accounting profit as follows. Remember that Net Profit + Depreciation = Cash flow. Hence, if profit is to be estimated on the basis of cash flow, depreciation must be deducted from cash flow. Depreciation p.a. = Rs. 40,000 - r 5 = Rs. 8,000.

Year	- Cash flow :	Depreciation	Net profit	Taxes	After Profit
1	Rs. 8,000	Rs. 8,000	-	-	—
2	Rs. 8,800	Rs. 8,000	Rs. 800	Rs. 400	Rs. 400
3	Rs. 11,200	Rs. 8,000	Rs. 3,200	Rs. 1,600	Rs. 1,600
4	Rs. 12,000	Rs. 8,000	Rs. 4,000	Rs. 2,000	Rs. 2,000
5	Rs. 20,000	Rs. 8,000	Rs. 12,000	Rs. 6,000	Rs. 6,000
					<u>Rs. 10,000</u>

Average Profit = Rs. 10,000 / 5 years = Rs. 2,000

Average Investment = 40,000 / 2 = Rs. 20,000

Accounting Rate of Return = Average Profit / Average Investment  
 = 2,000 / 20,000 × 100  
 = 10%

11. A company is considering to invest Rs. 80,000 in a capital project. Its scrap value is zero and its economic life is 5 years. Tax rate is 50%. The straight line method is used by the company to provide depreciation. Its cash flow before tax is as follows :

First year	Rs. 16,000	Fourth year	Rs. 24,000
Second year	Rs. 17,600	Fifth year	Rs. 40,000
Third year	Rs. 22,400		

The present value factors at 10% are as follows :

First year	0.9091	Fourth year	0.6830
Second year	0.8265	Fifth year	0.6209
Third year	0.7513		

From the above information find out (1) Profitability on the basis of Net Present Value Method at 10% rate of discount. (2) Profitability Index.

**Solution :**

First we shall calculate the net cash flow.

Years	Cash flow	Depreciation	Net Profit	Taxes	Profit after tax	Net cash flow (Net profit + Depreciation)
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	16,000	16,000	-	-	-	16,000
2	17,600	16,000	1,600	800	800	16,800
3	22,400	16,000	6,400	3,200	3,200	19,200

4	24,000	16,000	8,000	4,000	4,000	20,000
5	40,000	16,000	24,000	12,000	12,000	28,000
						Rs. 1,00,000

The present value of these cash flows at 10% rate of discount is as follows :

Years	Cash flow Rs.	Discount factor (10%)	Present value Rs.
1	16,000	0.9091	14,551
2	16,800	0.8265	13,885
3	19,200	0.7513	14,425
4	20,000	0.6830	13,660
5	28,000	0.6209	17,385
			73,906

Net Present Value = P.V. of Cash inflow - P.V. of investment

$$NPV = \text{Rs. } 73,906 - 80,000$$

$$NPV = - \text{Rs. } 6,094$$

This project is not acceptable because net present value (NPV) of its cash flow is negative which means it is not profitable. The investment is in excess of P.V. of Cash inflows.

(2) Profitability Index = Present value of Cash Inflow / Investment

$$= \frac{73,906}{80,000}$$

$$= 0.92$$

This project is not acceptable, as profitability index is less than 1.

12. Ashok Limited is considering the purchase of a machine which will have a working life of five years. The machine is expected to earn Rs. 10,000 per annum before deduction of tax. The company considers a yield of 20% necessary before investment is made in a project. How much could be spent in purchasing the machine ?

**Solution :**

The expected rate of return is given in the example, which is 20%. So present value would be found out on the basis of 20% yield.

Year	Cash Flow Rs.	Discount Factor @ 20%	Present Value of Cash Flow Rs.
1	10,000	0.8333	8,333
2	10,000	0.6944	6,944
3	10,000	0.5788	5,788



4	10,000	0.4824	4,824
5	10,000	0.4019	<u>4,019</u>
		Total Present Value	<u>29,908</u>

Thus the present value of Cash Inflows is Rs. 29,908 that is, it is approximately Rs. 30,000. Thus it can invest Rs. 30,000 in the machine, so that with the annual cash flow of Rs. 10,000, 20% expected return before tax can be obtained.

13. A company has an investment opportunity costing Rs. 40,000 with the following expected net cash flow (i.e. after taxes and before depreciation).

Year	Net Cash flow	Year	Net Cash flow
1	7,000	6	8,000
2	7,000	7	10,000
3	7,000	8	15,000
4	7,000	9	10,000
5	7,000	10	4,000

Using 10% as the cost of capital (rate of discount) determine the following.

(i) Pay-back Period.

(ii) Net Present Value at 10% discounting factor, (iii) Profitability Index at 10% discounting factor, (iv) Internal Rate of Return with the help of 10% discounting factor and 15% discounting factor.

Present Value :

Year	1	2	3	4	5	6	7	8	9	10
Present Value (For Re. 1 at 10%)	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386
(For Re. 1 at 15%)	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327	0.284	0.247

**Solution :**

(A) Pay-back period : We first prepare a table showing Cumulative Cash Flow (CCF) :

Year	Cash Flow Rs.	Cumulative Cash Flow Rs.
1	7,000	7,000
2	7,000	14,000
3	7,000	21,000
4	7,000	28,000
5	7,000	35,000
6	8,000	43,000

Upto the end of fifth year, investment upto Rs. 35,000 is recovered from cash flow. But the total investment is Rs. 40,000 and so to recover the balance of Rs. 5,000, some period of 6th year is needed. The total cash flow of 6th year is Rs. 8,000 out of which Rs. 5,000 can be recovered as follows :

$$5,000 / 8,000 = 5/8 \text{ year}$$

Pay-back period = 5 5/8 years.

(B) Net, Present Value Method :

Year	Cash Flow Rs.	Discount (10%)	Factor Present Value
			Rs.
1	7,000	0.909	6,363
2	7,000	0.826	5,782
3	7,000	0.751	5,257
4	7,000	0.683	4,781
5	7,000	0.621	4,347
6	8,000	0.564	4,512
7	10,000	0.513	5,130
8	15,000	0.467	7,005
9	10,000	0.424	4,240
10	4,000	0.386	1,544
			<u>48,961</u>
			<u>1</u>

Net Present Value = P.V. of Cash inflow - P.IV. of Investment

$$= 48,961 - \text{Rs. } 40,000$$

= (+) Rs. 8,961 Project is profitable, as the NPV is positive (+)

(C) Profitability Index :

Profitability index = P. V. of Cash Inflow / P. V. Cash Outflow '(Investment)'

$$= \text{Rs. } 48,961 / \text{Rs. } 40,000$$

$$= 1.224$$

Here, Index is more than 1, so the project is profitable.

(D) Internal Rate of Return :

The actual rate will be ascertained by Trial and Error Method. The IRR is that rate at which the P.V. of Cash Inflow becomes equal to the P.V. of Investment. As in the above table, the P.V. of Cash Inflow is in excess of P.V. of Investment at 10%, we higher rate of 15%.

Year	Cash Flow Rs.	Discount (15%)	Factor Present Value
			Rs.
1	7,000	0.870	6,090

2	7,000	0.756	5,292
3	7,000	0.658	4,606
4	7,000	0.572	4,004
5	7,000	0.497	3,479
6	8,000	0.432	3,456
7	10,000	0.376	3,760
8	15,000	0.327	4,905
9	10,000	0.284	2,840
10	4,000	0.247	988

Rs. 39,420

investment Rs. 40,000 - 39,420 Present Value as above = Rs. 580. This shows that the IRR should be lower than 15% and higher than 10%, We find the actual rate with the help of following formula.

Where a = The lower rate of trial

b = The higher rate of trial

c = The excess P.V. at lower rate

d = The shortfall of P.V. at higher rate

$$= 10\% + 8,961 / 8,961 + 580 \times (15\% - 10\%)$$

$$= 10\% + 0.94 (5)$$

$$= 10\% + 4.7\%$$

$$\therefore \text{IRR} = 14.7\%$$

14. A company is considering the purchase of a new machine which will carry out some operations performed by labour. A and B are alternative models. From the following information, you are required to prepare a profitability statement and work out the (i) Pay Back Period and (ii) Return on Investment in respect of each machine.

	Machine A	Machine B
Estimated life of Machine (years)	5	6
	Rs.	Rs.
Cost of machine	1,50,000	2,50,000
Cost of indirect materials	6,000	8,000
Estimated savings in scrap	10,000	15,000
Additional cost of maintenance	19,000	27,000
Estimated savings in direct wages		
Employees not required (No.)	150	200
Wages per employee	600	600

## B. Vertical Form

		1995	1994
<b>1. Sources of funds</b>		<b>25.20</b>	<b>25.60</b>
<b>(1) Shareholders' funds</b>			
(a) Share capital	14.00		
(b) Reserves and surplus	11.20		
<b>(2) Loan funds</b>		<b>21.20</b>	<b>15.60</b>
(a) Secured loans	14.30		
(b) Unsecured loans	6.90		
		<b>46.40</b>	<b>41.20</b>
<b>11. Application of funds (1) Fixed assets</b>		<b>32.00</b>	<b>32.20</b>
<b>(2) Investments</b>		<b>1.00</b>	<b>1.00</b>
<b>(3) Current assets, loans and advances</b>		<b>23.40</b>	<b>15.60</b>
		<b>56.40</b>	<b>48.80</b>
<b>Less: Current liabilities and provisions</b>		<b>10.50</b>	<b>8.10</b>
<b>Net current assets</b>		<b>45.90</b>	<b>40.70</b>
<b>(4) Miscellaneous expenditures and losses</b>		<b>0.50</b>	<b>0.50</b>
		<b>46.40</b>	<b>41.20</b>

### 4.3.1 Liabilities

Liabilities defined very broadly represent what the business entity owes others. The Companies Act classifies them as follows:

1. Share capital
2. Reserves and surplus
3. Secured loans
4. Unsecured loans
5. Current liabilities and provisions.

**Share Capital:** This is divided into two types: equity capital and preference capital. The first represents the contribution of equity shareholders who are theoretically the owners to the firm. Equity capital, being risk capital, carries no fixed rate of dividend. Preference capital represents the contribution of preference shareholders and the dividend rate payable on it is fixed.

**Reserves:** There are two types of reserves, revenue reserves and capital reserves. Revenue reserves represent accumulated retained earnings from the profits of normal business operations. These are held in various forms: general reserve, investment allowance reserve, capital redemption reserve, dividend equalization reserve, etc. Capital reserves arise out of gains, which are not related to normal business operations. Examples of such gains are the premium on issue of shares or gain in revaluation of

Taxation is to be regarded as 50% of profit. Ignore depreciation for calculation of tax. Which machine would you recommend? State your reasons.

**Solution:**

In order to determine which machine would be profitable, it will be necessary to find out savings from each, and deduct the additional there from due to use of that machine, which will give net savings. By deducting 50% taxation from this, the net cash flow arising from each will be obtained.

Annual Saving :	Machine A	Machine B
	Rs.	Rs.
Wages (150 × 600) (200 600)	90,000	1,20,000
Scrap	<u>10,000</u>	<u>15,000</u>
Total Saving	1,00,000	1,35,000
Additional Expenses :		
Indirect Materials	6,000	8,000
Maintenance	<u>19,000</u>	<u>25,000</u>
Profit before depreciation	75,000	1,00,000
Less : Tax 50%	<u>37,500</u>	<u>50,000</u>
Annual Cash flow	<u>37,500</u>	<u>50,000</u>
Pay-back Period =	1,50,000	2,50,000
	37,500	50,000
	= 4 years	= 5 years

(A) From the view point of pay-back period, Machine A should be selected.

(B) From the view point of Accounting Rate of Return the Net Profit in A is Rs. 7,500 (cash flow Rs. - Rs. 37,500 Depreciation) and the investment is Rs. 1,50,000,

So the rate of return on Machine A is  $7,500 / 1,50,000 \times 100 = 5\%$ .

While the Net Profit of B is Rs. 8,333 (Rs. 50,000 Cash flow -Rs. 41,667 Depreciation) and Investment is Rs. 2,50,000 and so the rate of return is 3.3%.  $\text{Return} = 8,333 / 2,50,000 \times 100 = 3.3\%$ .

Thus it is profitable to buy machine A.

Note : The instruction given is "ignore depreciation for calculation of tax" and so the example has been worked out accordingly. But it is unrealistic not to consider depreciation for tax purposes. Illustration 10 :

15. A company is considering investing in a capital project which will cost Rs. 1,00,000. The project will require an increase in the inventories and receivables of Rs. 50,000. The project will generate additional sales of Rs. 1,00,000 p.a. and will require cash expenses of Rs. 30,000 in each year of its 5 year life. It will be depreciated on a straight line basis. The tax rate of the company is 50% and 10% after tax cost of capital.

What are the Net Present Value and Internal Rate of Return for the project ?

(A) Net Present Value Method :

First we calculate total investment and total Cash Inflow :

**Solution :**

**Total Investment :**

1 Project Expenses	Rs. 1,00,000
2 Investment in stock & receivables	<u>Rs. 50,000</u>
Total Investment	<u>Rs. 1,50,000</u>

**Gash Inflow :**

Increase in annual Sales	Rs. 1,00,000
	<u>30,000</u>
Less : Cash Expenses	70,000
Less : Depreciation Rs. 1,00,000 / 5 years	<u>20,000</u>
Taxable Income	50,000
50% Taxation	<u>25,000</u>
Profit after tax	25,000
Add : Depreciation (No-Cash Adjustment)	<u>20,000</u>
Cash Flow after Taxation	<u>45,000</u>

Thus the total cash flow every year would be Rs. 45,000, while in the last year Rs. 50,000 would be released from stock and debtors, and so the cash flow would be Rs. 45,000 + Rs. 50,000 = Rs. 95,000. The present value of cash flow would be as under.

Year	Cash Flow Rs.	Discount Factor (10%)	Present Value Rs.
1	45,000	0.909	40,905
2	45,000	0.827	37,215
3	45,000	0.751	33,795
4	45,000	0.683	30,735
5	95,000	0.621	58,995
			<u>2,01,645</u>

Net Present Value = P.V. of Cash Inflow - P.V. of Investment

= Rs. 2,01,645 - Rs. 1,50,000

N.P.V. = + Rs. 51,645

As NPV is positive (+), the Project is profitable.

Internal Rate of Return :

In the above calculations, the present value at 10% discount factor was Rs. 2,01,645, which is more than investment. Hence, for trial and error purpose, we take a higher rate. Suppose we take 20% rate, when the present value would be Rs. 1,54,650 as follows, which is still more than the investment.

Year	Cash inflow	P.V. factor	P.V.
1	45,000 ×	0.833	37,485
2	45,000 ×	0.6944	31,230
3	45,000 ×	0.5797	26,055
4	45,000 ×	0.4813	21,690
5	95,000 ×	0.4019	<u>38,190</u>
			<u>1,54,650</u>

Thus still a higher rate will be taken for calculating present value. If 22% is taken, the P.V. would be.

$$45,000 \times 0.8197 = 36,887$$

$$45,000 \times 0.6719 = 30,236$$

$$45,000 \times 0.5507 = 24,782$$

$$45,000 \times 0.4514 = 20,313$$

$$95,000 \times 0.3700 = 35,150$$

1,47,368

At 22% the present value of cash flow is less than investment. It means the IRR is between 20% and 22%. We use the following formula :

$$\text{Formula} = a + c/(c+d) \times (b-a)$$

$$\text{Here } c = 1,54,650 - 1,50,000 = 4,650$$

$$\text{and } d = 1,50,000 - 1,47,368 = 2,632$$

$$= 20\% + 4650 / 4,650 + 2,632 + (22-20)$$

$$= 20\% + 4,650 / 7,282 \times 2$$

$$= 20\% + 1.28\%$$

$$= 21.28\%$$

Note : While calculating P.V. of cash flow, we have seen that for the first four years, the cash flow is constant at Rs. 45,000 p.a. So instead of calculating P.V. of this amount for 4 years separately, it can be calculated from the other table of present value combined for 4 years.

According to this table, if Re. 1 is received, per annum for 4 years uniformly, its present value at 10% discount factor will be Rs. 3.17 at 20% it will be Rs. 2.59 and at 22% it will be Rs. 2.49.

$$\text{at } 10\% \quad 45,000 \times 3.17 = 1,42,650 \text{ P.V.}$$

$$\text{at } 20\% \quad 45,000 \times 2.59 = 1,16,550 \text{ P.V.}$$

$$\text{at } 22\% \quad 45,000 \times 2.49 = 1,12,050 \text{ P.V.}$$

## 5.11 Exercise

Answer the following questions

- a. Explain the terms capital budgeting and capital budgeting process?
- b. State in brief the steps to be followed in capital budgeting process?
- c. Explain pay back period, method of project appraisal? State its merits and limitations?
- d. Explain average rate of return method of project appraisal? State its merits and limitations?
- e. Explain net present value method of project appraisal? State its merits and limitations?
- f. Explain the effects of taxation in capital budgeting decision?
- g. Explain social cost benefit analysis in capital budgeting?
- h. Explain the term capital rationing?



## 5.12 Practical Exercise

1. Vision Ltd. has got four proposals for investment. Calculate which proposal is acceptable according to Pay Back Method.

Proposal	Investment	Cash Flow			
		1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>re</sup> year	4 <sup>th</sup> year
A	300000	80000	120000	140000	20000
B	300000	60000	40000	180000	20000
C	300000	80000	120000	100000	20000
D	300000	90000	110000	50000	10000

2. Small Ltd. wants to purchase a machine worth Rs.900000. Its estimated life will be 5 years. The profit estimated after deductions of depreciation and taxes of company is Rs.40000; Rs.50000; Rs.40000; Rs.48000 and Rs.52000 respectively.

Find out the Rate of Average Return.

3. Smita Ltd. is considering investing in a project, requiring a capital outlay of Rs.200000. Forecast for annual income after depreciation, but before tax is as follows:

Year	Rs.
1	90000
2	100000
3	90000
4	80000
5	80000

Calculate depreciation at 20 % on original cost. Income tax rate is 50 % of net income. You are required to evaluate the project under following methods.

- (1) Pay-back method and (2) Rate of return on average investment method.

4. Bharat Ltd. is contemplating to buy a new machine for the factory. The total outlay for the project is Rs.100000 and has no scrap value. Its useful life is 5 years. The rate of taxes on the profits of the company is 50 %. Depreciation is to be charged on this machine on the straight-line method. The cash flow likely to arise from the investment project is estimated is follows:

Cash flow	
Year	Rs.
1	22000
2	20000
3	20000
4	30000
5	48000

The present value at 10 % d; count factor is

Year 1	.909	Year 4	.683
Year 2	.826	Year 5	.621
Year 3	.751		

Determine the profitability by net present value method and give your advice whether the project is profitable.

5. Digvijay Ltd. is contemplating to purchase a machine. Two machines A and B are available, each costing Rs.5 lakhs. In comparing the profitability of the machines, a discounting of 10 % is to be used and the machine is to be written off in 5 years by straight-line method of depreciation with nil salvage value. Cash inflows after tax are expected as follows:

Year	Machine A (Rs. in Lakshs)	Machine B (Rs. in Laksh)
1	1.5	0.5
2	2.0	1.5
3	2.5	2.0
4	1.5	3.0
5	1.0	2.0

Indicate which machine would be profitable using the following methods of ranking investment proposals.

- (i) Pay-Back Method
- (ii) Net Present Value Method
- (iii) Profitability Index Method and
- (iv) Average Value of return

The Discounting Factors at 10 % are

Years	1	2	3	4	5
Discounting factor	0.909	0.826	0.751	0.683	0.621

6. The Mihir Ltd. is considering to purchase a new plant at a cost of Rs.130000. The company estimates a maintenance cost of Rs.12000 each year of its operation. The working life of the plant is estimated to be 6 years. Its scrap value is estimated at Rs.24000. The cash flows (before depreciation, taxes and maintenance costs) are as follows.

Year	Rs.	Year	Rs.
1	32000	4	60000
2	45000	5	70000
3	50000	6	120000

The company charges depreciation on Straight Line Method. Assuming that discount rate is 12 % and the rate is 50 % state whether this project should be accepted or rejected. Use net present value method.

At 12 % discount rate, the present value of a rupee is as under:

First year	0.893	Fourth year	0.636
Second year	0.797	Fifth year	0.567
Third year	0.712	Sixth year	0.507

7. A company is considering an investment proposal to instal new milling controls at a cost of Rs.52,000. The facility has a life expectancy of 5 years and no salvage value. The tax rate is 35 per cent. Assume the firm uses straight line depreciation and the same is allowed for tax purposes. The estimated cash flows before depreciation and tax (CFBT) from the investment proposal are as follows:

Year	CFBT
1	Rs 11,000
2	10,692
3	12,769
4	13,462
5	20,385

Compute the following:

- (i) Pay back period,
  - (ii) Average rate of return,
  - (iii) Internal rate of return,
  - (iv) Net present value at 10 per cent discount rate,
  - (v) Profitability index at 10 per cent discount rate.
- (iv) Net present value (NPV)

8. A large sized chemical company is considering investing in a project that costs Rs 5,10,000. The estimated salvage value is zero; tax rate is 35 per cent. The company uses straight line depreciation for tax purposes and the proposed project has cash flows before tax (CFBT) as follow:

Year	CFBT
1	Rs 1,20,000
2	1,00,000
3	1,50,000
4	1,50,000
5	2,50,000

Determine the following: (a) Pay back period, and (b) Average rate of return.

9. A company wants to purchase a plant for its expanding operations. The desired plant is available at Rs 3,10,000 in cash or Rs 4,50,000 to be paid in 5 equal

annual instalments due at the end of each year. Assuming the required rate of return of 15 per cent, which option should the company exercise? Ignore taxes.

10. A machine purchased four years ago has been depreciated @ 25 per cent on reducing balance to a book value of Rs 55,000. The machine originally had a projected life of 10 years and zero salvage value.

A new machine will cost Rs 1,30,000. Its installation cost estimated by the technician is Rs 20,000. It is also estimated that the installation of the new machine will result in a reduced operating cost of Rs 30,000 per year for next 6 years. The old machine could be sold for Rs 20,000. The new machine will have a 6 year life with no salvage value. The company's normal income is taxed at 35 per cent.

Assuming the cost of capital of 10 per cent, determine whether the existing machine should be replaced. This 25 per cent block of assets will cease to exist at the end of 6 years.

12. The Royal Industries is considering the replacement of one of its moulding machines. The existing machine is in good operating conditions but is smaller than required if the firm is to expand its operations. The machine is 5 years old, has a current salvage value of Rs 32,000 and a remaining depreciable life of 10 years. The machine was originally purchased for Rs 75,000 and is being depreciated at Rs 5,000 per year for tax purposes.

The new machine will cost Rs 1,50,000 and will be depreciated on a straight line basis for tax purposes over 10 years, with no salvage value. The management anticipates, with the expanded operations, there will be need of additional- net working capital of Rs 30,000. The new machine will allow the firm to expand current operations and mere by increase annual sales from Rs 4,00,000 to Rs 4,40,000; annual operating costs from Rs 2,00,000 to Rs 2,10,000. The company's tax rate is 35 per cent and its cost of capital is 10 per cent. Should the company replace its existing machine? Assume the loss on sale of existing machine can be claimed as short-term capital loss in the current year itself.

13. A project involving an outlay of Rs. 10 mln has the following benefits associated with it.

Year 1	Year 2	Year 3
Cash Flow (Rs. in Prob. mln)	Cash Flow (Rs. in Prob. mln)	Cash Flow (Rs. in Prob. mln)
5                    0.4	5                    0.4	3                    0.3
5                    0.5	6                    0.4	4                    0.5
6                    0.1	7                    0.2	5                    0.2

Assume that the cash flows are independent. Calculate the expected net present value and the standard deviation of net present value assuming that  $i \sim 10$  per cent.

14. Janakiram is considering an investment which requires a current outlay of Rs. 26,000. The expected value and standard deviation of cash flows are:

Year	Expected Value	Standard Deviation
1	Rs. 13,000	Rs. 5,000
2	10,000	6,000
3	9,000	5,000
4	8,000	6,000

The cash flows are perfectly correlated. Calculate the expected net present value and standard deviation of net present value of this investment, if the risk-free interest rate is 8 per cent.

15. Udit Lamps Company is considering an investment project which has an estimated life of four years. The cost of the project is 10,000 and the possible cash flows are given below:

Year 1	Year 2		Year 3		Year 4		
Cash Flow	Prob.	Cash Flow	Prob.	Cash Flow	Prob.	Cash Flow	Prob.
2,200	0.2	3,000	0.4	4,000	0.3	2,000	0.2
3,200	0.5	4,000	0.3	5,000	0.5	3,000	0.4
4,000	0.3	5,000	0.3	6,000	0.2	4,000	0.2

The cash flows of various years are independent and the risk-free discount rate (post-tax) is 6 per cent.

(i) What is the expected NPV?

(ii) If the NPV is approximately normally distributed, what is the probability that the NPV will be zero or less?

(iii) What is the probability that the profitability index will be greater than 1.2?

16. Consider the cash flows of two projects, R and S:

Year	R	S.
0	(50,000)	(950,000)
1	32,000	—
2	30,000	—
3	30,000	100,000

(a) Calculate the NPV for R and S.

(b) Calculate the NPV and IRR\* for R and S, assuming a re-investment rate of 15 per cent.

Assume that the cost of capital is 12 per cent.

17. A firm which has Rs. 5,100,000 of investible funds is considering the following projects:

Project	Outlay (Rs.)	NPV (Rs.)
A	2,210,000	900,000
B	1,600,000	700,000
C	1,200,000	550,000
D	1,000,000	500,000
E	800,000	450,000
F	750,000	350,000
G	700,000	300,000
H	400,000	250,000

Projects B and C are mutually exclusive; likewise, projects E and F are mutually exclusive.

Any uninvested amount results in a negative NPV—one rupee of negative NPV for every ten rupees of uninvested amount.

Select the most desirable combination of projects.

18. TDS Limited is considering a number of plant improvement projects for which Rs. 2,200,000 have been allocated. The following projects are under consideration:

Project	Outlay (Rs.)	NPV (Rs.)
A	1,230,000	250,000
B	1,000,000	200,000
C	800,000	200,000
D	600,000	200,000
E	400,000	150,000
F	100,000	50,000

Projects A and B are mutually exclusive. If project A is undertaken, the initial cost of C is reduced by Rs. 100,000 (without affecting its benefits). If project B is undertaken the initial cost of D is reduced by Rs. 100,000 (without affecting its benefits.) The benefit Cost ratio of unutilised funds is 0.90.

Which projects should be chosen?

assets. Surplus is the balance in the profit and loss account, which has not been appropriated to any particular reserve account. Note that reserves and surplus along with equity capital represent owners' equity.

**Secured Loans:** These denote borrowings of the firm against which specific securities have been provided. The important components of secured loans are: debentures, loans from financial institutions, and loans from commercial banks.

**Unsecured Loans:** These are the borrowings of the firm against which no specific security has been provided. The major components of unsecured loans are: fixed deposits, loans and advances from promoters, inter-corporate borrowings, and unsecured loans from banks.

**Current Liabilities and Provisions:** Current liabilities and provisions, as per the classification under the Companies Act, consist of the following: amounts due to the suppliers of goods and services bought on credit; advance payments received; accrued expenses; unclaimed dividend; provisions for taxes, dividends, gratuity, pensions, etc.

Current liabilities for managerial purposes are obligations which are expected to mature in the next twelve months. So defined, they include the following: (i) loans which are payable within one year from the date of balance sheet, (ii) accounts payable (creditors) on account of goods and services purchased on credit for which payment has to be made within one year, (iii) provision for taxation, (iv) accruals for wages, salaries, rentals, interest, and other expenses (these are expenses for services that have been received by the company but for which the payment has not fallen due), and (v) advance payments received for goods or services to be supplied in the future.

#### 4.3.2 Assets

Assets are classified as follows under the Companies Act:

1. Fixed assets
2. Investments
3. Current assets, loans and advances
4. Miscellaneous expenditures and losses

**Fixed Assets:** These assets have two characteristics: they are acquired for use over relatively long periods for carrying on the operations of the firm and they are ordinarily not meant for resale. Examples of fixed assets are land, buildings, plant, machinery, patents, and copyrights.

**Investments:** These are financial securities owned by the firm. Some investments represent long-term commitment of funds. (Usually these are the equity shares of other firms held for income and control purposes). Other investments are short-term in nature and may rightly be classified under current assets for managerial purposes.

**Current Assets, Loans, and Advances:** This category consists of cash and other resources, which get converted into cash during the operating cycle of the firm. Current assets are held for a short period of time as against fixed assets, which are held for relatively longer periods. The major components of current assets are: cash, debtors, inventories, loans and advances, and pre-paid expenses. Cash denotes funds readily disburseable by the firm. The bulk of it is usually in the form of bank balance; the rest comprises of currency held by the firm. Debtors (also called accounts receivable) represent the amounts owed to the firm by its customers who have bought goods,

## **Unit: 6:**

# **Risk Analysis in Capital Budgeting**

### **Introduction**

The whole process of capital budgeting is related with the future activities like future cash outflow or future cash inflows etc. In fact various predictions are made regarding future inflows and outflows. Future is always uncertain so a project is selected on the basis of such uncertain future outcomes may cause problems if the actual picture differs from what was expected. It is possible to predict the outcome of some decisions with complete certainty because only one outcome can arise. However, there are many occasions when a decision can lead to more than one possible outcome, such situations are to be set with uncertainty. The traditional definition of the difference between risk and uncertainty has been that uncertainty cannot be quantified while risk can be, in this sense, risk is concerned with the use of quantification of the likelihood of future outcomes. Risk decomposes into three topics: probability, loss, and prediction. The word uncertainty to cover all future outcomes which cannot be predicted with accuracy. People have different attitudes towards the future. Some welcome the opportunity to take risk and may be called risk takers or risk seekers. Other are risk averse. In Armstrong's Principles of Forecasting, in defining risk, as a primary source of advanced information. Forecasting has many points of congruence to risk analysis, but business and finance are data-rich compared with the subjects such as health effects or natural disasters. So, we have much to learn from the capital budgeting with risk analysis.

An organization's performance is profoundly influenced by the elements contained within its environment. There are so many internal and external factors which create uncertainty regarding future course of actions like political situation, inflation, state of economy etc. In turn the organization also has an impact on its environment. It is the role of a management to predict events that are likely to occur within the environment in order that the enterprise may meet any challenges or take advantage of any new opportunities.



## **Structure of the Chapter:**

- 6.1 Objectives:**
- 6.2 Degrees of Certainty**
- 6.3 Techniques to Deal with Risk**
  - 6.3.1 Risk Adjusted Discount Rate:**
  - 6.3.2 Certainty Equivalent Coefficient:**
  - 6.3.3 Pay Back Criteria:**
  - 6.3.4 Sensitivity Analysis**
  - 6.3.5 Probability Assignment:**
  - 6.3.6 Simulation**
  - 6.3.7 Optimistic – Pessimistic Estimates**
  - 6.3.8 Standard Deviation in Measurement of Risk**
  - 6.3.9 Coefficient of Variation**
  - 6.3.10 Value of Information**
  - 6.3.11 Decision trees**
- 6.4 Practicals:**
- 6.5 Exercise:**
- 6.6 Practical exercise**

## 6.1 Objectives:

By the end of this chapter the student will learn about

- How to make capital investment decision in uncertain conditions
- Different techniques to deal with uncertainty

## 6.2 Degrees of Certainty

The degrees of certainty may be classified into the following categories:

- ◆ **Complete certainty:** All relevant information about the decision variables and outcomes is known with certainty.
- ◆ **Assumed certainty:** For all practical purpose the future is known exactly and estimates become deterministic.
- ◆ **Risk:** When it not known exactly what will happen in future, but the variance possibilities are neglected by their assumed probability of occurrence.
- ◆ **Uncertainty:** Where a variety of outcomes are possible but probabilities cannot be assigned.
- ◆ **Extreme Uncertainty:** Where no information is available to assess the likelihood of alternative outcomes.

Uncertainty arises from a lack of previous experience and knowledge. In a new venture, for example, it is possible for uncertainty to be attached to the following factors:

- Taxation rules.
- Level of operating costs.
- Level sales volume.
- Level of revenue
- Level of selling prices.
- Level of capital outlay required.
- Date of completion.

Inevitably decision making under conditions of uncertainty is more complicated than is the case under risk condition. In fact there is no single best criterion that should be used in selecting a strategy of the various available techniques. Risk occurs where future outcomes of current action are unknown, but the probabilities of these future outcomes can be reasonably estimated from the knowledge of past and current events. Risk is therefore normally measured by volatility of returns because a certain outcome has no variance and hence, no volatility. Uncertainty on the other hand, occurs where the probabilities of future outcomes cannot be predicted from past or current events, because no probability estimates are available.

## 6.3 Techniques to Deal with Risk

### 6.3.1 Risk Adjusted Discount Rate:

The easiest and most common method of allowing for risk is by adjusting the discount rate applied to the future cash flows arising from the project. The rate of discount is equal to the cost of capital or in other words it is the rate, which the investors

demand from the company on their investments. By this method a premium can be added to the average required discount rate as a safety margin to compensate for the enhanced risk of the project. This acknowledges that if the same discount rate is applied to all proposed capital projects, no distinction would be made between high and low risk projects. It means that higher the risk in a project, higher would be the discount rate and the lower the risk in the project, the lower would be the discount rate.

Thus Risk-adjusted discount rate is the rate established by adding a expected Risk premium to the Risk-free rate in Order to determine the Present value of a risky investment.

Suppose. the rate of interest on government treasury bills is 8% p.a. then the risk free interest rate is 8%. If the company is considering a project of producing a new product to put in the existing market, then due to risk, they would require a premium of say, 6%, then the risk adjusted discount rate would be  $8\%+6\% = 14\%$ .

However, the difficulty in this method is that it is difficult to determine the risk adjusted discount rate. How high should be the discount rate or what should be the premium over risk free rate in respect of a project involving higher risk and what is the degree of risk involved in the project.

### 6.3.2 Certainty Equivalent Coefficient:

Certainty Equivalent means An amount that would be accepted today (risk free) in lieu of a chance to receive a possibly higher, but uncertain, amount.

Certainty equivalent method overcomes the defects contained in the method risk adjusted discount rate. Here in this method future cash flows are estimated as usual, but along with that risk less cash flow is also determined. Suppose the management estimates that taking into account the risk involved in the project, the cash flow for third year is Rs.80000. But they believe that a minimum of Rs.64000 is sure to be received without risk. Thus the risk less flow of third year is Rs.64000. If we find the ratio, it will give certainty equivalent coefficient.

$$\begin{aligned} \text{Certainty Equivalent coefficient} &= \frac{\text{Risk less cash flow}}{\text{Risky cash flow}} \\ &= \frac{64000}{80000} \\ &= 0.8 \end{aligned}$$

Thus in the above manner coefficients are worked out for all the years of life of the project. When risky cash flows are multiplied by these coefficients, we get risk less returns. The rate of discount used for this purpose is the risk free rate and not adjusted rate. If the net present value of this risk less cash flows is positive then the project is accepted.

### 6.3.3 Pay Back Criteria:

However, another way of allowing for risk can be using the payback evaluation technique in either its simple form or preferably by calculating the discounted payback for the projects. The company can set a maximum period for the project to repay its original investment and this also reflects the risk profile of the project.

#### Advantages:

Easy to understand

Biased toward liquidity

#### Disadvantages:

Ignores the time value of money

Ignores cash flows after the payback period

Biased against long-term projects

Requires an arbitrary acceptance criteria

A project accepted based on the payback criteria may not have a positive NPV

### 6.3.4 Sensitivity Analysis

The assumption of equal weights to all research objectives in setting priorities is liable to criticism especially when the objectives are argumentative in nature. For instance, efficiency and equity objectives are often in conflict with each other. The main objective of research is to improve production efficiency, and therefore it is presumed that the benefits of research trickle down on its large-scale application benefiting the majority landless and small landholders who possess sizeable proportion of livestock wealth. The emphasis of research thus may vary over time and space, so are weights attached to different research objectives. In this chapter, we examine the sensitivity of priority ranking/resource allocation to changes in weights to the specified research objectives. This would provide information on the robustness of the results of the priority setting exercise. This is also important from the point of view of designing suitable research strategies consistent with the role of livestock in socioeconomic development.

Sensitivity analysis is the study of the key assumptions or calculations on which a management decision is based in order to predict alternative outcomes of that decision if different assumptions are adopted. It is a 'what if' technique that measure how the expected values in a decision model will be affected by changes in the data. Sensitivity analysis or 'what if' involve evaluating the impact on the financial returns from the project if certain key variables changed from those forecast in the base evaluation. The sensitivity of the overall returns from the project to relatively small changes in one or a few, key variables helps managers to understand the risk profile of the project, if these variables are also non-controllable the level of risk may be unacceptably high and the project is rejected.

Thus Sensitivity analysis can be termed as Analysis of the effect on a project's profitability of changes in sales, cost, and so on.

Sensitivity analysis is a modeling procedure used in forecasting whereby changes are made in the estimates of the variables to establish whether any will critically affect the outcome of the forecast. It is possible to use sensitivity analysis for helping to determine the value of information in addition to its role in strategic decision making. Sensitivity analysis seeks to determine the range of variations in the coefficients over which the solution will remain optimal.

### 6.3.5 Probability Assignment:

In every method it is seen that it gives different estimates of cash flows but fails to show the chance of variability of these cash flows. For this purpose probability may be assigned to each of the cash flows. The probability assignment will give some definite measure of possibility of different cash flows. It indicates the percentage chance of occurrence of each possible cash flow.

### 6.3.6 Simulation

Simulation means the use of a mathematical model to imitate a situation many times in order to estimate the likelihood of various possible outcomes. Simulation is the representation of a system by a model which will react to change in a similar way to that which is being simulated. This evolves a decision maker to predict the outcome of particular decision through testing it via the model. Normally simulation techniques are used to solve problems involving uncertainty. There are several techniques of simulation that are in use. However, 'Monte-Carlo' method is very popular as it is very simple and easy to use. Monte Carlo Simulation and Finance explains the nuts and bolts of this essential technique used to value derivatives and other securities. The technique uses random numbers and is used to solve problems which involves conditions of uncertainty.

In simulation, a computer would normally be used to build and run the model. This is particularly important in this area, since meaningful information can be extracted from the simulation only after a number of runs with different random number.

Some problems are too complex to solve with pure mathematics, or they involve random elements or risk situation that defy a practical mathematical solution. In such situation, analysts sometime construct a model of the real world problem and use a trial and error approach to arrive at reasonable solutions to the problem. For using simulation one should go through the following steps:

- Decide what course of action to take.
- Construct a numerical model.
- Run the experiment.
- Consider the results and the possibilities to modify the model or changes data inputs.
- Set up possible course of action for testing.
- Introduce the variables associated with the problems.
- Define the problem precisely.

Simulation modeling is extremely useful in production Scheduling manpower planning decision, parking problems, inventory problems, investment analysis, queuing

problems maintenance problems, testing a series of marketing problems, location of factories for cost reduction etc.

### 6.3.7 Optimistic – Pessimistic Estimates

In decision-making the first step is usually to make a single 'best estimate' for each item. One might then also make optimistic and pessimistic estimates for each variable. Another approach is to make the 'most likely' estimate for each item in turn, to see how much difference it makes to the overall result. Large changes to particular items will often not be important, so we need to identify those critical variables where even a fairly small change can make quite a large difference to the overall result.

The worst possible/best possible outcomes can be evaluated from the pessimistic and optimistic attitudes of the decisions made. In making decision under uncertainty, the decision maker should assess not only the most likely outcome from a decision but also the outcome that will arise if the worst possible happens. This analysis will help in understanding the full range of possible outcomes from a decision and will help the decision maker to take right decision keeping in view the risk involved in the decision.

Suppose, the investment in a project is Rs.75000 and its useful life is 5 years. The cost of the project is 12%. The optimistic future cash flow is estimated at Rs.34000 and the present value of annuity of Rs.1 for 5 years at 12% is Rs.3.605, in pessimistic estimation, the cash flow is Rs.17000 per annum, while it is Rs.23000 under normal or most likely conditions. The net present value under all the three estimates would be as follows.

$$\text{Optimistic} = 34000 * 3.605 = 122570$$

$$\text{Most likely} = 23000 * 3.605 = 82915$$

$$\text{Pessimistic} = 17000 * 3.605 = 61285$$

Thus this method takes into account the uncertainty of future and gives three estimates. It is thus superior to the single figure forecasts.

### 6.3.8 Standard Deviation in Measurement of Risk

Risk is measured by the possible variation of outcomes around the expected value and the decision will be taken keeping in view the variation in the expected value where two projects have the same expected value the decision maker would choose the project which has smaller variation in expected value. So, the project which has a larger standard deviation will be considered as more risky as compared to a project having smaller standard deviation. Standard deviation is the square root of variance.

