

## **COURSE: MANAGEMENT ACCOUNTING**

**COURSE CODE: MC-105**

**LESSON: 01**

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## **MANAGEMENT ACCOUNTING: NATURE AND SCOPE**

**Objective:** The present lesson explains the meaning, nature, scope and limitations of accounting. Further, it discusses the activities covered under management accounting and its difference with financial accounting.

### **LESSON STRUCTURE**

- 1.1 Introduction
- 1.2 Definitions of Management Accounting
- 1.3 Nature of Management Accounting
- 1.4 Functions of Management Accounting
- 1.5 Scope of Management Accounting
- 1.6 The Management Accountant
- 1.7 Management Accounting and Financial Accounting
- 1.8 Cost Accounting and Management Accounting
- 1.9 Limitations of Management Accounting
- 1.10 Self-Test Questions
- 1.11 Suggested Readings

### **1.1 INTRODUCTION**

Management accounting can be viewed as Management-oriented Accounting. Basically it is the study of managerial aspect of financial accounting, "accounting in relation to management function". It shows how the accounting function can be re-oriented so as to fit it within the framework of management activity. The primary task of management accounting is, therefore, to redesign the entire accounting system so that it may serve the operational

needs of the firm. If furnishes definite accounting information, past, present or future, which may be used as a basis for management action. The financial data are so devised and systematically development that they become a unique tool for management decision.

## **1.2 DEFINITIONS OF MANAGEMENT ACCOUNTING**

The term "Management Accounting", observe, Broad and Carmichael, covers all those services by which the accounting department can assist the top management and other departments in the formation of policy, control of execution and appreciation of effectiveness. This definition points out that management is entrusted with the primary task of planning, execution and control of the operating activities of an enterprise. It constantly needs accounting information on which to base its decision. A decision based on data is usually correct and the risk of erring is minimized. The position of the management in respect of its functions can be compared to that of an army general who wants to wage a successful battle. A general can hardly fight successfully unless he gets full information about the surrounding situation and the extent of effectiveness of each of his battalions and, to the extend possible, even the enemy's intentions. Like a general a successful management too strives to outstrip other competitors in the field by streamlining its operating efficiency. It needs a thorough knowledge of the situation and the circumstances in which the firm operates. Such knowledge can only be gained through the processed financial data rendered by the accounting department on the basis of which it can take policy decision regarding execution, control, etc. It is here that the role of management accounting comes in. It supplies all sorts of accounting information in the

form of such statements as may be needed by the management. Therefore, management accounting is concerned with the accumulation, classification and interpretation of information that assists individual executives to fulfill organizational objectives.

The Report of the Anglo-American Council of Productivity (1950) has also given a definition of management accounting, which has been widely accepted. According to it, "Management accounting is the presentation of accounting information in such a way as to assist the management in creation of policy and the day to day operation of an undertaking". The reasoning added to this statement was, "the technique of accounting is of extreme importance because it works in the most nearly universal medium available for the expression of facts, so that facts of great diversity can be represented in the same picture. It is not the production of these pictures that is a function of management but the use of them." An analysis of the above definition shows that management needs information for better decision-making and effectiveness. The collection and presentation of such information come within the area of management accounting. Thus, accounting information should be recorded and presented in the form of reports at such frequent intervals, as the management may want. These reports present a systematic review of past events as well as an analytical survey of current economic trends. Such reports are mainly suggestive in approach and the data contained in them are quite up to date. The accounting data so supplied thus provide the informational basis of action. The quality of information so supplied depends upon its usefulness to management in decision-making. The usual approach is that, first of all, a thorough analysis of the whole

managerial process is made, then the information required for each area is explored, and finally, all the information, after analysis in terms of alternatives, is taken into consideration before arriving at a management decision. It is to be understood here that the accounting information has no end in itself; it is a means to an end. As its basic idea is to serve the management, its form and frequency are all decided by managerial needs. Therefore, accounting aids the management by providing quantitative information on the economic well being of the enterprise. It would be appropriate if we called management accounting an Enterprise Economics. Its scope extends to the use of certain modern sophisticated managerial techniques in analyzing and interpreting operative data and to the establishment of a communication network for financial reporting at all managerial levels of an organization.

### **1.3 NATURE OF MANAGEMENT ACCOUNTING**

The term management accounting is composed of 'management' and 'accounting'. The word 'management' here does not signify only the top management but the entire personnel charged with the authority and responsibility of operating an enterprise. The task of management accounting involves furnishing accounting information to the management, which may base its decisions on it. It is through management accounting that the management gets the tools for an analysis of its administrative action and can lay suitable stress on the possible alternatives in terms of costs, prices and profits, etc. but it should be understood that the accounting information supplied to management is not the sole basis for managerial decisions. Along with the accounting information, management takes into consideration or weighs other factors concerning actual execution. For reaching a final

decision, management has to apply its common sense, foresight, knowledge and experience of operating an enterprise, in addition to the information that is already has.

The word 'accounting' used in this phrase should not lead us to believe that it is restricted to a mere record of business transactions i.e., book keeping only. It has indeed a 'macro-economic approach'. As it draws its raw material from several other disciplines like costing, statistics, mathematics, financial accounting, etc., it can be called an interdisciplinary subject, the scope of which is not clearly demarcated. Other fields of study, which can be covered by management accounting, are political science, sociology, psychology, management, economics, statistics, law, etc. A knowledge of political science helps to understand authority relationship and responsibility identification in an organization. A study of sociology helps to understand the behaviour of man in groups. Psychology enables us to know the mental make-up of employers and employees. A knowledge of these subjects helps to increase motivation, and to control the actions of the people who are ultimately responsible for costs. This builds a better employer-employee relationship and a sound morale. The subject of management reveals the processes involved in the art of managing, a knowledge of economics assists in the determination of optimum output in the forecasting of sales and production, etc., and also makes it possible to analyze management action in terms of cost revenues, profits, growth, etc. It is with the help of statistics that this information is presented to the management in a form that can be assimilated. The subject of management accounting also encompasses the subject of law, knowledge

of which is necessary to find out if the management action is ultra-vires or not. It is, therefore, a wide and diverse subject.

Management accounting has no set principles such as the double entry system of bookkeeping. In place of generally accepted accounting principles, the philosophy of cost benefit analysis is the core guide of this discipline. It says that no accounting system is good or bad but is can be considered desirable so long as it brings incremental benefits in excess of its incremental costs. Applying management accounting principles to financial matters can arrive at no single perfect solution. It is, therefore, an inexact science, which uses its own conventions rather than standardized principles. The facts to be studied here can be interpreted in different ways and the precision of the inferences depends upon the skill, judgement and common sense of different management accountants. It occupies a middle position between a fully matured and an infant subject.

Since management accounting is managerially oriented, its data is selective in nature. It focuses on potential opportunities rather than opportunities lost. The data is operative in nature catering to the operational needs of a firm. It details events, monetary and non-monetary. The nature of data, the form of presentation and its duration are mainly determined by managerial needs. It is quite frequently reported as it is meant for internal uses and managerial control. An accountant should look at his enterprise from the management's point of view. Whenever he fails to do that he ceases to be a management accountant.

Management accounting is highly sensitive to management needs. However, it assists the management and does not replace it. It represents a service

phase of management rather than a service to management from management accountant. It is rather highly personalized service. Finally, it can be said that the management accounting serves as a management information system and so enables the management to manage better.

## 1.4 FUNCTIONS OF MANAGEMENT ACCOUNTING

The basic function of management accounting is to assist the management in performing its functions effectively. The functions of the management are planning, organizing, directing and controlling. Management accounting helps in the performance of each of these functions in the following ways:

- (i) **Provides data:** Management accounting serves as a vital source of data for management planning. The accounts and documents are a repository of a vast quantity of data about the past progress of the enterprise, which are a must for making forecasts for the future.
- (ii) **Modifies data:** The accounting data required for managerial decisions is properly compiled and classified. For example, purchase figures for different months may be classified to know total purchases made during each period product-wise, supplier-wise and territory-wise.
- (iii) **Analyses and interprets data:** The accounting data is analyzed meaningfully for effective planning and decision-making. For this purpose the data is presented in a comparative form. Ratios are calculated and likely trends are projected.
- (iv) **Serves as a means of communicating:** Management accounting provides a means of communicating management plans upward, downward and outward through the organization. Initially, it means identifying the feasibility and consistency of the various segments of

the plan. At later stages it keeps all parties informed about the plans that have been agreed upon and their roles in these plans.