### 6.3.9 Coefficient of Variation

The standard deviation is an absolute measure of variability and not the relative measure of variability and so it can not be useful in comparing the projects when the size of such projects are different. In such circumstances, a useful measure of risk for project comparison is the coefficient of variation which is calculated as follows:

Standard deviation

Coefficient of variation =  $\frac{\text{Standard deviation}}{\text{EV of profit}} \times 100$

EV of profit

EV = Expected Value

A project with a higher coefficient of variation would be more risky than a project with a lower coefficient of variation.

### 6.3.10 Value of Information

We can sometimes reduce the uncertainty involved in making a decision by collecting more information. However, we will usually have to pay for this additional information, the value of perfect information tells us the maximum amounts it is worth paying for it. If we know in advance which one of the outcome will occur, then we choose the decision which all lead to the maximum payoff. This does not mean that we can control the choice of outcome. Outcome will be the same whether favorable or unfavorable but we can make an estimate of it.

Let us take the illustration. The bakery shopkeeper could take orders for breads to be delivered the following day. He cannot control how many orders he will receive but he could earn on an average Rs.5 per day without having any kind of information regarding the demand of the breads. Sometimes due to lack of information it may happen that he has more breads than the demand and sometimes situation may be reverse but then he found a source from which he could make out perfect estimation regarding demand of his bread but for providing such information to him he had to pay certain amount to the information provider. By getting such perfect information he was able to generate maximum profit of Rs.8 per day and this profit is certain to be received.

The difference between this figure and the maximum expected pay off without perfect information is called "The value of perfect Information".

The value of perfect information for the shopkeeper is: Rs.8 – Rs.5 = Re.3 per day, which is equal to the minimum expected opportunity loss.

The value of perfect information means the maximum amount we should pay for additional information about the likelihood of each outcome arising. The shopkeeper could afford to pay up to Rs.3 per day for getting perfect information or to operate an ordering systems or for market research information to enable the daily demand to be predicted more accurately than at present.

The information received may be of two types:

#### Perfect Information

Perfect information is information about the future outcome of an event with absolute certainty and is guaranteed to predict the future with 100% accuracy. Perfect information, therefore, removes all doubts and uncertainty from decision, and it would enable managers to make decisions with complete confidence that they have selected the most profitable course of action.

## **Imperfect Information:**

There is one serious drawback to the technique we must take care off. Estimating the value of perfect information should help management to decide whether obtaining information would be worth the cost of its collection, but in practice information is rarely ever perfect. Market still be wrong; they provide imperfect information. It is possible, however, to arrive at an assessment of how much it would be worth paying for such imperfect information, given that we have a rough indication of how right or wrong it is likely to be.

Information, whether perfect or imperfect, will cost money to obtain and so if the option exists for a decision maker to obtain the information or not, a further decision that has to be made is: 'would the information be worth the cost of obtaining it?'

### **6.3.11 Decision trees**

Decision tree is a graphical presentation of the problems related with uncertainty. It represents problems in a series of decision to be made under conditions of uncertainty. It can be said that in many cases present investment decisions may have its effects on future investment decision. It may involve a sequence of decisions over time. Any of the decision may be dependent on the outcome of preceding decisions or the outcomes of a trial. A decision tree is a diagrammatic representation of the relationship among decision state of nature and outcomes. Thus Decision Trees are excellent tools for helping you to choose between several courses of action. They provide a highly effective structure within which you can lay out options and investigate the possible outcomes of choosing those options. They also help you to form a balanced picture of the risks and rewards associated with each possible course of action.

#### **Drawing a Decision Tree**

You start a Decision Tree with a decision that you need to make. Draw a small square to represent this towards the left of a large piece of paper.

From this box draw out lines towards the right for each possible solution, and write that solution along the line. Keep the lines apart as far as possible so that you can expand your thoughts.

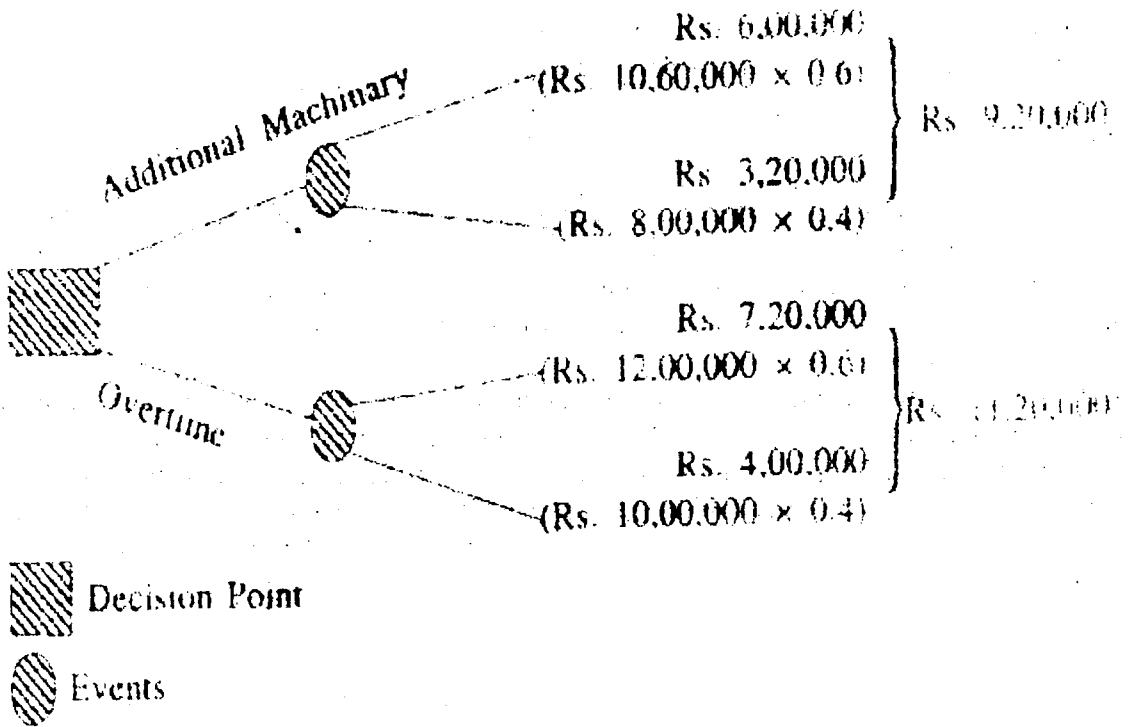
At the end of each line, consider the results. If the result of taking that decision is uncertain, draw a small circle. If the result is another decision that you need to make, draw another square. Squares represent decisions, and circles represent uncertain outcomes. Write the decision or factor above the square or circle. If you have completed the solution at the end of the line, just leave it blank.

Starting from the new decision squares on your diagram, draw out lines representing the options that you could select. From the circles draw lines representing possible outcomes. Again make a brief note on the line saying what it means. Keep on doing this until you have drawn out as many of the possible outcomes and decisions as you can see leading on from the original decisions.

**Example:** Suppose, the manager of a company anticipates an increase in demand for his product and so looking for more production. Two alternatives are available with him, 1. to use additional machinery and 2. to arrange for overtime work.. Two



possibilities of outcome may considered here, one, sales may increase and two, sales may decline. In case of utilization of extra resources for increasing output, suppose sales are likely to rise by Rs.1000000 with the probability of such event of 0.6 or they are likely to decline by Rs.800000 with probability of such event of 0.4. In case of the provision for overtime work, on the other hand, sales are likely to rise by Rs.1200000 with the probability of such event of 0.6 or they are likely to decline by Rs.1000000 with probability of such event by 0.4. Graphical presentation of the whole problem is given below.



It is clear from the above diagram that the alternative of overtime is preferable to that of additional machinery. Hence, the manager must decide in favour of overtime.

#### 6.4 Practicals:

1. The total investment in a project of Vinee Ltd. is estimated at Rs. 110000. Its forecast cash flow and certainty equivalent are as follows:

Year	Cash Flow (Rs.)	Co-efficient
1	55000	0.90
2	40000	0.70
3	40000	0.50
4	60000	0.30

The risk free discount rate 10%. Determine on the basis of NPV, whether the project should be accepted. The present values of Rs.1 at 10% for different year are 0.909, 0.826, 0.751, 0.683.

services on credit. Debtors are shown in the balance sheet at the amount owed, less an allowance for the bad debts. Inventories (also called stocks) consist of raw materials, work-in-process, finished goods, and stores and spares. Loans and advances are the amounts loaned to employees, advances given to suppliers and contractors, and deposits made with governmental and other agencies. They are shown at the actual amount. Pre-paid expenses are expenditures incurred for services to be rendered in the future.

**Miscellaneous Expenditures and Losses:** This category consists of two items: (i) miscellaneous expenditures and (ii) losses. Miscellaneous expenditures represent certain outlays such as preliminary expenses and pre-operative expenses, which have not been written off.

#### **4.4 Profit and Loss Account**

The Companies Act has prescribed a standard form for the balance sheet, but none for the profit and loss account. However, the Companies Act does require that the information provided should be adequate to reflect a true and fair picture of the operations of the company for the accounting period. The Companies Act has also specified that the profit and loss account must show specific information as required by Schedule-IV.

The profit and loss account, like the balance sheet, may be presented in the horizontal form (account form) or the vertical form (the report form). Typically, companies employ the vertical form.

Following are the horizontal and vertical presentations of the profit and loss accounts, which mainly represents following items.

- Net sales
- Cost of goods sold
- Gross profit
- Operating expenses
- Operating profit
- Non-operating surplus/deficit
- Profit before interest and tax
- Interest
- Profit before tax
- Tax
- Profit after tax

Year	Cash flow	Co-efficient	Risk-less Cash flow	Discount factor	Discounted Cash flow
1	55000	0.90	49500	0.909	44995
2	40000	0.70	28000	0.826	23130
3	40000	0.50	20000	0.751	15120
4	60000	0.30	18000	0.683	12290
					95535
			Investment		110000
			Net Present Value		-14464

As the NPV of the project is negative, it should not be accepted.

A Vipul Ltd. is considering a proposal to buy one machine out of the two. An investment of Rs. 55000 is required in each machine and useful life of each machine is estimated at 4 year. The vendors of these machines have given a guarantee to purchase these machines for Rs. 10000 at the end of their useful life. The company uses certainty-equivalent co-efficient to evaluate the risky projects. The risk-adjusted rate of discount is 16%, while the risk less discount rate is 10%.

Year	Machine A		Machine B	
	Cash flow	C.E.	Cash flow	C.E.
1	30000	0.8	18000	0.9
2	30000	0.7	36000	0.8
3	30000	0.6	24000	0.7
4	30000	0.5	32000	0.4

Which machine should be purchased?

Solution:

When certainty equivalent coefficient is used, it means that the cash flow arrived at on that basis certain to be received e.g. the cash flow for first year for machine A is estimated at Rs. 30000 and its C.E. is 0.8. It means that Rs. 30000 x 0.8 = Rs. 24000 cash flow is sure to be received during the first year. There is no risk about it. Its present value should be calculated at risk less discount rate, because risk has been covered by discounting the cash flows. So discount rate should not be adjusted for risk.

Remember that when C.E. is used for adjusting cash flow forecast, always use risk less discount rate.

Year	Cash Flow	Certainty Equivalent	Revised Cash flow	Discount Factor	Present Value
1	30000	0.8	24000	0.909	21716
2	30000	0.7	21000	0.826	17346
3	30000	0.6	18000	0.751	13518
4	30000	0.5	15000	0.683	10245
Value at the end	10000	1.0	10000	0.683	6830

			Total Present Value	69655
			Less: Investment	55000
			Net Present Value	+ 14655

<b>Machine B:</b>					
Year	Cash Flow	Certainty Equivalent	Revised Cash flow	Discount Factor	Present Value
1	18000	0.9	16200	0.909	14726
2	36000	0.8	28800	0.826	23789
3	24000	0.7	16800	0.71	12617
4	32000	0.4	12800	0.683	8742
Value at the end	10000	1.0	10000	0.683	6830
			Total Present Value		66704
			Less: Investment		55000
			Net Present Value		+ 11704

As in both the cases the value to be realized is Rs. 10000 at the end, it is certain to be received and so its C.E. should be treated as 1.

Though both the alternative presents positive NPVs but project A is preferable because it produces higher NPV than project B.

3. A Nishu Ltd. is considering two mutually exclusive projects A and B. In both the cases, initial investment will be Rs. 1,10,000 and the useful life of both will be 10 years. No projects has no scrap value. The probable cash flow will be as follows:

	Project A Rs.	Project B Rs.
Optimistic	50,000	70,000
Most Likely	40,000	35,000
Pessimistic	18,000	4,000

If the rate of discount is 10% calculate the present value and state which project is better out of the two. The annuity of Re. 1 at 10% for 10 years is Rs. 6.145.

Solution:

	Project A	Net Present Value	Project B	Net Present Value
Optimistic	50,000x6.145 =307250	1,97250	70,000 x 6.145 = 430150	320150
Most likely	40,000x6.145 =245800	135800	35000 x 6.145 = 215075	105075
Pessimistic	18,000 x 6.145 =Rs. 1,10,610	610	4000 x 6.145 = 24580	-85420

Comparing the two projects, it seems project B is more risky, as in the pessimistic estimate it may result into a loss of Rs. 85,420, while in case if it materializes, it may result into a considerable profit. Thus project A should be selected. However it depends upon the attitude of the decision maker. If he is conservative, he will select project A as there is no possibility of loss. But if he is a risk taker, he will select B as it has a possibility of paying a very high return in case of success.

4. A Parshwa Ltd. is considering a project in which investment in fixed assets would be Rs. 48 lakhs and investment in current assets would be Rs. 22 lakhs. Its useful life is estimated at 5 years, during which returns would be earned at equal rate and at the end of which the scrap value will be Rs. 3 lakhs. The estimate of its income before depreciation and taxes will be as follow:

Annual Income (In lacs Rs.)	Probability
5	0.1
10	0.2
20	0.5
30	0.1
40	0.1

Tax rate is 50 %. The minimum rate of return is 12 %. From the tables, it is found that the present value of Re. 1 for 10 years at 12 % rate of discount would be Rs. 5.670 and its present value at the end of 10<sup>th</sup> year would be 0.322. Would, you recommend this proposal?

**Solution:**

The income given in the example is before depreciation and taxes hence we shall first calculate depreciation.

Cost of fixed assets Rs. 48 lacs – scrap value of Rs. 3 lacs  
 = Rs. 45 lacs = Depreciation on Straight line method = Rs. 45 lacs / 10 years = Rs. 4.5 lacs.

Cash Flow (Before tax and Depreciation)	Depre- ciation	Taxable Income	Tax at 50 %	Income After tax	Cash Flow Including Depreciat ion	Probabi- lity	Adjusted Revised Cash flow
Rs. 5 lacs	4.5	0.5	0.25	0.25	4.75	0.1	0.475
Rs. 10 lacs	4.5	5.5	2.75	2.75	7.25	0.2	1.450
Rs. 20 lacs	4.5	15.5	7.75	7.75	12.25	0.5	6.125
Rs. 30 lacs	4.5	25.5	12.75	12.75	17.25	1.0	1.725
Rs. 40 lacs	4.5	35.5	17.75	17.75	22.25	0.1	2.225
							12.00

**Calculation for Net Present Value**

Rs. 12 lacs for 10 years x 5.670 (at 12%) =

Rs. 3 lacs scrap value at the end of 10<sup>th</sup> years x 0.322 =

Rs.

68.04 lacs

.966

Current Assets at the end of 10 <sup>th</sup> years	Rs. 22 lacs	7.584
Total present value of cash flow		76.69
- total investment (Rs. 48 - Rs. 22)		70.00
Net present value		6.69

This proposal may be accepted because its NPV is positive

Note: working capital blocked in the business will be treated as outflow initially and at the end of the project it will be released from the project and in that year it will be treated as inflow for the project. In the same manner, scrap value has two uses, initially it is used for calculation of amount of depreciation and in the last year of the project it is treated as inflow in the project.

### 6.5 Exercise:

Answer the following questions

1. What are the reasons for which risk reducing measures to be used in capital budgeting?
2. Explain sensitivity analysis as a risk reducing measure in capital budgeting?
3. Explain simulation as a risk reducing measure in capital budgeting?
4. What a maximum amount can be paid for obtaining perfect information for coming activities?
5. Explain the concept of decision trees?

### 6.6 Practical exercise

1. Mahavir Ltd. is considering to purchase one out of the two machines for production of a new product. The investment in each machine will be Rs. 1,10,000 and they would give benefit of 12 years. For each alternative, three estimates of cash flows are given: Most likely, Optimistic and Pessimistic.

	Machine A Rs.	Machine B Rs.
Cost price	1,10,000	10,000
Estimate of Cash flow:		
Optimistic	33,000	44,000
Most Likely	25,000	20,000
Pessimistic	19,000	2,000

The cost of capital of the project is 14%. Which project is more risky? The annuity of Rs. 1 at 14% for 12 years is Rs. 5.66.

2. Two mutually exclusive projects are under consideration by Harry Ltd. The initial investment in both of them is Rs. 1,00,000. The economic life of both is estimated at 5 years and they have no scarp value. Their estimated cash flows and certainty equivalent are as under:

Year	Project A	Project B		
	Cash flow Rs.	Certainty Equivalent	Cash flow	Certainty Equivalent
1	70,000	0.8	85,000	0.5
2	65,000	0.6	1,25,000	0.4
3	55,000	0.5	50,000	0.3
4	35,000	0.4	30,000	0.2
5	30,000	0.3	20,000	0.1

If the cost of capital of both is 15 %, calculate the net present value of both and state which projects is acceptable.

3. The Cautious Ltd is considering a proposal for the purchase of a new machine requiring an outlay of Rs 1,500 lakh. Its estimate of the cash flow distribution for the three-year life of the machine is given below (amount in Rs lakh):

Period -1		Period 2		Period 3	
Cash flows	Probability	Cash flows	Probability	Cash flows	Probability
Rs 800	0.1	Rs 800	0.1	Rs 1,200	0.2
650	0.2	750	0.3	900	0.5
400	0.4	600	0.4	600	0.2
200	0.3	500	0.2	300	0.1

The probability distribution is assumed to be independent. Risk-free rate of interest is 5 per cent. From the above information, determine the following:

(i) the expected NPV of the project;

(ii) the standard deviation of the probability distribution of NPV; (iii) the probability that the NPV will be

(a) zero or less (assuming that the distribution is normal);

(b) greater than zero; and

(c) at least equal to the mean;

(iv) the profitability index of the expected value; and

(v) the probability that the profitability index will be less than 1.

4. A company employs certainty-equivalent approach in the evaluation of risky investments. The capital budgeting department of the company has developed the following information regarding a new project:

Year	Expected CFAT (Rs thousand)	Certainty-equivalent quotient
0	250	1.0
1	160	0.8
2	140	0.7
3	120	0.6
4	120	0.4
5	80	0.3

The firm's cost of equity capital is 18 per cent; its cost of debt is 9 per cent and the riskless rate of interest in the market on the government securities is 6 per cent. Should the project be accepted?

5. The Delta Corporation is considering an investment in one of the two mutually exclusive proposals: Project A which involves an initial outlay of Rs 1,70,000 and Project B which has an outlay of Rs. 1,56,000. The Certainty-

Equivalent Approach is employed in evaluating risky investments. The current yield on treasury bills is 0.05 and the company uses this as the riskless rate. The expected values of net cash flows with their respective certainty-equivalents are:

Year	Project A		Project B	
	Cash flow (Rs thousand)	Certainty-equivalent	Cash flows (Rs thousand)	Certainty-equivalent
1	95	0.8	90	0.9
2	100	0.7	90	0.8
3	110	0.5	100	0.6

- (i) Which project should be acceptable to the company?
- (ii) Which project is riskier? How do you know?
- (iii) If the company was to use the risk-adjusted discount rate method, which project would be analysed with higher rate?

7. A company has under consideration two mutually exclusive projects for increasing its plant capacity. The management has developed pessimistic, most likely and optimistic estimates of the annual cash flows associated with each project. The estimates are as follows:



	Project A	Project B
Net investment	Rs 32,000	Rs 30,000
CFAT estimates:		
Pessimistic	1,200	3,700
Most 'likely	4,000	4,000
Optimistic	7,000	4,500

(a) Determine the NPV associated with each estimate given for both the projects. The projects have 20 year life each and the firm's cost of capital, 10 per cent.

(b) Which project do you consider should be selected by the company and why?

8. A company is examining two mutually exclusive investment proposals. The management of the company uses 'certainty-equivalents (CE) to evaluate new investment proposals. From the following information pertaining to these projects advise the company which project should be taken up by the company:

Year	Proposal A		Proposal B	
	CFAT	CE	CFAT	CE
0	Rs 25,500	1.0	Rs 25,000	1.0
1	15,000	0.8	9,000	0.9
2	15,000	0.7	18,000	0.8
3	15,000	0.6	12,000	0.7
4	15,000	0.5	16,000	0.4

The firm's cost of capital is 12 per cent and risk-free borrowing rate is 6 per cent.

9. A company is considering a proposal to buy one of the two machines to manufacture a new commodity. Each of the machines requires investments of Rs 50,000 and is expected to provide benefits over a period of 12 years. The firm has made 'pessimistic,' 'most likely' and 'optimistic' estimates of the returns associated with each of these alternatives. These estimates are as follows:

**Machine A      Machine B**

	Rs 50,000	Rs 50,000
Cost		
Cash flow estimates:		
Pessimistic	8,500	0
Most likely	12,500	10,000
Optimistic	16,000	20,000

Assuming 14 per cent cost of capital, which project do you consider more risky, and why?

10. Company is considering two mutually exclusive projects X and Y. Project X costs Rs 32,000 and Project Y Rs 36,000. You have been given below the net present value probability distribution for each project:

Project X		Project Y	
NPV estimate	Probability	NPV estimate	Probability
Rs 4,000	0.1	Rs 3,000	0.2
6,000	0.4	6,000	0.3
12,000	0.4	12,000	0.3
15,000	0.1	15,000	0.2

(a) Compute the expected net present value of projects X and Y.

(b) Compute the risk attached to each project that is, standard deviation of each probability distribution.

(c) Which project do you consider more risky and why?

(d) Compute the profitability index of each project.

11. The probability distributions of two projects' NPV are given below:

Project X		Project Y	
NPV	Probability	NPV	Probability
Rs 6,000	0.2	0	0.1
7,500	0.7	Rs 7,500	0.7
10,000	0.1	15,000	0.2

Calculate the expected value, the standard deviation, and the coefficient of variation for each project. Which of these mutually exclusive projects do you prefer and why?

12. A company is considering a proposal to purchase a new machine. The machine has an initial cost of Rs 55,000. The capital budgeting department has developed the following discrete probability distribution for cash flows generated by the project during its useful life of 3 years:

Period 1		Period 2		Period 3	
CFAT	Probability	CFAT	Probability	CFAT	Probability
Rs 16,000	0.2	Rs 20,000	0.5	Rs 25,000	0.1
20,000	0.4	23,000	0.1	30,000	0.3
25,000	0.3	25,000	0.2	35,000	0
30,000	0.1	28,000	0.2	50,000	0.3

(a) Assuming that the probability distributions of cash flows for future periods are independent, the firm's cost of capital is 10 per cent and the firm can invest in 5 per cent treasury bills, determine the expected NPV.

(b) Determine the standard deviation about the expected value.

(c) If the total distribution is approximately normal and assumed continuous:

- (i) what is the probability of the NPV being less than zero,
- (ii) greater than zero.
- (iii) profitability index being 1 or less
- (iv) at least equal to mean,
- (v) 10 per cent below mean, and
- (vi) 10 per cent above mean?

13. Determine the risk-adjusted net present value of the following projects:

Net cash outlays (Rs)	1,00,000	1,20,000	2,10,000
Project life (years)	5	5	5
Annual cash inflow (Rs)	35,000	42,000	70,000
Coefficient of variation	0.4	0.8	1.2

The company selects the risk-adjusted rate of discount on the basis of the coefficient of variation:

Coefficient of variation	Risk-adjusted rate of discount
0.0	0.10
0.4	0.12
0.8	0.14
1.2	0.16
1.6	0.18
2.0	0.22
More than 2.0	0.25

## **Unit :7: Funds Flow Analysis**

### **Introduction**

Traditionally there are two types of statements are prepared by every business organization viz., Profit and Loss account and Balance Sheet. Profit and Loss accounts shows results of operations of specific period normally a year where as the Balance Sheet shows the balances of assets and liabilities standing at a specific date. But both the above statements do not contain sufficiently wide range of information to make assessment of organization by the end user of the information. Over a time, practically all the items in the Balance Sheet undergo a change. For instance, additional capital may have been issued or loan may raised or fixed assets may be disposed off, in such circumstances there are certain questions which remain unanswered by usual financial statements like Profit and Loss accounts and Balance Sheet. Fund flow statement provides information to the readers of the statement that how such funds became available during the accounting period and how such funds were applied. This statement demonstrates the movement of funds into and out of the business during the accounting period. With the help of the fund flow statement certain questions can be answered like what were the sources of funds to purchase fixed assets? What happened to the funds acquired by issue of shares or debentures? etc. which can not be answered with the help of profit and loss account and balance sheet.

### **Structure of the Chapter:**

- 7.1 Objectives:**
- 7.2 Funds Flow Analysis**
- 7.3 Performa of Funds flow Statement (Vertical Format)**
- 7.4 Statement of Changes in Working Capital**
- 7.5 Sources of Funds**
- 7.6 Application of Funds**
- 7.7 Funds Flow Statement vs. Profit and Loss Account**
- 7.8 Funds Flow Statement vs. Balance Sheet**
- 7.10 Drawbacks of Funds Flow Analysis**
- 7.11 Exercise**

### **7.1 Objectives**

By the end of this chapter the should will learn about

- The concept of fund and fund flow
- Various sources of funds and application of funds in a business
- Preparation of fund flow statements
- Utility of fund flow statement
- Limitations of fund flow statements

**Profit and Loss Account of Ram Limited for the Year Ending on March 31, 1995**

(Rs. in million)

		1995	1994
Net sales		70.1	62.3
Cost of goods sold		55.2	47.5
Stocks	42.1		
Wages and salaries	6.8		
Other manufacturing expenses	6.3		
Gross profit		14.9	14.8
Operating expenses		5.6	4.9
Depreciation	3.0		
General administration.	1.2		
Selling	1.4		
Operating profit		9.3	9.9
Non-operating surplus/deficit		(0.4)	0.6
Profit before interest and tax		8.9	10.5
Interest		2.1	2.2
Profit before tax		6.8	8.3
Tax		3.5	4.1
Profit after tax		3.3	4.2
Dividends		2.7	2.7
Retained earnings		0.6	1.5
Per share data (in rupees)			
Earnings per share		2.2	2.8
Dividend per share		1.8	1.8
Market price per share		21.0	20.0
Book value per share		17.46	17.07

Sales - sales inwards - excise duty.

Sales are the sum of the invoice price of goods sold and services rendered during the period. Sales inwards represent the invoice value of goods returned by the customers. Excise duty refers to the amount paid to the government.

Cost of goods sold is the sum of costs incurred for manufacturing the goods sold during the accounting period. It consists of direct material cost, direct labour cost, and factory overheads. It should be distinguished from the cost of production. The latter

## **7.2 Funds Flow Analysis**

In business large amount of money is invested and it is used for different purposes. In fund flow analysis emphasis is on from what sources inflows are generated and where it is applied during the specific period. In view of recognised important of capital inflows and outflows, which often involve large amounts of money should be reported to the stakeholders, the funds flow statement is devised. This statement is also called "Statement of Sources and application of funds" and "Statement of changed in financial Position". Though it is true that profit and loss accounts indicates the profit or loss of the specific period and balance sheet represents the state of affairs, it must come to the notice of shareholders who are owners of the business that for achieving such profit or loss or such states of affairs, in what manner the funds are brought in to the business and in what manner such funds are used in the business. By having such information shareholders can take informed decision regarding their investment in the business.

The Funds flow statement contain all the details of the financial resources which have become available during an accounting period and the ways in which those resources have been used up. This statement discloses the amounts raised from various sources of finance during a period and then explains how that finance has been used in the business. This statement is valuable in interpretation of the accounts.

A balance sheet sets out the financial position at a point of time, setting liabilities from which funds have been raised against assets acquired by the use of those funds. A funds flow statement analyses the changes which have taken place in the assets and liabilities during certain period as disclosed by a comparison of the opening and closing balance sheets. It is necessary in the fund flow statement that the funds generated from different liabilities and profits of the period must compensate with the application of such funds for acquiring different assets.

### **Concept of "Fund"**

The term "fund" has been defined and interpreted differently by different experts. The term "fund" refers to all the financial resources of the company. On the other hand, "fund" has been understood as "Cash" only. However, the most acceptable meaning of the "fund" is "working capital". Working Capital is the excess of Current Asset over Current Liabilities. While attempting to understand the concept of Funds Flow Analyses, we shall also abide by the popular definition of funds, meaning working capital.

### **Concept of Flow**

When "Funds" mean working capital, flow of funds refers to movement of funds which cause a change in working capital of the organisation.

## **7.3 Performa of Funds flow Statement (Vertical Format)**

The following performa statement of funds flow statement shows various sources from which funds are generated and various areas where such generated funds are applied.

Statement of Sources and Application of Funds of ABC Ltd. For the year ended 31<sup>st</sup> March-----

<b>Sources of Funds</b>		
Fund from Operation		XXX
Issue of Shares Capital		XXX
Raising of long-term loans		XXX
Receipts from partly paid shares, called up		XXX
Sales of non current (fixed) assets		XXX
Non- trading receipts, such as dividends received		XXX
Sale of Investment (long – term)		XXX
Decrease in Working Capital (as per schedule of changes in w.c.)		XXX
	<b>Total</b>	XXX
<b>Application or Uses of Funds:</b>		
Funds lost in Operations		
Redemption of Preference Share Capital		
Redemption of Debentures		
Repayment of long – term loans		
Purchase of non-current (fixed) assets		
Purchase of long-term Investments		
Non-trading payments		
Payments of dividends*		
Payment of tax*		
Increase in Working Capital (as per schedule of changes in w.c.)		
	<b>Total</b>	XXX

However, the Horizontal format is more commonly used.

**Funds flow statement of ABC Ltd. For the year ended.....**

Sources	Rs.	Applications	Rs.
Funds from Operations	XXX	Funds lost in Operation	XXX
Issue of Share Capital	XXX	Redemption of Preference Share capital	XXX
Issue of Debentures	XXX	Redemption of Debentures	XXX
Raising of long-term loans	XXX	Repayment of long-term loans	XXX
Receipts from partly paid shares, called up	XXX	Purchase of non-current (fixed) assets	XXX
Sale of non-current (fixed) assets	XXX	Purchase of long term Investments	XXX
Non-trading receipts such as dividends	XXX	Non-trading payments	XXX
Sale of long-term Investments	XXX	Payment of Dividends	XXX
Non Decrease in Working Capital	XXX	Payment of tax	XX
		Net Increase in Working capital	XXX
<b>Total</b>	<b>XXX</b>	<b>Total</b>	<b>XXX</b>

## 7.4 Statement of Changes in Working Capital

This statement follows the Statement of Sources and Application of Funds. The primary purpose of the statement is to explain the net change in Working Capital, as arrived in the Funds Flow Statement. In this statement, all Current Assets and Current Liabilities are individually listed. For all current assets and liabilities opening and closing balances will be compared and the result of which will be a part of statement showing changes in working capital which will ultimately become a part of fund flow statement.

### Statement of Changes in Working Capital

Particulars	Beginning of the year Rs.	End of the year Rs.	Working Increase Rs.	Capital Decrease Rs.
Current Assets	xxx	xxx		
Cash in hand	xxx	xxx	xxx	
Cash at Bank	xxx	xxx	xxx	
Bills Receivable	xxx	xxx		xxx
Sundry Debtors	xxx	xxx		xxx
Closing Stock	xxx	xxx	xxx	
Short term Investments	xxx	xxx	xxx	
Prepaid Expenses	xxx	xxx	xxx	
Other Current Assets	xxx	xxx		xxx
Total (A)	xxx	xxx		
Current Liabilities				
Bills payable			xxxx	
Sundry Creditors	xxxx	xxxx		xxxx
Outstanding Expenses	xxxx	xxxx		xxxx
Bank overdraft	xxxx	xxxx		xxxx
Short-term loans taken	xxxx	xxxx	xxxx	
Proposed dividend	xxxx	xxxx	xxxx	
Provision of tax	xxxx	xxxx		xxxx
Other Current liabilities	xxxx	xxxx	xxxx	
Total (B)	xxxx	xxxx		
Working Capital (A)- (B)	xxxx	xxxx		
Net Increase or Decrease in Working Capital	xxxx	xxxx	xxxx	xxxx
	xxxx	xxxx	xxxx	xxxx

**Increase in Current Assets** – The acquisition of current assets will result in funds outflow. The funds may be applied to finance an increase in stock, debtors etc.



- **Decrease in Current Liabilities** – Decrease or reduction in current liabilities also represent funds outflow. The funds may be applied for paying to creditors, Bills payable etc.
- **Decrease in Current Assets** – The reduction in current assets e.g. stock or debtors balances will result in release of funds to be applied elsewhere.
- **Increase in Current Liabilities** - Short-term funds raised during the period by any increase in the Current liabilities like trade creditors, bank overdraft and tax dues, means that these sources have lent more at the end of the year than at the beginning.

For the better understanding of the students, a practical example is used for finding changes in working capital but students should not that this example is used just for understanding otherwise practical problems will not be asked from this chapter.

- From the Balance Sheets of two years of XYZ Ltd. prepare a statement showing changes in working capital

Particulars	2000	2001
<b>Assets</b>		
Cash	60,000	94,000
Debtors	2,40,000	2,30,000
Stock	1,60,000	1,80,000
Land	1,00,000	1,32,000
	<b>5,60,000</b>	<b>6,36,000</b>
<b>Total</b>		
<b>Capital &amp; Liabilities</b>		
Share Capital	40,000	5,00,000
Creditors	1,40,000	90,000
Retained earnings	20,000	46,000
	<b>5,60,000</b>	<b>6,36,000</b>
<b>Total</b>		

Statement showing changes in working capital

Particulars	2000	2001	Increase (+)	Decrease (-)
<b>Current assets</b>				
Cash	60,000	94,000	34,000	-
Debtors	2,40,000	2,30,000	-	10,000
Stock	1,60,000	1,80,000	20,000	-
	<b>4,60,000</b>	<b>5,40,000</b>	-	-
<b>Current liabilities</b>				
Creditors	1,40,000	90,000	50,000	-
Working capital (CA – CL)	3,20,000	4,14,000	-	-
Net increase in Working Capital	94,000	-	-	94,000
	<b>4,14,000</b>	<b>4,14,000</b>	<b>1,04,000</b>	<b>1,04,000</b>

## 7.5 Sources of Funds

The funds inflow into the organisation will come from the following sources:

### Funds Generated From Operations

These are the funds generated from the main operations of the business for which the business is carried on. During the course of trading activity, a company generated revenue mainly in the form of sale proceeds and paid out for costs. The difference between these two items will be the amounts of funds generated by the trading operations. The funds generated from business operations are the results shown in profit or loss account for the period. Profit of certain period shown in profits and loss account may be treated as funds from operations for specific period but such profits also includes certain non cash expenses and non cash incomes the effect of which needs to be nullified. So the profit shown in profit and loss account needs to be adjusted and for that purpose an adjusted profit and loss account is prepared

Funds from operations can also be arrived at by preparing Adjustment Profit and Loss Account as follows:

A Performa Adjusted Profit and Loss Account is presented below:

### Adjusted Profit and Loss Account (Horizontal Preparation)

Particulars	Rs.	Particulars	Rs.
To Depreciation & Depletion or amortization of fictitious and intangible assets, such as : Goodwill, Patents, Trade Marks, Preliminary Expenses etc.	XXX	By Operating Balance (of P & L A/c.)	XXX
		By Transfers from excess provisions	
		By Appreciation in the value of fixed assets	XXX
		By Dividends received	XXX
To Appropriation of Retained Earnings, such as: Transfers to General Reserve, Dividend Equalization Fund, Sinking Fund, etc.	XXX	By Profit on sale of fixed or non-current assets	XXX
	XXX	By Funds from operations (balancing figure in case debit side exceeds credit side)	XXX
	XXX		
To Loss on Sale of any non-current or fixed asset	XXX		
To Dividends (including interim dividend)	XXX		
To Proposed Dividend (if not taken as a current liability)	XXX		
To Provision for taxation (if not taken as a current liability)	XXX		
To Closing balance of P & L A/c	XXX		
To funds lost in Operations (balancing figure, in case credit side exceeds the debit-side)	XXX		
	XXX		XXX

**CALCULATION OF FUNDS FROM OPERATIONS (Vertical Format)**

Particulars		Rs.
Closing Balance of P & L A/c or Retained Earnings (as given in the Balance Sheet)		xxx
Add: Non-fund and Non-operating items which have been already debited to P&L A/c:		xxx
(i)	Depreciation and Depletion	xxx
(ii)	Amortization of fictitious and Intangible Assets such as:	xxx
	(a) Goodwill	xxx
	(b) Patents	xxx
	(c) Trade marks	xxx
	(d) Preliminary Expenses	xxx
	(e) Discount on issue of Shares, etc.	xxx
(iii)	Appropriate of Retained Earnings, such as:	xxx
	(a) Transfer of General Reserve	xxx
	(b) Dividend Equalization fund	xxx
	(c) Transfer to Sinking Fund	xxx
	(d) Contingency Reserve, etc	xxx
(iv)	Loss on Sale of any non-current (fixed) assets such as :	xxx
	(a) Loss on sale of land and building	xxx
	(b) Loss on sale of machinery	xxx
	(c) Loss on sale of furniture	xxx
	(d) Loss on sale of long-term investments, etc.	xxx
(v)	Dividends including:	xxx
	(a) Interim Dividend	xxx
	(b) Proposed dividend (if it is an appropriation of profits and not taken as current liability)	xxx
		xxx
(vi)	Provision for Taxation (if it is not taken as Current Liability)	xxx
(vii)	Any other non-fund/non-operating items which have been debited to P/L	xxx
<b>Total</b>	<b>(A)</b>	xxx
		xxx
		xxx
Less: Non-fund or Non-operating items which have already been credited to P&L A/c		xxx
(i)	Profit or Gain from the sale of non-current (fixed) assets such as:	xxx
	(a) Profit on sale of land and building	xxx
	(b) Profit on sale of plant & machinery	xxx
	(c) Profit on sale of long term investments, etc.	xxx
		xxx

(ii)	Appreciation in the value of fixed assets, such as increase in the value of land if it has been credited to P&L A/c		
(iii)	Dividends Received		
(iv)	Excess Provision retransferred to P&L A/c or written off		
(v)	Any other non-operating item which has been credited to P&L A/c		
(vi)	Opening balance of P&L or Retained earnings 9as given in the balance sheet)		
Total	(B)		
Fund generated by operations (A) – (B)			

**For the better understanding of the students, a practical example is used for finding funds from operation but students should note that this example is used just for understanding otherwise practical problems will not be asked from this chapter.**

Calculate funds from operations with the help of the following Profit & Loss A/c of ABC Ltd.

Profit & Loss A/c of ABC Ltd. For the year ending 31<sup>st</sup> March,2000.

Particulars	Rs.	Particulars	Rs.
To Expenses paid and outstanding	1,50,000	By Gross Profit	2,25,000
To Depreciation	35,000	By Gain of sale of land	30,000
To Loss on sale of machine	2,000		
To Discount	100		
To Goodwill	10,000		
To Net Profit	57,900		
	<b>2,55,000</b>		<b>2,55,000</b>

Calculation of funds from operations of ABC Ltd.

(Rs.)

Net profit (as given)		57,900
Add: Non-fund or non-operating items which have been debited to P&L A/c		
Depreciation	35,000	
Loss on sales of machine	2,000	
Goodwill	10,000	47,000
		<b>1,04,900</b>
Less: Non-fund or non-operating items which have been credited to P&L A/c	30,000	30,000
Gain on sale of land		74,900
Funds from operations		

### Funds Raised From Shares, Debentures and Long-term Loans

Apart from funds from operations, Long-term funds are injected into the business during the year by issue of new shares or debentures and by raising long-term loans. If any premium is collected, that is also form part of funds raised from the above said sources of finance.

### **Sale of Fixed Assets and long-term Investments**

Any amount generated from sale of fixed assets or long-term investments is a source of funds. While preparation of the Funds flow statement the gross sale proceeds from sale is taken as source of funds. Any profit of loss arising from such sale is adjusted in the funds generated from operations.

## **7.6 Application of Funds**

Application of funds may take place in following manners:

- **Repayment of Preference Capital or Debenture or Long -Term Debt:**  
This represents the application of funds for redemption of preference shares or debentures, repayment of long-term loans previously generated to run the business.
- **Purchase of Fixed Assets or Long – Term Investments:**  
The funds used to purchase long – term assets are usually the most significant application of funds during the year. This group includes capital expenditures on lands, buildings, plant and machinery, Furniture and Fittings, Vehicles and long – term investments outside the business.
- **Distribution of Dividends and Payment of Taxes:**  
The dividends distributed to the shareholders and tax paid during the year is also applications of funds from the firm.
- **Loss From Operation:**  
Losses made in the trading activities uses the funds. If costs exceed revenue, a cash outflow will be experienced. This can be found out by preparing adjusted profit and loss account.

## **7.7 Funds Flow Statement vs. Profit and Loss Account**

Following are the main differences between a Funds Flow Statement and a Profit and Loss Account:

- **Objective –** The main objective of preparing a fund Flow Statement is to ascertain the funds generated from operations and from other sources and to know the uses of such funds within the firm for different purposes.

The main objective of preparing a Profit and Loss Account is to ascertain the net profit earned/loss incurred by the company out of the business operations at the end of a particular period.

- **Basis –** The Funds Flow Statement is prepared based on the financial statements of two consequent years. A Profit and Loss Account is prepared on the basis of Nominal accounts of the current year.

**Usefulness** – The Funds Flow Statement is mainly useful for creditors and management. Creditors can know where the funds deployed in the business, generated from them. Management can use fund flow statement for framing different policies. The profit and loss account is useful not only to creditors and management but also to the shareholders and investors. Shareholders and investors can make informed decisions regarding their investments.

**Type of Data Used** – The funds Flow Statement takes into account not only the funds available from trading operations but also the funds available from other sources like issue of share capital/debentures, sale of fixed assets etc. Whereas the profit and loss account uses only income and expenditure transactions relating to trading operations of a particular period.

For instance, when shares are issued for cash, the same is shown in funds flow statement as a source of funds whereas in profit and loss account it is not shown as income.

So the fund flow statement uses more data related with capital and revenue transactions both where as profit and loss account use data related only with revenue transactions.

**Legal Necessity** – Preparation of Funds Flow Statement is not a statutory obligation and is left to the discretion of management. But it is desirable to prepare fund flow statement.

Preparation of Profit and Loss Account is a statutory obligation.

## 7.8 Funds Flow Statement vs. Balance Sheet

Following are the main difference between a Funds Flow Statement and Balance Sheet:

**Objective** – The Funds Flow Statement is prepared to know the total generation of funds from different sources and their use in a year. Balance Sheet is prepared to know states of affairs of a company as on a particular date.

**Basis** – The Funds Flow Statement is prepared with the help of the balance sheets of two consecutive years. The balance sheet is prepared on the basis of different account balances in the ledger.

**Usefulness** – Funds Flow Statement is useful mainly to management and to the creditors.

A Balance Sheet is useful not only for the management and creditors but also to the shareholders, outsiders and Government agencies etc.

**Treatment of Current Assets and Current Liabilities** – In Funds Flow Statement current assets and Current Liabilities are used to find out increase or decrease in working capital.

In Balance Sheet, current assets and current liabilities are shown on assets and liabilities side respectively to make the presentation of states of affairs.

represents the cost of goods produced in the accounting year, not the cost of goods sold during the same period. Gross profit is the difference between net sales and cost of goods sold.

Operating expenses consist of general administrative expenses, selling and distribution expenses, and depreciation.

Operating profit is the difference between gross profit and operating expenses.

Non-operating surplus represents gains arising from sources other than normal operations of the business. Its major components are income from investments and gains from disposal of assets. Likewise, non-operating deficit represents losses from activities unrelated to the normal operations of the firm.

Profit before interest and taxes is the sum of operating profit and non-operating surplus/deficit.

Interest is the expense incurred for borrowed funds, such as term loans, debentures, public deposits, and working capital advances.

Profit before tax is obtained by deducting interest from profits before interest and taxes.

Tax represents the income tax payable on the taxable profit of the year.

Profit after tax is the difference between the profit before tax and tax for the year.

Dividends represent the amount earmarked for distribution to shareholders.

Retained earnings are the difference between profit after tax and dividends.

## 4.5 Finance Topics

The important topics in finance may be keyed to the balance sheet and the profit and loss account.

### Balance Sheet Related Finance Topics

The finance topics that may be keyed primarily to the balance sheet are:

- What should be the capital structure of the firm?
- What is the cost of capital of the firm?
- What should be the working capital financing policy of the firm?
- How should capital budgeting decisions be taken?
- How may cash management be made more effective?
- What is a sensible framework for receivables management?
- How should the firm develop its inventory policy?

### Profit and Loss Account Related Finance Topics

The principal finance topics which may be keyed primarily with reference to the profit and loss account are:

- What is the revenue risk of the firm?
- What is the gross profit margin of the firm?
- Is the firm's depreciation policy reasonable?



- **Legal Necessity** – Preparation of a Funds Flow Statement is at the discretion of the management but it is desirable to prepare fund flow statement. Preparation of the Balance Sheet is a statutory obligation.

## 7.9 Uses of Funds Flow Statement

- **To Determine Financial Consequences of Operations** – Funds Flow Analysis determines the financial consequences of business operations. It helps in ascertaining the reasons for the existing situation and answering certain questions which cannot be found out either from profit and loss account or balance sheet. Examples are stated below.

- There may be sufficient cash in the business. But how such high liquidity is existing, is not known.
- The profit earned by the firm from different sources is not easily understood by the management.
- The company may be incurring losses but its liquidity position is sound or the firm will be investing in fixed assets despite losses.
- The firm may declare dividend in spite of losses or low profits.
- Some time it may happen that company is having good profits but the liquidity position is not satisfactory.

The reason for such positions can be ascertained with the help of funds flow statement.

- **Working Capital Utilization** – The fund flow statement helps the management in assessing whether the optimum working capital was available in the business or not and whether it was effectively used to the maximum extent in business operations or not. The statement also depicts the surplus or deficit in working capital than required. This helps the management to use the surplus working capital profitably or to locate the sources of additional working capital in case of scarcity.

- **To add Securing New Finances** – It helps the creditors of the business for considering the company's request for new term loan. Creditors of the business can make their decision regarding giving loan or credit to the business.

- **Helps in Allocation of Financial Resources** – Funds flow statement helps the management in taking decisions regarding allocation of the limited financial resources among different projects on priority basis. In that manner the management can make the best possible use of available scarce resources.

- **Helps in Evaluation of Operational Issues** – The statement, functions as an analytical guide for evaluating operational issues. The statement enable the management to understand the study of trends of success or failure of operations and available resources.

## 7.10 Drawbacks of Funds Flow Analysis

- **Historical Nature** – The funds flow statement is historical in nature like any other financial statement. It does not predict or estimate the sources and application of funds for the near future. It can prepare only in respect of transactions already incurred and transactions already incurred cannot be changed.
- **New Items are Not Disclosed** – The funds flow statement does not disclose any new items which affect the financial position of the business. The funds flow statement simply rearranges the data given in conventional financial statement and schedules. It can be treated as representation of financial transaction in a different manner which is already provided in profit and loss account and balance sheet.
- **Not Relevant** – A study of changes in cash is more relevant than a study of changes in funds for the purpose of managerial decision making. So study of cash flow statement is more desirable than study of funds flow statement and that's why it has become compulsory for every company to prepare Cash Flow statement where as it is not compulsion to prepare Fund Flow statement.
- **Not Foolproof** – Fund flow statement is not prepared from the primary data it is prepared from the secondary data which is already given in profit and loss account of the year and the balance sheet of the year so if there is any defect or wrong data is used in preparation of profit or loss account or balance sheet then it will also affect the preparation of fund flow statement. The funds flow statement is prepared from the data provided in the balance sheet and profit and loss account. Hence, the defects in financial statements will be carried over to funds flow statement also.

For the better understanding of the students, a practical example is used for preparation of fund flow statement but students should note that this example is used just for understanding otherwise practical problems will not be asked from this chapter.

\*From the following Balance Sheet of Gokul Ltd., as on 31<sup>st</sup> December, 2000 and 31<sup>st</sup> December 2001, you are required to prepare a funds flow statement.

Liabilities	2000	2001	Assets	2000	2001
Share capital	4,00,000	5,00,000	Land & Building	4,00,000	4,80,000
General reserve	80,000	1,40,000	Machinery	3,60,000	2,60,000
P&L A/c	64,000	78,000	Stock	2,00,000	2,52,000
Bank loan(Long Term)	3,20,000	80,000	Debtors	1,60,000	1,28,000
Cr.itor	3,00,000	2,60,000	Cash at Bank	1,04,000	18,000
Provision for Taxation	80,000	80,000			
		11,38,000		12,24,000	11,38,000

Additional information:

(a) During the year ended 31<sup>st</sup> December 2001 dividend of Rs. 84,000 was paid.

- (b) Assets of another company were purchased for a consideration of Rs. 1,00,000 payable by the issue of shares. The assets included Land and Buildings of Rs. 50,000 and stock of Rs. 50,000.
- (c) Depreciation written off on machinery is Rs. 24,000 and on Land and Buildings is Rs. 45,000.
- (d) Income tax paid during the year was Rs. 70,000.
- (e) Additions to Buildings were for Rs. 75,000.

**Schedule showing changes in working capital**

Particulars	2000	2001	Increase	Decrease
<b>Current assets:</b>				
Cash at Bank	1,04,000	18,000		86,000
Debtors	1,60,000	1,28,000		32,000
Stock	2,00,000	2,52,000	52,000	
	(i) 4,64,000	3,98,000		
<b>Current liabilities</b>				
Creditors	(ii) 3,00,000	2,60,000	40,000	
Working Capital	(i) - (ii) 1,64,000	1,38,000		
Decrease in Working Capital		26,000	26,000	
	1,64,000	1,64,000	1,18,000	1,18,000

**Fund flow statement for the year ending 31<sup>st</sup> Dec. 2001**

Sources	Rs.	Application	Rs.
Issue of Shares	50,000	Purchase of Land & Buildings	75,000
Sale of Machinery	76,000	Bank Loan paid	2,40,000
Funds from operations	3,17,000	Dividend paid	84,000
Decrease in Working Capital	26,000	Income-tax paid	70,000
	4,69,000		4,69,000

**Working notes:**

**Provision for Taxation A/c**

Particulars	Rs.	Particulars	Rs.
To Cash	70,000	By Balance b/d	60,000
To Balance b/d	80,000	By Adjusted P&L a/c	90,000
	1,50,000		1,50,000

**Machinery a/c**

Particulars	Rs.	Particulars	Rs.
To Balance b/d	3,60,000	By Adjusted P&L A/c	24,000
		By Sale of machinery	76,000
		By Balance c/d	2,60,000
	3,60,000		3,60,000

**Land & Buildings A/c**

Particulars	Rs.	Particulars	Rs.
To Balance b/d	4,00,000	By Adjusted P&L A/c	45,000
To Share Capital	50,000	By Balance b/d	4,80,000
To Cash	75,000		
	5,25,000		5,25,000

**General Reserve A/c**

Particulars	Rs.	Particulars	Rs.
To Balance c/d	1,40,000	By Balance b/d	80,000
		By Adjusted P&L A/c	60,000
	1,40,000		1,40,000

**Adjusted Profit and Loss A/c**

Particulars	Rs.	Particulars	Rs.
To Machinery	24,000	By Opening Balance	64,000
To Land & Buildings	45,000	By funds from operations	3,17,000
To Provision for tax	90,000		
To General Reserve	60,000		
To Dividends paid	84,000		
To Closing balance	78,000		
	3,81,000		3,81,000

**7.11 Exercise**

**Answer the following questions:**

1. What is fund? Explain the concept of fund flow analysis?
2. How a fund flow analysis differs from profit and loss account?
3. How a fund flow analysis differs from Balance Sheet?
4. Explain the benefits of Fund Flow Statement?
5. Explain the limitations of Fund Flow Statement?
6. Preparation of fund flow statement is desirable – Explain the sentence.

## **Unit : 8: Cash Flow Analysis**

### **Introduction:**

Cash flow statement can be treated as an analytical tool in financial management which can analyze cash inflows and outflows of specific period which can be useful for understanding liquidity position of an enterprise. Now a days, management or shareholders or creditors of the business are not only interested in knowing profitability of the business moreover they are interested in knowing the liquidity position of the business which is provided by cash flow statement. So we can say that cash flow statement is complementary to profit and loss account and balance sheet as it provides information about the cash receipts and payments of a firm for a given period, which is not given in profit and loss account and balance sheet. It provides valuable information regarding how the cash and cash equivalents were generated through out the year and in what manner they were used. The economic decision that are taken by users require an evaluation of the ability of an enterprise to generate cash and cash equivalents and the timing and certainty of their generation. The statement deals with the provision of information about the historical changes in cash equivalents of an enterprise by means of a cash flow statement which classifies cash flows during the period from operating, investing and financing activities.

## Structure of the Chapter

- 8.1 Objectives
- 8.2 Classification of Cash Flows
  - 8.2.1 Cash From Operations:
  - 8.2.2 Cash Flows from Investing Activities:
  - 8.2.3 Cash Flows from Financing Activities
- 8.3 Performa Cash Flow Statement of XYZ Ltd.
- 8.4 Funds Flow Statement vs. Cash Flow Statement
- 8.5 Uses of Cash Flow Statement
- 8.6 Limitation of Cash Flow Analysis
- 8.7 Exercise

### 8.1 Objectives

At the end of this chapter the student will learn about –

- Understanding of cash flow statement
- Different inflows and outflows in cash flow statement
- Preparation of cash flow statement
- Utility of cash flow statement
- Limitation of cash flow statement

### Meaning of Certain Terms

- Cash flows are inflows and outflows of cash and cash equivalents. It means the movement of cash into the organisation and movement of cash out of the organisation.
- Cash equivalents are short –term, highly liquid investments that are readily convertible into known amount of cash and which are subject to an insignificant risk of changes in value. Examples of cash equivalents are, treasury bills, commercial paper etc.
- Cash comprises cash on hand as well as demand deposit with banks.

Cash flow is essentially the movement of money into and out of Organization; it's the cycle of cash inflows and cash outflows that determine Organization' solvency.

Cash flow analysis is the study of the cycle of Organization' cash inflows and outflows, with the purpose of maintaining an adequate cash flow for Organization, and to provide the basis for cash flow management.

Cash flow analysis involves examining the components of Organization that affect cash flow, such as accounts receivable, inventory, accounts payable, and credit terms. By performing a cash flow analysis on these separate components, you'll be able to more easily identify cash flow problems and find ways to improve your cash flow.

A quick and easy way to perform a cash flow analysis is to compare the total unpaid purchases to the total sales due at the end of each month. If the total unpaid purchases are greater than the total sales due, you'll need to spend more cash than you receive in the next month, indicating a potential cash flow problem

## 8.2 Classification of Cash Flows

The cash flow statement during a period is classified into three main categories of cash inflows and cash outflows:

### - Cash Flows from Operating activities

These inflows and outflows of cash can be generated from day to day operations of the business. These type of cash outflow or inflow occur from routine activities of the business for which the business was started. Operating activities are the principal revenue-producing activities of the enterprise and other activities are investing and financing activities. Operating activities include cash effects of those transactions and events that enter into the determination of new profit or loss.

Following are examples of cash flows from operating activities:

- ❑ Cash payments or refunds of income-taxes unless they can be specifically identified with financing and investing activities.
- ❑ Cash payment to suppliers for goods and services
- ❑ Cash payments to and on behalf of employees
- ❑ Cash receipts from royalties, fees, commissions, and other revenue
- ❑ Cash receipts and payments of an insurance enterprise for premiums and claims, annuities and other policy benefits
- ❑ Cash receipts from the sale of goods and the rendering of services.

### 8.2.1 Cash From Operations:

Cash from operations can be found out by using following method.

Funds from Operations (as learnt in the Funds Flow Statement)		XXX
Add: Increase in Current Liabilities (excluding Bank Overdraft)	XXX	
Decrease in Current Assets (excluding cash & bank balance)	XXX	XXX
Less : Increase in Current Assets (excluding cash & bank balance)	XXX	XXX
Decrease in Current Liabilities (excluding bank overdraft)	XXX	XXX
<b>Cash from Operations</b>		<b>XXX</b>

## **8.2.2 Cash Flows from Investing Activities:**

Investing activities are the acquisition and disposal of long – term assets and other investment not included in cash equivalents. In other words, investing activities include transactions and events that involve the purchase and sale of long – term productive asset (e.g. land, building, plant and machinery etc.) not held for re-sale and other investments. Such type of transactions do not occur frequently or every year so the quantum of transactions from such type of activities are very less in comparison with operating activities. Such transactions occur mainly at the beginning of the business or at the time of expansion of the business.

The following are examples of cash flows arising from investing activities:

- Cash receipts from the repayment of advances and loans made to third parties
- Cash receipts from disposal of shares, warrants, or debt instruments of other enterprises and interests in joint ventures
- Cash payments to acquire shares, warrants, or debt instruments of other enterprises and interests in joint ventures.
- Cash receipts from disposal of fixed assets.
- Cash advances and loans made to third parties
- Cash payments to acquire fixed assets

## **8.2.3 Cash Flows from Financing Activities**

Financing activities are activities that result in changes in the size and composition of the owners' capital (including preference share capital in the case of a company) and borrowings of the enterprise. Such transactions raised normally when new capital is deployed in the business or when there is redemption of capital.

Following are the examples of cash flows arising from financing activities:

- Payment of dividend.
- Cash repayments of amounts borrowed
- Cash proceeds from issuing debentures, loans notes, bonds and other short – term borrowing
- Cash proceeds from issuing shares or other similar instruments



### 8.3 Performa Cash Flow Statement of XYZ Ltd. For the year ending..... (Horizontal Preparation)

Source	RS.	Application	RS.
Opening Balance		Opening Balance	
Cash	XXX	Bank Overdrafts	
Bank	XXX	<b>Cash Outflows</b>	
<b>Cash Inflows</b>		Redemption of Redeemable	XXX
Cash from Operations	XXX	Preference Shares	XXX
Issue of Shares	XXX	Redemption of Debentures	XXX
Raising of Long Term Loans/ Debentures	XXX	Repayment of Loans	XXX
Sale of Fixed Assets and Investments	XXX	Non Operating Expenses	XXX
Non Trading Receipts	XXX	Closing Balance	
		Cash	XXX
		Bank	XXX
	XXX		XXX

**Note:** The cash Flow Statement can also be presented in the vertical form.

Now, it has become compulsion for every company to prepare cash flow statement and such statement will be prepared as per the Accounting Standard – 3 issued by Institute of Chartered Accountants of India.

### 8.4 Funds Flow Statement vs. Cash Flow Statement

Both funds flow and cash flow statement use past transaction for analysis. The difference between these two statement are given below:

- Funds flow statement tallies the funds generated from various sources with various uses to which they are put. Cash flow statements start with the opening balance of cash and reach to the closing balance of cash by proceeding through sources and uses.
- Funds flow statement analysis the sources and application of funds of long term nature and the net increase or decrease in long term funds will be reflected on the working capital of the firm. The cash flow statement will only considered the increase or decrease in current assets and current liabilities in calculating the cash flow of funds from operations.
- Funds Flow statement is based on the mercantile or accrual account systems. In case of preparation cash flow statement only those transactions effecting the cash or cash equivalents is only taken into consideration.
- Funds Flow analysis is prepared for long range financial planning. Cash flow analysis is prepared for identifying and correcting the current liquidity problems of the firm.
- Funds Flow statement analysis is a broader concept, it takes into account both long term and short term funds into account in analysis. But cash flow statement only deal with the current assets and current liabilities of the balance sheet.

- It is not compulsory for every company to prepare Fund Flow Statement but it is compulsion on the part of every company to prepare Cash Flow Statement.

## 8.5 Uses of Cash Flow Statement

Tracking cash flow differs from tracking income and expenses. Cash flow analysis looks at when you actually receive or disburse money. Note that income is seldom received at the moment it's earned because employers pay weekly, biweekly, or monthly. Similarly, buying with credit permits paying for goods or services after you receive them, sometimes long after. Surprisingly, it is possible to earn more than you spend and still have a negative cash flow.

**Example(s):** X, a popular family dentist, has a large, successful practice. Her success leads her to expand and modernize her office suite, a costly proposition. But her patients, feeling the impact of a slowing economy, are becoming ever later in their payments. While X has earned sufficient income to pay for her office renovation, she is falling short of the cash needed to make her monthly payments.

Lets understand its uses in different areas.

**Helps in Efficient Cash Management –** One of the most important functions of the management is to manage company's cash resources in such a way that adequate cash is available to meet the liabilities. A projected cash flow statement enable the management to plan and co-ordinate the financial operations of the business efficiently.

Management of cash is essential for efficient and smooth running of the business. It may even happen that due to improper cash management scarcity of cash may arise and due to that many profitable opportunities may be lost.

**Helps in Internal Financial Management –** The cash flow analysis helps the management in exploring the possibility of repayment of long-term debts which depends upon the availability of cash. So if the repayment of debt is done as per schedule it may help in reducing interest burden as well as it can create a good impression for the firm.

**Discloses the Movement of Cash –** The cash flow statement discloses the increase or decrease in cash and the reasons therefore. Sometimes it may happen that the profitability position of the business may be good but the liquidity position may not be good. It helps the finance Manager in explaining how the company is short of cash despite higher profits and vice versa.

**Helps to Determine the Likely Flow of Cash:** With the help of projected cash flow statement, the management can determine the likely inflow or outflow of cash from operation and the amount of cash required to be raised from other sources to meet the future needs of the business. The management can understand about the need of cash resources at different time periods.

**Supplemental to Funds Flow Statement –** Cash flow analysis supplement the analysis provided by funds flow statement as cash is a part of the working capital.

- What is the degree of operating leverage?
- What is the degree of financial risk?
- How much is the scope for tax planning?
- What is the return on equity?
- What should be the dividend policy of the firm?

#### **4.6 Sources and Uses of Funds Statement**

The sources and uses of funds statement, also called the statement of changes in financial position, shows the sources and uses of funds during a given accounting period. This statement, drawing on the information contained in the balance sheet and the profit and loss account, provides insights into the movement of funds. Such analysis helps in answering questions like: How much funds have been generated from the operations of the business? Has the liquidity position of the firm improved? How are funds defined? Funds are defined as working capital or as cash. We discuss the development of sources and uses of funds statement first on the basis of working capital and then on the basis of cash.

##### **Sources and Uses of Funds Statement: Working Capital Basis**

The sources and uses of funds statement, on working capital basis, presents (i) the sources of working capital, (ii) the uses of working capital, and (iii) the net change in working capital. Here working capital is defined as the net working capital which is simply the difference between current assets and current liabilities.

##### **Sources of Working Capital**

The sources of working capital are discussed below:

- The operations of the business generate revenues and entail expenses. Revenues increases working capital; expenses, other than depreciation and other amortisations, decrease working capital. Hence, the working capital increase on account of operations is equal to : profit after tax + depreciation.
- An issue of share capital results in an inflow of working capital because it brings a cash inflow or an increase in short-term receivable.
- When a long-term loan is taken there is an increase in working capital because of cash inflow. A short-term loan, however, does not have any effect on working capital. A short-term loan increases a current asset (cash) and a current liability (short-term loan) by the same amount, leaving the working capital position unchanged.
- When a fixed asset or a long-term investment or any other non-current asset is sold there is a working capital inflow represented by cash or short-term receivables.

##### **Uses of Working Capital**

The uses of working capital are discussed below:

- The payment of dividend results in a cash (working capital) outflow.
- The repayment of long-term loans, debentures, and other long-term liabilities involves cash outflow and hence a use of working capital. The repayment of a current liability, it may be noted, does not affect the working capital position because it entails an equal reduction in current liabilities and current assets.

**Better Tool of Analysis** – For payment of liabilities which are likely to be matured in the near future, cash is more important than the working capital. As such, cash flow statement is certainly a better tool of analysis than funds flow statement for short term analysis.

## 8.6 Limitation of Cash Flow Analysis

- **Misleading Inter-industry Comparisons** – Cash flow statement does not measure the economic efficiency of one company in relation to another. Usually a company with heavy capital investment will have more cash inflows. Therefore, inter-industry comparison of cash flow statement may be misleading.
- **Misleading Comparison Over a Period of Time** – Just because the company's cash flow has increased in the current year, a company may not be better off than the previous year. Thus, the comparison over a period of time can be misleading.
- **Misleading Inter-firm Comparison** - The terms of purchases and sales will differ from firm to firm. Moreover, cash inflow does not always mean profit. Therefore, inter-firm comparison of cash flows may also be misleading.
- **Influenced by Changes in Management Policies** – The cash balance as disclosed by the cash flow statement may not represent the real liquid position of the business. The cash can be easily influenced by purchases and sales policies, by making certain advance payments or by postponing certain payments. So in such circumstances projected cash flow statement may not be useful.
- **Cannot be Equated with Income Statement** – Cash flow statement cannot be equated with the income statement. An income statement takes into account both cash as well as non-cash items. Hence net cash flow does not necessarily mean net income of the business.
- **Not a Replacement of Other Statements** – Cash flow statement is only a supplement of funds flow statement and cannot replace the income statement or the funds flow statement as each one has its own function or purpose of preparation. So it can not supplement but supplant the other statements.

Though cash flow statement has its own limitations, it is compulsion on the part of every company to make it and disclose it to its shareholders in the Annual Report presented to the shareholders every year.

For the better understanding of the students, a practical example is used for preparation of cash flow statements but students should note that this example is used just for understanding otherwise practical problems will not be asked from this chapter.

- The following are the Balance Sheets of Master Ltd. for the year 31<sup>st</sup> December 2000 and 2001:

Particulars	2000	2001
	(Rs.)	(Rs.)
<b>Liabilities:</b>		
Share Capital	2,00,000	3,00,000
Profit and Loss Account	1,20,000	1,60,000
Sundry Creditors	60,000	50,000
Provision for taxation	40,000	50,000
Proposed Dividend	20,000	30,000
	<b>4,40,000</b>	<b>5,90,000</b>
<b>Assets:</b>		
Fixed Assets	1,60,000	2,00,000
Add: Additions	40,000	60,000
	<b>2,00,000</b>	<b>2,60,000</b>
Less: Depreciation	18,000	24,000
	<b>1,82,000</b>	<b>2,36,000</b>
Investments	8,000	16,000
Stock	1,60,000	2,18,000
Debtors	60,000	80,000
Cash	30,000	40,000
	<b>4,40,000</b>	<b>5,90,000</b>

**Additional information:**

- Taxes Rs. 44,000 and dividend Rs. 24,000 were paid during the year 2001.
  - The profit for the year 2001 before depreciation Rs. 1, 34,000.
- Prepare a cash flow statement from the above given information in horizontal format.

**Cash Flow Statement for the year ending 31<sup>st</sup> Dec. 2001  
(Horizontal Format)**

Sources	Rs.	Applications	Rs.
Opening balance of Cash (1-1-2001)	30,000	Cash outflows:	
Cash inflows:	1,00,000	Purchase of fixed assets	60,000
Issue of share capital	1,34,000	Taxes paid	44,000
Cash from operations		Dividend paid	24,000
		Purchase of investments	8,000
		Increase in stock	58,000
		Increase in debtors	20,000
		Decrease in creditors	10,000
		Closing balance of cash	40,000
	<b>2,64,000</b>		<b>2,64,000</b>

Working notes:  
Fixed Assets a/c

Particulars	Rs.	Particulars	Rs.
To Balance	2,00,000	By Balance c/d	2,60,000
To Bank a/c (Balancing figure)	60,000		
	2,60,000		2,60,000

Investments a/c

Particulars	Rs.	Particulars	Rs.
To Balance b/d	8,000	By Balance c/d	16,000
To Bank (Balancing figure)	8,000		
	16,000		16,000

Provision for taxation a/c

Particulars	Rs.	Particulars	Rs.
To Bank	44,000	By Balance c/d	40,000
To Balance c/d	50,000	By P&L a/c	54,000
	94,000		94,000

Proposed dividends a/c

Particulars	Rs.	Particulars	Rs.
To Bank	24,000	By balance b/d	20,000
To Balance c/d	30,000	By P&L a/c	34,000
	54,000		54,000

Calculation of cash from operations

	Rs	
Profit and loss a/c balance on (31-12-2001)		1,60,000
Add: Non-cash and non-operating items already debited to Profit & Loss a/c:		
Depreciation on fixed assets	6,000	
Proposed dividend	34,000	
Provision for taxation	54,000	
		2,54,000
Less: Non-cash and non-operating items which have already been credited to P&L a/c:		
Profit and Loss a/c on 1-1-2001	1,20,000	1,20,000
Cash operating profit		1,34,000

Following are the summarized balance sheets of Super Ltd., as on 31st March, 2000 and 2001

Particulars	2000	2001
<b>Liabilities</b>		
Share Capital	2,00,000	2,50,000
General Reserve	50,000	60,000
Profit & Loss	30,500	30,600
Bank Loan (Long Term)	70,000	-
Sundry Creditors	1,50,000	1,35,200
Provision for taxation	30,000	35,000
	<b>5,30,500</b>	<b>5,10,800</b>
<b>Assets</b>		
Land & Buildings	2,00,000	1,90,000
Machinery	1,50,000	1,69,000
Stock	1,00,000	74,000
Sundry Debtors	80,000	64,200
Cash	500	800
Bank	-	7,800
Good will	-	5,000
	<b>5,30,500</b>	<b>5,10,800</b>

Additional information:

During the year ended 31<sup>st</sup> March 2001

- (i) Dividend of Rs. 23,000 was paid.
- (ii) Assets of another company were purchased for a consideration of Rs. 50,000 payable in shares. The following assets were purchased:  
Stock: Rs. 20,000; Machinery: Rs. 25,000
- (iii) Machinery was further purchase for Rs. 8,000.
- (iv) Depreciation written off on machinery Rs. 12,000 and
- (v) Income-tax provided during the year Rs. 33,000; Loss on sale of machinery Rs. 200 was written off to general reserve.

Prepare a cash flow statement in a vertical format.

Working Notes:  
Machinery a/c

Particulars	Rs.	Particulars	Rs.
To Balance b/d	1,50,000	By Loss of Machine	200
To Share Capital a/c (Purchase by issue of shares)	25,000	By Depreciation	12,000
To Cash (purchase of machinery)	8,000	By Cash (sale of machine)	1,800
		By Balance c/d	1,69,000
	<b>1,83,000</b>		<b>1,83,000</b>

Provision for Taxation a/c

Particulars	Rs.	Particulars	Rs.
To Bank (Tax paid)	28,000	By Balance b/d	30,000
To Balance c/d	35,000	By Profit & Loss A/c (Tax provision)	33,000
	63,000		63,000

Calculation of Profit made during the year

Balance as at 31-3-2001		30,600
Add: Appropriation made during the year:		
1. Proposed dividend	23,000	
2. Transfer to General Reserve		
Balance 1-4-2001		
60,000		
Less: Closing balance as on 31-3-2000		
50,000	10,200	
	33,000	66,200
10,000		
Add: loss on sale of Machinery		
200		
3. Income Tax	12,000	
	10,000	22,000
Add: non cash items		1,18,800
1. Depreciation – Machinery		30,500
2. Depreciation – Land & Building		88,300
Less: Balance as at 1-4-2000		
Profit made during the year from operations		

Calculation of cash from operations

Funds from operations		88,300
Add: Decrease in current Assets:		
Opening Stock	1,00,000	
Closing stock		
74,000	54,000	
Less: Purchase by issue of shares		
20,000	46,000	
	15,800	61,800
Decrease in stock		1,50,100
Debtors (80,000 – 64,200)		14,800
		1,35,300
Less: decrease in current liability creditors		
Cash from creditors		



**Cash flow statement of Super Ltd. as on 31<sup>st</sup> March, 2001**

Cash in hand and at Bank on 1-4-2000		500
<b>Add: Sources of Cash</b>		
Cash from Operation	1,35,300	
Sale of Machinery	1,800	1,37,100
<b>Total cash available for use</b>		1,37,600
<b>Less: Uses</b>		
Payment of Long Term loan	70,000	
Purchase of machinery for cash	8,000	
Payment of dividend	23,000	
Payment of tax	28,000	1,29,000
<b>Cash in hand and at Bank as on 31-3-2001 (7800+800)</b>		8,600

**8.7 Exercise**

**Answer the following questions:**

1. What is cash flow statement? Explain the three major heads for inflows and outflows in cash flow statement?
2. Explain the need and importance of preparing cash flow statement?
3. Give the difference between fund flow statement and cash flow statements?
4. What are the benefits of cash flow statement?
5. What are the limitations of cash flow statement?

## **Unit : 9:**

### **Leasing and Hire-Purchase**

#### **Introduction:**

For running a business two types of investments are needed, fixed investment in the business and working capital investment in the business. Fixed investment will block the amount in business for certain periods, which is comparatively a long period. Sometimes it may happen that the owner of the business may not have sufficient funds for running the business in such circumstances he may be finding some alternatives which can help him for running the business with limited funds. Leasing and hire purchase are some of such alternatives, which helps the owner of the business to run the business with limited funds. Leasing and hire-purchase have emerged as a supplementary source of intermediate to long-term finance. They are provided mainly by non-banking financial companies, financial institutions, and other organisations.

## **Structure of the Chapter:**

- 9.1 Objectives:**
- 9.2 Types of Lease Arrangements**
  - 9.2.1 Operating Leases**
  - 9.2.2 Financial Leases**
  - 9.2.3 Sale and Leaseback:**
  - 9.2.4 Leveraged Lease:**
- 9.3 Mechanics of Leasing**
  - 9.3.1 Legal Aspects of Leasing**
  - 9.3.2 Typical Contents of a Lease Agreement**
  - 9.3.3 Income Tax Provisions Relating to Leasing**
  - 9.3.4 Sales Tax Provisions Pertaining to Leasing**
  - 9.3.5 Procedural Aspects**
  - 9.3.6 Accounting Treatment of Leases**
- 9.4 Evaluation of Lease as a Financing Decision**
- 9.5 Other Considerations in Leasing**
- 9.6 Hire-Purchase Arrangement**
- 9.7 Choice between Leasing and Hire-Purchase**
- 9.8 Deposit in a Hire-Purchase**
- 9.9 Exercise**

### **9.1 Objectives:**

- By the end of this chapter, the student will come to know about:
- Meaning of lease
- Types of lease
- Mechanism of lease transaction
- Evaluation of lease
- Hire purchase transaction
- Difference between hire purchase transaction and lease transaction

### **Definition:**

A lease represents a contractual arrangement whereby the lessor grants the lessee the right to use an asset in return for periodical lease rental payments.

A hire-purchase involves, in essence, the purchase of an asset on the understanding that the purchaser (called the hirer) will pay in equal periodic instalments spread over a length of time. In substance, leasing and hire-purchase represent debt financing in different garbs.

This chapter discusses various aspects of leasing and hire-purchase. It is organised into eight sections:

- Types of lease arrangements
- Mechanics of leasing
- Financial evaluation from the lessee's point of view
- Evaluation of lease as a financing decision
- Lease rate determination by the lessor
- Other considerations in leasing
- Hire-purchase arrangement
- Choice between leasing and hire-purchase

### **Advantage of Lease**

- Additional line of finance
- Rentals are tax deductible
- Payments spread over 3 to 5 years
- Fixed interest rate, so you can budget exactly
- VAT is spread over the life of the transaction
- Does not use working capital
- The supplier gets immediate payment in full, so they may give you a better price

## **9.2 Types of Lease Arrangements**

Lease arrangements may be broadly divided into two categories:

1. Operating leases

2. Financial leases (leveraged leases and sale and leaseback arrangements are two important subcategories of financial leases)

### **9.2.1 Operating Leases**

An operating lease, or service lease, has the following features:

1. It is a short-term lease, the lease period being significantly less than the useful life of the equipment.

2. The lease is not fully amortised. Put differently, the lease rentals payable during the lease period are not sufficient to cover fully the cost of the equipment along with an acceptable return thereon.

3. The lease is usually cancellable at short notice.

4. The lessor is responsible for maintenance, insurance, and taxes.

Computers, vehicles, copiers, and furniture are examples of assets that are commonly leased under operating lease arrangements.

### 9.2.2 Financial Leases

The salient characteristics of a financial lease are:

1. It is an intermediate-term to long term non-cancellable arrangement.
2. The lessee is responsible for maintenance, insurance, and taxes.
3. The lease is fully amortised during the primary lease period. This means that during this period the lessor recovers, through the lease rentals, his investment in the equipment along with an acceptable rate of return.
4. The lessee usually enjoys the option of renewing the lease for further periods for very nominal lease rentals.

### 9.2.3 Sale and Leaseback:

This is a special financing lease arrangement in which a firm (firm C) sells an asset to another firm (firm D) and simultaneously the two firms enter into a financial lease by which firm D leases the asset to firm C. As a result, the seller receives the purchase consideration for the asset and also retains the use of the asset in return for periodic lease payments.

**9.2.4 Leveraged Lease:** Under a leveraged lease arrangement, the lessor borrows a portion of the purchase price of the asset from a lender, which is typically a commercial bank or a financial institution. The loan is secured by the asset and the lease payments. The lender is paid back from the lease payments, often directly by the lessee. The surplus left after satisfying the claims of the lender goes to the lessor. As owner of the asset, of course, the lessor is entitled to tax shelters associated with ownership.

## 9.3 Mechanics of Leasing

As a financial manager who is evaluating the possibility of leasing, you should know the following:

- Legal aspects of leasing
- Typical contents of a lease agreement
- Income tax provisions relating to leasing
- Sales tax provisions relating to leasing
- Procedural aspects of leasing
- Accounting treatment of leases.

### 9.3.1 Legal Aspects of Leasing

As there is no separate statute for equipment leasing in India, the provisions relating to bailment in the Indian Contract Act govern equipment leasing agreements as well. Section 148 of the Indian Contract Act defines bailment as:

• When a firm purchases fixed assets, long-term investments, or other non-current assets, it pays cash or incurs a short-term debt. Hence, working capital decreases.

**Sources and Uses of Funds Statement (Working Capital Basis) for the Year Ended March 31, 1995 for Ram Ltd.**

(Rs. in million)

Part A: Sources and Uses of Working Capital		
Sources of Working Capital		
Operations		6.3
Profit after tax	33	
Depreciation	3.0	
Issue of share capital		—
Long-term borrowings		1.8
Sale of fixed assets		2.0
<b>Total Working Capital Generated</b>		<b>10.1</b>
Uses of Working Capital		
Dividends		2.7
Purchase of fixed assets		5.8
Repayment of term loan		0.6
<b>Total Working Capital Used</b>		<b>9.1</b>
<b>Net Change in Working Capital</b>		<b>1.0</b>

“The delivery of goods by one person to another, for some purpose, upon a contract that they shall, when the purpose is accomplished, be returned or otherwise disposed off according to the directions of the person delivering them. The person delivering the goods is called the ‘bailor’ and the person to whom they are delivered is called the ‘bailee’.”

Since an equipment lease transaction is regarded as a contract of bailment, the obligations of the lessor and the lessee are similar to those of the bailor and the bailee as defined by the provisions of Sections 150 and 168 of the Indian Contract Act. Essentially these provisions have the following implications for the lessor and the lessee.

1. The lessor has the duty to deliver the asset to the lessee, to legally authorise the lessee to use the asset, and to leave the asset in peaceful possession of the lessee during the currency of the agreement.
2. The lessee has the obligation to pay the lease rentals as specified in the lease agreement, to protect the lessor’s title, to take reasonable care of the asset, and to return the leased asset on the expiry of the lease period.

### **9.3.2 Typical Contents of a Lease Agreement**

The lease agreement specifies the legal rights and obligations of the lessor and the lessee. It typically contains terms relating to the following.

1. Description of the lessor, the lessee, and the equipment,
2. Amount, time, and place of lease rental payments.
3. Time and place of equipment delivery.
4. Lessee’s responsibility for taking delivery and possession of the leased equipment.
5. Lessee’s responsibility for maintenance, repairs, registration, etc. and the lessor’s right in case of default by the lessee.
6. Lessee’s right to enjoy the benefits of the warranties provided by the equipment manufacturer/ supplier.
7. Insurance to be taken by the lessee on behalf of the lessor.
8. Variation in lease rentals if there is a change in certain external factors like bank interest rates, depreciation rates, and fiscal incentives.
9. Option of lease renewal for the lessee.
10. Return of equipment on expiry of the lease period.
11. Arbitration procedure in the event of dispute.