- (v) **Facilitates control:** Management accounting helps in translating given objectives and strategy into specified goals for attainment by a specified time and secures effective accomplishment of these goals in an efficient manner. All this is made possible through budgetary control and standard costing which is an integral part of management accounting.
- (vi) **Uses also qualitative information:** Management accounting does not restrict itself to financial data for helping the management in decision making but also uses such information which may not be capable of being measured in monetary terms. Such information may be collected from special surveys, statistical compilations, engineering records, etc.

## 1.5 SCOPE OF MANAGEMENT ACCOUNTING

Management accounting is concerned with presentation of accounting information in the most useful way for the management. Its scope is, therefore, quite vast and includes within its fold almost all aspects of business operations. However, the following areas can rightly be identified as falling within the ambit of management accounting:

- (i) **Financial Accounting:** Management accounting is mainly concerned with the rearrangement of the information provided by financial accounting. Hence, management cannot obtain full control and coordination of operations without a properly designed financial accounting system.

- (ii) **Cost Accounting:** Standard costing, marginal costing, opportunity cost analysis, differential costing and other cost techniques play a useful role in operation and control of the business undertaking.
- (iii) **Revaluation Accounting:** This is concerned with ensuring that capital is maintained intact in real terms and profit is calculated with this fact in mind.
- (iv) **Budgetary Control:** This includes framing of budgets, comparison of actual performance with the budgeted performance, computation of variances, finding of their causes, etc.
- (v) **Inventory Control:** It includes control over inventory from the time it is acquired till its final disposal.
- (vi) **Statistical Methods:** Graphs, charts, pictorial presentation, index numbers and other statistical methods make the information more impressive and intelligible.
- (vii) **Interim Reporting:** This includes preparation of monthly, quarterly, half-yearly income statements and the related reports, cash flow and funds flow statements, scrap reports, etc.
- (viii) **Taxation:** This includes computation of income in accordance with the tax laws, filing of returns and making tax payments.
- (ix) **Office Services:** This includes maintenance of proper data processing and other office management services, reporting on best use of mechanical and electronic devices.
- (x) **Internal Audit:** Development of a suitable internal audit system for internal control.
- (xi)

## 1.6 THE MANAGEMENT ACCOUNTANT

Management Accounting provides significant economic and financial data to the management and the Management Accountant is the channel through which this information efficiently and effectively flows to the management. The Management Accountant has a very significant role to perform in the installation, development and functioning of an efficient and effective management information system. He designs the framework of the financial and cost control reports that provide each management level with the most useful data at the most appropriate time. He educates executives in the need for control information and ways of using it. This is because his position is unique with respect to information about the organization. Apart from top management no one in the organization perhaps knows more about the various functions of the organization than him. He is, therefore, sometimes described as the Chief Intelligence Officer of the top management. He gathers information, breaks it down, sifts it out and organizes it into meaningful categories. He separates relevant and irrelevant information and then ranks relevant information in an intelligible form to the management and sometimes also to those who are interested in the information in the information outside the company. He also compares the actual performance with the planned one and reports and interprets the results of operations to all levels of management and to the owners of the business. Thus, in brief, management accountant or controller is the person who designs the management information system for the organization, operates it by means of interlocked budgets, computes variances and exhorts others to institute

corrective measures. Mr. P.L. Tandon has explained beautifully the position of the management accountant in the following words.

"The management accountant is exactly like the spokes in a wheel, connecting the rim of the wheel and the hub receiving the information. He processes the information and then returns the processed information back to where it came from"<sup>1</sup>.

Dr. Don Barker<sup>2</sup> sees a very bright future for the management accountants. According to him, "Management Accountants will be presented with many opportunities for innovative actions in the global economic environment. In addition to their role of providing accurate, timely and relevant information, management accountants will be expected to participate as business consultants and partners with management in the strategic planning process". Thus, there are tremendous possibilities for management accountants to shine as a professional group in the years to come. To fit in this role, it is necessary that the management accountants develop effective communication abilities, adopt a structured approach, a flexible accommodation and keep themselves aware with the latest evolving technologies in the profession.

## **FUNCTIONS OF MANAGEMENT ACCOUNTANT**

It is the duty of the management accountant to keep all levels of management informed of their real position. He has, therefore, varied functions to perform. His important functions can be summarized as follows:

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<sup>1</sup> Tandon, P.L.: "The Role of Management Accountants in General Management". 4th All India Seminar on Management Accounting, Lucknow, Feb. 1963.

2. President (1991-92), The Institute of Management Accountants, USA.

- (i) **Planning:** He has to establish, coordinate and administer as an integral part of management, an adequate plan for the control of the operations. Such a plan would include profit planning, programmes of capital investment and financing, sales forecasts, expenses budgets and cost standards.
- (ii) **Controlling:** He has to compare actual performance with operating plans and standards and to report and interpret the results of operations to all levels of management and the owners of the business. This is done through the compilation of appropriate accounting and statistical records and reports.
- (iii) **Coordinating:** He consults all segments of management responsible for policy or action. Such consultation might concern any phase of the operation of the business having to do with attainment of objectives and the effectiveness of the organizational structures and policies.
- (iv) **Other functions:**
  - He administers tax policies and procedures.
  - He supervises and coordinates the preparation of reports to governmental agencies.
  - He ensures fiscal protection for the assets of the business through adequate internal control and proper insurance coverage.
  - He carries out continuous appraisal economic and social forces and the government influences, and interprets their effect on the business.

It should be noted that the functions of a Management Accountant are more of those of a 'staff official'. He, in addition to processing historical

data, supplies a good deal of information concerning the future operations in line with the management's needs. Besides serving top management with information concerning the company as a whole, he supplies detailed information to the line officers regarding alternative plans and their profitability, which help them in decision-making. As a matter of fact the Management Accountant should not bother himself regarding the decision taken by the line officials after tendering advice unless he has reasonable grounds to believe that such a decision is going to affect the interests of corporation adversely. In such an event also he should report it to the concerned level of management with tact, firmness combined with politeness.

## **1.7 MANAGEMENT ACCOUNTING AND FINANCIAL ACCOUNTING**

Financial accounting and management accounting are closely interrelated since management accounting is to a large extent rearrangement of the data provided by financial accounting. Moreover, all accounting is financial in the sense that all accounting systems are in monetary terms and management is responsible for the contents of the financial accounting statements. In spite of such a close relationship between the two, there are certain fundamental differences. These differences can be laid down as follows:

- (i) Objectives:** Financial accounting is designed to supply information in the form of profit and loss account and balance sheet to external parties like shareholders, creditors, banks, investors and Government. Information is supplied periodically and is usually of such type in which management is not much interested. Management Accounting is designed principally for providing accounting information for internal

use of the management. Thus, financial accounting is primarily an external reporting process while management accounting is primarily an internal reporting process.

- (ii) **Analyzing performance:** Financial accounting portrays the position of business as a whole. The financial statements like income statement and balance sheet report on overall performance or statues of the business. On the other hand, management accounting directs its attention to the various divisions, departments of the business and reports about the profitability, performance, etc., of each of them. Financial accounting deals with the aggregates and, therefore, cannot reveal what part of the management action is going wrong and why. Management accounting provides detailed analytical data for these purposes.
- (iii) **Data used:** Financial accounting is concerned with the monetary record of past events. It is a post-mortem analysis of past activity and, therefore, out the date for management action. Management accounting is accounting for future and, therefore, it supplies data both for present and future duly analyzed in detail in the 'management language' so that it becomes a base for management action.
- (iv) **Monetary measurement:** In financial accounting only such economic events find place, which can be described in money. However, the management is equally interested in non-monetary economic events, viz., technical innovations, personnel in the organization, changes in the value of money, etc. These events affect management's decision and, therefore, management accounting cannot afford to ignore them.

For example, change in the value of money may not find a place in financial accounting on account of "going concern concept". But while affecting an insurance policy on an asset or providing for replacement of an asset, the management will have to take into account this factor.

- (v) **Periodicity of reporting:** The period of reporting is much longer in financial accounting as compared to management accounting. The Income Statement and the Balance Sheet are usually prepared yearly or in some cases half-yearly. Management requires information at frequent intervals and, therefore, financial accounting fails to cater to the needs of the management. In management accounting there is more emphasis on furnishing information quickly and at comparatively short intervals as per the requirements of the management.
- (vi) **Precision:** There is less emphasis on precision in case of management accounting as compared to financial accounting since the information is meant for internal consumption.
- (vii) **Nature:** Financial accounting is more objective while management accounting is more subjective. This is because management accounting is fundamentally based on judgement rather than on measurement.
- (viii) **Legal compulsion:** Financial accounting has more or less become compulsory for every business on account of the legal provisions of one or the other Act. However, a business is free to install or not to install system of management accounting.