### **9.3.3 Income Tax Provisions Relating to Leasing**

The principal income tax provisions relating to leasing are as follows:

1. The lessee can claim lease rentals as tax-deductible expenses.
2. The lease rentals received by the lessor are taxable under the head of ‘Profits and Gains of Business or Profession’
3. The lessor can claim depreciation on the investment made in leased assets.

### 9.3.4 Sales Tax Provisions Pertaining to Leasing

The major sales tax provisions relevant for leasing are as follows:

1. The lessor is not entitled for the concessional rate of central sales tax because the asset purchased for leasing is meant neither for resale nor for use in manufacture.
2. The 46th Amendment Act has brought lease transactions under the purview of 'sale' and has empowered the central and state governments to levy sales tax on lease transactions. While the Central Sales Tax Act has yet to be amended in this respect, several state governments have amended their sales tax laws to impose sales tax on lease transactions.

### 9.3.5 Procedural Aspects

The procedure involved in a lease arrangement usually consists of the following steps:

1. The lessee selects the equipment. This involves specification of the equipment, supplier, price, terms of warranties, guarantees, delivery period, installation, and service.
2. The lessee approaches the lessor, submits a formal application, and negotiates the terms of lease.
3. The lessee and the lessor sign the lease agreement.
4. The lessee assigns purchase rights to the lessor and the lessor purchases the equipment which is delivered to the lessee.
5. The lessee insures the equipment and endorses the insurance policy in favour of the lessor.

### 9.3.6 Accounting Treatment of Leases

Presently the accounting treatment of lease transactions is as follows:

- The leased asset is shown on the balance sheet of the lessor.
- Depreciation and other tax shields associated with the leased asset are claimed by the lessor.
- The entire lease rental is treated as income in the books of the lessor and as expense in the books of the lessee.

## 9.4 Evaluation of Lease as a Financing Decision

A leasing decision is commonly regarded as a financing decision. The decision to invest in the asset is taken for granted and the option of leasing is compared with the option of buying with borrowed funds. Leasing is compared with borrowing because both of them entail essentially similar obligations. To evaluate whether it is preferable to go for leasing, the 'Net advantage of leasing' is calculated.

### Net Advantage of Leasing (NAL)

To calculate the NAL a two-step procedure may be followed.

Step 1 Forecast the differential cash flow stream which reflects what happens if the firm chooses the 'leasing' option rather than the 'borrowing and buying' option.



Step 2 Calculate the net present value of the differential cash flow stream using the post-tax cost of debt. The net present value, so calculated, is the NAL.

## **9.5 OTHER CONSIDERATIONS IN LEASING**

In addition to the financial considerations discussed above, there are several other considerations which may be relevant in a buying-leasing decision situation.

### **Tax**

A firm which cannot, on its own, avail of tax benefits of owning an asset may share a part of that benefit in the form of lowered lease rental by leasing the asset from a firm which enjoys tax benefits in full.

### **Covenants**

Term loans have several restrictive covenants associated with them. These relate to matters like new investments, additional financing, working capital position, managerial appointments, dividend payment, and provision of guarantees. These restrictions seek to improve the debt-servicing capability of the borrower. Lease agreements generally contain fewer and less restrictive covenants. However, a lease agreement, in contrast with term finance, may impose some restriction on the use of asset. For example, it may specify the maximum number of hours per week the asset may be used. Such a restriction is meant to safeguard the asset, not to enhance the ability of the lessee to pay rentals.

### **Risk**

In a short-term lease, also referred to as an operating lease, the lessee can terminate the lease at will. This means that the risk of obsolescence is borne by the lessor. The lessor, however, enhances the lease rental suitably for bearing the risk of obsolescence. In effect, the lessee bears the cost of obsolescence risk.

### **Implementation**

If debt finance is sought from term lending institutions, the process of project preparation, appraisal, and sanction can be somewhat time consuming. It may take three to six months and sometimes even longer. As against this, lease financing arrangement can be tied up quickly. It can be finalised within a month. Hence, leasing facilitates expeditious implementation of a project. This may reduce cost and provide some competitive edge.

### **Matching of Lease Rentals to Cash Flow Capability**

Lease financing companies claim that they can tailor make lease rentals to match the cash flow capability of the lessee. The lease financing companies may offer the following patterns of lease rentals: seasonal, stepped-up, deferred. Further, lease rentals may be adjusted to enable the lessee to derive the maximal tax advantage from lease payments.

### **Control**

Many firms are averse to the 'nominee director' clause found in term loan agreements. It may mean unnecessary nuisance or, even worse, curtailment of operational freedom. Lease financing, however, does not carry such 'inconvenient'

clauses. Hence, it is likely to be viewed favourably vis-a-vis term financing, despite its higher cost.

## 9.6 Hire-Purchase Arrangement

### Features of a Hire Purchase Arrangement

The main features of a hire purchase arrangement are as follows:

1. The hiree (the counterpart of lessor) purchases the asset and gives it on hire to the hirer (the counterpart of lessee).
2. The hirer pays regular hire purchase instalments over a specified period of time. These instalments cover interest as well as principal repayment. When the hirer pays the last instalment, the title of the asset is transferred from the hiree to the hirer.
3. The hiree charges interest on a flat basis. This means that a certain rate of interest, is charged on the initial investment (made by the hiree) and not on the diminishing balance.
4. The total interest collected by the hiree is allocated over various years. For this purpose the 'sum of the years digits' method is commonly employed.

### Split of Hire-Purchase Instalments Between Interest and Principal Repayment

To illustrate, how the hire-purchase instalments are split between interest and principal repayment components, let us consider an example. Ravi Finance offers a hire-purchase proposal to one of its customers, Pooja Chemicals, which requires an equipment costing Rs. 1 million, on the following terms: (i) a flat interest rate of 14 per cent and (ii) a hire-purchase period of 36 months. Given this information, the total interest burden and the monthly hire-purchase instalment would be as follows:

Total interest burden: Rs. 1000,000 (0.14) (3) = Rs. 420,000

Monthly hire-purchase instalments : Rs. 1000,000 + Rs. 420,000 / 36  
= Rs. 39,444

To determine the split of the hire-purchase instalments between interest and principal repayments, let us first allocate the interest burden of Rs. 420,000 over the three years as per the sum of the years digit method. According to this method, the proportions of interest allocated to the three years would be as follows:

$$\text{1st year : } \frac{36 + 35 + 34 + \dots + 25}{36 + 35 + 34 + \dots + 1} = \frac{366}{666}$$

$$\text{2nd year: } \frac{24 + 23 + 22 + \dots + 13}{36 + 35 + 34 + \dots + 1} = \frac{222}{666}$$

$$\text{3rd year : } \frac{12 + 11 + 10 + \dots + 1}{36 + 35 + 34 + \dots + 1} = \frac{78}{666}$$

Based on these proportions, the interest allocations would be as follows:

$$\text{1st year : } \frac{366}{666} \times \text{Rs. } 420,000 = \text{Rs. } 230,811$$

$$\text{2nd year : } \frac{222}{666} \times \text{Rs. } 420,000 = \text{Rs. } 140,000$$

$$\text{3rd year : } \frac{78}{666} \times \text{Rs. } 420,000 = \text{Rs. } 49,189$$

Given these interest allocations, the annual hire-purchase instalments would be split as follows:

Year	Hire purchase instalment	Interest	Principal repayment
1	Rs. 473,333	Rs. 230,811	Rs. 242,522
2	Rs. 473,333	Rs. 140,000	Rs. 333,333
3	Rs. 473,333	Rs. 49,189	Rs. 424,144

### 9.7 Choice between Leasing and Hire-Purchase

Before discussing the procedure for choosing between leasing and hire-purchase options, the following differences between them, from the point of view of the lessee (hirer), may be noted.

#### Leasing

- Depreciation and investment allowance cannot be claimed by the lessee.
- The entire lease rental is a tax-deductible expenses.
- The lessee, not being the owner of the asset, does not enjoy the salvage value of the asset.

#### Hire-Purchase

- Depreciation and investment allowance can be claimed by the hirer.
- Only the interest component of the hire purchase instalment is tax-deductible.
- The hirer, being the owner of the asset, enjoys the salvage value of the asset.

### 9.8 Deposit in a Hire-purchase

Typically, a finance company that gives hire-purchase finance insists that the hirer gives a deposit which may be around 20 per cent of the cost of the asset. Of course, the deposit carries interest and is returnable at the end of the hire-purchase period.

## **9.9 Exercise.**

1. Compare operating lease with financial lease.
2. What is (i) a sale and leaseback arrangement, and (ii).a leveraged lease arrangement?
3. Discuss the legal aspects of leasing.
4. What are the typical contents of a lease agreement?
5. What are the principal income tax and sales tax provisions relating to leasing?
6. What steps are involved in a lease arrangement?
7. How is accounting done for financial leases?
8. Discuss the capital budgeting procedure when a leasing option is also available.
10. Discuss the non-financial considerations relevant in a leasing versus buying decision situation.
12. What are the features of a hire-purchase agreement?
13. How would you choose between leasing and hire-purchase?

## **Unit :10:**

# **Budgeting and Budgetary Control**

## **Introduction**

A budget is a plan expressed in quantitative, usually monetary term, covering a specific period of time, usually one year. In other words a budget is a systematic plan for the utilization of manpower and material resources.

Budgets are normally made to consider the risk and opportunities which lie ahead and how to confront them. In most businesses this process is formalized at least in short-term, with considerable effort put into preparing annual budgets and monitoring performance against those budgets. Preparation of budgets are not only restricted to business activities but also it is applicable to social activities. Budgets are prepared even for a small home to for a big nation.

Budgeting is management tool used for short-term planning and control. Traditionally budgets have been employed as devices to control expenditure, but a much more useful and constructive view is to treat the budgeting process as a means for obtaining the most effective and profitable use of the company's resources via planning and control. Short-term planning is formalized in the budgetary process.

A budget in merely a collation of plans and forecasts, expresses largely but not exclusively in financial terms. Even though many organization do not plan formally for more than a year ahead, the annual budget must be set in the context of longer term plans, which are likely to exist even they have not been made explicit. Budgets should be a management tool rather than merely an accounting exercise.

## **Structure of the Chapter:**

- 10.1 Objectives:**
- 10.2 Budgets**
- 10.3 Budgeting**
- 10.4 Budgetary Control**
- 10.5 Forecast vs. Budget**
- 10.6 Requirement of Sound Budgeting System**
- 10.7 Advantage of Budgeting**
- 10.8 Problems in Budgeting**
- 10.9 Budgeting Process**
- 10.10 Flexible Budgeting**
- 10.11 Zero-Base Budgeting (ZBB)**
- 10.12 Exercise**

## 10.1 Objectives:

At the end of this chapter the student will learn about –

- Meaning of budgets
- Need and importance of budgets
- Preparation of budgets
- Essentials of budgetary controls
- Advantages of budgeting
- Various types of budgeting
- Zero base budget

## 10.2 Budgets

It is a plan quantified in monetary terms, prepared and approved prior to a defined period of time, usually showing planned income to be generated and/or expenditure to be incurred during that period and the capital to be employed to attain a given objective. It is a plan of future activities for an organisation. It is expressed mainly in financial terms. But also usually incorporates many non-financial quantitative measures as well.

**The main characteristics of a budget are:**

1. It is prepared in advance and is derived from the long-term strategy of the organization.
2. It relates to future period for which objectives or goals have already been laid down.
3. It is expressed in quantitative form, physical or monetary units, or both.

Different types of budgets are prepared for different purposes e.g. Sales Budget, Production Budget, Administrative Expense Budget, Raw-material Budget etc. All these sectional budgets are afterwards integrated into a master budget, which represents an overall plan of the organization.

## 10.3 Budgeting

Budgeting is the whole process of designing, implementing and operating budgets. The main emphasis in this is short-term budgeting process involving the provision of resources to support plans which are being implemented.

## 10.4 Budgetary Control

No system of planning can be successful without having an effective and efficient system of control. Budgeting is closely connected with control. The exercise of control in the organization with the help of budgets is known as budgetary control. The process of budgetary control includes:

1. Preparation of various budgets.
2. Continuous comparison of actual performance with budgetary performance.
3. Revision of budgets in the light of changed circumstances.

A system of budgetary control should not become rigid. There should be enough scope of flexibility to provide for individual initiative and drive. Budgetary control is an important device for making the organization more efficient on all fronts. It is an important tool for controlling costs and achieving the overall objectives.

## 10.5 Forecast vs. Budget

Any organized business cannot avoid anticipating or calculating future conditions and trends for the framing of its future policy and decision. A forecast is a prediction of the future state of world in connection with those aspects of the world which are relevant to and likely to affect on future activities. Forecast is calculation of probable events. Both forecasting and planning involve recognition of the relevant factors in a given situation and understanding of what each factor has contributed to it and how each is likely to affect the future. Forecast is concerned with probable events and the budgeting relates to 'planned events'. Forecasts may be made for purposes other than budgeting.

Budget is an operating and financial plan to a business enterprise as well as budget is a sort of commitment or a target which the management seems to attain on the basis of the forecasts made. A forecast is an assessment of probable future events. At planning stage it is necessary to prepare forecasts of probable course of action for the business in future. Forecasts are made regarding sales, production cost and financial requirement at the business. A forecast denotes some degree of flexibility where as a budget denotes a definite target.

The following points of difference can be noted between forecast and budget as shown below.

### Forecast Vs Budget

1. Forecast is merely an estimate of what is likely to happen. It is a statement of probable events which are likely to happen under anticipated conditions during a specified period of time
1. Budget shows the policy and programme to be followed in a period under planned conditions.
2. Forecasts, being statements of future events, do not have any sense of control
2. A budget is a tool of controls since it represents action which can be shaped according to how it can be suited to the conditions which may or may not happen.
3. Forecasting is a preliminary step for budgeting. It ends with the forecast of likely events.
3. It begins when forecasting ends. Forecasts are converted into budgets.

4. Forecasts wider in scope and it can be made in those spheres where budgets cannot can not interfere.

4. Budgets have limited scope. It can be made of phenomenon capable of being expressed quantitatively.

## **10.6 Requirement of Sound Budgeting System**

The following are the essential requirement of a sound budgeting system :

### **Distributions of authority and responsibilities**

Clear lines of authority and responsibility have to be established throughout the organization and the authority and responsibility of different levels of management and departmental executives are clearly defined. So a person working in the organization can understand with what authority he can work as well as to whom he is accountable or responsible.

### **Goal Determinations**

Determination of the goal is the first part in the whole budgeting process. Such selected goal should be speared to each and every segment of the organization. So the workers working in the organization can clearly understand for which ultimate goal they will have to work. The organizational goal should be quantified and clearly stated. These goals should be within the framework of organization's strategic and long range plans. A well defined business policy and objective is a prerequisite for budgeting.

### **Participation**

All levels of management should participate in setting budgets. Because a target set by top management for particular department may not be achievable for that department so if a representative of that particular department is sitting in budget committee can speak the voice of that department during the process of goal setting. Since this can produce more realistic targets, lead to better understanding of corporate objectives and the constraints within which organisation works. Participation in budgeting process will motivate the personnel to achieve budget levels of efficiency and activity.

### **Flexibility**

In preparation of budget we predict future course of actions and as we know future is very uncertain. So the budget prepared should be flexible as far as possible and it should be changeable according to changes in the circumstances. The budget control system should provide for a degree of flexibility designed to change in relation to the level of activity attained and the impact of changes in sales and production level on revenue, expenses are known. It enables more accurate assessment of managerial and organizational performance.



**Part B: Changes in the Internal Content of Working Capital**

Working Capital Account	March 31, 1995	March 31, 1994	Working Capital Increase (Decrease)
<b>Current Assets:</b>			
Cash	1.00	0.60	0.40
Debtors	11.40	6.80	4.60
Inventories	10.50	7.20	3.30
Advances	0.50	1.00	(0.50)
<b>Current Liabilities &amp; Provisions:</b>			
Cash credit	7.30	7.30	—
Bank credit	2.50	2.50	—
Inter-corporate deposits	4.40	—	(4.40)
Trade credit	7.50	6.00	(1.50)
Advances	1.00	1.30	(0.70)
Provisions	1.00	0.80	(0.20)
<b>Working Capital (net change)</b>			1.00

**Sources and Uses of Funds Statement: Cash Basis**

The sources and uses of funds statement, on cash basis, shows (i) the sources of cash, (ii) the uses of cash, and (iii) the net change in cash. The sources of cash are the sources of working capital plus changes within the working capital account which increases the cash resources of the business. The sources and uses of cash are listed below:

**Sources of Cash**

Operations

Net income

Depreciation

Issue of share capital

Long-term borrowings

Sale of non-current assets

Increases in current liabilities

Decreases in current assets other than cash.

**Uses of Cash**

Payment of dividends

Purchase of non-current assets

Repayment of long-term borrowings

Decreases in current liabilities

Increases in current assets other than cash

## **Communication System**

Proper communication systems should be established for management reporting and information service so that information relating to actual performance is presented to the manager responsible for it promptly to enable the manager to know the nature of variations so that remedial actions are taken wherever necessary. Communication system is essential even in the situation when the employees working at bottom level may communicate any problem associated with actual performance.

## **Education**

Educating the budget process and creation of cost awareness atmosphere will lead to effective implementation of budgets. If proper education is given then the whole process of achieving budgetary goal may be achieved in a smooth manner.

## **Involvement of Top Management**

The top management's involvement in budget process is essential for successful implementation of the budgets. It should take interest not only in setting the budgets and targets but also to check upon the actual attainment, motivating the personnel, rewarding for achievement, investigation into reasons for any deviation for actual from budgeted, and taking punitive action wherever necessary. If the top management is not taking enough interest in whole budgetary process then it may become difficult to achieve budgetary goals.

## **Accounting**

A sound system for generating accurate and reliable and prompt accounting information is basic for successful implementation of budget system in an organization. Actual working on the budget may be presented in an accounting format to the top management who can take steps on the working of the budgetary process.

## **10.7 Advantage of Budgeting**

- The budget provides a yardstick against which the performance of the firm can be evaluated. It is better to compare actual with budget rather than with the past, since the latter may no longer be suitable for current and expected conditions.
- Communications are increased throughout the firm and coordination should be improved.
- Areas of efficiency and inefficiency are identified. Variance analysis will prompt remedial action where necessary.
- Scarce resources should be allocated in an optimal way, thus controlling expenditure.
- It forces management to plan ahead so that long term goals are achieved.
- Only reporting information which has not gone according to plan. It economizes on managerial time and maximizes efficiency. This is called 'Management by exception' reporting.

## 10.8 Problems in Budgeting

- The internal logic of static budget will be destroyed if top management reacts to draft budgets by requiring changes to be made to particular items which are then not reflected through the whole budget.
- Managers are often accused of wasting expenditure when they either :
  - A demand a grater budget allowance than is really needed, or
  - B unnecessary spending in order to fully utilize their allowance through fear of future cutbacks. Zero base budgeting can overcome this problem.
- They make allowance for tasks to be performed only on historical analysis.
- It may be difficult to align individual and corporate goals. Individual goals often change and may be much lower than the firm's goals.
- They have a built-in bias that tends to perpetuate inefficiencies. For example, next year's budget determined by increasing last year's by 15 percent, irrespective of the efficiency factor in last year.
- Managers may overestimate costs in order that they will not be held responsible in the future for over spending.
- Budgets are perceived by the work force as pressure devices imposed by top management. This can have an adverse effect on labour relations.
- It is important to match responsibility with control, otherwise a manager will be demotivated . Costs can only be controlled by a manager if they occur within a certain time span and can be influenced by that manager. A problem arises when a cost can be influenced by more than one person.
- Departmental conflict arises because of competition for resource allocation. Departments blame each other if targets are not achieved.
- Uncertainties can occur in the system e.g., uncertainty over demand, inflation, technological change, competition, weather, etc.
- It can be difficult to motivate work force to achieve budgetary goals.
- The pressure in the budgeting systems may results in inaccurate record keeping.

## 10.9 Budgeting Process

The method by which the annual budget is prepared will differ from organisation to organisation. In some organisation budgeting may be a well organised, well documented procedures while in other the budget may be prepared in a rather ad hoc and disorganized manner. The steps in budgeting process representatives to all organisations is given below.

### Specification and Communication of Organizational Objectives

Budgeting is a management tool used for shorter term planning and control. Classification of objectives into short-term and strategic long-term and communication to the managers will lay down a sort of guide for budgeting the activities within the specified objectives activities. Budget is a medium through which organization's objectives and policies are reflected. Budgeting is used tool for implementing the organizational objectives. It is essential to understand, specification and communication of organizational objectives before the managers start for budgeting the organizational activities. Distinction may be drawn between current operating activities and future strategic activities. If the objectives are clearly stated to various organizational heads then it may help in finding a path in which direction they will have to run otherwise

sometimes it may happen that they may forget the path which may affect the proceedings of whole budgetary process.

### **Determination of Key Success Factors**

The performance of every organization will be particularly influenced by certain critical success factor, such key factor will influence the activities of an undertaking and it will lime the volume of output and will have direct impact on the profitability of the organization. Critical success factors may consist of a specified raw material a specific type of labour skill, a tool, a service facility, floor spaces, cash resources etc. The limitation or shortage of such critical factors may result in restricting capacity utilization. The limiting factors may shift from time to time due to external and internal circumstances. In majority of organizations the most critical factor is likely to be consumer demand or the expected level of revenues of funds. Because of this the sales or funds budget is usually the first budget to be prepared. It will determine the content of other related the content of their related budgets.

### **Establishment of Clear Lines of Authority and Responsibility**

An organizational chart defining the lines of authority and responsibility of the managers responsible for accomplishment of organizational objectives is to be prepared. The organizational chart should define the following :

- The responsibility of individual functional manager.
- Delegation of authority to the concerned functional manager.
- Inter-functional relationship of the organization.

If such distribution of authority and responsibility is not done then it may lead to controversy regarding who is responsible for actual performance on the budget and to whom he or she may be responsible.

### **Establishment of Budget Centres**

Budget center is a section of an organization for which separate budgets can be prepared and control exercised. The entire organization is divided into different segments. Which are clearly defined for the purpose of budgetary control according to responsibilities of departmental heads. These segments of an organization defined for the purpose of budgetary control are technically referred to as budget centers and each such budgets centers are given their specific budgets with clear authorities and responsibilities for achieving their targets.

### **Determination of Budget Period**

Budget period is a period for which the budget is prepared. A budget period will decide the course of action of the budget. A budget can be a long term budget or short-term budget. A short-term budget is generally prepared for one year of lesser period. Quarterly, monthly even weekly budget can be prepared for certain operations of the company. The short-term budget will generally not exceed the full accounting year. The long-term budget, which extend to five or even more years. This long term budget will agree with the long-term forecast of sales, organizational schemes for expenses

modernization, diversification etc. The long-term budget are used for planning whereas short term budget used for implementation of long range plans, activities, objectives and also for control purpose. Capital expenditure budget and Research and development expenditure budget are the examples of long-term budget Annual sales budget, Income and expenditure budget are the examples of short-term budgets.

### **Establishment of Budget Committee**

In small organization, the person in charge of finance and accounting functions will involve in preparation of budgets. The setting up of a budget Committee is necessary in case of large and complex organization the budget involves the various functional activities, the closest association of functional managers is essential for satisfactory formulation and implementation of the budget. The budget committee will be composed major functional heads. It can be an effective medium for co-ordination and review of the budget programme. Such budget committee will keep constant watch over formation and actual performance of the budgetary process.

**The main functions of budget committee are as follows:**

- To participate in decision making in strategic issue like, expansion, modernisation, diversification and revision of organisational activities, which have direct relationship to the company's budgets.
- To receive and analyse the periodic performance report from budget centers.
- To review and advise on the general policies affecting more than one function
- To review, approval and adoption of revised budget.
- To recommend the functional budgets for revision.
- To examine the budget reports showing actual compared with budget.

### **Preparation of Budget Manual**

Budget manual is the documentation of policies and procedures involved in implementation of budgetary control system. A budget manual will normally set out the following:

- Exhaustive programme of budget preparation.
- Specification and timing to statement and reports.
- Procedures in Management information systems in the organization.
- Definition of organizational and functional objectives.
- Fixation of responsibility for preparation and implementation of budget and budgetary system
- Establishment of organizational hierarchy.
- Definition and Clarification of various terms used in budgets.

A budget manual can be treated as guide for those who are working on the budget. Budget manual contains a complete programme of activities involved in budget preparation. The budget manual should provide detailed procedure for preparation and development and control of each budget like Sales budget, Production budget, Direct material budget, direct labour budget, Overhead budget, Capital expenditure budget, R & D expenses budget etc.

## **Preparation of Sales or Revenue Budgets**

The sales or revenue budget is the starting point of most master budgets. All other budgets are made only on the basis of sales budget. So the sales budget should be prepared with at most care because future course of action on whole budgetary process is dependent on the preparation of sales budget. In manufacturing organization sales budgeting begins with the forecasting of the sales of individual products. These forecasts may be by geographical area, by class of customer or by some other segment. In case of manufacturing companies, the budgeting will begin with the Revenue budget of the organization. Forecasting sales is a difficult task as many assumption need to be made about consumer demand, environmental condition, likely customers demand, different prices, the probable prices for similar products old by competitors, the number of economic activity in the regions where the product is sold, the number of sales personnel required to service the estimated demand the appropriate level of advertising and promotional expenditures, changes in the taxes such as value added tax or customs and excise duties.

### **Preparation of Other Budget.**

Once the sales budget has been determined from a range of sales forecasts it is possible to construct the following other budgets.

#### **Production Budget –**

The production budget is an estimation of the quantity of goods that must be produced during the budget period. Preparation of production budget will largely depends upon the sales budget of the period. The aim of the production function will presumably be to supply finished goods of a specified quantity to meet marketing demands. The sum of sales requirement plus changes in stock levels of finished goods gives the production requirement for the period being budgeted. In order to construct the production budget we need the level of sales expected and the desired levels of stock of finished goods. The following formula is used for calculation of units to be produced.

$$\text{Production} = \text{Sales} + \text{Closing stock} - \text{Opening stock}$$

Production budget should be developed keeping in view the optimal balance between sales, inventories and production so as to result in minimum cost. Once the production level is determined. It becomes the starting point for the direct materials, direct labour and manufacturing overhead budgets.

#### **Budget of Plants Utilization –**

Plant utilization budget is prepared for the estimation of plant capacity to meet the budgeted production during the period considered under the budget. For this purpose the plant capacity is expressed in terms of convenient units of measurement like production in hours, production in weight (M.T./Kg) production in units etc. Budgeted machine load in each department should be worked out. In case the budgeted plants utilization is more than the plant capacity the management may think of extra shift working, purchase of new machinery, overtime-working sub-contracting etc. When the budgeted pace

utilization in lesser than the plant capacity, management should consider the ways to increase sales volume.

### **Direct Material Budget –**

The direct materials budget specifies the budgeted quantities of each material required for the budgeted production. Such budget is prepared mainly with the intension that the production process is not influenced by shortage of raw materials. The requirement to purchase of direct material can be calculated with the help of the following formula :

$$\text{Purchases} = \text{Closing stock} + \text{Usage} - \text{Opening stock}$$

The materials budget provides basis for fixing optimum levels of inventory stocks, establishment of control over material usage and purchase cost budget.

### **Direct Labour Budget**

The direct labour budget will ensure that the plan will make the required number of employees of relevant grades and suitable skills available at the right times so the whole production process is not disturbed due to lack of efficient labour force. It specifies the direct labour requirement of various products as envisaged in the production budget. The direct labour budget will be developed for both direct labour hours and direct labour cost. After the labour requirements relating to different grades are finalised, estimated rate per hour and labour cost per unit is arrived at.

### **Manufacturing Expenses Budget –**

Manufacturing overhead refers to the aggregate of factory indirect material, indirect labour and indirect expenses, which can be divided into fixed and variable element of manufacturing overhead. The fixed manufacturing overhead will not vary with the change in the level of activity and it can be estimated with the change in the level of activity and it can be estimated with a fair degree of accuracy. On the other hand, variable manufacture overhead per unit will be estimated and the total variable manufacturing overhead will be determined with the helps of the activity level. Preparation of variable overhead budget is based on scheduled production and operating conditions. So preparation of manufacturing budget will mainly depends upon production budgets.

**Administrative Expenses Budget:** - Administrative expenses in an organization will be incurred for the activities like: a. Formulation of policies, b. Directing the organization, and c. controlling the operations of in organization etc. The administrative expenses will not include those expenses, which are incurred for manufacturing, selling and distribution, R & D functions. The administrative overheads are of a fixed nature and the change in the level of activity will not bring any change in the administrative expenses incurred. On study of behavior of costs, if any administrative expenses are of variable or semi-variable nature, those expenses can be budgeted with the level of activity.

## **Selling and Distribution Expenses Budget –**

Selling expenses refers to expenses incurred relating to the activities like: a. Creation and stimulation of demand of company's product b. Maintaining and creating demand of product, and b. Securing orders. Selling expenses include salesmen's salaries, commissions, expenses and related administrative cost, etc. Distribution expenses refers to expenses incurred relating to the activities like making the goods available in the hands of the customer, transportation, freight charges, stock control, warehousing, etc. Preparation of selling and distribution expenses budget is based on the sales budget. The selling and distribution expenditure can be estimated with the help of flexible budgeting technique.

## **Research and Development Budget –**

Research and Development has become essential for every company for their survival in this competitive world. So every year a specific budget is prepared for research and development activity which will mainly cover materials, equipment and suppliers, salaries, expenses and other costs relating to design, development and technical research projects. Normally to what extent a company want to spend after research and development will solely depend upon the discretion of the management.

## **Capital Expenditure Budget –**

The capital expenditure budget represents the expected expenditure on fixed assets during the budget period. It is an outlay on assets that are required and held for the purpose of generating income, e.g. plant and machinery, motor vehicles, premises, etc. It is a plan for capital expenditure, in monetary terms. Capital expenditure may be incurred for expansion, diversification, modernisation plans. It relates to projects involving huge capital outlay and long-term commitments. A capital expenditure budget must reveal following information project-wise:

- Limit carried over to next period.
- Fresh appropriation, and
- Unutilized appropriation
- Cumulative expenditure up-to-date
- Original appropriation

Capital expenditure authorization is the formal authority to incur capital expenditure which meets the criteria defined to achieve the results laid down under a system of capital appraisal. Levels of authority must be clearly defined and the reporting structure of actual expenditure must be to the equivalent authority levels. Procedures for the control of capital expenditure through prior authorization on a formal proposal basis and monitoring as expenditure is incurred.

## **Manpower Budget –**

Manpower budget will take an overall view of the organizations need for manpower for all areas of activity – sales, manufacturing, administrative, executive and so on for a period of years. Estimation of the required manpower for different segment and actual



findings of available manpower will guide about the estimated requirement during the budget periods.

### **Marketing Expenditure Budget –**

Marketing budget include estimate expenditure to be incurred for advertising promotional activities, public relations, marketing research, customer services, etc. during the budget period. Normally the quantum and forms of such expenditure is determined at the discretion of higher authority.

### **Capital Budget -**

After determination of all expenditure budget a budget is to be prepared about the revenue needed for incurring the expenditures and for the purpose capital budget is prepared which will give the direction regarding the quantum of capital needed and sources from which it will be generated. Capital budget is concerned with the question of capacity and strategic direction. This must deal with the evaluation of alternate dispositions of capital funds as well as with the choice of the best capital structure.

### **Preparation of Master Budget**

Master budget is a budget, which is a prepared form, and summarizes the functional budgets. It is a summary budget that incorporates the key figures and totals of all other budgets. It contents elements of all other budgets. It is usually made by and for top management.

### **Negotiation of Budgets**

Budgets may be prepared in a top-down or bottom-up manner. Wherever it may be prepared but it need to be negotiated to the other departments on either side top or down so the other departments can be kept informed regarding budgets and budgetary process. In this process, the budget will need to be negotiated by supervisor subordinates and by different departments competing for the scarce resources. This process of negotiation can be done in both formal and informal ways. Participation in budgeting appears to lead to more positive attitude towards the budget and greater acceptance of it.

### **Co-ordination and Review of Budget**

Incompatibility and inconsistency may arise because the budgeting process usually involves a number of different departments – e.g., sales, production, marketing and numerous senior and lower level managers. So for overall achievement of budgetary goals, activities of all the concerned departments need to be co-ordinated and constantly reviewed. It should be ensured that consistency is arrived at in finalization of master budget.

### **Acceptance and Communication of Budgets**

After the master budget is accepted and agreed upon by all the levels of organizational hierarchy, it will be passed on for implementation. It is essential that each

manager responsible for implementing the budget policy be informed as to his responsibility.

## **Budget Monitoring**

It is important that the actual performance of each manager should be regularly and frequently compared against budget target in order to prevent it from getting out of control and in case of change in internal and external business environment a revision of the budget may be necessitated.

## **10.10 Flexible Budgeting**

Every budget is mainly prepared keeping in mind sales data of the related time period. But sometimes it may become difficult to predict exactly the quantum of sales that will be achieved in a budget period. Quantum of sales may differ in different predicted circumstances so instead of making a budget for single sales output level a flexible budget is prepared which changes according to changes in sales output. Such a budget is known as flexible budget. Flexible budget is a budget which, by recognizing the difference in behavior between fixed and variable costs in relation to fluctuation in output, turnover, or other variable factors, etc. It is designed to change in relation to the level of activity actually attained.

Flexible budget is one that takes accounts of a range of possible volumes. It is sometimes referred to as a multi-volume budget. The range of possible outputs may be known as the relevant range. 'Flexing' a budget takes place when the original budget is deliberately amended to take account of change activity levels.

Thus Flexible budgets are budgets that are adjusted to varying levels of output (often using standards) allowing easier comparisons with actual performance.

The flexible budget is based on the fundamental difference in behaviour of fixed costs, variable costs and semi-variable costs. Since fixed costs do not vary with short-run fluctuations in activity it can be seen that the flexible budget will really consist of two parts: The first is a fixed budget beignn made up of fixed cost and the fixed component of semi variable costs. The second part is a truly flexible budget that consists solely of variable costs.

**Steps in Preparation** – The steps involved in preparation of flexible budget are as follows:

- Build up the appropriate flexible budget for specified levels of activity.
- Analyze cost behaviour patterns in response to past levels of activity.
- Determine the types of standards that are to be used.
- Classify all costs into fixed, variable and semi-variable categories.
- Specify the time period that is used.

**Importance** – Flexible budgets are important aids to decision making which help the management in the following ways:

- Flexible budgets enable more accurate assessment of managerial and organisational performance.
- Flexible budget enable an organisation to predict its performance and income levels at a given range of sales levels and activity levels. It can be seen the impact of changes in sales and production levels on revenue, expenses and ultimately income.

**Disadvantages** - The procedure for drawing up a flexible budget is quite straight forward. The flexed budget is only accurate, if costs behave in a predicted manner. Too often assumptions are made about cost behaviour which are too simplistic and hence do not reflect what actually happens.

- Although flexed budgets tend to maintain fixed costs at the same level whatever the level of output/sales, very often fixed costs are actually fixed only over a relevant output range.
- The method of determining the fixed and variable elements of costs is often arbitrary and hence the flexed cost bare little relation to the correct budgeted cost for the flexed level of activity.
- Such budgets also rely on the assumption of continuity when costs may actually behave in a stepped or discontinues manner.
- Flexed budgets assume linearity of costs and therefore take no account of for example discounts for bulk purchases of materials. Labour costs are unlikely to behave in a linear fashion unless a piecework scheme is in operation.

### 10.11 Zero-Base Budgeting (ZBB)

Normally, a conventional budget is prepared by taking previous year as a base and on the basis of such previous year's actual performance; predictions regarding the next year activities are made. On the other part Zero Base Budget is prepare without taking previous year as a base year. ZBB is prepared on the assumption that every year is a new year without having any past experience. ZBB is a method of budgeting whereby all activities are re-evaluated each time a budget is formulated. It is an approach to budget review and evaluation that requires a manager to justify the resources requested for all activities and projects, including on-going activities and projects, in rank order. Each functional budget starts with assumption that the functional does not exists and it is at zero cost. Increments of costs are compared with increments of benefit, culminating in the planned maximum benefit for a given budgeted cost.

Zero-base Budgeting is a budgeting and financial management strategy to help policy makers achieve more cost-effective delivery of public services.

The concept of zero-base budgeting has been utilized successfully by private corporations and recommended for application to the federal budget for some time. For government use, this planning and budgeting technique endeavors to redirect effort and funds from lower priority current programs to higher priority new programs, improve efficiency and effectiveness, and reduce spending.

ZBB is a revolutionary concept of planning the future activities and there is a sharp contradiction from conventional budgeting. ZBB is the budgeting process which begin without any reference to any base-past budgets and actual happening. The

**Sources and Uses of Funds Statement (Cash basis) for the Year Ended March 31, 1995 for Ram Ltd.**

(Rs. in million)

Sources of Cash		
Operations		6.3
Net profit	3.3	
Depreciation	3.0	
Issue of share capital		
Long-term borrowings		1.8
Sale of fixed assets		2.0
Increases in current liabilities & provisions		6.8
Inter-corporate deposits	4.4	
Trade credit	1.5	
Advances	0.7	
Provisions	0.2	
Decreases in current assets, other than cash		0.5
Advances	0.5	
Total Cash Generated		17.4

Uses of Cash		
Payment of dividends		2.7
Purchase of fixed assets		5.8
Repayment of long-term borrowings		0.6
Decreases in current liabilities & provisions		
Increases in current assets, other than cash		7.7
Debtors 4.6		
Inventories 3.3		
Total Cash Used		17.0
Net Change in Cash Position		0.4

approach requires that all activities be analyzed in decision packages which are evaluated by systematic analysis and ranked in order to importance.

It is a formalized system of budgeting for the activities of an enterprise as if each activity were being performed for the first time i.e. form Zero-base. The Budgeting of a function, the start is from scratch or Zero and not on the basis of trends or historical figures adjusted for inflation and other conditions. It starts from the basic premise that the budget for the next year is zero and every process or expenditure has then to be justified in its entirety in order to be included in the next year's budget. The burden of proof thus shifts to each manager to justify why the money should be spent at all and to indicate what would happen if the proposed activity is not carried out and no money is spent.

Under this system a number of alternatives for each activity are identified, costs are evaluated in terms of the benefit to be obtained from them. The established activities will have to be compared with alternative applications of the resources that they would use during the budgetary planning period.

### Objectives of ZBB

What zero base budgeting tries to achieve is an optimal allocation of resources that incremental and other budgeting systems probably cannot achieve. ZBB starts by asking managers to identify and justify their area(s) of work in terms of decision packages (qv).

The way that ZBB forces managers to justify their work is by saying to them that unless and until they put forward a budget that more senior management can support, at least to a large extent, the budget will not be approved and funded. If ZBB is applied as literally as it is designed, then unjustified work simply stops, no matter who the boss is and no matter what work they are doing.

**Requisites for Implementation** – The steps involved in successful implementation of ZBB are:

- Available resources are directed towards alternatives in order to priority to ensure optimum results.
- The consequence of not funding the activity are to be estimated.
- Each separate activity of the organisation is described in a decision package.
- The performance assessment and measurement criteria for each activity is clearly defined.
- The benefits achieved at different levels of funding are analysed.
- Decision unites are identified by dividing the organisation according to functions or departments.
- In performance of an activity, the alternative methods and costs are evolved.
- Each activity or decision package is evaluated and ranked by cost benefit analysis.
- The targets and objective of each activity are clearly determined ignoring existing budget.

**Features** – ZBB is based on the premise that every rupee of expenditure requires justification. The traditional budgeting approach include expenditure of previous year which are automatically incorporated in new budget proposals and only increments are

subjected to debate. ZBB assumes that responsibility center manager has had no previous expenditure. Important features of ZBB are:

- Participation of all levels in decision-making.
- Alternative ways are considered.
- Quick budget adjustments can be made if; during the operating year costs are required to maintain expenditure level.
- Individual unit objects are linked to corporate targets.

**ZBB vs. Traditional Budgeting** - ZBB reverses the working process of traditional budgeting. Traditional budgeting starts with previous year expenditure level as a base and then discussion is focused to determine the 'cuts' and 'additions' to be made in previous year spending. In ZBB no reference is made to previous level of expenditure. A convincing case is made for each decision unit to justify the budget allotment of resources for that activity during the period under consideration and the available resources are allocated to different activities in order of its importance to optimize results.