The above points of difference between Financial Accounting and Management Accounting prove that Management Accounting has flexible

approach as compared to rigid approach in the case of Financial Accounting.

In brief, financial accounting simply shows how the business has moved in the past while management accounting shows how the business has to move in the future.

An attempt may now be made to compare and study the two types of accounting on basis of the characteristics of the data used. It is presented through the box- 1.1, given below.

### **Box 1.1**

<b>Features of data</b>	<b>Provided by Financial Accounting</b>	<b>Provided by Management accounting</b>
1. Period	After a stated period	At frequent intervals
2. Time	Historical data	Current and future data
3. Unit of expression	Money only	Any statistical unit
4. Nature	Actual data	Projected data
5. Specificity	Aggregates	Detailed analysis
6. Description	Money consequences	Events
7. Reality	Objective	Subjective
8. Precision	Pie to Pie accuracy	May be guess-work
9. Principles	Double entry system	Cost benefit analysis
10. Legality	Obligatory	Optional
11. Purpose	Overview of entire Business activity	Analytical details of such activities as call for decisions

## **1.8 COST ACCOUNTING AND MANAGEMENT ACCOUNTING**

Cost accounting is the process of accounting for costs. It embraces the accounting procedures relating to recording of all income and expenditure and the preparation of periodical statements and reports with the object of ascertaining and controlling costs. It is, thus, the formal mechanism by means of which the costs of products or services are ascertained and controlled. On the other hand, management accounting involves collecting, analyzing, interpreting and presenting all accounting information, which is useful to the management. It is closely associated with management control, which comprises planning, executing, measuring and evaluating the

performance of an organization. Thus, management accounting draws heavily on cost data and other information derived from cost accounting. Today cost accounting is generally indistinguishable from the so-called management accounting or internal accounting because it serves multiple purposes. However, management accounting can be distinguished from cost accounting in one important respect. Management accounting has a wider scope as compared to cost accounting. Cost accounting deals primarily with cost data while management accounting involves the considerations of both cost and revenue. Management accounting is an all inclusive accounting information system, which covers financial accounting, cost accounting, and all aspects of financial management. But it is not a substitute for other accounting functions. It involves a continuous process of reporting cost, financial and other relevant data in an analytical and informative way to management. We should not be very much concerned with boundaries of cost accounting and management accounting since they are complementary in nature. In the absence of a suitable system of cost accounting, management accountant will not be in a position to have detailed cost information and his function is bound to lose significance. On the other hand, the management accountant cannot effectively use the cost data unless it has been reported to him in a meaningful and informative form.

## **1.9 LIMITATIONS OF MANAGEMENT ACCOUNTING**

Management accounting, being comparatively a new discipline, suffers from certain limitations, which limit its effectiveness. These limitations are as follows:

1. **Limitations of basic records:** Management accounting derives its information from financial accounting, cost accounting and other records. The strength and weakness of the management accounting, therefore, depends upon the strength and weakness of these basic records. In other words, their limitations are also the limitations of management accounting.
2. **Persistent efforts.** The conclusions drawn by the management accountant are not executed automatically. He has to convince people at all levels. In other words, he must be an efficient salesman in selling his ideas.
3. **Management accounting is only a tool:** Management accounting cannot replace the management. Management accountant is only an adviser to the management. The decision regarding implementing his advice is to be taken by the management. There is always a temptation to take an easy course of arriving at decision by intuition rather than going by the advice of the management accountant.
4. **Wide scope:** Management accounting has a very wide scope incorporating many disciplines. It considers both monetary as well as non-monetary factors. This all brings inexactness and subjectivity in the conclusions obtained through it.
5. **Top-heavy structure:** The installation of management accounting system requires heavy costs on account of an elaborate organization and numerous rules and regulations. It can, therefore, be adopted only by big concerns.

6. **Opposition to change:** Management accounting demands a break away from traditional accounting practices. It calls for a rearrangement of the personnel and their activities, which is generally not liked by the people involved.
7. **Evolutionary stage:** Management accounting is still in its initial stage. It has, therefore, the same impediments as a new discipline will have, e.g., fluidity of concepts, raw techniques and imperfect analytical tools. This all creates doubt about the very utility of management accounting.

## 1.10 SELF-TEST QUESTIONS

1. What do you mean by management accounting? Explain giving examples.
2. What are the functions of a management accountant? Elaborate each one of them.
3. Explain the benefits of management accounting in the business sector and service sector.
4. Distinguish management accounting from financial accounting and cost accounting.
5. Explain the limitations of management accounting.

## 1.11 SUGGESTED READINGS

1. Ashish K. Bhattacharya, Principles and Practices of Cost Accounting (3<sup>rd</sup>.), New Delhi: Prentice Hall of India Private Limited, 2004.
2. Charles T. Horngren, Cost Accounting, A Managerial Emphasis, Prentice Hall Inc., 1973.
3. D. T. Decoster and E. L. Schafer, Management Accounting, New York: John Wiley and Sons, 1979.
4. John G. Blocker and Wettmer W. Keith, Cost Accounting, New Delhi: Tata Mc Grw Publishing Co. Ltd., 1976.
5. R. K. Sharma and Shashi K. Gupta, Management Accounting- Principles and Practice (7<sup>th</sup>.), New Delhi: Kalyani Publishers, 1996.

**COURSE: MANAGEMENT ACCOUNTING**

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**LESSON: 02**

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## **FINANCIAL STATEMENT ANALYSIS**

**Objective:** The present lesson explains the discrepancy between accounting income and economic income; identify the devices used in practice to exploit the use of the bottom line; the use of a firm's financial statements to calculate standard financial ratios; decompose the return on equity into its key determinants; carry out comparative analysis; and highlights the uses of financial statement analysis for different purposes.

## **LESSON STRUCTURE**

- 2.1 Introduction
- 2.2 Financial Statements
- 2.3 Financial Statement Analysis
- 2.4 Methodical Presentation of Financial Statement Analysis
- 2.5 Techniques /Tools of Financial Statement Analysis
- 2.6 Self-Test Questions
- 2.7 Suggested Readings

### **2.1 INTRODUCTION**

Financial statements are an important source of information for evaluating the performance and prospects of a firm. If properly analyzed and interpreted, financial statements can provide valuable insights into a firm's performance. Analysis of financial statements is of interest to lenders (short term as well as long term), investors, security analysts, managers, and others. Financial statement analysis may be done for a variety of purposes, which may range

from a simple analysis of the short-term liquidity position of the firm to a comprehensive assessment of the strengths and weaknesses of the firm in various areas. It is helpful in assessing corporate excellence, judging creditworthiness, forecasting bond ratings, evaluating intrinsic value of equity shares, predicting bankruptcy, and assessing market risk.

## **2.2 FINANCIAL STATEMENTS**

Managers, shareholders, creditors and other interested groups seek answers to the following questions about a firm: What is the financial position of firm at a given point of time? How has the firm performed financially over a given period of time? What have been the sources and uses of cash over a given period? To answer these questions, the accountant prepares two principal statements, the balance sheet and the profit and loss account, and an ancillary statement, the cash flow statement.

### **2.2.1 BALANCE SHEET**

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 account (horizontal) form or the report (vertical) form. Exhibit 2.1 shows the balance sheet of Horizon Limited as on March 31, 2005 cast in the account as well as the report form. While the report form is most commonly used by companies, it is more convenient to explain the contents of the balance sheet of Horizon Limited, cast in the account form, as given Exhibit 2.2.

Structure of Balance Sheet as per the Companies Act

### **Exhibit 2.1 Account Form**

<u>Liabilities</u>	<u>Assets</u>
Share capital	Fixed assets
Reserves and surplus	Investments
Unsecured loans	Current assets, loans and advances
Current liabilities and provisions	Current assets
Current liabilities	Loans and advances
Provisions	Miscellaneous expenditure and losses

## Exhibit 2.2 Report Form

### *I Sources of Funds*

- (1) Shareholders funds
  - (a) Share capital
  - (b) Reserves & 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 expenditure and losses.

**Liabilities.** Liabilities defined very broadly represent what the business entity owes others. The Companies Act classifies them as share capital, reserves and surplus, secured loans, unsecured loans, 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 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 and Surplus:** Reserves and surplus are profits, which have been retained in the firm. 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 reserves, dividend equalization reserve, and so on. 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 on revaluation of 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 or net worth.