The points of different between traditional budgeting and ZBB are as follows:

- Traditional budgeting makes a routing approach, which ZBB makes a very straight-forward approach and immediately spotlights the decision packages enjoying priority over others.
- In traditional budgeting, it is for top management to decide why particular amount should be spent on a particular decision unit. In ZBB their responsibility is shifted from top management to the manager of decision unit.
- In traditional budgeting, some managers deliberately inflate their budget request so that after the cuts they still get what they want. In ZBB, a rational analysis of budget proposal is attempted.
- Traditional budgeting is not as clear and responsive as ZBB.
- Traditional budgeting is accounting-oriented. Main stress happens to be on previous level of expenditure. ZBB makes a decision oriented approach.

**Benefits** –Followings are the benefits in following ZBB.

Since this system requires participation of all managers in preparation of budges, responsibility of all levels of management in successful execution of budgetary system can be ensured.

- ZBB is not based on incremental approach, so it promotes operational efficiency because it requires manager to review and justify their activities or the funds requested.
- It helps in close monitoring of cost behaviour patterns in order to decide the effect of alternative courses of action.
- It adds psychological impetus to employees to avoid wasteful expenditure.
- It is a planning tool for management which helps in identification of wasteful and obsolescent items of expenditure.

- The documentation required enables a co-ordination in-depth knowledge of an organisation's operations to be available to all management.
- In course of ZBB process, inefficient and obsolete operations are identified and removed.
- It will Focus the budget process on a comprehensive analysis of objectives and needs
- It will Combine planning and budgeting into a single process
- It will Cause managers to evaluate in detail the cost effectiveness of their operations
- It will Expand management participation in planning and budgeting at all levels of the organization

**Criticism** – The criticism levelled against ZBB for the following reasons:

- Defining the decision units and decision packages is the difficulty encountered by companies introducing ZBB.
- Another problem with ZBB is the difficulty of the ranking process. Managers face the following three common problems.
  - The large number of packages they have to rank.
  - There is often a conceptual difficulty in having to rank packages which they regard as being equally vital, for legal or operational reasons.
  - It is difficult to rank completely different types of activity, especially where activities have quantitative rather than qualitative benefits, such as spending on staff welfare and working conditions, where ranking must equally be entirely subjective.
  - Where objectives are very difficult to quantify as in research and development or general administration, ZBB does not offer any significant control advantage.
  - ZBB is criticised for emphasis of short-term benefits to the detriment of long-term benefits.
  - ZBB might call for management skills in decision analysis to construct decision packages which the organisation does not possess.
  - ZBB will lead to an enormous increase in paper work created by the decision packages. The assumptions about costs and benefits in each package must be continually updated, and new packages developed as soon as new activities emerge.

A Proforma of Various Budgets are given for the understanding of the students and no practical question will be asked from this chapter.

### Sales Budget for First Six Months of 1998

Product	January Rs.	February Rs.	March Rs.	April Rs.	May Rs.	June Rs.	Total Rs.
X1	Units Value						
	Wholesale						
	Retail						
	Area 1						
	Area 1						
	Area 3						
X2	Same as above						
X3	Same as above						

Information needed to prepare a Sales Budget:

- (1) price/demand relationships
- (2) past seasonal trends
- (3) current sales level
- (4) sales representatives' reports
- (5) market research, economic trends

### Production Budget

#### Production Budget for First Six months of 1998 (units)

	January	February	March	April	May	Total
Closing stock						
Sales during month						
Less: Opening stock						
Completed prodn-reqd						



## Materials Purchase Budget

### Material Purchase Budget for the First Six Month of 1998

	A		B	
	kg	Rs.	kg	Rs.
January				
February				
March				
April				
May				
June				

## Manpower Budget

### Machining Department

Component	Quantity units	Hours per unit	Total hours
X1			
X2			
X3			
X4			

Manpower required = Total hours / Effective working hours per person

Similar proforma can be made, for 'Assembly Department'.

**Machinery Utilisation Budget** The procedure for calculating machine time requirements follows an identical pattern to that of the above manpower budget. The resultant information is used to determine if any new asset purchases are required after allowance has been made for downtime due to routine maintenance and breakdowns. This mirrors the allowances built into the manpower budget for sickness and holidays.

## Production Cost Budget

### Departmental Production Cost Budget for First Six Months 1998

Product	January Rs.	February Rs.	March Rs.	April Rs.	May Rs.	June Rs.	Total Rs.
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Direct costs:

Labour

Materials

Expenses

Total direct costs

Indirect costs:

Labour

Salaries  
 Materials  
 Expenses  
 Depreciation  
**Total indirect costs**  
 Total departmental costs

**Administration,  
 Selling and Distribution Cost Budgets**

**Administration, Selling and Distribution Cost Budget**

	January	February	March	April	May
Sales quantity, '000 units					
Variable costs:	Amount (Rs.)				
Sales commission at 10%					
Vehicle fuel and servicing					
Fixed costs:					
Administration cost					
Basic salesman's salaries					
Advertising					
Office salaries					
Drivers' wages					
Vehicle standing charges					
<b>Total budget</b>					

**Research and Development Budget** Considering research and development as just another department and to budget for it in the same way as administrative, selling and distribution expenses

**Master Budgets**

**Budgeted Profit and Loss Account for the First Six Months 1998**

	January Rs.	February Rs.	March Rs.	April Rs.	May Rs.	June Rs.	Total Rs.
Sales, (Rs.)							
Less:							
Direct labour							
Direct materials							
Direct expenses							
Production overheads							

Administration costs  
 Selling costs  
 Distribution costs  
 Total costs  
 Profit/(Loss)

**Budgeted Balance Sheet**

Fixed assets	Rs.	Rs.
--------------	-----	-----

Current assets:

Stocks and work-in-progress

Debtors

Bank balance and cash

Less: Creditors due within one year

Net current assets (working capital)

Total net assets (capital employed)

Less: Creditors due after one year

Share capital and reserves

**Statement of Sources and Application of Funds**

Sources of funds:

Profit before tax

Add back: Depreciation Total cash generated from trading operations

Other sources:

Issue of new shares

New loan Total sources of funds

Less: Applications of funds: Payment of tax Payment of dividend Purchase of fixed assets

Increase in working capital:

Increase in stocks

Increase in debtors

Increase in creditors Movement in net liquid funds

## Special Financial Budgets

### Forecast Trading and Profit and Loss Account

	January Rs.	February Rs.	March Rs.	April Rs.	May Rs.	June Rs.	Total Rs.
Sales Less: Purchases							
Gross profit							
Wages							
Expenses							
Depreciation							
Net profit or (loss)							

### Cash Budget

	January Rs.	February Rs.	March Rs.	April Rs.	May Rs.	June Rs.
Cash Receipts:						
Cash sales						
Credit sales						
net of discount						
Asset sales						
Total (A)						
Cash Payments:						
Purchases (net)						
Wages						
Expenses						
Rent						
Machinery						
Total (B)						
Monthly +/-						
Cumulative balance						

### Capital Expenditure Budget

Category of Investment	Amount requested Rs.	Amount allocated Rs. %
Plant & Mach.		
Furniture etc.		
Vehicles		

**Capital Budget Report**

Project Title number	Actual/projected costs				
	Last year	This year	Total to date	Projected to complete	Authorised amount
	Rs.	Rs.	Rs.	Rs.	Rs.

**Flexible Budgeting** This is defined by the Chartered Institute of Management Accountants as a 'budget which is designed to change in accordance with the level of activity attained'. Essentially, the flexible budget consists of not one budget but a series of budgets, each being based on a different level of activity within the expected range.

**Flexible Budget**

**Flexible Budget at**

Activity level	70%	80%	90%	100%	Rs.	Rs.	Rs.	Rs.
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Direct labour

Direct materials

Variable overheads

Fixed overheads

Total

Following illustration will explain how various types of the budgets are prepared, but this illustration is given only for the understanding of the students and only theoretical questions will be asked in the examination from this chapter.

**Comprehensive Example on Preparation of 'Budgets'**

**Jesus Co. Ltd. Balance Sheet at 31st December 1993**

Issued share capital (Re. 1 Ordinary shares)			Rs. 3,50,000
Reserves			1,29,600
Capital employed			Rs. 4,79,600
<hr/>			
Represented by: Fixed assets:	Cost	Depreciation	Rs.
	Rs.	Rs.	
Machinery	2,20,000	1,04,000	1,16,000
Vehicles	35,000	18,000	17,000
	2,55,000	1,22,000	1,33,000
<hr/>			
Current assets: Stock of raw materials		36,000	
Finished goods (2,400 units)		21,600	
		57,600	
Debtors (Oct. Rs. 1,17,000, Nov. Rs. 1,30,000 and Dec. Rs. 1,28,000)		3,75,000	
Cash at bank		18,000	
		4,50,600	
<hr/>			
Less: Current liabilities:			
Creditors for materials	59,000		
Creditors for variable overheads	9,000		
Creditors for fixed overheads	36,000		
		1,04,000	
			3,46,600
			Rs. 4,79,600

The following information has been collected for the budget period:

(1) Sales at Rs. 20 per unit:

	January	February	March	April	May	June
Units	4,300	6,200	8,100	4,200	7,100	8,100

(2) Production is to be as stable as possible throughout the period, with a closing stock in June of 3,400 units.

(3) Unit production costs are expected to be:

## 4.11 Common Size Statements

Ratio analysis apart, another useful way of analysing financial statements is to convert them into common size statements by expressing absolute rupee amounts into percentages. When this method is pursued, the income statement exhibits each expense item or group of expense items as a percentage of net sales, and net sales are taken at 100 per cent. Similarly, each individual asset and liability classification is shown as a percentage of total assets and liabilities respectively. Statements prepared in this way are referred to as common-size statements.

Common-size comparative statements prepared for one firm over the years would highlight the relative changes in each group of expenses, assets and liabilities. These statements may be equally useful for inter-firm comparisons, given the fact that absolute figures of two firms of the same industry are not comparable. Financial statements and common-size statements of the Ram Ltd are presented in following example.

### Example

The accompanying balance sheet and profit and loss account relate to Ram Ltd. Convert these into common-size statements.

#### Balance Sheet as at 31st March

	Previous Year 99	Current Year 2000
	(Amount in lakhs of rupees)	
<b>Liabilities</b>		
Equity share capital (of Rs 10 each)	240	240.0
General reserves	96	182.0
Long-term loans	182	169.5
Creditors	67	52.0
Outstanding expenses	6	—
Other current liabilities	9	6.5
	600	650.0
<b>Assets</b>		
Plant asset net of accumulated depreciation	402	390
Cash	54	78
Debtors	60	65
Inventories	84	117
	600	650

	Rs.
Raw materials	5
Direct labour	3
Variable overheads	2
	10

(4) Monthly purchases of raw materials should be:

January	February	March	April	May	June
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
34,000	30,000	29,000	37,000	34,000	32,000

(5) Customers pay their accounts during the third month after the month of sale.

(6) Creditors for materials are paid during the second month after purchase.

(7) Variable overheads are paid on the basis of 25% in the month of production, and 75% in the month following.

(8) Fixed overheads of Rs. 40,000 per month are paid during the following month.

(9) Three automatic lathes are purchased for Rs. 75,000, and paid for in April.

(10) Depreciation on machinery will be Rs. 3,000 per month until March, increasing to Rs. 4,000 per month for the rest of the period.

Depreciation on vehicles will be Rs. 500 per month.

(11) Wages are paid during the month of production.

### (1) Sales Budget

January	February	March	April	May	June	Total
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
86,000	1,24,000	1,62,000	84,000	1,42,000	1,62,000	7,60,000

### (2) Production Budget (in units)

The opening stock on 1st January is known to be 2,400 units, and the closing stock on 30th June is required to be 3,400 units. The production required will be:

Monthly sales for the six months	38,000
Add: Stock increase over the period	1,000
Required production	39,000
	39,000

Each month's production =  $39,000/6 = 6,500$  units.

The production budget in units will be:



	January	February	March	April	May	June
Opening stock	2,400	4,600	4,900	3,300	5,600	5,000
Add: Production	6,500	6,500	6,500	6,500	6,500	6,500
	8,900	11,100	11,400	9,800	12,100	11,500
Less: Sales	4,300	6,200	8,100	4,200	7,100	8,100
Closing stock	4,600	4,900	3,300	5,600	5,500	3,400

### (3) Raw Materials Budget

The opening balance sheet records the stock of raw materials at Rs. 36 000. Monthly purchases are known, and the material content of each unit of production is Rs. 5. The materials budget can now be prepared.

	January Rs.	February Rs.	March Rs.	April Rs.	May Rs.	June Rs.
Opening stock	36,000	37,500	35,000	31,500	36,000	37,500
Add: Purchases	34,000	30,000	29,000	37,000	34,000	32,000
	70,000	67,500	64,000	68,500	70,000	69,500
Less: Usage	32,500	32,500	32,500	32,500	32,500	32,500
Closing stock	37,500	35,000	31,500	36,000	37,500	37,000

### (4) Production Budget (in value)

#### Calculation for Cost of Production

Rs./unit

Direct materials 5

Direct labour 3

Variable overheads 2

10

	January Rs.	February Rs.	March Rs.	April Rs.	May Rs.	June Rs.	Total Rs.
Direct materials	32,500	32,500	32,500	32,500	32,500	32,500	1,95,000
Direct labour	19,500	19,500	19,500	19,500	19,500	19,500	1,17,000
Variable overheads	13,000	13,000	13,000	13,000	13,000	13,000	78,000
	Rs. 65,000	Rs. 65,000	Rs. 65,000	65,000	Rs. 65,000	Rs. 65,000	3,90,000

### (5) Fixed Overheads Budget

Fixed overheads will not vary with production, but will remain as a static charge. If during the budget period there is an increase in an element of cost. There will be a corresponding increase in budgeted fixed overheads. It will be normal to have fixed overheads spread equally throughout the period. The monthly charge in the example is estimated at Rs. 40,000.

#### (6) Debtors Budget

Sales are made at Rs. 20 per unit, and customers pay during the third month after the month of sale. The first three months of the budget period will expect to receive payment for the sales of October, November, December of the previous year. These were respectively Rs. 117,000, Rs. 130,000 and Rs. 128,000.

	January Rs.	February Rs.	March Rs.	April Rs.	May -Rs.	June Rs.
Opening balances	3,75,000	3,44,000	3,38,000	3,72,000	3,70,000	3,88,000
Add: Sales	86,000	1,24,000	1,62,000	84,000	1,42,000	1,62,000
	4,61,000	4,68,000	5,00,000	4,56,000	5,12,000	5,50,000
Less: Cash received	1,17,000	1,30,000	1,28,000	86,000	1,24,000	1,62,000
Closing balances Rs.	3,44,000	Rs. 3,38,000	Rs. 3,72,000	Rs. 3,70,000	Rs. 3,88,000	Rs. 3,88,000

#### (7) Creditors for Materials Budget

Suppliers are paid during the second month after purchase. November's purchases of Rs. 26,000 will be paid for during January, and December's purchases of Rs. 33,000 during February.

	January Rs.	February Rs.	March Rs.	April Rs.	May Rs.	June . Rs.
Opening balances	59,000	67,000	64,000	59,000	66,000	71000
Add: Purchases	34,000	30,000	39,000	37,000	34,000	32000
	93,000	97,000	93,000	96,000	1,00,000	103000
Less: Payments	26,000	33,000	34,000	30,000	29,000	37000
Closing balances	Rs. 67,000	Rs. 64,000	Rs. 59,000	Rs. 66,000	Rs. 71,000	Rs. 66000

**(8) Capital Budget**

	January Rs.	February Rs.	March Rs.	April Rs.	May Rs.	June Rs.	Total Rs.
Machinery	3,000	3,000	3,000	4,000	4,000	4,000	21,000
Vehicles	500	500	500	500	500	500	3,000
	<u>Rs. 3,500</u>	<u>Rs. 3,500</u>	<u>Rs. 3,500</u>	<u>Rs. 4,500</u>	<u>Rs. 4,500</u>	<u>Rs. 4,500</u>	<u>Rs. 24,000</u>

**(9) Cash budget**

	January Rs.	February Rs.	March Rs.	April Rs.	May Rs.	June Rs.	Total Rs.
Receipts: Sales	1,17,000	1,30,000	1,28,000	86,000	1,24,000	1,62,000	
Payments: Materials	26,000	33,000	34,000	30,000	29,000	37,000	
Labour variable	19,500	19,500	19,500	19,500	19,500	19,500	
overheads 25%	3,250	3,250	3,250	3,250	3,250	3,250	
75%	9,750	9,750	9,750	9,750	9,750	9,750	
Fixed overheads	36,000	40,000	40,000	40,000	40,000	40,000	
Machinery	—	—	—	75,000	—	—	
	<u>Rs. 93,750</u>	<u>Rs. 1,05,500</u>	<u>Rs. 1,06,500</u>	<u>Rs. 1,77,500</u>	<u>Rs. 1,01,500</u>	<u>Rs. 1,09,500</u>	
<b>Cash Budget</b>							
Opening balance	18,000	41,250	65,750	87,250	(4,250)	18,250	
Add: Receipts	1,17,000	1,30,000	1,28,000	86,000	1,24,000	1,62,000	
	<u>1,35,000</u>	<u>1,71,250</u>	<u>1,93,750</u>	<u>1,73,250</u>	<u>1,19,750</u>	<u>1,80,250</u>	
Less: Payments	93,750	1,05,500	1,06,500	1,77,500	1,01,500	1,09,500	
	<u>Rs. 41,250</u>	<u>Rs. 65,750</u>	<u>Rs. 87,250</u>	<u>Rs. (4,250)</u>	<u>Rs. 18,250</u>	<u>Rs. 70,750</u>	

**(10) Master Budget****Operating Statement for the Period 1st January to 30th June 1998**

	Rs.	Rs.
Sales		7,60,000
Less: Cost of sales:		
Opening stock	21,600	
Add: Production	3,90,000	
	4,11,600	
Less: Closing stock (3400 x Rs. 10)	34,000	
		3,77,600
Gross profit		3,82,400
Less: Fixed overheads (6 x Rs. 40000)	2,40,000	
Depreciation	24,000	
		2,64,000
Net profit		Rs. 1,18,400

**Estimated Balance Sheet at 30th June 1998**

	Rs.	Rs.	Rs.
Issued share capital (Re. 1 ordinary shares)			3,50,000
Reserves (Re. 1 29600 + Rs. 118400)			<u>2,48,000</u>
Capital employed			<u>Rs. 5,98,000</u>

	Rs.	Rs.	Rs.
Represented by:			
Fixed assets:			
	Cost	Depreciation	
Machinery	2,95,000	1,25,000	1,70,000
Vehicles	35,000	21,000	14,000
	<u>3,30,000</u>	<u>1,46,000</u>	1,84,000

**Current assets:****Stock**

(Raw materials Rs. 37,000;

Finished goods Rs. 34,000)

**Debtors**

71,000

3,88,000

Cash at bank		<u>70,750</u>
		5,29,750
Less: Current liabilities:		
Creditors for materials	66,000	
Creditors for variable overheads	9,750	
Creditors for fixed overheads	40,000	
		1,15,750
		<u>4,14,000</u>
		<u>Rs. 5,98,000</u>

## 10.12 Exercise

Answer the following questions

1. Explain the terms budget, budgeting and budgetary control?
2. Distinguish between budget and forecast?
3. What are the essential requirements of sound budgetary system?
4. What are the advantages of budgeting?
5. What problems are created in budgeting?
6. Explain in brief steps needed in budgeting process?
7. Explain following budgets.
  - i) Sales Budget
  - ii) Production Budget
  - iii) Direct material Budget
  - iv) Manufacturing Expenses Budget
  - v) Capital Expenditure Budget
8. What is a flexible budget? State its importance and limitations?
9. What is ZBB? State its advantages and limitation. ?
10. In what manner ZBB differs from Traditional Budget- explain?

## **Unit :11:**

# **FINANCIAL SERVICES**

### **Introduction:**

In earlier days the scope of financial services was very restricted, it was mainly concern with providing funds to the borrowors for the sort term and long term purposes. But, now a days wide variety of financial services are offered by such agencies. During this chapter, we shall discuss about the various services provided by different agencies.

## **Structure of the Chapter:**

### **11.1 Objectives:**

### **11.2 Financial Services : Meaning**

### **11.3 Types of Financial Services**

#### **11.3.1 Hire Purchase**

#### **11.3.2 Leasing**

#### **11.3.3 Factoring Services:**

#### **11.3.4 Credit Rating**

#### **11.3.5 Insurance**

#### **11.3.6 Venture Capital**

#### **11.3.7 Mutual Funds**

#### **11.3.8 Merchant Banking**

#### **11.3.9 Loan Syndication**

#### **11.3.10 Depository Services**

#### **11.3.11 Custodial Services**

#### **11.3.12 Share Registration Services**

#### **11.3.13 Debenture Trusteeship**

#### **11.3.14 Credit Cards**

### **11.4 Exercise**

### **1.1 Objectives:**

By the end of this chapter, the student will come to know about:

- Hire purchase services
- Lease services
- Factoring services
- Credit rating services
- Loan syndication
- Mutual funds
- Credit Cards

### **11.2 Financial Services : Meaning**

Financial services aim at providing funds or substitutes of funds for the desired venture at an optimum cost to the promoters and with best possible returns to the investors within the regulatory framework prescribed by the society.

### **11.3 Types of Financial Services**

Financial Services sector renders a large variety of services to meet the requirements of an individual user. These services *intra alia* may include the services or financial products described here in below :

#### **Provision of Funds or its Substitutes**

- Venture Capital - issue of shares, debentures, seed capital etc.
- Various services of a bank
- Asset financing including term loans, leasing, hire purchase

#### **Managing Investible Funds**

- Portfolio management
- Merchant banking
- Mutual and Pension funds etc.

#### **Risk Sharing**

- Underwriting of money market instruments,
- Insurance of various types
- Export credit and guarantee etc.

#### **Consultancy Services**

- Project preparatory services
- Preparation of project reports
- Appraisal of projects
- Rehabilitation of projects
- Business advisory services including legal, financial, taxation
- Valuation of investments
- Credit rating
- Merger, acquisitions and restructuring etc.

#### **Market Operations**

- Stock market related - share broking etc.
- Money market operations like sale/purchase of assets and investments
- Asset management like depositories, custodial services etc.
- Registrars/share transfer agents
- Trusteeships
- Retail market operations
- Futures, options, derivatives, etc.
- Settlement and clearing services for financial contracts, instruments and other assets



## **Research and Development**

- Equity/market research
- Investor education
- Training of personnel
- Basic market oriented services for long-term development like softwares, communication facilities etc.
- Market development
- Financial information services etc.

### **11.3.1 Hire Purchase**

A hire purchase contract allows one party to acquire possession of goods belonging to another party by paying an initial deposit, followed by a number of instalments over a specified period of time. The goods do not become the legal property of the acquirer until after the final instalment has been paid. The hire purchase price of an item is greater than its cash price because of the inclusion of interest payable to the seller as consideration for the use of his funds over the hiring period.

In these types of sales some amount of cash is usually paid on signing the contract. balance is payable together with interest usually in equal instalments. Sometimes instalments may include fixed proportion of the purchase price and interest on the outstanding balances from year to year, in such cases instalment, will be reducing from year to year.

### **11.3.2 Leasing**

In India leasing has been developed as an important supplementary source of finance and is gaining increased acceptance from the industries. The technique of leasing gives the facility to possess and operate the asset without owning the asset. It is a method of financing where huge capital outlays are substituted by periodical rental payments. Under a typical leasing transaction, a lessor acquires the title to the equipment to be leased by paying 100 per cent value for the asset identified by the lessee and then leases it out to the lessee under a lease agreement for a period normally less than the depreciable life of the asset.

**Types of Leases** - Lease agreements are basically of two types. They are (a) Financial Lease and (b) Operating Lease. The other variations in lease agreements are (c) Sale and lease back.

#### **(a) Financial Lease**

A 'Financial Lease' is a non-cancellable contractual commitment on the part of the lessee (the user) to make a series of payments to the lessor for the use of an asset. In this type of leases, lessee will use and have control over the asset without holding the title to it. The lessee acquires most of the economic values associated with the outright ownership of the asset. The lessee is expected to pay for up keep and maintenance of the asset.

### Income Statement for the year ended March 31

	Previous year	Current year
	(Amount in lakhs of rupees)	
Gross sales	370	480
Less returns	20	30
Net sales	350	450
Less cost of goods sold	190	215
Gross profit	160	235
Less selling, general and administrative cost	50	72
Operating profit	110	163
Less interest expenses	20	17
Earning before taxes	90	146
Less taxes	31.5	51.5
Earning after taxes	58.5	94.9

#### *Solution*

### Income Statement (Common-size) for the years ended March 31 (Percentages)

	Previous year	Current year
Net sales	100.0	100.0
Cost of goods sold	54.3	47.8
Gross profit	45.7	52.2
Selling, general and administrative expenses	14.3	16.0
Operating profit	31.4	36.2
Interest	5.7	3.8
Earnings before taxes	25.7	32.4
Taxes	9.0	11.4
Earnings after taxes (EAT)	16.7	21.0

## (b) Operating Lease

An operating lease stands in contrast to the financial lease in almost all aspects. This lease agreement gives to the lessee only a limited right to use the asset. The main characteristics of operating lease is as follows :

- The lease can be cancelled by the lessee prior to its expiration at a short notice.
- The lessor is responsible for up keep and maintenance of the asset.
- The lessee is not given any uplift to purchase the asset at the end of the lease period.
- The lease is for a smaller period.
- The sum of all the lease payments by the lessee does not necessarily fully provide for the recovery of cost of the asset.
- The lessor has the option to lease out the asset again to another party.

## (c) Sale and Lease Back

Under this the lessee first purchases the equipment of his choice and then sells it to the lessor firm. The lessor in turn leases out the asset to the same lessee. The advantage of this method is that the lessee can satisfy himself completely regarding the quality of the asset and after possession of the asset convert the sale into a lease arrangement. This option he can exercise even in the case of an old asset used by him for sometime to get the release of a lumpsum cash which he can put into alternative use. The lessor gets the tax credit for depreciation.

### 11.3.3 Factoring Services:

The dictionary meaning of 'factoring is 'the work of a factor'; the business of buying up trade debts or lending money on the security of trade debts. Factoring may be defined as a contract by which the factor is to provide at least two of the services i.e., finance, the maintenance of accounts, the collection of receivables and protection against credit risks.

**Functions of Factor** - Factoring is a financial service covering the financing and collection of receivables in domestic as well as international trade. Broadly speaking the main functions of the factor are:

- ◆ Providing finance against bills receivables and trade debts.
- ◆ Undertaking sales ledger administration responsibilities of the client including maintenance of books, accounting, asset management, collection of debts and furnishing information reports to the client.
- ◆ Providing debt insurance facility to the client against possible losses arising insolvency/bankruptcy of debtors and,
- ◆ Offering relevant consultancy services in the areas of finance, marketing etc.

**Mechanics of Factoring** -The following is the procedure in factoring service

- ◆ Seller (client) negotiates with the Factor for establishing factor relationship.
- ◆ Request by seller for credit check on the buyer (customer) whose name and address is furnished to the factor.

- ◆ Factor checks the credit credentials and approves the buyer, a credit limit and the period up to which credit can be given, are fixed.
- ◆ Seller sells goods to the buyer.
- ◆ Seller sends invoice to the factor. The invoice is accounted for in the buyers' accounts in the Factor's sales ledger.
- ◆ Factor sends notice of assignment/copy of invoice to the buyer.

**Cost - Benefit Analysis of Factoring** - There are two types of cost involved :

1. Factoring Commission, 2. Interest on advance granted by factor. The benefits of factoring are :

- It provides specialised service in credit management.
- It saves the cost of credit administration due to the scale of economies and specialisation

A concern has to evaluate costs and benefits to arrive at a decision regarding the use of factoring services with the aid of numerical computation.

### **Advantages and Disadvantages of Factoring**

#### ◆ **Advantages**

- It compresses operating cycles by providing liquidity.
- It transfers credit risk from the firm to the factor.
- It ensures a definite pattern of cash inflow from credit sales.
- Factor assumes responsibility for sales ledger administration.

#### ◆ **Disadvantages**

- It is relatively expensive source of short-term credit.
- It requires cumbersome documentation requirements.
- It may be perceived as a sign of financial weakness.
- Factoring transactions attract stamp duty.

### **11.3.4 Credit Rating**

Credit rating has assumed an important place in the modern and developed financial markets. It is a boon to the companies as well as investors. It facilitate the company in raising funds in the capital market and helps the investors to select their risk-return trade off.

Fund procurement is one of the key functions of a business undertaking. Among the various sources of fund, long-term debt, debentures, bonds, fixed deposit and commercial paper, besides, share capital are worth mentioning. The issuer of these instruments approaches capital market, financial institutions and various agencies to raise necessary finance at certain terms and conditions.

As investors are concerned with the timely payment of interest and principal, credit rating indicates the creditworthiness of a borrower. Credit rating, essentially, indicates

the risk involved in a debt instrument as well as its qualities. Higher the credit rating greater is the probability that the borrower will make timely payment of principal and interest and vice versa.

Thus, a credit rating is not a general evaluation of the issuing organisation. It essentially reflects the probability of timely repayment of Principal and interest by a borrower company. The credit rating is not a one time evaluation of credit risk of a security. The rating agency may change the rating considering the changes periodically.

**Credit Rating Agencies in India** - In India, the rating coverage is of a fairly recent origin, beginning 1988 when the first rating agency Credit Rating and Information Services of India Ltd. (CRISIL) was established. At present there are other three rating agencies - Investment Information and Credit Rating Agency of India Ltd. (ICRA), Credit Analysis and Research (CARE) and Duff & Phelps Credit Rating India (OCR) have also entered in the credit rating business.

(a) **CRISIL** : CRISIL was jointly promoted, in 1988, by India's leading financial institutions, ICICI and UTI. Its other shareholders include LIC, SBI, HDFC, GIC, Standard Chartered Bank, Bank of Tokyo, Banque Indo shez, Sakura Bank, UCO Bank, Canara Bank, Central Bank of India, IOB, Vysya Bank Ltd. and Bank of Madura Ltd. CRISIL went public in 1992 and to date is India's only listed credit rating agency. In 1995, CRISIL entered into a strategic alliance with Standard & Poor's to extend its credit rating services to borrowers from the overseas market. The services offered are broadly classified as Rating, Information Services, Infrastructure services and consultancy.

(b) **ICRA** : ICRA has been promoted by IFCI and 21 other shareholders comprising foreign and nationalised banks and Indian insurance companies. Established in 1991, ICRA is the second rating agency in India. Services offered by ICRA can be broadly classified as analytical services, advisory services and investment services.

(c) **CARE** : CARE has been promoted, in 1992, by IDBI jointly with Canara Bank, UTI, Private sector banks and Insurance Companies. The services offered by CARE include credit rating of debt instruments, credit assessment of companies, advisory services, credit reports and performance ratings.

◆ CARE undertakes ratings of all types of debt instruments of all maturities, including short-term instruments like commercial paper, certificates of deposits etc. not exceeding 12 months; and medium and long-term instruments like Term deposits, Floating rate Notes, Bonds and debentures.

◆ CARE also undertakes rating of securitised paper and structured obligations.

◆ CARE undertakes credit assessment of companies for use by banks and financial institutions. It is without reference to any particular instrument. CARE analyses the overall debt management of the company and its capacity to service its obligations.

◆ CARE also undertakes performance rating of parallel marketers of Liquefied Petroleum Gas (LPG) and Superior Kerosene Oil (SKO), as per the scheme notified by Ministry of Petroleum and Natural Gas, Government of India.

**Benefits** - The benefits to various parties concerned with credit rating are listed below :

◆ **Investors**

- It enables the investors to get superior information at low cost.
- It enables the investors to take calculated risk in their investments.

- It encourages the common man to invest his savings in corporate securities and get high returns.

#### ◆ **Corporate Borrowers**

- It facilitates companies with good rating enter the capital market confidently and raise funds at comparatively cheaper rates.

- It can be used as a marketing tool.
- It facilitates foreign collaborations.
- It encourages discipline among the corporate borrowers.

#### ◆ **Government**

- Fair and good ratings motivate the public to invest their savings in company shares, deposits and debentures. Thus, the idle savings of the public are channelised for productive uses.
- It facilitates formulation of public policy guidelines on institutional investments.

- Credit rating system plays a vital role in investor protection without casting burden for that responsibility on the Government.

### **Mandatory Provisions for Credit Rating**

◆ **Commercial Paper Issue - Credit Rating:** The RBI as per its revised guidelines has directed the companies intended to issue commercial papers to obtain maximum credit rating, otherwise, they will not be allowed to issue commercial paper. Further, rating obtained must specifically relate to commercial paper and should not be more than one month old.

◆ **Debenture Credit Rating Disclosure is Mandatory :** The SEBI has directed the companies intending to issue debentures to the public to state in the prospectus, whether the debentures issued by it are credit rated. In case, the credit rating has been acquired by the company from credit rating agency, the rating has to be clearly stated, otherwise the company has to state clearly that the debentures has not been credit rated.

◆ **Public Deposit: Credit Rating:** On and from January 2, 1998 (i) no non-banking financial company having net owned fund (hereinafter referred to as 'NOF') of twenty five lakh of rupees and above shall accept public deposit unless it has obtained minimum credit rating for fixed deposits from any one of approved credit rating agencies at least once a year and a copy of the rating is sent to the Reserve Bank of India alongwith return on prudential norms;

## CRISIL Rating Symbols of CRISIL

For Debentures	Symbol	Degree of Safety
High Investment Grades	AAA	Highest safety
	AA	High safety
Investment Grades	A	Adequate safety
	BBB	Moderate safety
Speculative Grades	BB	Inadequate safety
	B	High Risk
	C	Substantial Risk
	D	In default
For Fixed Deposit Programme	Symbol	Degree of Safety
	FAAA	Highest safety
	FAA	High safety
	FA	Adequate safety
	FB	Moderate safety
	FC	High risk
	FD	Default
For Short-term Instruments	Symbol	Degree of Safety
	P-1	Very strong
	P-2	Strong
	P-3	Adequate
	P-4	Adverse
	P-5	Default

### 11.3.5 Insurance

With the increase in business operation, there is considerable increase in the business risk. The advance of technology, the multiplicity of activities and our growing interdependence make larger and larger disasters inevitable. Progress has put more people, more companies at risk than ever before. Traffic multiplies on the roads, in the air and at sea. The disasters cause death or hardship for many more people and properties than those directly involved. Profits, customers and goodwill can be lost. No one is safe from thefts. No building is safe from fire. No business is immune from risks.

The essence of insurance lies in the elimination of the uncertain risk of loss for the individual through the combination of a large number of similarly exposed individuals who contribute to a common fund premium payments sufficient to make good the loss caused to any one individual.

**Insurable Interest** - Insurable interest is the basic requirement in the insurance contract. It means that insured stands to benefit by the safety of subject-matter of insurance or to lose by its loss or incur liability in respect thereof.

To be logical and complete any procedure for identifying and analyzing loss exposures should take into account following :

### (i) Property Losses

◆ **Physical Damage to Property**: Property may be damaged by many common perils like fire, windstorm, flood, earthquake and vandalism.

◆ **Loss of Use of Property**: A business can also lose the use of property without suffering physical damage. For example, a number of governmental agencies have the authority to close down a business in certain circumstances.

◆ **Criminal Activity** : Almost every firm is exposed to loss by robbery, burglary and other crimes - and not just from outsiders.

◆ **Business Interruption Loss** : An important consideration for any business person is costly shut-down that can result from fire or other peril. Where such a shut-down or business interruption occurs, the owner then has to deal with (i) the loss of use of building (measured by the loss of revenue while the store is closed for repairs), and (ii) extra expenses to speed repairs or to rent space at another location in order to avoid closing.

### (ii) Liability Loss

A firm may be legally liable - that is, responsible to pay for bodily injury or property damages suffered by another person or firm.

◆ **Liability to General Public** : A court may find a business firm liable for injuries or other losses, which the firm or its employees can cause to a member of general public through negligence or other fault.

◆ **Liability to Employees** : Employees can be injured or even contract disease as a result of job-related activities. To protect the interest of the employees in India, the Workmen's Compensation Act requires most employers to compensate employees to medical expenses and loss of income due to injuries or certain diseases arising from their employment.

◆ **Key Person Losses** : The most valuable assets of many firms are their people - especially those key persons whose skills, knowledge or special qualities are not easily replaced. Loss of the service of a key person through death, disabling injury, disease or resignation - can cause severe losses to the firm.

## Kinds of Business Insurance -

### (i) Insurance of Property

◆ **Burglary Insurance** : For loss of or damage to the property following forcible and violent entry into or exit from the premises. The business premises policy covers not only loss of the insured property, but also damages to such property and damage to the premises caused by burglars.

◆ **Cash Insurance** : For covering loss of cash whilst it is in transit or at counter or in the safe. The policy may be extended to cover infidelity of employees as also riot, strike and terrorism damages.



◆ **Engineering Insurance** : Insurance protection is available for construction, erection, commissioning, test run, operation, expansion etc. of a plant, machinery or equipment, provides coverage for own damage as well as to surrounding property, coverage for bodily injury to employees, to the third parties etc.

◆ **Fire Insurance** : Loss or damage to property caused by Fire is called fire waste.

◆ **Motor Insurance** : Motor Insurance policy is taken for covering the vehicles against accidental damage and third party liability.

## (ii) Insurance of Liability

◆ **Employer's Liability** : This policy will take care of the legal liability of the employer towards the employees and workmen under the workmen's compensation Act due to accident.

◆ **Product Liability** : It covers legal liability of the manufacturer of a product towards a customer, whereby the latter can legally claim the compensation for the damages caused while using an unsafe product manufactured by the former.

◆ **Public Liability** : For legal liability of the owner in respect of fatal/non-fatal injury caused to third party personal or damage to third party property arising out of accident for which the insured is held responsible under the law.

## (iii) Insurance of Persons

◆ **Group Mediclaim** : It will take care of the medical expenses necessitated due to the hospitalisation and domiciliary hospitalisation on account of accident/sickness/disease.

◆ **Group Personal Accident** : This policy is taken for providing compensation to the employees who meet with accident resulting in fatal or non-fatal injuries.

## (iv) Insurance of Pecuniary Losses

◆ **Fidelity Guarantee** : This policy covers the loss caused to the employer due to infidelity of the employees who are responsible for dealing with cash or stores or such other valuables.

◆ **Loss of Profits Insurance** : It takes care of the loss of profits and standing charges incurred by the insured due to reduction in turnover. These policies are granted in conjunction with the material damage policies and available following Fire, Machinery break-down and Boiler explosion.

◆ **Advance Loss of Profit Insurance** : When a major incident of damage to the works during construction phase is likely to result in delay in the commencement of commercial operations of the plant thereby delaying the ability to earn revenue.

**Machinery Breakdown Policy** - The machinery break down insurance policy covers the risk of damage arising from short circuiting, arcing, self heating, leakage of electricity, accidental damage to machinery at rest or whilst dismantled for repairs etc. All items of machinery with moving parts in which there may be possibility of breakdown also covered in this policy. When there is a total loss of machinery, it would be valued according to market value after deduction of depreciation for use. Only selected items of imported machinery is allowed to be insured under this policy.

**Erection Insurance Policy** - This Policy provides cover against risks arising out of various natural and man-made perils to projects under erection and it protects the

interests of the project authorities during the implementation stage of the projects. The risks covered generally are :

- Hazards occur for the owners and contractors during constructions.
- Risk relating to transportation of materials and machinery to the project site during implementation of the project.
- Risks during the erection and commissioning of the plant and machinery.

The period of insurance policy will complete with the plant put into operation. This policy is subject to certain general exclusions.

**Marine Insurance Policy** - This cover is available for exports, imports and inland transits of raw materials, plant, machinery and accessories and finished products, vessels and freight and such other interests. This policy is taken to protect from loss of damage to property while in shipment or inland transport.

### **Fire Policy -**

#### ◆ About the Fire Policy

There are three types of fire policies :

**Fire Policy A** : This type of policy is applicable to office building, hospitals, school, library, restaurant, hotels showrooms, shops, etc.

**Fire Policy B** : This type of policy is applicable to office building, hospitals, school, library, restaurant, hotels showrooms, shops, etc. But the cover available as against Fire policy A is limited.

**Fire Policy C** : This type of policy is applicable to office building, hospitals, school, library, restaurant, hotels showrooms, shops, etc. But the cover available as against Fire policy A is limited, however a wider range of risks can be insured by paying additional premium.

A standard Fire policy C offers the following covers:

- (a) Fire (b) Lightening (c) Explosion/Implosion (d) Riot, Strike, Malicious damage (e) Terrorist damage (f) Impact damage (g) Air craft damage.

In addition to the foregone, by paying additional premium the cover may be broadened to include the following:

- (a) Flood; (b) Storm; (c) Tempest; (d) Typhoon; (e) Inundation; (f) Bursting of pipes; (g) Earthquake; (h) Subsidence.

### **11.3.6 Venture Capital**

Venture capital can be defined as the long-term equity investments in business which display potential for significant growth and financial return. The nature of financing i.e. long-term equity, implies that the investor bears the risk of venture, but would earn a return commensurate with its success. Thus, the return for the investor is not through a steady dividend or interest yield but through capital gain. This definition incorporates the three main features that distinguishes venture capital investment from other forms of capital investment. They are :

- Supporting entrepreneurial talent by providing finance
- Providing business management skills
- A return in the form of capital gains.

Venture capital is generally regarded as a risk capital. The venture capital investor thus looks for markets with tremendous growth potential to be exploited with entrepreneur towards a highly rewarding relationship. To foster the growth of better technology new risky lines of business need support in the form of venture capital. The venture capital investment is a medium term high risk investment. The concept of venture capital has gained momentum in high risk oriented industrial wheel of the world economy during last five decades and it is of recent takeoff in the horizon of Indian Financial systems. The practice of venture capital as an effective financing organ is yet to operate in full swing in our country.

**Important Players** - The important players in financing Venture Capital financing in India are as follows:

- Risk Capital Technology Finance Corporation Ltd.
- Venture Capital Fund
- Technology Development and Information Company of India
- Indus Venture Capital Fund
- Gujarat Venture Finance Ltd.
- Credit Capital Venture Fund
- State Bank Venture Capital Fund
- Can Bank Venture Capital Fund
- Grindlays Bank Venture Capital Fund
- APIDC Venture Capital Ltd.

### 11.3.7 Mutual Funds

Mutual fund is the other area of financial services which has grown rapidly in India over the last ten years. Today they are playing significant role in mobilising individual savings and providing stability to the Indian capital market. Mutual fund, a financial innovation, provides for a novel way of mobilising savings from small investors and allowing them to participate in the equity and other securities of the industrial organisations with less risk. A mutual fund is an investment company or a trust that pools the resources of thousands of its shareholders or unit holders and invests on behalf of them in diversified securities and a cross section of companies to attain the objectives of the investors, which in return achieve income or growth or both.

The money thus collected is then invested by the fund manager in different types of securities. These could range from shares to debentures to money market instruments, depending upon the scheme's stated objectives. Thus, a Mutual Fund is the most suitable investment for the common man as it offers an opportunity to invest in a diversified, professionally managed basket of securities at a relatively low cost.

The income earned through this investment and the capital appreciation realised by the scheme, are distributed amongst the investors in proportion to the number of units they own by way of dividend or Net Asset Value appreciation.

### **11.3.8 Merchant Banking**

In the present day capital market scenario the merchant banks play as an encouraging and supporting force to the entrepreneurs, corporate sectors and the investors. The recent modifications of the Indian Capital market environment have emerged the various financial institutions as the major sources of finance for the organisations. Several new institutions have appeared in the financial spectacle and merchant bankers have joined to expand the range of financial services.

**Activities of Merchant Banker** - The activities performed by Merchant Bankers include the following:

- Management of issue of corporate securities of existing companies and newly floated companies
- Offering financial expertise in mergers, takeover, capital reorganisation to corporate sectors
- Management of investment trusts
- Handling insurance business
- Loan syndication and corporate advisory services
- Portfolio management
- Custodial and depository services
- Broking of corporate securities
- Attractive foreign investment

### **11.3.9 Loan Syndication**

Loan syndication refers to the services rendered by the Financial service expert or Firm in procurement of term loans and working capital loans from financial institutions, banks and other financing and investment firms for his/its client. The major activities involved in syndication o/ loans consists of the following :

- ◆ Preparation of project reports and other necessary information with the help of his client.
- ◆ Scouting for location or identification of source of finance.
- ◆ Shortlisting the providers of funds and preliminary discussion with them about the possibilities of finance and viability of the proposal.
- ◆ Preparation and filing of loan applications with the finance firms which shows interest in financing.
- ◆ Submission of all necessary information for appraisal of the proposal.
- ◆ Obtain in principle letter sanctioning the loan.

The syndicator of loan will charge his client the fee for the services rendered.

**Balance Sheets (Common-size as at March 31) (Percentages)**

	Previous year	Current year
<b>Owners' equity:</b>		
Equity share capital	40.0	36.9
General reserves	16.0	28.0
	<u>56.0</u>	<u>64.9</u>
<b>Long-term borrowings:</b>		
Loan	30.3	26.1
<b>Current liabilities:</b>		
Creditors	11.2	8.0
Outstanding expenses	1.0	
Other liabilities	1.5	1.0
	<u>13.7</u>	<u>9.0</u>
<b>Total liabilities</b>	<u>100.0</u>	<u>100.0</u>
<b>Fixed assets:</b>		
Plant assets net of accumulated depreciation	67.0	60.0
<b>Current assets:</b>		
Cash	9.0	12.0
Debtors	10.0	10.0
Inventories	14.0	18.0
	<u>33.0</u>	<u>40.0</u>
<b>Total assets</b>	<u>100.0</u>	<u>100.0</u>

**4.11 Accounting Ratios**

Financial statements prepared by a company at the end of every year is used by various people. Financial Statements prepared by a body corporate is used by wide variety of persons which includes prospective investors, creditors and even management. If relationship between various related items in these financial statements are found out and established through ratios, they can provide useful clues to understand accurately the financial health and ability of business to make profit. From such ratios various uses can take their decisions. Like shareholders can take their decision regarding investment in the business by seeing dividend pay out ratio, earning per share ratio etc. Ratios also help in detecting any adverse trends present in the financial statements. So, it can help the management in determining the areas where they will have to concentrate. Today, ratios has assumed such an importance that anybody connected with the business turns to ratio for measuring the financial strength and earning capacity of the business. E.g. a banker

### 11.3.10 Depository Services

**Meaning of Depository** - The term depository means a place where something is deposited for safe keeping; a bank in which funds or securities are deposited by others, usually under the terms of specific depository agreement. Depository means one who receives a deposit of money, securities, instruments, or other property, a person to whom something is entrusted, a trustee, a person or group entrusted with the preservation or safe keeping of something. The depository is an organisation where the securities of a shareholder are held in the form of electronic accounts, in the same way as a bank holds money. The depository holds electronic custody of securities and also arranges for transfer of ownership of securities on the settlement dates. This system is known as scripless trading system. Any body to be eligible to provide depository services must register with SEBI.

**Depository System** - Depository system is concerned with conversion of securities from physical to electronic form, settlement of trades in electronic segment, electronic transfer of ownership of shares and electronic custody of securities. All securities in the depositories are identical in all respects and are thus fungible. The ownership and transfer of securities take place by means of electronic book entries, avoiding the risks associated with the paper. Depository system is not mandatory, it is optional and it is left to the investor to decide whether he wants the securities to be dematerialised. The system results in instant transfer as compared to six to eight weeks time under physical mode.

**Constituents of Depository** - The constituents of a depository are as under:

- Issuer or Company
- Issuer Registrar
- Depository Participant
- Clearing Members
- Stock Brokers
- Clearing Corporations
- Investors

**Functional Aspects** - The functional aspects of depository system would include:

- Account opening
- Dematerialisation
- Rematerialisation
- Clearing and settlement
- Initial public issues
- Corporate actions
- Pledge and hypothecation
- Transmission and nomination
- Reconciliation

**National Securities Depository Limited (NSDL)** - NSDL was registered by the SEBI on June 7, 1996 as India's first depository to facilitate trading and settlement of securities in

the dematerialised form. The NSDL is promoted by IDBI, LT and NSDL provide electronic depository facilities for securities traded in the equity and debt markets in the country. NSDL has been set up to cater to the demanding needs of the Indian capital markets. In the first phase of operations, NSDL will dematerialise scrips and replace them with electronic entries. With NSDL taking the lead in commencing depository operations, other aspirants like BOL shareholding - BSE combine and the ICICI - DSE combine are now expediting their depository plans. NSDL has a very important role to play in framing the future of Indian capital market, but its success depends on the investor.

### **11.3.11 Custodial Services**

A custodian is a person who keeps custody of the securities on behalf of somebody else. It means, the valuable documents and papers should be carefully guarded by keeping them in the proper place under tight security. Custodian is a person who has custody of something; caretaker of a public building and property.

Custodian is a caretaker of the securities and documents and in return he gets some benefit for his services called "Custodial Charges". Since the work of custodian is risky, costly and cumbersome in nature, only entities can do such work of custodian services which involves a lot of money, space requirement, full safety measures etc. Institutions can do it successfully.

### **11.3.12 Share Registration Services**

In a company, the secretary or other official of the company will normally deal with the company share registration work. With the increase in public issues and number of investors, a specialised service called 'share registration services' has emerged as one of the important facets of financial services sector. For big companies with large investors base, the duties of a registrar can be an immense necessity and it becomes a matter of decision whether or not the company maintains its own registration department or contracts the work out to a professional registrar. The company registrarship is a highly professional service involving minute attention to detail. There is a high routine content in the work associated with the maintenance of company registers which in the past required the employment of large numbers of staff, but as the operation lends itself to computer applications, it is now far less labour intensive.

### **11.3.13 Debenture Trusteeship**

When a company seeks to issue debentures or debenture stock, or even unsecured loan stock, it is customary to appoint a trustee to protect the interests of the debenture holders or stockholders. The issue is normally constituted under a trust deed entered into between the company and the trustee. The powers and duties of the trustee will be set out in the deed. In general, it is the concern of the trustee to see that the obligations of the company are duly performed. The debentures or stock may carry a fixed charge over certain fixed assets, or a floating charge over the undertaking generally, or both. The trustee would normally hold the documents of title to any specifically charged assets and in some cases may be required to ensure that the floating assets of the undertaking are maintained at a stipulated level. If there is a sinking fund for the redemption of the debentures or stock, the trustee will be responsible for seeing that the fund is operated in accordance with the deed. The trustee may have a particularly active role where there are a number of dealings in the charged assets by way of sales, purchases, leases, etc. The security property can be released only with the consent of the trustee and such consent would also be necessary where, for any reason, it is proposed to reduce the value of

security property by the withdrawal of assets from behind the debentures or stock without replacement. The trustee will also be responsible for seeing that freehold and leasehold properties are properly insured and that all outgoings are duly met.

### 11.3.14 Credit Cards

The development of the credit card is probably the most significant phenomenon of the modern financial services sector. In India credit cards are mainly issued by the public sector commercial banks and some foreign banks and private sector organisations have also issued the credit cards. It is a natural extension of ordinary banking facilities. credit card is a convenient and easy way for the everyday shopper to make his payments for all kinds of goods and services without the use of cash. Now credit card is popular throughout all sections of the country. There are three quite distinct parties to a credit card operation viz., card holder, the merchant and the card-issuing organisation.

There is an element of free credit granted to cardholders because (a) accounts are settled monthly covering purchases of goods or services since the last monthly statement and (b) the cardholder is allowed say, 15 days from the date of his monthly statement to settle the outstanding amount. It follows that if a cardholder's statement is normally prepared on say, the 15th of the month, any purchases made on 16th of the month could carry the benefit of 45 days free credit. When a person applies for a credit card, he will be asked to supply details of his financial circumstances and, subject to satisfactory references, he will be given a card with an appropriate credit limit.

### 11.4 Exercise

- Q.1 Write in brief about the various services provided by finance consultant in modern world ?
- Q.2 What are the advantages and disadvantages of leasing ?
- Q.3 Write a note on different agencies providing service of credit rating ?
- Q.4 Write a note on contribution of financial consultant in the field of insurance ?
- Q.5 Write a note on venture capital services ?
- Q.6 Write a note on services of debenture trusteeship by financial consultant?



# NOTES

# NOTES

or other creditor will measure the repaying capacity and financial strength on the basis of accounting ratios.

The Balance Sheet and the Statement of Income are essential, but they are only the starting point for successful financial management. Apply Ratio Analysis to Financial Statements to analyze the success, failure, and progress of your business.

Ratio Analysis enables the business owner/manager to spot trends in a business and to compare its performance and condition with the average performance of similar businesses in the same industry. To do this compare your ratios with the average of businesses similar to yours and compare your own ratios for several successive years. watching especially for any unfavorable trends that may be starting.

In finance, ratios are usually two financial statement items that may be related to one another and may provide the prudent user a good deal of information. Of the myriad of ratios that could be generated, some will be more meaningful than others.

Without ratios, total interpretation of accounts is almost impossible. Ratio will help in understanding the facts of the accounts, which are not apparent in from the records. A ratio can be expressed in three different ways. It proportion, e.g. 3 : 1. Second in percentage, e. g. 40%. Third in rates, e.g. 8 times a year.

### **Interpretation Through Ratios**

A ratio can not be useful unless it is analyzed or interpreted and so after finding ratios, it can be compared with the ideal ratio prevailing in industry or with the past ratios or with the ratios of any firm in the same field so, that the proper results can be obtained. Ratios, as shown above, are relative figures reflecting the relationship between variables. They enable analysts to draw conclusions regarding financial operations. The use of ratios, as a tool of financial analysis, involves their comparison, for a single ratio, like absolute figures, fails to reveal the true position. Four types of comparisons are involved: (i) trend ratios, (ii) inter-firm comparison, (iii) comparison of items within a single year's financial statement of a firm, and (iv) comparison with standards or plans.

### **Techniques And Purposes Of Analysis**

Accounting ratios are generally classified as follows

**Revenue Statement Ratios** : e.g. Gross profit ratio, Net Profit ratio. Such ratio interpret the results of revenue statements.

**Balance Sheet Ratios** : e.g. Current ratio, liquidity ratio. Such ratio interpret the results of balance sheet.

### **Classification of Accounting Ratios Revenue Statement Ratios**

The ratios computed showing relationship between the two items of profit and loss account are enumerated below :

- (a) Gross Profit Ratio
- (b) Operating Ratio.
- (c) Expense Ratio
- (d) Net Profit Ratio

## (a) Stock Turnover

### (A) Gross Profit Ratio

$$\text{Gross Profit Ratio} = \text{Gross Profit/Sales} \times 100$$

Such ratio help in understanding the profitability of the business from the basic operations. It is a ratio expressing relationship between Gross Profit earned to Net Sales. It is a useful indication of the profitability of business.

This ratio should be high as far as possible. If this ratio is low, it indicates that the cost of sales is high or that the buying is inefficient. It means the profit is high or cost is low.

### (B) Operating Ratio

$$\text{Operating ratio} = \text{Operating expenses/sales} * 100$$

It shows what to what extent the amount is expended for the purpose of different expenses, this expenses may be related with the cost of goods sold as well as the other administrative expenses. It is a ratio showing relationship between Cost of goods sold plus Operating expenses and Net Sales. It shows the efficiency of the management. The higher the ratio, the less will be the margin available to proprietors. This ratio is also usually expressed as a percentage. It should be lesser as far as possible.

Cost of Sales = Opening stock + Net purchases + Purchases expenses - Closing stock.

OR

Cost of Sales = Net Sales - Gross Profit.

### (C) Expense Ratio

It is computed by dividing expenses by sales. The term 'expenses' includes (i) cost of goods sold, (ii) administrative expenses, (iii) selling and distribution expenses, (iv) financial expenses but excludes taxes, dividends and extraordinary losses due to theft of goods, good destroyed by fire and so on. There are different variants of expenses ratios. That is,

$$\text{Expense Ratio} = \text{Expenses} / \text{Sales}$$

This ratio shows the proportion of the amount of sales which is used for the purpose of different expenses. This ratio is calculated mainly for the purpose of ascertaining relationship between operating expenses and net sales, expense ratios are computed. Some accountants calculate expenses ratio in respect of raw-material consumed, direct wages and factory expenses. In all these ratios in denominator sales is written.

This ratios should be lesser as far as possible. These ratios over a number of years will reveal the extent to which expenses vary in relation to sales.

### (D) Net Profit Ratio

$$\text{Net Profit Ratio} = (\text{Net Profit} \times 100) / \text{Net Sales}$$

This ratio can be treated as profitability ratio and it shows mainly the relations of profit earned with the sales. This ratio is very much useful to the management. And this ratio should be higher as far as possible. The ratio is valuable for the purpose of ascertaining the over-all profitability of business and shows the efficiency of the operations of the business. This ratio is widely used for the purpose of interpretation.

require much higher ratio than 2 to 1. The need for safety margin arises from the inevitable unevenness in the flow of funds through the current assets and liabilities account. The fact that a firm may rarely count on such an even flow requires that the size of the current assets should be sufficiently larger than current liabilities so that the firm would be assured of being able to pay its current maturing debt as and when it becomes due. It is important to note that a very high ratio of current assets to current liabilities may be indicative of slack management practices, at the same time, the firm may not be making full use of its current borrowing capacity. Therefore, a firm should have a reasonable current ratio.

**Current Assets** = Cash and Bank balance + Stock + Debtors + B/R + Prepaid expenses + Investments readily convertible into cash + Loans and advances.

**Current Liabilities** = Creditors + B/P + Bank O/D + Unclaimed dividend + Provision for Taxation + Proposed dividend.

So, in simple words, The current assets of a firm, as already stated, represent those assets which may be, in the ordinary course of business, converted into cash within a short period of time, normally not exceeding one year. The current liabilities defined as liabilities which are short-term maturing obligations to be met, as originally contemplated, within a year.

### **Liquid Ratio**

**Liquid ratio** = Liquid assets/Liquid liabilities

Here, liquid assets means all current assets except closing stock where as liquid liability means all current liability less bank overdraft. As observed above, one defect of the current ratio is that it fails to convey any information on the composition of the current assets of a firm. A rupee of cash is considered equivalent to a rupee of inventory or receivables. But it is not so. A rupee of cash is more readily available (i.e. more liquid) to meet current obligations than a rupee of, say, inventory. This impairs the usefulness of the current ratio. Stock is not treated as a liquid asset because it cannot be readily changed into cash as and when required. Bank overdraft is not involved in liquid liabilities because bank overdraft is not likely to be called on demand and is treated as a sort of permanent mode of financing. The liquid ratio which is mainly designed to show the cash available to meet immediate payments. It is obtained by dividing the liquid assets by liquid liabilities. If the liquid assets are equal to or more than liquid liabilities, the condition may be considered as satisfactory. The quick ratio is a more rigorous and penetrating test of the liquidity position of a firm.

### **Acid-Test Ratio**

**Acid-test Ratio** = Quick Assets / Liquid Liabilities

Here in this ratio only cash factors of current assets are considered and no other factor will be considered. It is computed by dividing the worth of quick assets by liquid liabilities. Here, quick assets do not include both stock and debtors, because payments from debtors would not generally be received immediately when liquid liabilities are to be paid. The acid-test ratio is a rigorous measure of a firm's ability to service short-term liabilities. The usefulness of the ratio lies in the fact that it is widely accepted as the best available test of the liquidity position of a firm.

## Proprietary Ratio

Proprietor's ratio = Proprietor's fund/Total Assets

This ratio shows the relationship of proprietor's fund with the total assets means that to what extent the assets of the business is financed by proprietor's fund. The ratio shows the proportion of proprietors' funds to the total assets employed in the business. The proprietors' funds or shareholders' equity consist of share capital and reserves & Surplus. This ratio should be higher as far as possible means the the higher the ratio, the stronger the financial position of the enterprise, as it signifies that the proprietors have provided larger funds to purchase the assets.

Moreover, a very high ratio is also not desirable, because it means that insufficient use is being made of outside funds.

## Debt-Equity Ratio

Debt-Equity Ratio =  $\frac{\text{Long term Liabilities}}{\text{Shareholders Funds}} \times 100$

This ratio indicates the capital mix in the business. It shows to what extent debt is involved in the business against the owner's funds. It shows the proportion of long-term External Equities and Internal Equities.

This ratio reflects the relative claims of creditors and shareholders against the assets of the firm. Alternatively, this ratio indicates the relative proportions of debt and equity in financing the assets of a firm.

## Capital Gearing Ratio

Capital gearing ratio = Fixed interest bearing capital/equity capital

Normally, two types of capital is usually available in the business. One is demanding fixed rate of return at the end of specific period which mainly include preference share and debentures. Whereas the other capital is that type which is not demanding any amount of fixed return at the end of specific period. Such capital includes equity capital. This ratio indicates the relationship and capital mix of fixed interest bearing capital with the normal capital. In other words, it is the ratio of fixed dividend bearing capital to ordinary capital. The higher this ratio, the capital structure of the body corporate is said to be highly geared.

## Long term Funds to Fixed Assets

This ratio indicates to what extent the long term assets are financed by the long term funds in the business. Normally, the fixed assets of business must be purchased out of Fixed Capital only, which includes share capital, reserves and long term liabilities. The ratio must be 1 : 1 or more.

Long term Funds to Fixed Assets Ratio =  $\frac{\text{Long term Funds}}{\text{Fixed Assets}}$

Where Long-term Funds = Share Capital + Reserves + Long term Liability

## Composite Ratios :

Here, in this type of ratios on item will be from profit and loss account and other will be balance sheet. The ratios expressing relation between one item of Profit and Loss

Account and the other item from Balance Sheet are combined or composite ratios. The following are some of these ratios :

**(1) Return on Investment :**

- (i) Return on Capital Employed
- (ii) Return on Shareholders' Funds
- (iii) Return on Equity Shareholders' Funds\*.

**(2) Debtors' Turnover (Debtors' Ratio)**

**(3) Creditors' Turnover (Creditors' Ratio)**

**(4) Fixed Assets Turnover Ratio.**

**(5) Total Assets Turnover.**

**(6) Debt Service Coverage Ratio.**

**Return on Investment :**

This ratio is concerned with the overall profitability of the business. It shows profitability from various angles. Profitability may be from the point of view of firm as a whole or from the angle of the equity shareholders etc. This ratio should be higher as far as possible. Return on investment indicates the profitability of business and is very much in use among financial analysts. Under this head, we shall study three different ratios:

(i) Return, on capital employed (ii) Return on shareholders' funds (iii) Return on equity.

**Return on Capital Employed**

$$\text{Return on Capital Employed} = \frac{\text{Net Profit}}{\text{Capital Employed}} \times 100$$

Here, this ratio indicate the profitability of the business from the angle of the firm as a whole. This ratio should be higher as far as possible. This ratio shows the rate of return on the capital employed. This ratio is of very much use to the management of the company. The term Capital Employed includes share capital, reserves and long term loans such as debentures.

It must be remembered that in this ratio Net Profit is Profit before deducting Interest and Taxes = EBIT (Earnings before interest and taxes)

Where Capital Employed = Share Capital + Reserves + long Term Loan

**Return on Shareholders' Funds**

$$\text{Return on Shareholders' Funds} = \frac{\text{Net Profit}}{\text{Shareholders Funds}} \times 100$$

This ratio is also showing the profitability of the business but this profitability is indicated from the angle of the shareholders. From this ratio is, the shareholders in the business can make out to what extent they earned by making investment in the business. So, this ratio is very much useful to the shareholders of the business. Proprietors' Funds include share capital and reserves. It also indicates whether the return on proprietors'

funds is enough in relation to the risks that they undertake. The profit should be after interest and tax i.e. PAT - Profit After Tax.

### **Return on Equity Shareholders 'Funds'**

$$\text{Return of Equity Shareholders Fund} = \frac{\text{Net Profit} - \text{Preference Dividend}}{\text{Ordinary Share Capital} + \text{Free Reserves}} \times 100$$

It shows what percentage of profit is earned on the capital invested by ordinary shareholders. The ratio is obtained by dividing net profit after deduction of preference dividend by the sum of ordinary share capital plus free reserves.

**In case of all the above three ratios, fictitious assets given in the balance sheet must be deducted in the denominator.**

#### **Debtors' Ratio:**

(i) Firstly, average daily sales is found out then (ii) Collection period is determined.

$$\text{Average Daily Sales} = \frac{\text{Credit Sales}}{365}$$

$$(i) \text{ Debtors' Ratio} = \frac{\text{Debtors} + \text{Bills Receivable}}{\text{Average Daily Sales}}$$

#### **Average Daily Sales**

Alternative Formula : Instead of calculating average daily sales as above, the following formula may be used to find out Debtors Ratio

$$(ii) \text{ Debtors Ratio} = \frac{\text{Debtors} + \text{Bills Receivable}}{\text{Average Daily Sales} \times 365}$$

#### **Credit Sales**

This ratio indicates the credit policy of the business. It shows that to what extent the amount is blocked in the debtors of the company. For the better management of the current assets this ratio should be lower as far as possible. The ratio shows the number of days taken to collect the dues of credit sales. The ratio is computed by dividing the sum of debtors and bills receivable by the average daily sales. The average daily sales is obtained by dividing the total annual sales by 365.

#### **Debtors Turnover:**

$$\text{Debtors Turnover} = \frac{\text{Credit Sales}}{\text{Average Debtors}}$$

$$\text{Where Average Debtors} = \frac{\text{Opening Debtors} + \text{Closing Debtors}}{2}$$

If B/R is given, it should be involved in the debtors.

The debtors turnover suggests the number of times the sum of credit sale is collected during the year, while debtors ratio indicates the number of days during which the dues for credit sales are collected. Suppose the debtors ratio is 73 days, it means that debtors pay their dues for credit sales after 73 days of making the sales.

It means that during the year the collection for credit sales is made

**5 times during the year ( 365 days/73 days = 5).**

#### **(1) Creditors Velocity or Creditors Ratio**

$$\text{Creditors' Ratio} = \frac{\text{Creditors} + \text{Bills Payable}}{\text{Average Daily Purchase}}$$

$$\text{Creditors Velocity} = \frac{\text{Creditors} + \text{Bills Payable}}{\text{Annual Purchase}} \times 365$$



**Creditors Turnover = Credit Purchases/ Average Creditors**

If creditors Ratio or Average Payment Period is to be calculated on the basis of Creditors Turnover, it will be done as follows :

**Creditors Ratio = 360 or 365/Creditors Turnover**

It shows the number of days within which we make payment to our creditors for credit purchases is obtained from creditors velocity. This ratio is helpful to the management and it also shows the buying efficiencies of the management. This ratio shows what credit period is given by the creditors to us. It helps the management in making arrangement in the working capital need. This ratio should be higher as far as possible so that comparatively there will be less need of working capital. Suppose the credit period is 45 days, i.e. our creditors allow us a credit period of 45 days.

**Fixed Assets Turnover**

**Fixed Assets Turnover =  $\frac{\text{Sales}}{\text{Fixed Assets}}$**

This ratio is showing that to what extent the sale is generated by making investment in the fixed assets. This ratio should be higher as far as possible. The more the sales in relation to the sum invested in fixed assets, the more efficient is the use of fixed assets.

**(2) Total Assets Turnover**

**Total Assets Turnover = Sales/Total Assets**

Total assets includes not only fixed assets as well as it includes current assets as well. This ratio shows to what extent sale is achieved by making investments in the total assets of the business. This ratio should be higher as far as possible. This ratio is very much helpful to the management of the business.

**Debt Service Coverage Ratio:**

This ratio is indicating that to what extent the business has generated profits for the purpose of debt repayment. It means calculation is made as to how many times the profit covers the payment of principal and interest on loan.

Debt repayment mainly includes the installments for the purpose of debt repayment as well as the interest on it. When a creditor or bank lends money to the business, he always examines the paying capacity of the borrower. This ratio is very much useful to the lender of the money for checking the efficiencies of the person taking the money.

**Debt Service Coverage Ratio: Profit available for debt repayment/Install. + Interest**

**Here Profit means profit available for payment of debt**

**Profit = Profit after tax + Depreciation and other non-cash adjustments + interest payable on loan**

**Debt Service Coverage ratio = Profit available for Debt Payment/installment of principal + Interest**

**Coverage Ratios** The second category of leverage ratios are coverage ratios. These ratios are computed from information available in the profit and loss account. For

a normal firm, in the ordinary course of business, the claims of creditors are not met out of the sale proceeds of the permanent assets of the firm. The obligations of a firm are normally met out of the earnings or operating profits. These claims consist of (i) interest on loans, (ii) preference dividend, and (iii) amortisation of principal or repayment of the instalment of loans or redemption of preference capital on maturity. The soundness of a firm, from the view-point of long-term creditors, lies in its ability to service their claims. This ability is indicated by the coverage ratios. The coverage ratios measure the relationship between what is normally available from operations of the firms and the claims of the outsiders. The important coverage ratios are: (i) interest coverage, (ii) dividend coverage, (iii) total coverage, (iv) total cashflow coverage, and (v) debt service coverage ratio.

**Interest Coverage Ratio** It is also known as 'time-interest-earned ratio'. This ratio measures the debt servicing capacity of a firm insofar as fixed interest on long-term loan is concerned. It is determined by dividing the operating profits or earnings before interest and taxes (EBIT) by the fixed interest charges on loans. Thus,

EBIT

$$\text{Interest coverage} = \frac{\text{EBIT}}{\text{Interest}}$$

It should be noted that this ratio uses the concept of net profits before taxes because interest is tax-deductible so that tax is calculated after paying interest on long-term loan. This ratio, as the name suggests, shows how many times the interest charges are covered by the EBIT out of which they will be paid. In other words, it indicates the extent to which a fall in EBIT is tolerable in the sense that the ability of the firm to service its interest payments would not be adversely affected. For instance, an interest coverage of 10 times would imply that even if the firm's EBIT were to decline to one-tenth of the present level, the net profits available for servicing the interest on loan would still be equivalent to the claims of the creditors. On the other hand, a coverage of five times would indicate that a fall in operating earnings only to upto one-fifth level may be tolerated. From the point of view of the creditors, the larger the coverage, the greater is the ability of the firm to handle fixed-charge liabilities and the more assured is the payment of interest to the creditors. However, too high a ratio may imply unused debt capacity. In contrast, a low ratio is a danger signal that the firm is using excessive debt and does not have the ability to offer assured payment of interest to the creditors.

**Dividend Coverage Ratio:** It measures the ability of a firm to pay dividend on preference shares which carry a stated rate of return. This ratio is the ratio (expressed as x number of times) of net profits after taxes (EAT) and the amount of preference dividend. Thus,

EAT

$$\text{Dividend coverage} = \frac{\text{EAT}}{\text{Preference dividend}}$$

**Total Coverage Ratio** While the interest coverage and preference dividend coverage ratios consider the fixed obligations of a firm to the respective suppliers of funds, that is, creditors and preference shareholders, the total coverage ratio has a wider scope and takes into account all the fixed obligations of a firm, that is, (i) interest on

loan, (ii) preference dividend, (iii) lease payments, and (iv) repayment of principal. Symbolically,

$$\text{Total coverage} = \frac{\text{EBIT} + \text{Lease payment}}{\text{Interest} + \text{Lease payments} + (\text{Preference dividend} + \text{Instalment of principal})/(1 - t)}$$

**Earnings Per Share (EPS)** measures the profit available to the equity shareholders on a per share basis, that is, the amount that they may get on every share held. It is calculated by dividing the profits available to the shareholders by the number of the outstanding shares. The profits available to the ordinary shareholders are represented by net profits after taxes and preference dividend. Thus,

$$\text{EPS} = \frac{\text{Net profit available to equity holders}}{\text{Number of ordinary shares outstanding}}$$

**Dividend Per Share (DPS)** is the dividends paid to the shareholders on a per share basis. In other words, DPS is the net distributed profit belonging to the shareholders divided by the number of ordinary shares outstanding. That is,

$$\text{DPS} = \frac{\text{Dividend paid to ordinary shareholders}}{\text{Number of ordinary shares outstanding}}$$

**Dividend-Pay Out (D/P) Ratio** is also known as pay-out ratio. It measures the relationship between the earnings belonging to the ordinary shareholders and the dividend paid to them. In other words, the D/P ratio shows what percentage share of the net profits after taxes and preference dividend is paid out as dividend to the equity holders. It may be calculated by dividing the total dividend paid to the owners by the total profits/earnings available to them. Alternatively, it may be found out by dividing the DPS by the EPS. Thus,

**Total dividend (cash dividend) to equityholders**

$$1. \text{D/P} = \frac{\text{Total dividend (cash dividend) to equityholders}}{\text{Total net profit belonging to equityholders}} \times 100$$

**Dividend per ordinary share (DPS)**

$$2. \text{D/P} = \frac{\text{Dividend per ordinary share (DPS)}}{\text{Earnings per share (EPS)}} \times 100$$

**Earnings and Dividend Yield** is closely related to the EPS and DPS. While the EPS and DPS are based on the book value per share, the yield is expressed in terms of the market value per share. The earnings yield may be defined as the ratio of earnings per share to

the market value per ordinary share. Similarly, the dividend yield is calculated by dividing the cash dividends per share by the market value per share. That is,

$$1. \text{ Earning yield} = \frac{\text{EPS}}{\text{Market value per share}} \times 100$$

$$2. \text{ Dividend yield} = \frac{\text{DPS}}{\text{Market value per share}} \times 100$$

The earning yield is also called the earning-price ratio.

**Price Earnings (P/E) Ratio** is closely related to the earnings yield/earnings price ratio. It is actually the reciprocal of the latter. This ratio is computed by dividing the market price of the shares by the EPS. Thus,

$$\text{P/E ratio} = \frac{\text{Market price of share}}{\text{EPS}}$$

### Utility of Ratio Analysis

Ratio analysis is useful or the beneficial to various class of the people like shareholders, management, creditors etc. Their uses for the ratio may be different. So, wide variety of ratios can be used for the uses of various class of people. The ratio analysis provides useful data to the management, which would help them in taking important policy decisions. Ratio analysis helps in inter-firm comparison, which shows the strength and weakness of the firm as compared to other firms and will indicate corrective measures. The ratios of the last three to five years will indicate the trend in the respective fields. Ratios guide the management in making some of the important decisions. Useful information about the trend of profitability is available from profitability ratios. In fact, the use of ratios was made initially to ascertain the liquidity of business. The use of ratios was started by banks for ascertaining the liquidity and profitability of body corporate' business for the purpose of advancing loans to them. It gradually became popular and other creditors began to use them profitably. Now even the investors calculate ratios from the published accounts of the body corporate in order to have an idea about the solvency and profitability of the body corporate before investing their savings.

### Limitations of Ratio Analysis

Even though there are various benefits available to variety of people from various ratios it has some limitations. Followings are some of the limitations of the ratios:

There is practically no standard ratio against which the actual performance can be compared. The satisfactory level of various ratios may differ from one industry to another only because circumstances differ from industry to industry and even from firm to firm. While comparing ratios of different firms, it must be remembered that different firms follow different accountancy plans and policies. Hence,



**Balance-Sheet**

	Funds Employed		Rs.	Rs.
(1)	Shareholder's Funds:			
	Equity Share Capital			
	Preference Share Capital			
	Reserve and Surplus			
(2)	Loan Funds (Long-term Funds) :			
	1. Debentures			
	2. Financial Institution's Loan	Capital Employed :		
	Application of Funds (Employment of. Capital)			
(1)	Fixed Assets less Depreciation			
(2)	Investments			
(3)	Current Assets. Loans and Advances :			
	(i) Stock '			
	(ii) Debtors			
	(iii) Cash and Bank			
Less :	Current Liabilities :			
	(i) Creditors			
	(ii) Bills Payable			
	Net Current Assets	Total Assets	....	....

**Practical**

1. Parth Ltd. has made a profit of Rs. 9,75,000 after charging depreciation of Rs. 5,00,000 and providing for tax. The sum of interest and other sums written off are Rs. 32,120.

The details about loans are as follows :

15% Debentures of Rs. 10,00,000 of which 1/4th is payable during the current year.

18% Term Loan of Rs. 4,00,000 of which 1/4 is payable at the end of the current year.

16% Cash Credit Rs. 5,00,000.

18% Loan from private parties Rs. 2,00,000 which is payable in full during the current year.

Compute the Debt Service Coverage Ratio.

**Solution :**

(I)	Payment of Interest :	Rs.
	(1) 15% Debentures of Rs. 10 lakhs	1,50,000
	(2) 18% Term Loan of Rs. 4 lakhs	72,000
	(3) 16% Cash Credit of Rs. 5 lakhs	80,000
	(4) 18% Loan of Rs. 2 lakhs from private parties	36,000
	<b>Total</b>	<b>3,38,000</b>
(II)	Payment of Principal :	Rs.
	(1) 15% Debentures of Rs. 10 lakhs × 1/4	2,50,000
	(2) 18% Term loan of Rs. 4 lakhs × 1/4	1,00,000
	(3) 18% Private loan of Rs. 2 lakhs =	2,00,000
		<b>5,50,000</b>
(III)	Profit available for Payment of Debt :	Rs.
	Net Profit	9,75,000
	+ Depreciation	5,00,000
	+ Other Non-cash items written	32,120
	+ Interest which is payable	3,38,000
	(It is added because it is	
	already deducted from profit	
	as the profit given is after tax)	
		<b>18,45,120</b>

Debt Service Coverage Ratio = Profit

**Principal + Interest**

$$= \frac{18,45,120}{3,38,000 + 5,50,000}$$

$$= 2.078$$

The ratio shows that from the sum of profit debt (Principal + Interest) can be paid 1.74 times i.e. profit is sufficient for payment of debt.

2. The following are the summarized balance sheets of Rehan Ltd. for two years. You are required to rearrange it in the form suitable for computing ratios :

**Balance Sheets**

Liabilities	1997 Rs.	1998 Rs.	Assets	1997 Rs.	1998 Rs.
Share Capital :			Fixed Assets		
Equity shares of			Less : Depreciation	3,50,000	4,90,000
Rs. 100 each	1,00,000	1,50,000	Current Assets :		
8% Pref. Shares			Stock	1,60,000	60,000
of Rs. 100 each	50,000	50,000	Debtors	40,000	35,000
Reserves	2,00,000	1,50,000	Cash	10,000	5,000
6% Debentures	1,00,000	1,00,000			
Current Liabilities	90,000	1,20,000			
Bank Overdraft	20,000	20,000			
	5,60,000	5,90,000		5,60,000	5,90,000

From the above information you are required to calculate the following ratios and comment on the financial position of body corporate.

(1) Current Ratio (2) Liquid Ratio (3) Acid-Test Ratio (4) Proprietary Ratio (5) Long term Funds to Fixed Assets Ratio.



**Solution:**

In the absence of any figures relating to Profit and Loss Account, the comments would be based on Balance Sheet ratios only.

First of all we shall prepare a vertical balance sheet which is useful for computing various ratios.

		Previous year's Figures	Current Figures
		1997	1998
	<b>Funds Employed</b>	Rs.	. Rs.
(1)	<b>Shareholder's Funds :</b>		
	(A) Equity shares of Rs.100 each	1,00,000	1,50,000
	8% Pref. shares of Rs. 100 each	50,000	50,000
	(B) Reserves and Surplus	2,00,000	1,50,000
		3,50,000	3,50,000
(2)	<b>Loan Funds :</b>		
	Secured Loan : 6% Debentures	1,00,000	1,00,000
		4,50,000	4,50,000
	Application of Funds		
(1)	<b>Fixed Assets :</b>		
	Total Fixed Assets Less Depreciation (a)	3,50,000	4,90,000
(2)	<b>Investments</b>		
(3)	<b>Current Assets, Loans and Advances :</b>		
	(1) Stock	1,60,000	60,000
	(2) Debtors	40,000	35,000
	(3) Cash	10,000	5,000
		2,10,000	1,00,000
Less	<b>Current Liabilities and Provisions :</b>		
	(1) Current Liabilities	90,000	1,20,000
	(2) Bank Overdraft	20,000	20,000
		1,10,000	1,40,000
	Net Current Assets (Working Capital) (b)	1,00,000	40,000
	<b>Total Assets (a) + -(b)</b>	4,50,000	4,50,000

**(1) Current ratio** = Current Assets / Current Liabilities

For 1997 = 2,10,000/1,10,000 = 1.91:1

For 1998 = 1,00,000/1,40,000 = 0.71 : 1

Current ratio indicates the working capital position. There has been considerable deterioration in the current ratio. On one hand, current assets have been reduced to almost half of what they were last year, whereas the current liabilities have increased by nearly 40%. Normally, this ratio should be 2:1. i.e. the value of current assets should be twice the current liabilities. The standard had been met last year, whereas the ratio during the current year should cause anxiety. Current assets are less than current liabilities, meaning thereby that the body corporate would not be able to meet its current obligations as and when they will fall due. If immediate steps are not taken to remedy the situation, the body corporate will be put to considerable trouble.