**Secured Loans:** These are the borrowings of the firm against which specific collateral 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 amounts due to the suppliers of goods and services bought on credit, advance payments received, accrued expenses, unclaimed dividend, provisions for taxes, dividends, and so on. Current liabilities for managerial purposes (as distinct from their definition in the Companies Act) are obligations, which are expected

to mature in the next twelve months. So defined, they include current liabilities and provisions as per the classification under the Companies Act plus loans (secured and unsecured) which are repayable within one year from the date of the balance sheet.

**Assets:** Broadly speaking, assets represent resources, which are of some value to the firm. They have been acquired at a specific monetary cost by the firm for the conduct of its operations. Assets are classified under the Companies Act as fixed assets, investments, current assets, loans and advances, miscellaneous expenditure 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 likely to be short term in nature such as holdings of units in mutual fund schemes and may rightly be classified under current assets for managerial purposes. (Under the requirements of the Companies Act, however, short term holding of financial securities also has to be shown under investments and not under current assets.)

**Current Assets, Loans and Advances:** This category consists of cash and other assets, 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, sundry debtors, inventories, loans and advances, and pre-paid expenses. Cash denotes funds readily disbursable by the firm. The bulk of it is usually in the form of bank balances and the rest is currency held by the firm. Sundry debtors (also called accounts receivable) represent the amounts owned to the firm by its customers who have bought goods and services on credit. Sundry debtors are shown in the balance sheet at the amount owed, less an allowance for bad debts. Inventories (also called stocks) consist of raw materials, work-in-process, finished goods, and stores and spares. They are usually reported at the lower of the cost or market value. Loans and advances are the amounts loaned to employees, advances given to suppliers and contractors, advance tax paid, 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. These are shown at the cost unexpired service.

**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 developmental expenses, which have not been written off. From the accounting point of view, a loss represents a decrease in owners' equity. Hence, when a loss occurs, the owners' equity should be reduced by that amount. However, as per company law requirements, the share capital (representing owners' equity) cannot be reduced when a loss occurs. So the share capital is kept intact on the left hand side (the liabilities side) of the balance sheet and the loss is shown on the right hand side (the assets side) of the balance sheet.

## 2.2.2 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 account form or the report form. Typically, companies employ the report form. The report form statement may be a single-step statement or a multi-step statement. In a single step statement, all revenue items are recorded first, then the expense items are show and finally the net profit is given. While a single step profit and loss account aggregates all revenues and expenses, a multi-step profit and loss account provides disaggregated information. Further, instead of showing only the final profit measure, viz., the profit after tax figure, it presents profit measures at intermediate stages as well.

- 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.

## 2.3 FINANCIAL STATEMENTS ANALYSIS

**Financial Statements Analysis (FSA) refers to the process of the critical examination of the financial information contained in the financial statements in order to understand and make decisions regarding the operations of the firm. The FSA is basically a study of the relationship among various financial facts and figures is given in a set of financial statements. The basic financial statements i.e. the Balance Sheet and the Income Statement, already discussed in the preceding lesson contain a whole lot of historical data. The complex figures as given in these financial statements are dissected/broken up into simple and valuable elements and significant relationships are established between the elements of the same statement or different financial statements. This process of dissection, establishing relationships and interpretation thereof to understand the working and financial position of a firm is called the FSA. Thus, FSA is the process of establishing and identifying the financial weaknesses and strength of the firm. It is indicative of two aspects of a firm i.e. the profitability and the financial position and it is what is known as the objectives of the FSA.**

**2.3.1 Objectives of the FSA:** Broadly, the objective of the FSA is to understand the information contained in financial statements with a view to know the weaknesses and strength of the firm and to make a forecast about the future prospects of the firm and thereby enabling the financial analyst to take different decisions regarding the operations of the firm. The objectives of the FSA can be identified as:

- To assess the present profitability and operating efficiency of the firm as a whole as well as for its different departments and segments.
- To find out the relative importance of different components of the financial position of the firm.
- To identify the reasons for change in the profitability/financial position of the firm, and
- To assess the short term as well as the long term liquidity position of the firm.

### **2.3.2 Types of Financial Analysis**

Financial analysis can be classified into different categories depending upon (1) the material used, and (2) the modus operandi of analysis.

1. **On the Basis of Material Used:** Under this category the financial analysis can be of two types: a) External Analysis; b) Internal Analysis

- a. **External Analysis:** The outsiders to the business carry out this kind of analysis, which includes investors, credit agencies, government agencies and other creditors who have no access to the internal records of the company. In the recent times this analysis has gathered momentum towards better corporate governance and government regulations for more detailed disclosure of information by the companies in their financial statements.
- b. **Internal Analysis:** In contrary to the above this analysis is done by those who have access to the books of accounts and other information related to the business. The analysis is done depending upon the objective to be achieved through this analysis.

2. **On the basis of Modus Operandi:** In this case too, the financial analysis can be of two types: a) Horizontal Analysis; b) Vertical Analysis

- a **Horizontal Analysis:** Under this financial statements for a number of years are reviewed and analyzed. The current year's figures are compared with standard or base year.
- b **Vertical Analysis:** Under this type of analysis a study is made of the quantitative relationship of the various items in financial statements on a particular date. For example, the ratios of different items of costs for a particular period may be calculated with the sales for that period. These types of financial analysis are useful in comparing the performance of several companies

in the same group, or divisions or departments in the same company.

In addition to above, the FSA for a firm can be undertaken in different ways. There is 'the best' technique of the FSA, which can be applied to all the firms under all the situations. The type of the FSA undertaken depends upon the person doing the FSA and the purpose of which the FSA has been undertaken. Different person/parties may undertake the FSA for different purposes. The persons/parties, who are usually interested in the FSA, may be the shareholders, the creditors, the financial institutions, the investors and the management itself. The FSA can be classified into different categories as follows: a) Internal and External FSA; b) Dynamic and Static FSA

**a) Internal and External FSA:** The FSA is said to be internal when it is done by a person who has access to the books of the account and other related information of the firm. This type of FSA is conducted for measuring the operational and managerial efficiency at different hierarchy levels of the firm. This type of analysis is quite comprehensive and reliable. In order to undertake internal FSA, either an employee of the same firm or an outside agency may be entrusted the responsibility. External FSA, on the other hand, is one, which is conducted by an outsider without having any access to the basic accounting record of the firm. These outsiders may be the creditors, the investors, the shareholders, the credit rating agencies etc. The external FSA is dependent on the published financial data of the firm and consequently can serve only limited purpose.

**b) Dynamic and Static FSA:** The FSA is said to be dynamic if it covers a period of several years. Financial data/information for different years is incorporated in the FSA to assess the progress of the firm. This type of FSA is also called the horizontal analysis. The dynamic FSA is useful for long-term trend analysis and planning. In dynamic FSA, the figures/data for a year are placed and compared with the figures/data for several other years and changes from 1 year to another are identified. Since, the dynamic analysis covers a period of more than 1 year (may be up to 5 years or 10 years), is given a considerable insight into areas of financial weaknesses and strength of the firm. On the other hand, the static FSA covers a period of 1 year only and the analysis is made on the basis of only one set of financial statements. So, it is study in terms of information at a particular date only. It is also called vertical FSA. Impliedly, the static FSA fails to incorporate the periodic changes and therefore, may not be very conducive to a proper understanding of the financial position of the firm. It may be noted that both the dynamic and static FSA should be conducted simultaneously as both are indispensable for understanding the profitability and financial position of the firm.

On the basis of the above discussion, it can be said that FSA is an investigative and thought provoking process in nature. The basic objective of FSA is financial planning and forecasting on the basis of meaningful interpretation of the financial information. It is forward looking exercise. Since, decisions are going to be taken on the basis

of the FSA, the analyst must be careful, precise, analytical, objective and intelligent enough to undertake the FSA in a systematic way.

## **2.4 METHODICAL PRESENTATION TO FSA**

The financial statements usually present the financial data in a traditional form. However, in order to make meaningful and convenient analysis, the presentation of data may be modified and suitably rearranged. In the modified form, the items of a statement are presented in a vertical form and in a particular sequence only. However, it must be noted that this modified form of the financial statements is only a matter of convenience and not a compulsory requirement and therefore, there is no standard form of methodical presentation. The FSA can be undertaken even without such modification but not so conveniently. In methodical presentation, the financial information can be presented even side by side for inter-firm comparison or for dynamic FSA. A set of methodical presentation of the Income Statement and the B/S are given in the Table 2.1 and 2.2 respectively.