**(2) Liquid Ratio** = Liquid Assets/Liquid Liabilities

Where Liquid Assets = Current Assets - Stock

and Liquid Liabilities = Liquid Assets - Bank overdraft

For 1997 = 50,000/90,000 = 0.55:1

For 1998 = 40,000/1,20,000 = 0.33:1

The liquid ratio is a better indication of liquid position of the body corporate and shows whether the body corporate will be able to meet its current obligations due for immediate payment at a short notice. No standard norm is available for this ratio. However, it is supposed that liquid assets should at least cover the liquid liabilities i.e. the ratio should be 1 : 1. The ratio for this body corporate during 1997 was unsatisfactory and has deteriorated to such an extent during 1998, that the body corporate would be facing financial crisis, if immediate corrective steps are not taken to improve this situation. It may be suggested that the body corporate should issue either shares or debentures to improve its liquid position.

**(3) Acid-Test Ratio** = Quick Assets/Liquid Liabilities

Here Quick Assets = Cash + Bank + Easily marketable securities. 10,000

For 1997 = 10,000/90,000 = 0.11:1

For 1998 = 5,000/1,20,000 = 0.042:1

This ratio indicates a danger signal. It suggests that immediate steps should be taken to increase quick assets.

$$\begin{aligned}
 \text{(4) Proprietary Ratio} &= \frac{\text{Proprietary Funds}}{\text{Total Assets}} \times 100 \\
 \text{For 1997} &= \frac{3,50,000}{5,50,000} \times 100 \\
 &= 63.64 \% \\
 \text{For 1998} &= \frac{3,50,000}{5,90,000} \times 100 \\
 &= 59.32 \%
 \end{aligned}$$

The ratio indicates the sum of capital contributed by the proprietors. The higher the ratio, the stronger is the financial position of business. The ratio during 1997 shows a comfortable position which has gone down in 1998 showing a deteriorating financial position. The proprietor's funds have remained stationary (increase in share capital Rs. 50,000 is rewarded by decrease in Reserves of Rs. 50,000) during these two years against which total assets have increased by nearly Rs. 40,000. Such a declining trend must be arrested as the existing position is not satisfactory.

#### (5) Long Term Funds to Fixed Assets Ratio

$$= \frac{\text{Long Term Funds}}{\text{Fixed Assets}} \times 100$$

(Long Term Funds = Share Capital + Reserves + Long Term Liabilities)

$$\begin{aligned}
 \text{For 1997} &= \frac{4,50,000}{3,50,000} \times 100 = 128.57 \% \\
 \text{For 1998} &= \frac{4,50,000}{4,90,000} \times 100 = 91.84\%
 \end{aligned}$$

The fixed assets should always be acquired out of long term funds meaning thereby that this ratio should not be less than 100. The ratio for this body corporate during 1997 indicated a reasonable position, as the fixed capital was more than adequate to cover the fixed assets. The circumstances in 1998 is however, not comfortable as the ratio has not only deteriorated but has even gone down below 100 suggesting that the body corporate has financed its purchases of fixed assets out of the short term finances which is a dangerous financial policy. The body corporate will not be able to repay its short term liabilities, sunk in fixed assets and may be forced to dispose of some of its fixed assets to repay these short term liabilities. The better course for the body corporate is to issue either shares or debentures or to obtain long term finances to acquire fixed assets.

The over-all financial position of the body corporate is not satisfactory and shows a considerable deterioration from its position of the previous year.

3. From the following statements of Smita Ltd. for the year ending 31st March, 2002, you are required to rearrange the items in the form of Financial Statements suitable for analysis and calculate the following ratios and state the significance of each such ratio :

- (1) Current ratio
- (2) Acid-test ratio (Liquid ratio)
- (3) Operating ratio
- (4) Stock turnover ratio
- (5) Debtors' Ratio and Debtors' Turnover

Balance Sheet as on 31-3-2002

Liabilities	Rs.	Assets	Rs.
Share Capital :		Land and Buildings	50,000
Issued and Paid up :		Plant and Machinery	20,000
50,000 Equity Shares of		Stock	15,000
Re. 1 each	50,000	Debtors	25,000
General Reserve	40,000	Cash	15,000
Profit & Loss A/c	15,000		
Sundry Creditors	20,000		
	1,25,000		1,25,000

Profit and Loss Account for the year ending 31-3-2002

	Rs.		Rs.
To Opening Stock	25,000	By Sales	1,80,000
" Purchases	1,05,000	" Closing Stock	15,000
" Gross Profit-c/d	65,000		
	1,95,000		1,95,000
To Advertisement expenses	23,000	By Gross Profit-b/d	65,000
Selling expenses	8,000	" Profit on sale of	
" Finance expenses	4,000	fixed assets	5,000
" Net Profit	35,000		
	70,000		70,000

**Solution**

The given balance sheet and profit and loss account will be rearranged as below :

**Balance Sheet as on 31-3-2002**

Sources of Funds		Rs.	Rs.
Share Capital		50,000	
General Reserve		40,000	
Profit and Loss Account .		15,000	
<b>Shareholders' Funds :</b>			<b>1,05,000</b>
<b>Application of Funds</b>			
<b>Fixed Assets :</b>			
Land and Buildings		50,000	
Plant and machinery		20,000	70,000
<b>Current Assets :</b>			
Stock	15,000		
Debtors	25,000		
Cash	15,000	55,000	
<b>Less : Current Liabilities :</b>			
Sundry Creditors		20,000	
<b>Net Current Assets :</b>			<b>35,000</b>
			<b>1,05,000</b>

**Profit and Loss Account for the year ending 31-3-2002**

		Rs.	Rs.
Sales			1,80,000
<b>Less : Cost of Sales :</b>			
Opening Stock		25,000	
Add : Purchases		1,05,000	
		30,000	
<b>Less : Closing Stock</b>		15,000	1,15,000
<b>Gross Profit :</b>			<b>65,000</b>
<b>Less : Operating Expenses :</b>			
Administration expenses		23,000	
Selling Expenses		8,000	
Finance Expenses		4,000	35,000
<b>Operating Net Profit :</b>			<b>30,000</b>

Add : Profit on Sale of Fixed Assets			5,000
Net Profit :			35,000

Let us now examine the ratios :

$$(1) \text{ Current Ratio} = \text{Current Assets} / \text{Current Liabilities}$$

$$= 55,000 / 20,000 = 2.75:1$$

The standard for current ratio is 2 : 1, whereas the same for this body corporate is 2.75 : 1 signifying that for every Re. 1 of current liabilities the body corporate is having Rs. 2.75 worth of current assets. The state of affairs is quite relaxed and looking to the fact that current assets mostly comprise liquid assets, it can be said that the body corporate will be able to meet its current liabilities with ease, as and when they arise.

$$(2) \text{ Acid-Test or Liquid Ratio} = \text{Liquid Liabilities} / \text{Liquid Assets}$$

Note that the two ratios, liquid ratio and acid test ratio are used here to mean the same ratio.

$$\text{Acid-Test Ratio} = 40,000 / 20,000$$

$$= 2:1$$

This ratio indicates the ability of the body corporate to meet its current obligations without delay. The standard may be taken as 1 : 1, whereas in the case of this body corporate the ratio is as high as 2 : 1. Hence, the body corporate would be very easily meeting its short term obligations as and when they fall due.

$$(3) \text{ Operating Ratio} = (\text{Cost of goods sold} + \text{Operating Exp}) \times 100$$

$$\text{Sales}$$

$$= 1,15,000 + 35,000 \times 100$$

$$1,80,000$$

$$= 83.33\%$$

This calculation shows that for sale of every Rs. 100, the operating expenses take up Rs. 83.33 leaving Rs. 16.67 as net profits for the proprietors. It signifies the efficiency of management. It is difficult to comment on the efficiency with which the business is managed only from this figure of 83.33%. Comparison with the figures of other units in the same business and also with the past figures of the same body corporate is required before any opinion can be given.

$$(4) \text{ Stock Turnover} = \text{Cost of goods sold}$$

$$\text{Average stock}$$

$$1,15,000 / 20,000 = 5.75$$

$$\text{Average Stock} = \frac{\text{Opening Stock} + \text{Closing Stock}}{2}$$

$$= \frac{25,000 + 15,000}{2}$$

$$= \text{Rs. } 20,000$$

This ratio indicates the speed with which the stock is turned over. The greater this ratio, the more efficient is the management of sales. In this particular case, the stock is turned over 5.75 times during the year or in other words the average stock is sold out within 9 weeks (52 ÷ 5.75). This may be treated as satisfactory turnover.

However, final opinion can be formed only after comparing this figure with those of other body corporate's in the same business.

$$(5) \text{ Debtors Ratio} = \frac{\text{Debtors} + \text{Bills Receivable}}{\text{Average daily sales}}$$

$$= \frac{25,000}{500} = 50 \text{ days}$$

$$(\text{Average daily sales} = 1,80,000/360 = \text{Rs. } 500)$$

Note : It is interesting to note that in order to arrive at the figure of daily sales, it is a common practice to divide the annual sales by 365. However some suggest that it should better be divided by 360. If working days only are taken into account, then the total sales must be divided by 300 exclusive of non-working Sundays and holidays from 365. Alternative Technique :

$$\text{Debtors Ratio} = \frac{\text{Debtors} + \text{Bills Receivable}}{\text{Credit Sales}}$$

$$= \frac{25,000}{1,80,000 \times 360} = 50 \text{ days}$$

$$\text{Debtors Turnover} = \frac{1,80,000}{25,000} = 7.2$$

$$\text{Debtors Ratio} = \frac{360 \text{ days}}{7.2} = 50 \text{ days}$$

As opening debtors are not given, we have taken closing debtors instead of average debtors

The debtors ratio or the average collection period indicates the efficiency or otherwise of the collection department. It is difficult to give any judgment from the simple figure of 50 days, unless the average collection period of the whole industry is given. If 30 days is taken to be the average collection period, then this figure of 50 days shows an unsatisfactory credit and collection policy.

4. The following is the Balance Sheet of Prithvi Ltd. as on 31-3-2003. Rearrange it in a form suitable for analysis and Calculate the following ratios :

(1) Net Profit Ratio (2) Current Ratio (3) Proprietary Ratio (4) Return of capital Employed (5) Debtors Ratio (6) Fixed-assets Turnover.

*Balance Sheet as on 31-3-2003*

	Rs.		Rs.
Creditors	16,000	Cash at Bank	26,000
Bills Payable	6,000	Debtors	11,000
Debentures	1,00,000	Stock	50,000
Reserves and Profits	69,000	Bills Receivable	4,000
Paid up Capital	1,00,000	Fixed- Assets	2,00,000
	2,91,000		2,91,000

Sales : 2,00,000; Net Profits Rs. 60,000.

**Solution :**

*Balance Sheet as on 31-3-2003*

Sources of Funds		Rs.
Share Capital		1,00,000
Reserves and Profits		69,000
		1,69,000
Debtures		1,00,000
Application of Funds		2,69,000
Fixed Assets		
Current Assets :		2,00,000
Debtors	11,000	
Stock	50,000	
Cash at Bank	26,000	
Bills Receivable	4,000	
	91,000	
Less : Current Liabilities :		
Creditors	16,000	
Bills Payable	6,000	22,000
	Net Current Assets :	69,000
		2,69,000

Various ratios useful for financial analysis are as follows :

(1) **Net Profit Ratio** =  $\frac{\text{Net Profit}}{\text{sales}} \times 100$   
 =  $\frac{60,000}{2,00,000} \times 100 = 30\%$

It is difficult to give opinion about the profitability of business only on the basis of single year's ratio. The information about the nature of business, the figures relating to other firms and the statistics for the past few years of the body corporate are required for comparison purposes. However, 30% net profit on sales seems to be reasonable in case of normal business.

(2) **Current Ratio** =  $\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{91,000}{22,000} = 4.14:1$

The current assets cover current liabilities four times, which shows a highly comfortable liquid position.



(3) **Proprietary Ratio** = Proprietors' Funds / Total Assets = 1,69,00/2,91,00 = 58.08

The ratio seems to be unsatisfactory. Normally the proprietors should provide at least sufficient funds to cover the fixed assets from which the revenue of the enterprise will be derived. The faster the percentage is to 100, the better the financial strength.

(4) **Return on Capital Employed** = Net Profit / Capital Employed × 100

$$= \frac{\text{Net Profits}}{\text{Share Capital} + \text{Reserves} + \text{Debentures}} \times 100$$

$$= \frac{60,000}{1,00,000 + 69,000 + 1,00,000} \times 100$$

$$= 22.30 \%$$

It is difficult to opine about the reasonableness or otherwise of this return in the absence of details regarding these figures of other body corporates and past figures of the same business. However, normally this return may be treated as satisfactory.

(5) **Debtors Ratio** = Debtors + Bills Receivable

Average daily sales

Average daily sales = 2,00,000 / 365 = Rs. 548

Debtors Ratio =  $\frac{11,000 + 4,000}{548} = 27 \text{ days}$

The average period of credit is 27 days or the collection period of credit sales is 27 days. Whether this credit period is excessive or reasonable can be said only when the information regarding credit period of other concerns in the same business is available.

**Debtors Turnover** = Credit Sales / Average Debtors = 20,00,000 / 15,000 = 13.3

Debtors Ratio = 365 / 13.3 = 27 days

(6) **Fixed Assets-Sales Ratio** = Sales / Fixed Assets = 20,00,00/1,00,000 = 1.1

This ratio suggests the efficiency of management. If the proportion of sales to investment in fixed assets is more, it suggests that the fixed assets are utilized more efficiently in business. However, no view can be given on the basis of 1 : 1 ratio unless it is compared with other firms in the same business.

5. The information given below is taken from the financial records of two Body corporates engaged in the same industry. From the following information find following ratios for the year ending 2004.

	Riddhi Ltd.	Siddhi Ltd.
	Rs.	Rs.
Total Sales (out of which 20% are cash sales)	6,40,000	6,40,000
Cost of goods sold	4,48,000	4,16,000
Net Profit (After 50% revenue tax)	32,000	51,200

Equity Share Capital	3,00,000	2,60,000
Retained earnings	49,600	1,32,400
15% Debentures	1,60,000	1,32,000
Sundry Creditors	70,000	1,00,000
Bank Overdraft	18,000	40,000
Fixed Assets	3,20,000	3,10,000
Stock	64,000	1,60,000
Debtors	80,000	72,000
Cash	32,000	20,000
Preliminary expenses	1,600	2,400

From the above information, calculate the following accounting ratios for the both body corporates and make brief comment on each of them,

- (i) Current Ratio
- (ii) Debtors' Ratio (360 days to be taken for the year)
- (iii) Operating Ratio.
- (iv) Rate of return on shareholders' funds
  - (i) Rate of return on total capital employed.

### Solution

(1) Current Ratio = Current Assets / Current Liabilities

Current Assets :	Riddhi I td.	Siddhi Ltd.
	Rs.	Rs.
Stock	64,000	1,60,000
Debtors	80,000	72,000
Cash	32,000	20,000
	1,76,000	2,52,000

Current Liabilities :		
Sundry Creditors .	70,000	1,00,000
Bank Overdraft	18,000	40,000
	88,000	1,40,000

$$\text{Riddhi Ltd.} = 1,76,000 / 88,000 = 2.1 : 1$$

$$\text{Siddhi Ltd.} = 2,52,000 / 1,40,000 = 1.8 : 1$$

Comment : Generally ratio of 2 indicates a good liquid position. From that viewpoint the liquid position of Riddhi Ltd. is better than that of Siddhi Ltd.

(2) **Operating Ratio** =  $\frac{\text{Cost of goods sold} + \text{Operating Expenses}}{\text{Total Sales}} \times 100$

	Riddhi Ltd.			Siddhi Ltd.
	Rs.			Rs.
Total Sales	6,40,000			6,40,000
Less : Cost of goods sold	4,48,000			4,16,000
Gross Profit	1,92,000			2,24,000
Less : Net Profit				
After 50% revenue-tax	32,000		51,200	
+ 50% tax	32,000	64,000	51,200	1,02,400
Operating Expenses		1,28,000		1,21,600

Riddhi Ltd. =  $\frac{(4,48,000 + 1,28,000)}{6,40,000} \times 100 = 90\%$

Siddhi Ltd. =  $\frac{(4,16,000 + 1,21,600)}{6,40,000} \times 100 = 84\%$

**Comment :** From the total revenue of sales, total expenses of Riddhi Ltd. 90% and Siddhi Ltd. 84% will be deducted showing net profit of 10% and 16% respectively. Thus management of Siddhi Ltd. is more efficient.

(3) **Debtors Ratio** =  $\frac{(\text{Debtors} + \text{Bills Receivable})}{\text{Credit Sales}} \times \text{No. of days of year}$

Riddhi Ltd. =  $\frac{(80,000 + 5,12,000)}{5,12,000} \times 360$

= 56.25 days

Siddhi Ltd. =  $\frac{(72,000 + 5,12,000)}{5,12,000} \times 360$

= 50.625 days

**Comment :** The collection of credit sales is better and speedy in case of Siddhi Ltd. hence, its working capital position will be better, because it is able to collect its dues earlier.

(4) **Rate of Return on Shareholders' Funds :**

=  $\frac{(\text{Net Profit (After Interest and tax)})}{\text{Shareholders' Funds}} \times 100$

Shareholders Funds :	Riddhi Ltd.	Siddhi Ltd.
Equity Share Capital	Rs. 3,00,000	Rs. 2,60,000
Retained earnings	49,600	1,32,400
	3,49,600	3,92,400
Less : Preliminary Expenses	1,600	2,400
	3,48,000	3,90,000

$$\text{Riddhi Ltd.} = (32,000 / 3,48,000) \times 100$$

$$= 9.195 \%$$

$$\text{Siddhi Ltd.} = (51,200 / 3,90,000) \times 100$$

$$= 13.128 \%$$

Comment : The return on shareholders funds of Siddhi Ltd. is higher as compared to Riddhi Ltd. and so investors would be tempted to invest in Siddhi Ltd. Thus this ratio gives guidance to investors.

**(5) Return on total capital employed :**

$$= (\text{Net Profit (Before Interest and Tax)} / \text{Capital Employed}) \times 100$$

	Riddhi Ltd.	Siddhi Ltd.
	Rs.	Rs.
Net Profit (After 50% revenue tax)	32,000	51,200
+ Tax	32,000	51,200
+ Debenture Interest	24,000	19,800
Net Profit before Interest & Taxes	88,000	1,22,200
	A Co.	B Co.
Capital Employed :		
Equity share capital	3,00,000	2,60,000
+ Retained Earnings	49,600	1,32,400
+ Debentures	1,60,000	1,32,000
	5,09,600	5,24,400
Less : Preliminary Expenses	1,600	2,400
	5,08,000	5,22,000

$$\text{Riddhi Ltd.} = (88,000 / 5,08,000) \times 100$$

$$= 17.32 \%$$

$$\text{Siddhi Ltd.} = (1,22,200 / 5,22,000) \times 100$$

$$= 23.41 \%$$

Comment : The rate of return on capital employed in Siddhi Ltd. is much higher and so its profitability is much better than that of Riddhi Ltd.

6: The financial statements of XYZ Ltd. for the past two years are summarized below :

As on	31-3-19X6 Rs.	31-3-19X7 Rs.
<b>Assets :</b>		
Cash	-	1,500
Debtors .	55,000	40,000
Stock-in-trade	55,000	45,000
Prepaid expenses	300	500
Loan to a director payable in 2002	----	5,000
Plant at cost less depreciation	61,700	65,000
Land and building at cost less depreciation	75,000	75,000
<b>Rs.</b>	<b>2,47,000</b>	<b>2,32,000</b>
<b>Liabilities :-</b>		
Creditors	32,000	25,000
Provision for taxation	11,000	9,000
Bank overdraft	12,000	
Paid up capital	1,50,000	1,50,000
General reserve	30,000	30,000
Profit and loss -account	12,000	18,000
<b>Rs.</b>	<b>2,47,000</b>	<b>2,32,000</b>

(a) You are required to :

(i) Calculate current ratio; liquid ratio; proprietary ratio and stock-working capital ratio and comment thereon. Solution :

As on	31-3-19X6 Rs.	31-3-19X7 Rs.
<b>Current assets :</b>		
Cash	-	1,500
Debtors	55,000	40,000
Stock-in-trade	55,000	45,000
Prepaid expenses	300	500
<b>Rs.</b>	<b>1,10,300</b>	<b>87,000</b>
<b>Less : Current liabilities :</b>		
Creditors	32,000	25,000
Provision for taxation	11,000	9,000
Bank overdraft	12,000	-

	Rs.	55,000	34,000
Working capital		55,300	53,000
Current ratio =			
i.e. Current assets =		1,10,300	87,000.
Current liabilities	Rs.	55,000	34,000
	=	2.01 : 1	2.56 : 1

Comment:

Though the working capital position has considerably improved, in absolute terms the working capital has gone down by Rs. 2,300. The bank overdraft has been turned into favourable cash balance. Debtors and stock, both have reduced, resulting in the reduction of creditors as well.

However, this seems to be result of the contraction in business activities, which is evident from the facts (i) stocks have reduced, (ii) debtors have reduced and (iii) creditors have also reduced, (iv) there is no more a need for bank overdraft and (v) assuming that the provision for taxation is based on current year's profits, the profit has also gone down.

		Year ending	
		31-3-X6	31-3-X6
Liquid ratio = Quick assets / Quick liabilities			
Quick assets = Current assets	=	1,10,300	87,000
Less: Stock and prepaid expenses		-55,300	-45,500
	(i)	55,000	41,500
Quick liabilities = Current liabilities		55,000	34,000
Less Bank overdraft		-12,000	-NIL
	(ii)	= 43,000	34,000
Liquid ratio	(i) / (ii)	= 1.28 : 1	1.22 : 1

Comments:

Thus, though the current ratio has improved, the liquid ratio has slightly deteriorated. This is due to the repayment of the bank overdraft, which might have been done before due date to contract the business activity.

	31-3-X6 Rs.	31-3-X7 Rs.
Proprietors' funds :		
Paid up capital	1,50,000	1,50,000
General reserve	30,000	30,000
Profit and loss account	12,000	18,000
	Rs. 1,92,000	1,98,000
Total assets		
Fixed and long term assets	1,36,700	1,45,000
Current assets	1,10,300	87,000
	Rs. 2,47,000	2,32,000

**Proprietary ratio** = Proprietors' funds / Total assets  
 = 1,92,000 / 2,47,000                      1,98,000/2,32,000  
 = 0.78 : 1    0.85 : 1  
 or.....    78%    85%

**Stock-working capital ratio = Stock / Working capital**

31-3-X6	31-3-X7
55,000	45,000
55,300	53,000
= 0.99:1	0.85:1
i.e. 99%	85%

7: The following is the Balance sheet of Semi-Liquid Limited as on 31st March, 19X8.

Liabilities	RS.	Assets	Rs.
Share capital		Land and buildings	1,20,000
1000 Equity shares of		Plant and machinery	1,60,000
Rs. 100 each	1,00,000	Goodwill	1,20,000
1,000 9% Preference shares of		Investments (marketable)	20,000
Rs. 100 each	1,00,000	Debtors	60,000
General reserve	40,000	Stock	60,000
Profit and loss account	60,000	Cash on hand	60,000
8% Mortgage loan	1,60,000		
Sundry creditors	70,000		
Bank overdraft	20,000		
Provision for taxation	50,000		
	6,00,000		6,00,000

Compute the balance sheet ratios and comment on the liquidity, solvency and capital structure of the body corporate.

Solution :

We have to prepare the balance sheet in vertical form.



Semi Liquid Ltd. Balance Sheet as on 31st March, 19X8.

	Rs.	Rs.	Rs.
<b>Total funds employed :</b>			
<b>I. Proprietary funds :-</b>			
Equity share capital		1,00,000	
9% Preference share capital		1,00,000	
General reserve		40,000	
Profit and loss account		60,000	
			3,00,000
<b>II. Long term liabilities :</b>			
8% Mortgage loan			1.60,000
			Rs. 4,60,000
<b>Employee! as under :</b>			
<b>I. Fixed assets :</b>			
Goodwill		1,20,000	
Land and buildings		1,20,000	
Plant and machinery		1.60,000	
			4,00,000
<b>II. Working capital ;</b>			
<b>Current assets :</b>			
Investments	20,000		
Debtors	60,000		
Stock	60,000		
Cash	60,000		
		2,00,000	
<b>Less : Current liabilities :</b>			
Creditors	70,000		
Bank overdraft	20,000		
Provision for taxation	50,000		
		1,40,000	
			€0,000
			Rs. 4,60,000

Ratio:

(i) Current ratio = Current assets / Current liabilities  
 = 2,00,000 + 1,40,000 = 1.43:1

(ii) Liquid ratio = Current assets - Stock and prepaid expenses / Current liabilities - Bank overdraft  
 = 2,00,000-60,000 / 1,40,000-20,000  
 = 1,40,000/ 1,20,000  
 = 1.17:1

(iii) Proprietary ratio = Proprietor's funds / Total assets  
 = 3,00,000 / 6,00,000  
 = 0.5 : 1 OR 50%  
 OR Proprietors' funds / Total funds  
 3,00,000 / 4,60,000  
 = 0.65 : 1 OR 65%

(iv) Stock-working capital ratio.

= Stock / working capital.  
 = 60,000 / 60,000  
 = 1:1 = 100%.

(v) Capital gearing ratio = Preference share capital + 8% Mortgage loan  
 / Equity share capital + Reserves  
 = 1,00,000 + 1,60,000  
 = 2,60,000  
 = 1.3 : 1 OR 130%

**Comments :**

The body corporate seems to be quite stable financially, as its proprietary ratio is 50%. It is also in a very comfortable position, so far as its liquidity is concerned.

The liquid ratio is well above 1:1. However, its working capital position cannot be considered very happy as it is only 1.43 : 1. The stock is equal to the working capital, which is not adverse. The body corporate is quite highly geared. The fixed interest/dividend bearing capital is 130% of its equity.

8: Following is the profit and loss account and balance sheet of Hind Ltd. Redraft them for the purposes of analysis.tios:

Profit and loss account

Rs.		Rs.	
Opening stock of finished goods	1,00,000	Sales	10,00,000
Opening stock of raw materials	50,000	Closing stock of raw materials	1,50,000
Purchase of raw materials	3,00,000	Closing stock of finished goods	1,00,000
Direct wages	2,00,000	Profit on sale of shares	50,000
Manufacturing expenses	1,00,000		
Administration expenses	60,000		
Selling and distribution exp.	50,000		
Loss on sale of plant	55,000		
Interest on debentures	10,000		
Net profit	3,75,000		
	13,00,000		13,00,000
Balance sheet			
Liabilities	Rs.	Assets	Rs.
Share capital:		Fixed assets	2,50,000
Equity share capital	1,00,000	Stock of raw materials	1,50,000
Preference share capital	1,00,000	Stock of finished goods	1,00,000
Reserves	1,00,000	Sundry debtors	1,00,000
Debentures	2,00,000	Bank balance	50,000
Sundry creditors	1,00,000		
Bills payable	50,000		
	Rs. 6.50,000	Rs.	6.50,000

Solution:

Revenue Statement (in vertical format)

	Rs.	Rs.
Sales		10,00,000
Less: Cost of sales:		
Raw materials consumed (Opening stock + Purchases - Closing stock)	2,00,000	
Direct wages	2,00,000	
Manufacturing expenses	1,00,000	
Cost of production	5,00,000	
Add: Opening stock of finished goods	1,00,000	
	6,00,000	
Less: Closing stock of finished goods	1,00,000	
Cost of goods sold		5,00,000
Gross profit		5,00,000
Less: Opening expenses:		
Interest	10,000	
Administration -	60,000	
Selling and distribution expenses	50,000	1,20,000
Net operating profit		3,80,000
Add: Non-trading revenue:		
Profit on sale of shares		50,000
		4,30,000
Less: Non-trading expenses or losses:		
Loss on sale of plant		55,000
Revenue before tax/after tax .		3,75,000

Balance Sheet (vertical)		
	Rs.	Rs.
Assets		
Fixed assets		2,50,000
Current assets:		
Bank balance	50,000	
Sundry debtors	1,00,000	
Stock of raw materials	1,50,000	
Stock of finished goods	4,00,000	
Less: Current liabilities:		
Sundry creditors	1,00,000	
Bills payable	50,000	
	1,50,000	
Working capital		2,50,000
Capital employed		5,00,000

**Funds employed:**

	Rs.	Rs.
Proprietors' funds:		
Equity share capital	1,00,000	
Reserves	1,00,000	
Preference share capital	1,00,000	3,00,000
Loan funds:		
Debentures		2,00,000
		5,00,000

9: Below is the summarized Balance Sheet and Revenue statement of PQR for the year 19X0:

**Revenue Statement for the year 19X0**

	Rs.
Sales	8,00,000
Less: Cost of goods sold	6,55,000
Gross margin	1,45,000
Less: Administration and selling expenses	30,000
	1,15,000
Less: Interest	22,500
Net profit (before tax)	92,500
Taxation .	41,000
Net profit (after tax)	51,500

**Balance sheet as on 31-12-19X0**

Liabilities	Rs.	Assets	Rs.
Equity share <sup>1</sup> capital	-	Net fixed assets	4,00,000
(of Rs. 10/-,each)	2,00,000	Stock	2,00,000
Reserves	60,000	Debtors	87,500
14% Debentures	3,50,000	Marketable investments	37,500
Creditors	90,000	Cash	25,000
Bills payable	10,000		
Other liabilities	40,000		
Rs.	7,50,000	Rs.	7,50,000

Market price of the share is Rs. 30.

Calculate the various ratios to measure financial stability, financial management and profitability.

Also find .but (a) how many times the earnings does the body corporate's share quote?  
 (b) what is the debt-service ratio?, assuming 20% of debentures are repayable, (c) debtors turnover ratios.

**Solution:**

**I. Financial Stability and Management Ratios**

**(a) Short term-stability**

**Current ratio = Current assets / Current liabilities**

$$\begin{aligned} &= 2,00,000 + 87,500 + 37,500 + 25,000 / 90,000 + 10,000 + 40,000 \\ &= 3,50,000 / 1,40,000 \\ &= 2.5 : 1 \end{aligned}$$

**(b) Long term stability**

**(i) Proprietor ratio = Proprietors' funds / Total assets**

$$\begin{aligned} &= 2,00,000 + 60,000 / 7,50,000 \\ &= 2,60,000 / 7,50,000 \\ &= 0.35 : 1 \end{aligned}$$

**(ii) Debt equity ratio = Long term debts / Shareholders funds**

$$\begin{aligned} &= 150,000 / 2,60,000 \\ &= 1.35:1 \end{aligned}$$

**OR**

**Long term debts / Shareholders funds + Long term debts**

$$\begin{aligned} &= 3,50,000 / 2,60,000 + 3,50,000 \\ &= 3,50,000 / 6,10,000 \\ &= 0.57:1 \end{aligned}$$

**(c) Immediate solvency**

**Liquid ratio = Quick assets / Quick liabilities**

$$\begin{aligned} &= 87,500 + 37,500 + 25,000 / 90,000 + 10,000 + 40,000 \\ &= 1,50,000 / 1,40,000 \\ &= 1.07:1 \end{aligned}$$

**(d) Trading on equity**

**Capital gearing ratio = Capital entitled to fixed return / Capital not so entitled to fixed return**

$$\begin{aligned} &= 3,50,000 / 2,00,000 + 60,000 \\ &= 3,50,000 / 2,60,000 \\ &= 1.35:1 \end{aligned}$$

(e) Investment in stocks

$$\begin{aligned}\text{Stock working capital ratio} &= \text{Stock} / \text{Working capital} \\ &= 2,00,000 / 3,50,000 - 1,40,000 \\ &= 2,00,000 / 2,10,000 \\ &= 0.95:1\end{aligned}$$

II. Profitability Ratios

(a) Gross profit ratio = Gross margin / Net sales \* 100

$$\begin{aligned}&= 1,45,000 / 8,00,000 * 100 \\ &= 18.13\%\end{aligned}$$

(b) Operating ratio = Operating costs / Net sales \* 100

$$\begin{aligned}&= 6,55,000 + 30,000 + 22,500 / 8,00,000 * 100 \\ &= 7,07,500 / 8,00,000 * 100 \\ &= 88.44 \%\end{aligned}$$

(c) Net profit ratio = Net profit (before tax) / Capital employed \* 100

$$\begin{aligned}&= 92,500 / 8,00,000 * 100 \\ &= 11.56 \%\end{aligned}$$

(d) Return on capital employed = Net profit (before tax) / Capital employed \* 100

$$\begin{aligned}&= 92,500 / 6,10,000 \\ &= 15.16 \%\end{aligned}$$

(e) Return on proprietors funds = Net profit (after tax) / Proprietors' funds \* 100

$$= 51,500 / 2,80,000 * 100 = 18.39\%$$

(f) Return on equity capital = Net profit (after tax) - Preference dividend / Equity share capital

$$= 51,500 / 2,00,000 * 100 = 25.75\%$$

(g) Earnings per share = Net profit (after tax) - Preference dividend / No. of equity shares

$$\begin{aligned}&= (51,500 - 0) / 20,000 \\ &= \text{Rs. 2.575 per share.}\end{aligned}$$

III. Price Earnings Ratio = Market Price / EPS

$$\begin{aligned}&= \text{Rs. 30} / 2.575 \\ &= 11.65 \text{ times.}\end{aligned}$$



IV. Debt Service Ratio = Net profit (before tax) + Interest / Interest on loans + Annual debt installment

$$= 92,500 + 22,500 / 22,500 + 70,000$$

$$= 1,15,000 / 92,500$$

$$= 1.24 \text{ times}$$

V. Debtors' Turnover Ratio = Debtors / Average net credit sales \* 365

$$= 87,500 / 8,00,000 * 365$$

$$= 39.92 = 40 \text{ days appx.}$$

10: The balance sheet and the revenue statement of Apex Body corporate Ltd. are given hereunder:

Balance sheet as on 31st March, 19X8

Liabilities	Rs.	Assets	Rs.
Equity capital (Rs. 100 each)	1,20,000	Fixed assets	1,00,000
Retained earning	36,000	Prepaid expenses	1,000
6% Debentures	50,000	Inventory	40,000
Creditors	10,000	Debtors	70,000
Wages payable	3,000	Cash	11,000
Taxes	3,000		
	Rs. 2,22,000		Rs. 2,22,000

Revenue Statement for the year ended 31st March, 19X8

	Rs.	Rs.
Sales		4,00,000
Less: Opening stock	30,000	
Purchases	3,00,000	
	3,30,000	
Closing stock	40,000	
		2,50,000
Gross profit		1,10,000
Less: Operating expenses		80,000
Operating net profit		30,000
Less: Revenue tax		12,000
Net profit after tax		18,000

Using these statements, compute:

(i) Current ratio, (ii) Acid test ratio, (iii) Stock turnover ratio. (iv) No. of days sales in debtors, (v) Return on capital employed, (vi) Return on proprietors' equity, (vii) Earnings per share.

Also comment briefly on whether or not you think the body corporate is in sound financial position with an acceptable profitability. Also point any weakness which the ratios indicate.

**Solution:**

(1) Current ratio = Current assets/ Current liabilities =  $1,22,000/16,000 = 7.625:1$

(2) Acid test ratio = Quick assets/ Quick liabilities =  $81,000/16,000 = 5.06:1$

(3) Stock turnover ratio = Cost of sales / Average stock  
 $= 2,90,000 / 1/2 (30,000 + 40,000) = 8.3 \text{ times}$

(4) Debtors turnover ratio = Debtors/ Sales \* 365 =  $70,000/4,00,000 * 365 = 63.6 \text{ days}$

(5) Return on capital employed =  
= Operating net profit/ Total assets - current liabilities\*100  
 $= 30,000/2,06,000*100 = 14.6\%$

(6) Earnings per share = Net profit after tax/ No. of shares =  $18,000/1,200 = \text{Rs. } 15.$

(7) Proprietary ratio = Proprietor's equity/ Total assets  $1,56,000/2,21,000 = 0.71:1$

Proprietary ratio indicates the stability of the long term financial position. Here 71% of the total resources of the corporation has been financed by the proprietors' funds, this shows that the body corporate can be considered very stable in the long run.

The current ratio and liquid ratio are as high as 7.625:1 and 5.06:1 respectively indicating a very strong position of the body corporate to meet its immediate obligation.

The turnover rate is 8.3 times indicating that the body corporate is managing its stock well. However the same cannot be said about realization of debtors. The collection from debtors is not quite satisfactory as the average collection period is approximately 64 days.

The return before tax on total resources is quite low at 13.6%. The return after tax on proprietors funds however is better at 15%. This improvement has been made possible because of the 6% debentures. The interest on debentures is much less than the per-tax return of 14.56% on the capital working. The operating net profit ratios is quite low at 7.5%. The ratio of net profit after tax to sales is lower at 4.5%.

Thus from the profitability point of view Apex Co. Ltd. is not successful.

#### 4.12 Practical Exercise:

1. The following are the summarized balance sheets of Armaan Ltd.

##### Balance Sheets

Liabilities	31-3-2000 Rs.	31-3-2001 Rs.	Assets	31-3-2000 Rs.	31-3-2001 Rs.
Share Capital	1,00,000	1,00,000	Fixed Assets :		
Reserves	90,000	1,00,000	Land & Building	50,000	50,000
9% Debentures	1,00,000	1,00,000	Plant & Machinery	2,00,000	1,80,000
Current Liabilities :			Current Assets :		
Sundry Creditors	40,000	60,000	Stock	55,000	65,000
Provision for			Sundry Debtors	30,000	40,000
Taxation	30,000	10,000	Cash	25,000	35,000
	3,60,000	3,70,000		3,60,000	3,70,000

##### Additional Information :

	1998-99 Rs.	1999-2000 Rs.
Sales	3,75,000	2,92,000
Gross Profit	90,000	53,000
Net Profit (before interest and tax)	58,000	30,000

The stock on 1-4-1999 was valued at Rs. 45,000.

Calculate the following accounting ratios and comment in brief on each of them :

- (1) Current Ratio
- (2) Stock Turnover
- (3) Debtor's Ratio and Debtors Turnover
- (4) Return on Capital Employed.

2. The following are the summarized Profit & Loss Account of Pooja Ltd. for the year ending 31st March, 2000 and the Balance Sheet as on that date :

**Profit & Loss Account**

	Rs.		Rs.
To Opening Stock	2,10,000	By Sales :	
" Purchases	9,30,000	Credit 14,20,000	
" Gross Profit	6,00,000	Cash 80,000	15,00,000
		" Closing Stock By Gross Profit	2,40,000
	17,40,000		17,40,000
To Administrative Expenses			6,00,000
and Depreciation	2,60,000	" Profit on Sale of Assets	5,000
Selling Expenses .	65,000	" Interest	10,000
" Interest on Debentures	30,000		
" Net Profit	2,60,000		
	6,15,000		6,15,000

**Balance Sheet**

Liabilities	Rs.	Assets	Rs.
20,000 Equity Shares of		Land & Building	4,00,000
Rs. 10 each	2,00,000	Plant & Machinery	3,00,000
1,000 12% Preference Shares		Investments	1,00,000
of Rs. 100 each	1,00,000	Stock	2,40,000
Reserves	3,50,000	Debtors	1,00,000
Profit & Loss Account	2,00,000	Bills Receivable	42,000
Debentures	2,00,000	Cash & Bank	1,18,000
Creditors	1,30,000		
Bills Payable	60,000		
Bank Overdraft	60,000		
	13,00,000		13,00,000

From the above particulars, compute the following accounting ratios and give in brief their uses. (The necessary calculations should be based on taking 360 days in a year.)

(1) Gross Profit Ratio (2) Current Ratio (3) Debtors Ratio (4) Stock Turnover Ratio (Stock Ratio) (5) Return on Capital Employed.

3. The following is the Balance Sheet of Aayush Ltd. as on 31-3-2001 :-

Liabilities		Assets	Rs.
40,000 fully-paid Equity shares each of Rs. 10/-		Goodwill	2,00,000
	4,00,000	Fixed Assets	6,00,000
12% fully paid Preference shares each of Rs. 100/-		Investments	80,000
	2,50,000	Stock	2,25,000
Reserves	2,10,000	Debtors	1,68,000
Profit & Loss Account	85,000	Cash	15,000
13.5% Debentures	1,50,000	Preliminary Expenses	13,000
Creditors	60,000		
Bank Overdraft	30,000		
Outstanding Expenses	1,16,000		
	13,01,000		13,01,000

Details of Profit & Loss Account in brief :

	Rs.
Total sales (75% on credit)	6,80,000
— Cost of sales	4,00,000
Gross Profit	2,80,000
— Depreciation and Managerial Expenses	90,000
Net Profit (Before deducting tax at 50%)	1,90,000

Stock on 31-3-2000 was Rs. 1,75,000.

From the above particulars, compute the following Accounting Ratios and give in brief their uses.

(The necessary calculations should be based on taking 360 days in a year.)

- (1) Current Ratio
- (2) Debtors Ratio
- (3) Return on Capital Employed
- (4) Rate of Return on Equity Capital
- (5) Stock Ratio
- (6) Net Profit (after tax) Ratio
- (7) Gearing Ratio.

4. Following is the summarized Balance Sheet of Manish Ltd. on 31-3-98.

Liabilities	Rs.	Assets	Rs.
Equity Shares of Rs. 10 each	10,00,000	Fixed Assets	20,00,000
10% Preference Shares		Investments	2,00,000
of Rs. 100 each	4,00,000	Closing Stock	2,00,000
Reserves and Surplus	7,00,000	Sundry Debtors	4,60,000
15% Debentures	5,00,000	Bills Receivable	70,000
Sundry Creditors	2,40,000	Cash at Bank	50,000
Bank Overdraft	1,70,000	Preliminary Expenses	60,000
	30,40,000		30,40,000

Summarized Profit and Loss Account is as under for the year ending on 31-3-98

	Rs.
Sales (25% Cash sales)	80,00,000
less : Cost of Hoods sold	56,00,000
Gross Profit	24,00,000
Net profit (Before interest and tax 50%)	9,00,000

Calculate the following ratios :

(1) Rate on Return on Capital Employed (2) Proprietary Ratio (3) Debt-Equity Ratio (4) Capital-gearing Ratio (5) Debtors Ratio (365 days of the year.) (6) Rate of Return on Equity Shareholders Funds.

5. The following are Balance Sheets of Santosh Ltd. :

Liabilities	1996-97	1997-98	Assets	1996-97	1997-98
	Rs.	Rs.		Rs.	Rs.
Equity Share			Building	1,50,000	2,50,000
Capital	2,00,000	2,50,000	Machineries	1,00,000	50,000
10% Preference			Furniture	50,000	50,000
Share Capital	1,00,000	1,00,000	Stock	50,000	75,000
General Reserve	83,000	91,000	Debtors	1,50,000	1,25,000
15% Debentures	1,00,000	1,00,000	Bills Receivable	10,000	15,000
Creditors	8,000	10,000	Cash and		
Bills Payable	4,000	6,000	Bank	22,000	25,000
Provident Fund	8,000	4,000	Preliminary		
Provision for			Expenses	1,000	1,000
Taxation	10,000	5,000			
Bank Overdraft	20,000	25,000			
	5,33,000	5,91,000		5,33,000	5,91,000

**Additional Information :**

	1996-97	1997-98
	Rs.	Rs.
Total Sales (Cash sales are 3/5 of credit sales)	5,00,000	6,25,000
Gross Profit	1,00,000	1,50,000
Net Profit (before interest and taxes)	1,35,000	1,55,000
Opening Stock (1-4-1996)	30,000	
Assume: tax rate of 40%		

From the above information you are required to calculate the following ratios for both the years and interpret the first three ratios. 300 days be taken for the year.

- (1) Net Profit Ratio (4) Current Ratio  
 (2) Stock Turnover Ratio (5) Return on Capital Employed.  
 (3) Debtors Ratio.

6. The following are the Summarized Balance Sheets of Aditya Ltd :

Liabilities	31-3-97	31-3-98	Assets	31-3-97	31-3-98
	Rs.	Rs.		Rs.	Rs.
Equity Share Capital	1,50,000	2,50,000	Fixed Assets	4,20,000	5,40,000
10% Preference			Stock	65,000	92,500
Share Capital	1,00,000	1,00,000	Debtors	70,000	50,000
Reserves	70,000	1,20,000	Cash and Bank	15,000	7,500
10% Debentures	1,55,000	1,50,000	Prepaid Expenses	15,000	10,000
Bank O.D.	50,000	30,000			
Creditors	40,000	45,000			
Bills Payable	20,000	5,000			
	5,85,000	7,00,000		5,85,000	7,00,000

**Additional Information :**

	1996-97	1997-98
	Rs.	Rs.
Total Sales (Cash Sales are 4/5th of credit Sales)	9,00,000	13,50,000
Gross Profit	2,25,000	4,05,000
Net Profit (Before interest and tax, tax rate 50%)	1,59,000	2,85,000
Stock on 1-4-96 Rs. 70,000		

From the above information, calculate the following accounting ratios for both the years :

- (1) Net Profit Ratio.
- (2) Stock Turnover Ratio.
- (3) Debtors Ratio (300 days to be taken for year).
- (4) Current Ratio.

8: Following are the profit and loss account and balance sheet of XYZ Ltd.

		Rs.		Rs.
To Cost of sales			By Sales	4,00,000
Opening stock	30,000			
Add: Purchases	3,00,000			
	3,30,000			
Less: Closing stock	60,000	2,70,000		
Less: Gross profit c/d		1,30,000		
		4,00,000		4,00,000
" Expenses		20,000	By Gross profit b/d	1,20,000
" Net profit c/d		1,00,000		
		1,20,000		1,20,000
" Provision for tax		40,000	By Net profit b/d	1,00,000
" Dividend		20,000		
" Net profit		40,000		
	Rs.	1,00,000	Rs.	1,00,000

Balance sheet as on 31st December, 19X3

Liabilities	Rs.	Assets	Rs.
Share capital (Rs. '10 each)	2,00,000	Plant and machinery	80,000
Reserve	10,000	Land and building	20,000
Profit and loss a/c	30,000	Stock	50,000
Creditors	60,000	Debtors	80,000
			70,000
Rs.	3,00,000	Rs.	3,00,000

Market price of an equity share is Rs. 30.

Calculate the following ratios and comment:

- (a) Stock turnover ratio, (b) Debtors turnover ratio, (c) Creditors turnover ratio (d) Return, on capital employed, (e) Return on proprietors' fund, (f) Earning per share, (g) Price earning ratio, (h) Dividend pay out ratio.

9: Following is the profit and loss account and balance sheet of Hind Ltd. Redraft them for the purposes of analysis and calculate the following ratios:



(i) Gross profit ratio, (b) Net profit ratio, (c) Current ratio, (d) Debt equity ratio, (e) Stock turnover ratio, (f) Liquidity ratio,

Profit and loss account

Rs.		Rs.	
Opening stock of finished goods	1,00,000	Sales	10,00,000
Opening stock of raw materials	50,000	Closing stock of raw materials	1,50,000
Purchase of raw materials	3,00,000	Closing stock of finished goods	1,00,000
Direct wages	2,00,000	Profit on sale of shares	50,000
Manufacturing expenses	1,00,000		
Administration expenses	50,000		
Selling and distribution exp.	50,000		
Loss on sale of plant	53,000		
Interest on debentures	10,000		
Net profit	3,87,000		
<b>Rs.</b>	<b>13,00,000</b>	<b>Rs.</b>	<b>13,00,000</b>

Balance sheet

Liabilities	Rs.	Assets	Rs.
Share capital:		Fixed assets	2,50,000
Equity share capital	1,00,000	Stock of raw materials	1,50,000
Preference share capital	1,00,000	Stock of finished goods	1,00,000
Reserves	1,00,000	Sundry debtors	1,00,000
Debentures'	2,00,000	Bank balance	45,000
Sundry creditors	1,00,000		
Bills payable	45,000		
<b>Rs.</b>	<b>6,45,000</b>	<b>Rs.</b>	<b>6,45,000</b>

10. M Ltd. furnishes the following statement:

Balance Sheet as at 31st March, 19X8

Liabilities	Rs.	Assets	Rs.
3,000 Equity shares of		Land and buildings	30,000
Rs. 10 each fully paid-up	30,000	Plant and machinery	13,000
12% Debentures	20,000	Goodwill	20,000
Sundry creditors	10,000	Marketable securities	3,000
General reserve	8,000	Sundry debtors	10,000
P&L account	15,000	Stock	10,000
Provision for tax	8,000	Cash on hand	9,000
Bank overdraft	4,000		
Rs.	95,000	Rs.	95,000

Other information for the year ended 31st March 19X8.

Sales	Rs.	3,50,000	Net margin	Rs.	14,000
Gross margin	Rs.	35,000	Provision for tax	Rs.	5,000

You are required to :

(1) Arrange the Balance Sheet in the vertical form.

(2) Calculate the following ratios and comment upon it.

(a) Acid test ratio.

(b) Proprietary ratio.

(c) Return on capital employed

(d) Return on equity.

(e) Working capital ratio.

(f) Gross and net profit ratio.

11. The following is the Balance Sheet of X Ltd, as on 31st March 19X4 :

	Rs.		Rs.
Share capital :			
10,000 10% Preference shares		Land and building	2,00,000
Rs. 10/- each fully paid	1,00,000	Plant and machinery	1,50,000
30,000 Equity shares of		Furniture	20,000
Rs. 10/- each fully paid	3,00,000	Stock	85,000
General reserve	90,000	Debtors	80,000
Share premium	10,000	Bills receivable	15,000
Profit and loss a/c	35,000	Prepaid expenses	5,000
Trade creditors	90,000	Cash in hand	35,000
Bills payable	26,000	Cash at bank	1,11,000
15% Debentures	50,000		
Rs.	7,01,000	Rs.	7,01,000

Re-arrange the above Balance Sheet in a form suitable for analysis and calculate the following ratios :

- (a) Current ratio. (b) Liquid ratio.  
 (c) Stock to working capital ratio. (d) Proprietary ratio, and  
 (e) Capital gearing ratio.

12. From the following statements of A Ltd. for the year ending 31st March 19X5, you are required to rearrange the items in the form of financial statements suitable for analysis and calculate the following ratios and state the significance of each such ratio briefly:

- (1) Current ratio. (2) Liquid ratio.  
 (3) Operating ratio. (4) Stock turnover, ratio.  
 (5) Debtors turnover. (6) Net operating profit to capital employed.

Balance sheet as on 31st March 19X5

Liabilities	Rs.	Assets	Rs.
Share capital:-			
Issued and paid-up 5,000		Land and buildings	50,000
Equity shares of Rs. 10 each	50,000	Plant and machinery	20,000
General reserve	40,000	Stock	15,000
Profit and loss account	16,000	Debtors	25,000
Sundry creditors	30,000	Cash	26,000
Rs.	1,36,000	Rs.	1,36,000

Trading and Profit and Loss Account for the year ended 31st March 19X5

	Rs.		Rs.
To Opening stock	25,000	By Sales	1,80,000
" Purchases	1,05,000	" Closing stock	15,000
" Gross profit c/d	65,000		
Rs.	1,95,000	Rs.	1,95,000
To Administration expenses	23,000	By Gross profit b/d	65,000
" Selling expenses	10,000	" Profit on sale	
" Finance expenses	2,000	of fixed assets	5,000
" Net profit	35,000		
Rs.	70,000	Rs.	70,000

13. Following is the Balance Sheet of X Ltd, as at 31st March, 19X5.

Liabilities	Rs.	Assets	Rs.
6000 Equity shares of			
Rs. 10 each	60,000	Goodwill	26,000
2000 10% Preference shares		Land and building	80,000
of Rs. 10 each	20,000	Plant and machinery	40,000
General reserve	30,000	Marketable investments	6,000
Profit and loss a/c	16,000	Sundry debtors	20,000
12% Mortgage loan	45,000	Inventory	20,000
Sundry creditors	20,000	Cash on hand	19,000
Dena Bank - Current a/c	20,000	Preliminary expenses	4,000
Provision for taxation	4,000		
Rs.	2,15,000	Rs.	2,15,000

Further information for the year ended 31st March, 19X5:

	Rs.
(i) Turnover of sales	7,00,000
(ii) Gross profit	70,000
(iii) Net profit (after providing for taxation at 50%)	14,000
(a) You are required to present the balance sheet in vertical form	

14. The following are the Trading and Profit and Loss accounts of Y Ltd. for the years ended 31st December, 19X3 and 19X4 respectively :

	19X3 Rs.	19X4 Rs.		19X3 Rs.	19X4 Rs.
To Opening Stock	1,30,000	1,50,000	By Sales	18,00,000	22,00,000
" Purchases	13,70,000	17,90,000	" Closing stock	1,50,000	1,80,000
" Gross profit	4,50,000	4,40,000			
Rs.	19,60,000		Rs.	19,50,000	23,80,000
To Administrative .			By Gross profit	4,50,000	4,40,000
expenses	1,80,000	2,01,000			
" Selling expenses	80,000	1,01,000			
" Debenture interests	18,000	18,000			
" Depreciation on					
furniture	7,000	10,000			
" Provision for					
taxation	93,000	55,000			
" Net profit	72,000	55,000			
Rs.	4,50,000	4,40,000	Rs.	4,50,000	4,40,000

Calculate the following ratios for the above two years and comment on the same :

- |                         |                           |
|-------------------------|---------------------------|
| (a) Gross profit ratio. | (b) Net profit ratio.     |
| (c) Operating ratio.    | (d) Stock turnover ratio. |

15. The following are the comparative Profit and Loss accounts of ABC Pvt. Ltd. for the years ended 31st March, 19X8 and 31st March 19X9.

	31-3-19X8 Rs.	31-3-19X9 Rs.		31-3-19X8 Rs.	31-3-19X9 Rs.
To Opening stock	30,000	80,000	By Sales	16,87,000	23,65,000
" Purchases	10,40,000	15,20,000	" Closing stock	80,000	1,50,000
" Wages	2,00,000	3,00,000	" Interest on	15,000	15,000
" Salaries :			investments		
Works manager	20,000	30,000			
General manager	60,000	80,000			
Sales manager	15,000	25,000			
Office staff	90,000	1,10,000			
Sales men	60,000	75,000			
" Depreciation :					
Plant & machinery	15,000	20,000			
Office equipments	10,000	8,000			
Vehicles	20,000	17,000			
" Rent :					
Factory	15,000	15,000			
Office	10,000	10,000			
Sales depot	12,000	15,000			
" Sundry office exp.	60,000	80,000			
" Sundry selling and					
distribution exp.	40,000	55,000			
" Loss on sale of					
fixed assets	25,000	10,000			
" Revenue tax	30,000	40,000			
" Net profit c/d	30,000	40,000			
Rs.	17,82,000	25,30,000	Rs.	17,82,000	25,30,000
To Transfer to			By Balance	35,000	45,000
general reserve	10,000	10,000	" Net profit b/d	30,000	40,000
" Dividend	11,000	10,000			
" Balance c/d	44,000	65,000			
Rs.	65,000	85,000	Rs.	65,000	85,000

(a) You are required to present the above in vertical form.

(b) Compute the following ratios :

(i) Gross profit ratios, (ii) Net "profit ratios, (iii) Stock turnover ratios.

(c) Comment on the above revenue statements.

16. From the following Balance Sheet of ABC Co. Ltd-, compute :

(i) Liquid ratio; (ii) Profitability ratio; (iii) Capital gearing ratio; (iv) Stock turnover ratio; (v) Debtors turnover ratio (number of days) and offer your comments in brief. ABC Co. Ltd. Balance Sheet as on 31st March, 19X5.

	Rs.		Rs.
Equity share capital	7,00,000	Fixed assets	9,00,000
Reserves	8,00,000	Stock	4,60,000
Secured loans	2,00,000	Sundry debtors	6,30,000
Current liabilities	2,55,000	Cash and bank	5,15,000
Provision	5,50,000		
Rs.	25,05,000	Rs.	25,05,000

Total sales during the year summed to Rs. 21,00,000 (including cash sales of Rs. 8,20,000) which yielded a Gross Profit of 33.33% on sales. The stock on 31st March, 19X4 was Rs. 2,40,000.

17. The following is the Balance Sheet of XYZ Ltd. as on 31st March, 19X5. XYZ Ltd.  
Balance Sheet as on 31st March, 19X5

Liabilities	Rs.	Assets	Rs.
Equity share capital	10,00,000	Goodwill	3,00,000
10% Preference share capital	4,00,000	Land and building	7,00,000
General reserve	1,00,000	Plant and machinery	6,00,000
12% Debentures	2,00,000	Furniture and fixtures	50,000
Profit and loss a/c	1,00,000	Investments	50,000
Sundry creditors	1,40,000	Stock	2,40,000
Bills payable	20,000	Debtors	3,05,000
Bank overdraft	20,000	Bills receivable	50,000
Outstanding expenses	20,000	Cash in hand	35,000
Provision for taxation	45,000	Preliminary expenses	5,000
Provision for dividend	1,05,000	Prepaid expenses	15,000
Rs.	21,50,000	Rs.	21,50,000

Convert the above Balance Sheet into vertical form and calculate the following ratios:

- (a) Current ratio, (b) Liquid ratio, (c) Proprietor's ratio, (d) Capital gearing ratio and (e) Stock-working capital ratio.



18. The following is the Balance sheet of B.S.M. Ltd. as at 31st March, 19X5:

Liabilities		Rs.	Assets		Rs.
Share capital			Fixed assets		8,70,000
5,000 Equity shares of			(less Depreciation)		
Rs. 100/-each	5,00,000		Current assets-		
2,000. 12% Pref.			Stock-in trade	2,00,000	
shares of Rs. 1 00			Sundry debtors	2,30,000	
each	2,00,000		Bills receivable	20,000	
		7,00,000	Cash on hand		
Reserves and surplus		3,00,000	and at bank	1,00,000	
12% Debentures		2,00,000			5,50,000
Current liabilities					
Creditors	1,70,000				
Bank overdraft	50,000				
		2,20,000			
	Rs.	14,20,000		Rs.	14,20,000

The following is the Body corporate's Revenue statement for the year ended 31st March, 19X5:

Rs.	
Net sale(Credit)	9,00,000
Cost of sales	6,75,000
Gross profit	2,25,000
Administrative expenses	52,000
Selling and distribution expenses	61,400
Operating profit (before tax)	1,11,600
Taxation	45,000
Operating profit (after tax)	Rs. 66,600

From the above information, you are required to compute the following ratios:

- |                                   |                              |
|-----------------------------------|------------------------------|
| (i) Current                       | (ii) Net profit              |
| (iii) Liquid                      | (iv) Capital gearing         |
| (v) Gross profit                  | (vi) Proprietary             |
| (vii) Debtors' turnover           | (viii) Stock working capital |
| (ix) Creditors' turnover          | (x) Earning per share        |
| (xi) Return on proprietors' funds | (Xii) Expenses               |

(xiii) Return on-equity capital

(iv) Debt service

(xvi) Price earning ratio (at a price of Rs. 300)

19. Following is the profit and loss account and balance sheet of Hetal Ltd. Profit and loss account for the year ended 31-12-19X3

Liabilities	Rs.	Assets	Rs.
To Cost of sales		By Sales	4,00,000
Opening stock 30,000			
Add: Purchases 3,00,000			
3,30,000			
Less: Closing stock 50,000	2,80,000		
Less: Gross profit c/d	1,20,000		
	4,00,000		4,00,000
To Expenses	20,000	By Gross profit <b/f	1,20,000
To Net profit c/d	1,00,000		
	1,20,000		1,20,000
To Provision for tax	40,000	By Net profit b/d	1,00,000
To Dividend	30,000		
To Net profit	30,000		
	1,00,000		1,00,000

Balance sheet as at 31st December 19X3

Liabilities	Rs.	Assets	Rs.
Share capital (Rs. 10)	2,00,000	Plant and machinery	80,000
Reserve	10,000	Land and building	20,000
Profit and loss a/c	30,000	Stock	50,000
Creditors	60,000	Debtors	80,000
		Cash and bank	70,000
	3,00,000		3,00,000

Market price of an equity share is Rs. 5.

Calculate the following ratios:

- (a) Stock turnover ratio, (b) Debtors' turnover ratio, (c) Creditors turnover ratio, (d) Return on capital employed, (e) Return on proprietors' fund, (f) Earning per share, (g) Price earning ratio, (h) Dividend pay out ratio.

#### 4.13 EXERCISE

- Discuss the following accounting concepts: entity concept, money measurement concept, going concern concept, cost concept, conservatism concept, dual aspect concept
  - Present the horizontal form as well as the vertical form of the balance sheet?
  - Describe the various asset accounts and liability accounts found on a company's balance sheet
  - Discuss the important items found on the profit and loss account
- List the finance topics that may be keyed primarily to the balance sheet
- What are the sources of working capital? What are the uses of working capital?
- What are the sources of cash? What are the uses of cash?
- Explain the concept and need of ratio analysis?
- Explain various revenue ratios?
- Explain various types of Balance Sheet ratios?
- Write a note about various composite ratios?
- Write about the usefulness and limitations of ratio analysis?

## **Unit: 5 : Capital Budgeting**

### **Introduction**

Capital Budgeting means 'planning of capital expenditure'. Capital budgeting is concerned with investment in long term assets. Many alternatives available when a decision is to be made about making investment in long term asset, but an investment in long term should be made by keeping in mind various factors. As investment in long term assets involve huge cash outflow, a careful decision need to be made regarding investments in such assets. Capital investment involves a cash outflow in the immediate future in anticipation of returns at a future date. The capital investment decisions assume vital significance in any form of business organization. The planning and control of capital expenditure is termed as 'Capital Budgeting'. Capital budgeting is the art of finding assets that are worth more than they cost, to achieve a predetermined goal i.e., optimizing the wealth of a business enterprise. The need for capital budgeting arises normally at the time of commencement of the business or at expansion of the business or at the time of diversification of the business.

The investment proposals need to be related to the underlying corporate objectives and strategies. Capital expenditure decisions usually involve large sums of money and impacts of such decisions will be for long time periods. Acceptance of non-viable proposals acts as a drag on the resources of an enterprise and may eventually lead to bankruptcy.

For making a rational decision regarding the capital investment proposals at hand, the decision maker needs some techniques to convert the cash outflows and cash inflows of a project into meaningful yardsticks, which can measure the economic worthiness of projects.

Realistic investment appraisal requires the financial evaluation of many factors, such as the choice of size, type, location and timing of investments, taxation, opportunity cost of funds available and alternative forms of financing the outlays. This show that capital investment decisions are difficult on account of their complexity and their strategic significance.

## **Structure of the chapter :**

- 5.1 Objective:**
- 5.2 Definition:**
- 5.3 Capital Budgeting Decisions:**
- 5.4 Capital Investment Process**
- 5.5 Investment Appraisal Methods:**
  - 5.5.1 Payback Period:**
  - 5.5.2 Accounting Rate of Return Method**
  - 5.5.3 Net Present Value (NPV) Method**
  - 5.5.4 Internal Rate of Return (IRR) Method**
  - 5.5.5 Profitability Index (PI) Method**
  - 5.5.6 Discounted Payback Period Method**
- 5.6 Taxation**
- 5.7 Investment Incentives**
- 5.8 Social Cost Benefit Analysis**
- 5.9 Capital Rationing**
- 5.10 Practical Problems**
- 5.11 Exercise**
- 5.12 Practical Exercise**

## 5.1 Objective:

At the end of this chapter the student will learn about –

- Meaning of capital budgeting
- Need of capital budgeting
- Procedure in capital budgeting
- Various project appraisal methods in capital budgeting

## 5.2 Definition:

According to Robert Anthony, 'The capital budget is essentially a list of what management believes to be worthwhile projects for the acquisition of new capital assets together with the estimated cost of each project.'

Thus in one line Capital budgeting means The process of determining which potential long-term projects are worth undertaking, by comparing their expected discounted cash flows with their internal rates of return.

## 5.3 Capital Budgeting Decisions:

Capital budgeting decisions are taken with immense care because such decisions are taken for such transaction which involve huge amount of capital and the effect of which will be alive for many years. Moreover, such decisions are not reversible. The effects of capital budgeting extend into the future and influence the organization's profitability and its growth in the long run. A relatively high degree of risks is associated with these decisions. Many problems create in taking decision regarding capital budgeting like capital budgeting activities involve prediction of future inflows and outflows but future is never certain and so risk is created. moreover, technologies may become obsolete in near future and in such case capital budgeting decision proves fail.

## 5.4 Capital Investment Process

The steps in strategic capital investment process is discussed below:

### Search for Investment Opportunities:

The first and probably most crucial stage in the process involves the recognition of opportunities. Unless the opportunities are available for good investment, there is no possibility for making investments in capital assets. This activity involves a continuous search for investment opportunities, which are compatible with the firms' objectives. Although business may pursue many goals, survival and profitability are two most important objectives. It requires imagination and diligence by management if they are to be detected at any early state. The earlier opportunity is identified the greater should be the potential returns before competitors start reacting.

### — Screening the Alternatives:

Each proposal is then subjected to a preliminary screening process in order to assess whether it is technically feasible, resources required are available and the expected returns are adequate to compensate for the risks involved. Thus Screening is a step in which the venture capitalist reaches an initial decision to investigate further the investment

(or not). The alternatives will be screened with the intention to see whether it is feasible or desirable to conduct a full scale evaluation of opportunities. It is required to determine whether such opportunities are worth further investigation. If warranted, the investor reads the plan more thoroughly as part of the generic screen to assess potential of the product or idea to obtain first impressions of management. Readily available information must be used to ascertain whether the opportunity is compatible with the existing business and corporate strategy and the likely returns compensate for the risk involved.

### **Analysis of Feasible Alternatives:**

- If a proposal satisfies the screening process it is then analyzed in more detail by gathering technical, economic and other data. Projects are also classified into new products, expansions or improvements, and ranked within each classification with respect of profitability, risk and degree of urgency.

### **Evaluation of Alternatives:**

This stage will involve the determination of proposal and its investments, inflows and outflows. For the purpose project appraisal techniques will be used.

Capitalist conducts detailed analysis of the options. Criteria that will be applied are:

- assessment of concept;
- assessment of the principals; and
- assessment of returns.

Investment appraisal techniques are fully described later in this chapter and range from the simple payback method and accounting rate of return to the more sophisticated discounted cash flow techniques. The technique selected should enable a manager to make the best decision in the light of prevailing circumstances.

### **Authorization:**

Once evaluation is completed then proposal will be forwarded to a higher level of management for authorization to take up the project.

## **5.5 Investment Appraisal Methods:**

There are various investment appraisal methods available, which are listed below.

1. Internal Rate of Return
2. Net Present Value Method
3. Accounting rate of Return or Average Rate of Return
4. Profitability Index
5. Payback Period

### 5.5.1 Payback Period:

It is the period within which the amount invested in the business will be received back. The criteria for selection is the shortest payback period means the project which has the shortest payback period will be selected. Emphasis under this method is not on the profitability but on the period of return of investment, such type of appraisal method should be selected while appraising risky investments. For the purpose of calculation of payback period Cash Flow After Tax (CFAT) will be considered.

Following illustration will explain how pay back period is calculated

**Illustration:** A project involves a total initial expenditure of Rs. 2, 10,000 and it is estimated to generate future cash inflow of Rs. 30,000, Rs. 38,000, Rs. 25,000, Rs. 22,000, Rs. 36,000, Rs. 40,000, Rs. 28,000, Rs. 24,000 and Rs. 24,000, respectively in the years during its life time. Calculate pay back period.

#### Calculation of Pay back Period

Years	Cash Inflows	Cumulative Cash Inflows
1	30,000	30,000
2	38,000	68,000
3	25,000	93,000
4	22,000	1,15,000
5	36,000	1,51,000
6	40,000	1,91,000
7	40,000	2,31,000
8	28,000	2,59,000
9	24,000	2,83,000
10	24,000	3,07,000

So after 6 years, Rs. 1, 92,000 are recovered

Remaining amount of Rs.19000 will be recovered in the 7<sup>th</sup> year but the total earning of the 7<sup>th</sup> year is Rs.40000, which is the outcome of 12 months working, so we will find proportionate time period for inflow of Rs.19000.

Therefore, payback period = 6 years+ (19,000/ 40,000 x 12) months  
= 6 years and 5.7 months

### 5.5.2 Accounting Rate of Return Method

The Accounting Rate of Return (also known as Return on Investment or Return on Capital Employed) method employ the normal accounting technique to measure the increase in profit expected to result from an investment by expressing the net accounting profit arising from the investment as a percentage of that capital investment. In this method, following formula is applied to arrive at the accounting rate of return.

$$\text{Accounting rate of return} = \frac{\text{Average annual profit after tax}}{\text{Average or initial investment}} \times 100$$





more than the present value of cash outflow. The objective of the firm is to create wealth by using existing and future resources to produce goods and services. To create wealth, inflows must exceed the present value of all anticipated cash outflows.

The net present value (NPV) is the most useful of these discounted cash flow methods. NPV analysis yields a result, expressed in after-tax dollars (important for profit-based operations), that takes into consideration the difference in the value of future cash flows and the cost of raising the capital required for the investment. NPV helps make sound decisions about whether to accept or reject potential investment projects based on an objective financial criterion. Projects associated with positive NPVs represent net savings for the organization. Projects associated with an NPV of zero will recuperate only the cost of the capital required to make the investment. Projects associated with negative NPVs represent a financial loss for the organization.

Net present value is obtained by discounting all cash outflows and inflows attributable to a capital investment project by a chosen percentage e.g., the entity's weighted average cost of capital. The method discounts the net cash flows from the investment by the minimum required rate of return, and deducts the initial investment to give the yield from the funds invested. If yield is positive the project is acceptable. If it is negative the project is unable to pay for itself and is thus unacceptable. If there are more than one investment proposals, the proposal which have the highest net present value will be selected.

The exercise involved in calculating the present value is known as discounting and the factors by which we have multiplied the cash flows are known as the discount factors. The discount factor is given by the following expression:

$$\frac{1}{(1+r)^n}$$

Where 'r' is the rate of interest per annum and 'n' is the number of years over which we are discounting.

Discounted cash flow is an evaluation of the future net cash flows generated by a capital project, by discounting them to their present day value. One of the main disadvantages of both payback and accounting rates of return methods is that they ignore the fact that money has time value. The discounting technique converts cash inflows and outflows for different years into their respective values at the same point of time, allows for the time value of money.

### **Compounding Rate and Capitalizing Rate -**

The compounding rate is used in project evaluation to determine the present value of past investment/cash flow, whereas the capitalizing rate is applied in the reserve process of discriminating present value of future cash flow. Both consider the time value of money.

Following illustration will show the calculation of net present value.

**Illustration:** Machine A costs Rs. 1, 10,000, payable immediately. Machine B costs Rs. 1, 20,000, half payable immediately and half payable in one year's time. The cash receipts expected are as follows:

Year (at the end)	A	B
1	20,000	-
2	60,000	60,000
3	40,000	60,000
4	30,000	80,000
5	20,000	-

With 7% rate of interest which machine should be selected.

**Solution:** In the tables given below amounts given in bracket will mean negative figures.

#### Machine A

Year	Cash flow Rs.	DF @ 7%	PV Rs.
0	(1, 00,000)	1, 10,000	(1, 10,000)
1	20,000	0.93458	18,692
2	60,000	0.87344	52,406
3	40,000	0.81630	32,652
4	30,000	0.76289	22,887
5	20,000	0.71299	14,260
			NPV = 30,897

#### Machine B

Year	Cash flow Rs.	DF @ 7%	PV Rs.
0	(60,000)	1.00000	(60,000)
1	(60,000)	0.93458	(56,075)
2	60,000	0.87344	52,406
3	60,000	0.81630	48,978
4	80,000	0.76289	61,031
			NPV = 46,340

Since machine B has the higher NPV, our decision should be to select machine B.

### 5.5.4 Internal Rate of Return (IRR) Method

The **Internal Rate of Return (IRR)** is the discount rate that results in a net present value of zero for a series of future cash flows. It is an Discounted Cash Flow (DCF) approach to valuation and investing just as Net Present Value (NPV). Both IRR and NPV are widely used to decide which investments to undertake and which investments not to make.

The major difference is that while Net Present Value is expressed in monetary units (Euro's or Dollars for example), the IRR is the true interest yield expected from an investment expressed as a percentage.

**Internal Rate of Return is the flip side of Net Present Value** and is based on the same principles and the same math. NPV shows the value of a stream of future cash flows discounted back to the present by some percentage that represents the minimum desired rate of return, often your company's cost of capital. IRR, on the other hand, computes a break-even rate of return. It shows the discount rate below which an investment results in a positive NPV (and should be made) and above which an investment results in a negative NPV (and should be avoided). It's the break-even discount rate, the rate at which the value of cash outflows equals the value of cash inflows.

Many people find the percentages of IRR easier to understand than Net Present Value. Another benefit from IRR is that it can be calculated without having to estimate the (absolute) cost of capital.

When IRR is used, the usual approach is to select the projects whose IRR exceeds the cost of capital (often called hurdle rate when used in the IRR context). This may seem simple and straightforward at first sight. However a **major disadvantage of using the Internal Rate of Return** instead of Net Present Value is that if managers focus on maximizing IRR and not NPV, there is a significant risk in companies where the return on investment is greater than the Weighted Average Cost of Capital (WACC) that managers will not invest in projects expected to earn greater than the WACC, but less than the return on existing assets. This while the aim of the value-oriented manager should be to invest in any project that has a positive NPV!

In other words: the aim should not be to maximize the **Internal Rate of Return**, but to maximize Net Present Value.

### **Relative Ranking of Projects: IRR vs. NPV –**

The relative ranking of projects, using the different DCF methods will be considered initially in simple accept/reject situations. This will be extended later to a detailed assessment of situations where a choice has to be made between two or more alternatives. In simple accept/reject situations a firm is able to implement all projects showing a return at or above the firm's cost of capital. Both NPV and IRR would appear to be equally valid in the sense that they will both lead to accept or reject the same projects.

Using NPV, all projects with a positive net present value, when discounted at the firm's cost of capital, will be accepted. Using IRR all projects which yield an internal rate of return in excess of the firm's cost of capital will be chosen.

However, although IRR and NPV lead to the same conclusion regarding project acceptability, the ranking of a set of projects obtained from IRR does not necessarily agree with that produced using NPV. Since, in the latter case, the ranking may vary according to particular discount rate used.

Argument about the merits of the relative rankings in simple accept/reject situations is thus concerned with the question of value. It is argued that the IRR measures only the quality of the investment while NPV takes into account both the quality and the scale. This is because the IRR provides a relative measure of value (%IRR) while the NPV provides an absolute measure (Rs. surplus).

While one project may have a higher rate of profit per unit of capital invested than another, if it has fewer units of capital invested in it, it may make a smaller contribution to the wealth of the firm. Thus, if the objective is to maximize the firm's wealth, then the ranking of project NPVs provides the correct measure. If the objective is to maximize the rate of profitability per unit of capital invested, then IRR would provide the correct ranking of projects, but this objective could be achieved by rejecting all but the most highly profitable projects. This is clearly unrealistic and, therefore, one would conclude that NPV ranking is correct and IRR unsatisfactory as a measure of relative project value.

When two investment proposals are mutually exclusive, both methods will give contradictory results. When two mutually exclusive projects are not expected to have the same life, NPV and IRR methods will give conflicting ranking.

### 5.5.5 Profitability Index (PI) Method

When resources are limited, the profitability index (PI) provides a tool for selecting among various project combinations and alternatives.

A set of limited resources and projects can yield various combinations.

The highest weighted average PI can indicate what projects to select.

It is a method of assessing capital expenditure opportunities in the profitability index, sometimes called the cost-benefit ratio. The profitability index is the present value of an anticipated net future cash flows divided by the initial outlay. The only difference between the Net present value method and Profitability index method is that when using the NPV technique the initial outlay is deducted from the present value of anticipated cash flows, whereas with the profitability index approach the initial outlay is used as a divisor. In general terms, a project is acceptable if its profitability index value is greater than 1 clearly a project offering a profitability index greater than 1 must also offer a net present value which is positive. Profitability index indicate per rupee return on investment in terms of present value. Mathematically, PI (profitability index) can be expressed as follows:

$$\text{Profitability Index (PI)} = \frac{\text{Present value of cash inflows}}{\text{Present value of cash outlay}}$$

This method is also called cost-benefit ratio or desirability ratio method.

However, the major problem of this method lies in projecting the future rates of interest at which the cash inflows will be re-invested.

- The following mutually exclusively projects can be considered:

Particulars	Project A	Project B
P.V. of cash inflows	20,000	8,000
(i)	15,000	5,000
Initial cash outlay	5,000	3,000
(ii)	1.33	1.60
Net present value		
Profitability Index		
(i)-(ii)		

According to the NPV method, Project A would be preferred, whereas according to profitability index Project B would be preferred.

Although PI method is based on NPV, it is better evaluation technique than NPV in situation of capital rationing.

For example two projects may have the same NPV of RS. 20,000 but Project A requires initial outlay of Rs. 1, 00,000 whereas B only Rs. 50,000. Project B would be preferred as per the yardstick of PI method. NPV method shows return in general where as the PI method shows per rupee return.

### 5.5.6 Discounted Payback Period Method

In this method the cash flows involved in a project are discounted back to present value terms as discussed above. The cash inflows are then directly compared to the original investment in order to identify the period taken to payback the original investment in present values terms. This method can be denoted as good combination of original pay back period and time value of money. This method overcomes one of the main objections to the original payback method, in that is now fully allows for the timing of the cash flows, but it still does not take into account those cash flows which occur subsequent to the payback period and which may be substantial.

The discounted payback period can screen out investments that do not have any present value: if they never "pay back" in terms of discounted cash flows, this means that they have either a zero or a negative present value. However, the discounted payback period cannot help us rank or select among profitable projects.

The method is a variation of payback period method, which can be used if DCF methods are employed. This is calculated in much the same way as the payback, except that the cash flows accumulated are the base year value cash flows which have been discounted at the discount rate used in the NPV method (i.e., the required return to investment). Thus, in addition to the recovery of cash investment, the cost of financing the investment during the time that part of the investment remains unrecovered is also provided for. It thus, unlike the ordinary payback method, ensures the achievement of at least the minimum required return.

The following illustration will explain the calculation of discounted pay back period.

Soham Ltd. is implementing a project with an initial capital outlay of RS. 8000. Its cash inflows are as follows:

Year	Rs.
1	6,000
2	2,000
3	1,000
4	5,000

The expected rate of return on the capital invested is 12% p.a. Calculate the discount payback period of the project.

Computation of present value of cash flows

Year	Cash inflow Rs.	Discount factor @ 12%	Present value Rs.
1	6,000	0.893	5,358
2	2,000	0.797	1,594
3	1,000	0.712	712
4	5,000	0.636	3,180
			Total P.V. = 10,844

The discount payback period of the project is 3 years i.e. the discount cash inflows for the first three years ( Rs. 5,358 + Rs. 1,594 + Rs. 712) is equivalent to the initial capital outlay of Rs. 7,664. In the fourth year the inflow will be 3180 but the amount needed for the pay back is only Rs. 336 (8000-7664) so for the purpose, we have to find the proposanate time period and it will be 1.26 months

$(336 * 12 / 3180)$

so, the discounted payback period is 3 years and 1.26 months.

## 5.6 Taxation

Tax factor is one of the most important determinant for deciding investment in any project. Tax laws vary from country to country and varying types of allowances can distort the impact of taxation on particular types of projects. However, tax payments represents a cash outflow from the business and therefore, these tax cash flows are a critical part of the project evaluation process. Because taxation causes a change in cash flows it is a factor to be considered in project appraisal. Indeed in some practical situations the taxation implication are dominant influences on the final investment decision. The following paragraphs cover the general impact of taxation on the appraisal process.

The project appraisal should be based on the net, after tax, incremental cash flows arising from the project. It follows that the general treatment of taxation in project appraisal involves estimating the cash outflows or inflows arising in respect of taxation, incorporating them in the project cash flow estimates and discounting in the usual manner. Because of the complexities of the taxation system, the tax cash flows resulting

## **Unit: 6:**

### **Risk Analysis in Capital Budgeting**

#### **Introduction**

The whole process of capital budgeting is related with the future activities like future cash outflow or future cash inflows etc. In fact various predictions are made regarding future inflows and outflows. Future is always uncertain so a project is selected on the basis of such uncertain future outcomes may cause problems if the actual picture differs from what was expected. It is possible to predict the outcome of some decisions with complete certainty because only one outcome can arise. However, there are many occasions when a decision can lead to more than one possible outcome, such situations are to be set with uncertainty. The traditional definition of the difference between risk and uncertainty has been that uncertainty cannot be quantified while risk can be, in this sense, risk is concerned with the use of quantification of the likelihood of future outcomes. Risk decomposes into three topics: probability, loss, and prediction. The word uncertainty to cover all future outcomes which cannot be predicted with accuracy. People have different attitudes towards the future. Some welcome the opportunity to take risk and may be called risk takers or risk seekers. Other are risk averse. In Armstrong's Principles of Forecasting, in defining risk, as a primary source of advanced information. Forecasting has many points of congruence to risk analysis, but business and finance are data-rich compared with the subjects such as health effects or natural disasters. So, we have much to learn from the capital budgeting with risk analysis.

An organization's performance is profoundly influenced by the elements contained within its environment. There are so many internal and external factors which create uncertainty regarding future course of actions like political situation, inflation, state of economy etc. In turn the organization also has an impact on its environment. It is the role of a management to predict events that are likely to occur within the environment in order that the enterprise may meet any challenges or take advantage of any new opportunities.