**Table 2.1 : Income Statement (Methodical presentation).**

**INCOME STATEMENT FOR THE YEAR ENDING.....**

	Amount	Amount
Sales		
Cash sales	*****	
Credit sales	*****	
Less: Sales return	<u>*****</u>	
Net sales	(1)	*****
Less: Cost of good sold:		
Opening stock	*****	
+ Purchases	*****	
+ Manufacturing expenses	*****	
+ Direct expenses	*****	
- Closing stock	<u>*****</u>	
Total cost of goods sold	(2)	<u>*****</u>
Gross Profit	(3)	*****
Less: Operating expenses :	(4)	
Selling expenses	*****	
Administrative expenses	*****	
Depreciation	<u>*****</u>	<u>*****</u>
Operating profit	(5)	*****
Add: Non Operating Income		*****
Less: Non Operating Expenses		*****
Profit before Interest & Taxes	(6)	<u>*****</u>
Less : Interest Charges:	(7)	
Interest on Loans	*****	
Interest on Debenture	<u>*****</u>	<u>*****</u>
Profit before tax (6-7)	(8)	*****
Less: Provision for tax	(9)	<u>*****</u>
Net Profit	(10)	<u>*****</u>

**Table 2.2: The balance Sheet (Methodical presentation).**  
**BALANCE SHEET AS ON.....**

	<b>Amount</b>	<b>Amount</b>
Preference Share Capital	*****	
Equity Share Capital	*****	
Total Share Capital	(1) *****	*****
Add: Capital Reserve	*****	
General Reserve	*****	
Share Premium A/c	*****	
Capital Redemption Reserve A/c	*****	
Profit & Loss A/c	*****	*****
Less: Preliminary Expenses	*****	
Accumulated Losses	*****	*****
Shareholders Fund	(2)	*****
Add: Long Term Loans	*****	
Debentures	*****	*****
Capital Employed	(3)	*****

**Represented by:**

Fixed Assets		
Land & Building		*****
Plant & Machinery		*****
Furniture & Fixture		*****
Gross Block		*****
Less : Depreciation		*****
Fixed Assets (Net)	(4)	*****
Working Capital		
Cash and Bank	*****	
Receivable	*****	
Marketable Securities	*****	
Liquid Assets	(5)	*****
+ Inventories		*****
Total Current Assets	(6)	*****

Trade Creditors	*****
Bills Payable	*****
Expenses Outstanding	*****
Provision for Tax	*****
Quick Liabilities (7)	*****
+ Bank Overdraft	*****
Total Current Liabilities (8)	*****
Net Working Capital (6-8) (9)	*****
Total Assets (4+9) (10)	*****

## 2.5 TECHNIQUES/TOOLS OF THE FSA

As already discussed, that the FSA can be undertaken by different persons and for different purposes, therefore, the methodology adopted for the FSA may be varying from the one situation to another. However, the following are some of the common techniques of the FSA: a) Comparative financial statements. (b) Common-size financial statements, (c) Trend percentages analysis, and (d) Ration Analysis. The last techniques i.e. the ration analysis is the most common, comprehensive and powerful tool of the FSA. For the sake of proper understanding, all these techniques have been discussed in detail as follows:

### 2.5.1 COMPARATIVE FINANCIAL STATEMENTS (CFS)

In CFS, two or more BS and/or the IS of a firm are presented simultaneously in columnar form. The financial data for two or more years are placed and presented in adjacent columns and thereby the financial data is provided a times perspective in order to facilitate periodic comparison. In CFS, the BS and the IS for number of years are presented in condensed form for year-to-year comparison and to exhibit the magnitude and direction of changes.

The preparation of the CFS is based on the premise that a statement covering a period of a number of years is more meaningful and significant than for a single year only, and that the financial statements for one period represent only 1 phase of the long and continuous history of the firm. Nowadays, most of the published Annual Reports of the companies provide important statistical information about the company in condensed form for the last so many years. The presentation of such data enhances the usefulness of these reports and brings out more clearly the nature and trends of changes affecting the profitability and financial position of the firm.

So, the CFS helps a financial analyst in horizontal analysis of the firm and in establishing operating and positional trend of the firm. The CFS may be prepared to show the absolute amount of different items in monetary terms, the amount of periodic changes in monetary terms and the percentages of periodic changes to reveal the proportionate changes. The CFS can be prepared for both the BS and IS.

**Comparative Income Statement (CIS):** A CIS shows the figures of different items of the ISs of the firm in absolute terms, the absolute changes from one period to another and if desired, the changes in percentage form. The CIS is helpful in deriving meaningful conclusions regarding changes in sales volume, cost of goods sold, different expense items etc. From the CIS a financial analyst can quickly ascertain whether sales are increasing or decreasing and by how much amount or by how much percentage. Similarly, analysis can be made for other items also.

**Comparative Balance Sheet (CBS):** The CBS shows the different assets and liabilities of the firm on different dates to make comparisons of absolute

balances and also of changes if any, from one date to another. The CBS may be helpful in analyzing and evaluating the financial position of the firm over a period of number of years. The preparation of CFS can be explained with the help of Example 2.1.

**Example 2.1:** Following are the IS and BS of ABC & Co. for the year 2003 and 2004, Prepare the CBS and CIS for these two years.

**Income Statements for the year 2003 and 2004**

**(Figures in Rs.)**

<b>Particulars</b>	<b>2003</b>	<b>2004</b>	<b>Particulars</b>	<b>2003</b>	<b>2004</b>
To Cost of good sold	300000	375000	By Net Sales	400000	500000
To General Expenses	10000	10000			
To Selling Expenses	15000	20000			
To Net Profit	<u>75000</u>	<u>95000</u>			
	<u>400000</u>	<u>500000</u>		<u>400000</u>	<u>500000</u>

**Balance Sheets as on December 31**

**(Figures in Rs.)**

<b>Liabilities</b>	<b>2003</b>	<b>2004</b>	<b>Assets</b>	<b>2003</b>	<b>2004</b>
Capital	350000	350000	Land	50000	50000
Reserves	100000	122500	Building	150000	135000
Secured Loans	50000	75000	Plant	150000	135000
Creditors	100000	137000	Furniture	50000	70000
Outstanding Expenses	50000	75000	Cash	50000	70000
			Debtors	100000	150000
			Stores	100000	150000

<u>650000</u>	<u>760000</u>	<u>650000</u>	<u>760000</u>
---------------	---------------	---------------	---------------

**Solution:**

**COMPARATIVE INCOME STATEMENT  
FOR THE YEARS ENDING 2003 AND 2004**

**(Figures in Rs.)**

<b>Liabilities</b>	<b>2003</b>	<b>2004</b>	<b>Change in</b>	<b>% change in</b>
			<b>2004</b>	<b>2004</b>
Net Sales	400000	500000	100000	+ 25
Less cost of goods Soled	<u>300000</u>	<u>375000</u>	<u>75000</u>	<u>+ 25</u>
Gross Profit (1)	<u>100000</u>	<u>125000</u>	<u>25000</u>	<u>+ 25</u>
Less General	10000	10000	----	----
Selling Expenses	<u>15000</u>	<u>20000</u>	<u>5000</u>	<u>+ 33.3</u>
Total Expenses (2)	<u>15000</u>	<u>30000</u>	<u>5000</u>	<u>+ 20</u>
Net Profit (1-2)	<u>75000</u>	<u>95000</u>	<u>20000</u>	<u>+ 26.7</u>

**COMPARATIVE BALANCE SHEET AS ON DEC. 31**

<b>Liabilities</b>	<b>2003</b>	<b>2004</b>	<b>Change in</b>	<b>% change in</b>
			<b>2004</b>	<b>2004</b>
Land	50000	50000	----	----
Building	150000	135000	- 15000	- 10
Plant	150000	135000	-15000	- 10
Furniture	<u>50000</u>	<u>70000</u>	<u>20000</u>	<u>+ 40</u>
Total F. assets (1)	<u>400000</u>	<u>390000</u>	<u>-10000</u>	<u>- 2.5</u>
Cash	50000	70000	20000	40

Debtors	100000	150000	50000	50
Stock	<u>100000</u>	<u>150000</u>	<u>50000</u>	<u>50</u>
Total C. Assets (2)	<u>250000</u>	<u>370000</u>	<u>120000</u>	<u>48</u>
Creditors	100000	137500	37500	37.5
O/s Expenses	<u>50000</u>	<u>75000</u>	<u>25000</u>	<u>50</u>
Total Liabilities (3)	<u>150000</u>	<u>212500</u>	<u>62500</u>	<u>41.7</u>
Net Working	<u>100000</u>	<u>157500</u>	<u>57500</u>	<u>57.5</u>
Capital (2 - 3)				
Total Assets (1+2)	<u>650000</u>	<u>760000</u>	<u>110000</u>	<u>16.9</u>
Capital	350000	350000	-----	-----
Reserves	<u>100000</u>	<u>122500</u>	<u>22500</u>	<u>22.5</u>
Proprietor's Fund (4)	<u>450000</u>	<u>472500</u>	<u>22500</u>	<u>5</u>
Secured Loans (5)	<u>50000</u>	<u>75000</u>	<u>25000</u>	<u>50</u>
Capital Employed	<u>500000</u>	<u>547500</u>	<u>47500</u>	<u>9.5</u>
(4+5)				
Total Assets (1+2)	<u>650000</u>	<u>760000</u>	<u>110000</u>	<u>16.9</u>
Cap.+ Total				
Liabilities (3+4+5)	<u>650000</u>	<u>760000</u>	<u>110000</u>	<u>16.9</u>

**Interpretation:** On the basis of CIS it can be said that Gross Profit for the year 2004 has increased by 25% over the profit for the year 2003. The Net Sales during the same period has increased by 25%, which was coupled with increase in the cost of goods sold which also increased by same 25%. This means that Input/Output ratio or the production efficiency level has been maintained during 2004. the same increase of 25% in Net Sales and the Cost of goods sold has resulted in increase in Gross Profit by 25%. The increase in Net Profit is more pronounced i.e. by 26.7%. The reason for a higher increase in Net Profit is the comparatively less increase in total expenses (only 20%). The General Expenses during 2003 and 2004 were same but the increase in Selling Expenses by 33 1/3% has resulted increase of total

expenses by 20%. The CBS also reveals many facts about the composition of assets and the financial structure of the firm. The Fixed Assets have decreased over the period by 2.5%, though this decrease has primarily resulted by the amount of depreciation @ 10% on Buildings and Plant. However, the Current Assets have increased by 48%, this increase of 48% is too much in view of increase in Net Sales by 25% only. Moreover, the Current Liabilities have increased by 41.7%. Since the increase in Current Assets is more than increase in Current Liabilities, therefore the Net Working Capital has increased by 57.5%. This clearly indicates that the Working Capital of the firm is not properly managed. Had the increase in current assets restricted to 25% or the increase in current liabilities was also achieved at 48% or so, then the situation would not have been so alarming. However, the decrease in fixed assets has been offset by increase in Net Working Capital and consequently the total assets have increased by 16.9%. The firm has not raised any capital during the period and the increase in proprietor's funds has resulted because of increase in retained profits by Rs. 22,500. The Secured Loans have also increased by 50%. The funds provided by the retained earnings and the secured loans seem to have been utilized in financing the current assets. This has, on one hand increased the short term paying capacity of the firm and on the other hand, will affect the earning capacity of the firm as the current assets are less or non productive. The increase in total assets by 16.9% is matched with the increase in total liabilities (proprietor's fund plus the secured loans)) by 16.9%. So, the CFS explains about the changes in different items of the financial statements. However, despite this revelation, the CFS fails to highlight the component

changes in relation to total assets or total liabilities. The CFS does not throw light on the variations in each asset as a percentage of total assets for a particular period or changes in different liabilities in relation to total liabilities for that period etc. This drawback of CFS is taken care of by the Common Size Statement.

### 2.5.2 COMMON SIZE STATEMENT (CSS)

**The CSS represents the relationship of different items of a financial statement with some Common item by expressing each item as a percentage of the Common item. In Common size Balance Sheet, each item of the Balance Sheet is stated as a percentage of the total of the Balance Sheet. Similarly in Common size Income Statement, each item is stated as percentage of the Net Sales. The percentages for different items are computed by dividing the absolute amount of that item by the Common base (i.e. the Balance Sheet Total or the Net Sales as the case may be) and then multiplying by 100. The percentage so calculated can be easily compared with the corresponding percentages in some other period. Thus, the CSS is useful not only in intra-firm comparisons over a series of different year but also in making inter-firm comparisons for the same year or for several years. The procedure and the technique of preparation of the CSS can be explained with the help of Example 2.2.**

#### Example 2.2.

With the use of data given in the Example 2.1 prepare the Common Size BS and Common Size IS for the years 2003 & 2004.

#### Solution:

#### COMMON SIZE BALANCE SHEET

<b>Liabilities</b>	<b>Amount (Rs.)</b>		<b>Percentages</b>	
	<b>2003</b>	<b>2004</b>	<b>2003</b>	<b>2004</b>
Land	50000	50000	7.70	6.59
Building	150000	135000	23.07	17.76
Plant	150000	135000	23.07	17.76
Furniture	<u>50000</u>	<u>70000</u>	<u>7.70</u>	<u>9.21</u>
Total Fixed Assets (1)	<u>400000</u>	<u>390000</u>	<u>61.54</u>	<u>51.32</u>
Cash	50000	70000	7.70	9.20
Debtors	100000	150000	15.38	19.74
Stock	<u>100000</u>	<u>150000</u>	<u>15.38</u>	<u>19.74</u>
Total C. Assets (2)	<u>250000</u>	<u>370000</u>	<u>38.46</u>	<u>48.68</u>

Total Assets (1+2)	<u>650000</u>	<u>760000</u>	<u>100</u>	<u>100</u>
Capital	350000	350000	53.85	46.05
Reserves	<u>100000</u>	<u>122500</u>	<u>15.38</u>	<u>16.12</u>
Proprietor's Fund (3)	<u>450000</u>	<u>472500</u>	<u>69.23</u>	<u>62.17</u>
Secured Loan	50000	75000	7.70	9.87
Creditor	100000	137500	15.37	18.09
O/s Expenses	<u>50000</u>	<u>75000</u>	<u>7.70</u>	<u>9.87</u>
Total Liabilities (4)	<u>200000</u>	<u>287500</u>	<u>30.77</u>	<u>37.83</u>
Total Capital +				
Liabilities (3+4)	<u>650000</u>	<u>760000</u>	<u>100</u>	<u>100</u>

#### COMMON SIZE INCOME STATEMENT

	Amount (Rs.)			
	2003	2004	2003	2004
Net Sales	400000	500000	100.0	100.0
Less : Cost of goods sold	<u>300000</u>	<u>375000</u>	<u>75.0</u>	<u>75.0</u>
Gross Profit (1)	100000	125000	25.0	25.0
Less : General Expenses	10000	10000	2.5	2.0
Selling Expenses	<u>15000</u>	<u>20000</u>	<u>3.75</u>	<u>4.0</u>
Total Op. Expenses(2)	25000	30000	<u>6.25</u>	<u>6.0</u>
Net Profit (1-2)	75000	95000	18.75	19.00

**Interpretation:** The Common size BS and the Common Size IS reveal that proportion of fixed assets out of total assets has reduced from 61.54% to 51.32% whereas the proportion of reliance of the firm on the current assets. Similarly, out the total liabilities the proportion of the proprietor's funds has reduced from 69.23% to 62.17% and the proportion of external liabilities has increased from 30.77% to 37.83%. Since, no new capital has been issued and the other liabilities have increased, the proportion of capital in the total financing of the firm has gone down from 53.85% to 46.05%. Further, the Cost of goods sold as well as the Gross Profit has remained pegged at 75% and 25% of Net Sales. However, the Net Profit has increased

from 18.75% to 19% of Net Sales. This is due to decrease in operating expenses from 6.25% to 6% of the Net Sales.

It can be observed that the CSS can be used for analyzing and comparing the financial position of a firm for two different periods or between two firms for the same year. This comparability was not available in the CFS because of difference in firms' sizes or in different years. Of course, in order to make the CSS more meaningful, the analyst should ensure that accounting policies of different firms being compared or for different year are unchanged or not significantly different.

The CSS can be easily used for analyzing and for some real insight into operational and financial position of the firm over a period of different years. However, it may become difficult and cumbersome if the period to be covered is more than two years. The CSS does not show the variations in different items from one period to another. In horizontal analysis, the CSS may not provide sufficient information about the changing pattern or trend of different items over years. In such a situation, the Trend Percentage Analysis can be of immense help.

### **2.5.3 TREND PERCENTAGE ANALYSIS (TPA)**

The TPA is a technique of studying several financial statements over a series of years. In TPA, the trend percentages are calculated for each item by taking the figure of that item for some base year as 100. So, the trend percentage is the percentage relationship, which each item of different years bears to the same item in the base year. Any year may be taken as the base year. Any year may be taken as the base year, but generally the starting/initial year is taken as the base year. So, each item for base year is taken as 100 and then

the same item for other years is expressed as a percentage of the base year. The TPA which can be used both for the BS as well as the IS has been explained with the help of the Example 3.3.

**Example 2.3:** From the following data relating to the ABC & Co. for the year 2001 to 2004, calculate the trend percentages (taking 2001 as base year).

(Figure in Rs.)

	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
Net Sales	200000	190000	240000	260000
Less: Cost of goods sold	<u>120000</u>	<u>117800</u>	<u>139200</u>	<u>145600</u>
Gross Profit	80000	72200	100800	114400
Less: Expenses	<u>20000</u>	<u>19400</u>	<u>22000</u>	<u>24000</u>
Net Profit	<u>60000</u>	<u>52800</u>	<u>78800</u>	<u>90400</u>

Trend percentages

	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
Net Sales	100	95.0	120.0	130.0
Less: Cost of goods sold	<u>100</u>	<u>9.2</u>	<u>115.8</u>	<u>121.3</u>
Gross GXX Profit	100	90.3	126.0	143.0
Less: Expenses	<u>100</u>	<u>97.0</u>	<u>110.0</u>	<u>120.0</u>
Net Profit	<u>100</u>	<u>88.0</u>	<u>131.3</u>	<u>150.6</u>

**Interpretation:** On the whole, the 2002 was a bad year but the recovery was made during 2003 with increase in volume as well as profits. The figures of 2002 when compared with 2001 reveal that the Sales have reduced by 5%, but the cost of goods sold and the Expenses have decreased only by 1.8% and 3% respectively. This resulted in decrease in Net Profit by 12%. The

position was recovered in 2003 and not only the decline was arrested but the positive growth was also visible both in 2003 and 2004. Again, the increase in Net Profit by 31.3% (2003) and 50.6% (2004) is much more than the increased in sales by 20% and 30% respectively. This again testifies that a substantial portion of the cost of goods sold and expenses is of fixed nature. So, the TPA is an important tool of historical analysis. It can be of immense help in making a comparative analysis over a series of years. The TPA provides brevity and easy readability to several financial statements as the percentages figures disclose more than the absolute figures. However, some precautions must be taken while using the TPA as a technique of the AFS as follows:

There should not be a significant and material change in accounting policies over the years. This consistency is necessary to ensure meaningful comparability.

- i. Proper care must be taken while selecting the base year. It must be a normal and a representative year. Generally the initial year is taken as base year, but intervening year can also be taken as the base year, if the initial year is not found to be normal year.
- ii. The trend percentages should be analyzed vis-à-vis the absolute figure to avoid any misleading conclusions.
- iii. If possible, the figures for different year should be adjusted for variations in price level also. For example, increase in Net Sales by 30% (from 100 in 2001 to 130 in 2004) over 3 years might have resulted primarily because of increase in selling price and not because of increase in volume.

Quite often, it may be difficult to interpret the increase or decrease in any item (in absolute terms or in percentages terms) as a desirable change or an undesirable change. For example, decrease in cash may be discouraging if it is going to affect the liquidity but may be encouraging if it has resulted out of better cash management. Similarly, increase in inventory may result because of decrease in sales or because of necessity to maintain a minimum level of stock. In such cases, therefore, the techniques of CFS, CSS and the TPA may not be of much help. Financial analysts have developed another technique called the Ratio Analysis, which is presumably the most common and widely used technique of the FSA.

#### 2.5.4 RATIO ANALYSIS (RA)

The RA has emerged as the principal technique of the FSA. A ratio is a relationship expressed in mathematical terms between two individual or groups of figures connected with each other in some logical manner. The RA is based on the premise that a single accounting figure by itself may not communicate any meaningful information but when expressed as a relative to some other figure, it may definitely give some significant information. The relationship between two or more accounting figures/groups is called a financial ratio. A financial ratio helps to summarize a large mass of financial data into a concise form and to make meaningful interpretations and conclusions about the performance and positions of a firm. For example, a firm having Net Sales of Rs.5, 00,000 is making a gross profit of Rs.1, 00,000. It means that the ratio of the Gross Profit to Net Sales is 20% i.e.  
(Rs.1, 00,000/Rs.5, 00,000) x 100.

**Steps in Ratio Analysis:** The RA requires two steps as follows:

- i. Calculation of a ratio (as discussed later), and
- ii. Comparing the ratio with some predetermined standard. The standard ratio may be the past ratio of the same firm or industry's average ratio or a projected ratio or the ratio of the most successful firm in the industry. In interpreting the ratio is compared with some predetermined standard. The importance of a correct standard is obvious as the conclusion is going to be based on the standard itself.

**Types of comparisons:** As already stated that the RA comprised of two steps i.e. the calculation and thereafter the comparison with some standard. The calculation part (as discussed later) of a ratio merely involves the application of a formula to the given financial data to establish the mathematical relationship. The comparison is the next steps. The ratio can be compared in three different ways.

**Cross-Section Analysis:** One way of comparing the ratio or ratios of a firm is to compare them with the ratio or ratios of some other selected firm in the same industry at the same point of time. So, it involves the comparison of two or more firm's financial ratios at the same point of time. The Cross-Section Analysis helps the analyst to find out as to how a particular firm has performed in relation to its competitors. The firm's performance may be compared with the performance of the leader in the industry in order to uncover the major operational inefficiencies. In this type of an analysis, the comparison with a standard helps to find out the quantum as well as direction of deviation from the standard. It is necessary to look for the large deviations on either side of the standard could mean a major concern for attention. The Cross-Section Analysis is easy to be undertaken as most of the data required for this may be available in financial statements of the firm.

#### **2.5.5 Time-Series Analysis**

The analysis is called Time-Series Analysis when the performance of a firm is evaluated over a period of time. By comparing the present performance of a firm with the performance of the same firm over last few years, an assessment can be made about the trend in progress of the firm, about the direction of progress of the firm. The information generated by the Time-Series Analysis can also help the firm to assess whether the firm is approaching long term goals or not. The Time-Series Analysis can be extended to cover

projected financial statements. In particular, the Time Series Analysis looks for (i) Important trends in financial performance, (ii) Shift in trend over the years, and (iii) Significant deviations if any, from the other set of data.

**Combined Analysis:** If the Cross-Section and Time Series Analyses, both are combined together to study the behavior and pattern of ratios, then meaningful and comprehensive evaluation of the performance of the firm can definitely be made. A trend of ratios of a firm compared with the trends of the ratios of the standard firm can give good results. For example, the ratio of Operating expenses to Net Sales for a firm, may be higher than the industry average, however, over the years it has been declining for the firm, whereas the industry average has not shown any significant changes. (This topic is covered in detail in the chapters to follow)

## 2.6 SELF-TEST QUESTIONS

6. What do you mean by financial statements? Explain their different types .
7. What is financial statement analysis? Explain its objectives.
8. What are the types of financial statement analysis? How an accountant in a firm can arrange them?
9. Explain the benefits of financial statement analysis to a business operating in the manufacturing sector and service sector.
10. Explain the various techniques applied for carrying out the financial statement analysis.

## 2.7 SUGGESTED READINGS:

1. Ashish K. Bhattacharya, Principles and Practices of Cost Accounting (3<sup>rd</sup>.), New Delhi: Prentice Hall of India Private Limited, 2004.
2. Charles T. Horngren, Cost Accounting, A Managerial Emphasis, Prentice Hall Inc., 1973.

3. D. T. Decoster and E. L. Schafer, Management Accounting, New York: John Willey and Sons, 1979.
4. John G. Blocker and Wettmer W. Keith, Cost Accounting, New Delhi: Tata Mc Grw Publishing Co. Ltd., 1976.
5. R. K. Sharma and Shashi K. Gupta, Management Accounting-Principles and Practice (7<sup>th</sup>.), New Delhi: Kalyani Publishers, 1996.

## **COURSE: MANAGEMENT ACCOUNTING**

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Course code: **MC-105**

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Lesson: **3**

### **RATIO ANALYSIS**

**Objective:** To make appropriate decisions in keeping with the objectives of the firm, the financial manager must have analytical tools. The financial ratio analysis which is the subject matter of this chapter is such a tool. After going through this chapter, the students must be capable of analysing the financial data using ratio analysis.

#### **Lesson Structure**

- 3.1. Introduction to financial analysis
- 3.2. Use of financial ratios
- 3.3. Precaution in using ratio analysis
- 3.4. Types of ratios
  - 3.4.1. Liquidity ratios
  - 3.4.2. Debt (or leverage) ratios
  - 3.4.3. Coverage ratios
  - 3.4.4. Profitability ratios
  - 3.4.5. Market-value ratios
- 3.5. Illustrative problems
- 3.6. Summary
- 3.7. Review questions
- 3.8. Suggested readings

#### **3.1. Introduction to Ratio Analysis**

To evaluate the financial performance of a company, the financial ratios are used as a very sophisticated tool. But, the type of analysis varies according to the specific interests of the party involved. Trade creditors are interested primarily in the liquidity of a firm. Their claims are short term, and the ability of a firm to pay these claims is best judged by means of a thorough analysis of its liquidity. The claims of bondholders, on the other hand, are long term. Accordingly, they are more interested in the cash-flow ability of the company to service debt over the long run. The bondholder may evaluate this ability by analyzing the capital structure of the firm, the major sources and uses of funds, its profitability over time, and projections of future profitability.

Investors in a company's common stock are concerned principally with present and expected future earnings and the stability of these earnings about a trend, as well as

their covariance with the earnings of other companies. As a result, investors might concentrate their analysis on a company's profitability. They would be concerned with its financial condition insofar as it affects the ability of the company to pay dividends and to avoid bankruptcy. In order to bargain more effectively for outside funds, the management of a firm should be interested in all aspects of financial analysis that outside suppliers of capital use in evaluating the firm. Management also employs financial analysis for purposes of internal control. In particular, it is concerned with profitability on investment in the various assets of the company and in the efficiency of asset management.

### **3.2. Use of Financial Ratios**

For analysing the financial condition and performance of a company, the financial analyst needs certain yardsticks. The yardstick frequently used is a ratio, or index, relating two pieces of financial data to each other. Analysis and interpretation of various ratios should give experienced, skilled analysts a better understanding of the financial condition and performance of the firm than they would obtain from analysis of the financial data alone.

The analysis of financial ratios involves two types of comparison. First, the analyst can compare a present ratio with past and expected future ratios for the same company. The current ratio (the ratio of current assets to current liabilities) for the present year end could be compared with the current ratio for the preceding year end. When financial ratios are arrayed on a spreadsheet over a period of years, the analyst can study the composition of change and determine whether there has been an improvement or deterioration in the financial condition and performance over time. The above is termed as *trend analysis*. Financial ratios also can be computed for projected, or pro forma, statements and compared with present and past ratios. In the comparison over time, it is best to compare not only financial ratios but also the few figures.

The second method of comparison involves comparing the ratios of one firm with those of similar firms or with industry averages at the same point in time. Such a comparison gives insight into the relative financial condition and performance of the firm. Sometimes a company will not fit neatly into an industry category. In such situations, one should try to develop a set, albeit usually small, of peer firms for comparison purposes.

### **3.3. Precaution in using Ratio Analysis**

The analyst should avoid using rules of thumb indiscriminately for all industries. For example, the criterion that all companies should have at least a 2-to-1 current ratio is inappropriate. The analysis must be in relation to the type of business in which the firm is engaged and to the firm itself. The true test of liquidity is whether a company has the ability to pay its bills on time. Many sound companies, including electric utilities, have this ability despite current ratios substantially below 2 to 1. It depends on the nature of the business. Only by comparing the financial ratios of one firm with those of similar firms can one make a realistic judgement.

Similarly, analysis of the deviation from the norm should be based on some knowledge of the distribution of ratios for the companies involved. If the company being studied has a current ratio of 1.4 and the industry norm is 1.8, one would like to know the proportion of companies whose ratios are below 1.4. If it is only 2 per cent, we are likely to be much more concerned than if it is 25 per cent. Therefore, we need information on the dispersion of the distribution to judge the significance of the deviation of a financial ratio for a particular company from the industry norm.

Comparisons with the industry must be approached with caution. It may be that the financial condition and performance of the entire industry is less than satisfactory, and a company's being above average may not be sufficient. The company may have a number of problems on an absolute basis and should not take refuge in a favourable comparison with the industry. The industry ratios should not be treated as target asset and performance norms. Rather, they provide general guidelines. For benchmark purposes, a set of firms displaying 'best practices' should be developed.

In addition, the analyst should realize that the various companies within an industry grouping may not be homogeneous. Companies with multiple product lines often defy precise industry categorization. They may be placed in the most 'appropriate' industry grouping, but comparison with other companies in that industry may not be consistent. Also, companies in an industry may differ substantially in size.

Because reported financial data and the ratios computed from these data are numerical, there is a tendency to regard them as precise portrayals of a firm's true financial status. Accounting data such as depreciation, reserve for bad debts, and other reserves are estimates at best and may not reflect economic depreciation, bad debts, and other losses. To the extent possible, accounting data from different companies should be standardized.

### 3.4. Types of Ratios

Financial ratios can be grouped into five types: liquidity, debt, profitability, coverage, and market-value ratios. No one ratio gives us sufficient information by which to judge the financial condition and performance of the firm. Only when we analyze a group of ratios we are able to make reasonable judgements. We must be sure to take into account any seasonal character of a business. Underlying trends may be assessed only through a comparison of raw figures and ratios at the same time of year. We would not compare a December 31 balance sheet with a May 31 balance sheet, but we would compare December 31 with December 31.

Although the number of financial ratios that might be computed increases geometrically with the amount of financial data, we concentrate only on the more important ratios in this lesson. Computing unneeded ratios adds both complexity and confusion to the problem. To illustrate the ratios discussed in this lesson, we use the balance sheet and income statements of a Hypothetical Manufacturing Company shown in Tables 1 and 2.

**Table 3.1: Hypothetical Manufacturing Company Balance Sheet**

	March 31, 2005 (Rs.)	March 31, 2004 (Rs.)
<b>Assets</b>		
Cash and short-term investments	177689	175042
Accounts receivable	678279	740705
Inventories	1328963	1234725
Prepaid expenses	20756	17197
Deferred income taxes	35203	29165
Current assets	2240890	2196834
Property, plant, and equipment	159686	1538495
Less: Accumulated depreciation	856829	791205
	740057	747290
Investment, long term	65376	-
Other assets	205157	205624
<b>Total assets</b>	<b>3251480</b>	<b>3149748</b>
<b>Liabilities and shareholders' equity</b>		
Bank loans and notes payable	448508	356511

Accounts payable	148427	136793
Income taxes payable	36203	127455
Accruals	190938	164285
Current liabilities	824076	785044
Long-term debt	630783	626460
Shareholders' equity		
Common stock (Rs. 5 par value)	420828	420824
Additional paid-in capital	361158	361059
Retained earnings	1014635	956361
Total shareholders' equity	1796621	1738244
Total liabilities and equity	3251480	3149748

### 3.4.1. Liquidity ratios

Liquidity ratios are used to judge a firm's ability to meet short-term obligations. From them, much insight can be obtained into the present cash solvency of a company and its ability to remain solvent in the event of adversities. Essentially, we wish to compare short-term obligations with the short-term resources available to meet these obligations.

**Table 2. Hypothetical Manufacturing Company Statement of Earnings**

	Year ended March	Year ended march
	31, 2005 (Rs.)	31, 2004 (Rs.)
Net sales	3992758	3721241
Cost of goods sold	2680298	2499965
Selling, general, and administrative expenses	801395	726959
Depreciation	111509	113989
Interest expense	85274	69764
Earnings before taxes	314282	310564
Provision for taxes	113040	112356
Earnings after taxes	201242	198208
Cash dividends	142968	130455
Retained earnings	58274	67753

### Current ratio

One of the most general and most frequently used liquidity ratios is the current ratio:

$$\frac{\text{Current assets}}{\text{Current liabilities}} \quad (1)$$

For Hypothetical Manufacturing Co., the ratio for the 2005 year end is

$$\frac{\text{Rs. } 2240890}{\text{Rs. } 824076} = 2.72$$

The higher the current ratio, supposedly, the greater the ability of the firm to pay its bills. The ratio must be regarded as a crude measure of liquidity, however, because it does not take into account the liquidity of the individual components of the current assets. A firm having current assets composed principally of cash and current receivables is generally regarded as more liquid than a firm whose current assets consist primarily of inventories. Consequently, we must turn to 'finer' tools of analysis if we are to evaluate critically the liquidity of the firm. It is noteworthy that liquidity has been defined as the ability to realize value in money,

the most liquid of assets. Liquidity has two dimensions: (1) the time required converting the asset into money and (2) the certainty of the price realized. To the extent that the price realized on receivables is as predictable as that realized on inventories, receivables would be a more liquid asset than inventories, owing to the shorter time required to convert the asset into money. If the price realized on receivables is more certain than is that on inventories, receivables would be regarded as being even more liquid.

## Quick ratio

A somewhat more accurate guide to liquidity is the quick, or acid-test, ratio:

$$\frac{\text{Current assets less inventories}}{\text{Current liabilities}} \quad (2)$$

For Hypothetical Co., this ratio is

$$\frac{\text{Rs. } 2240890 - \text{Rs. } 1328963}{\text{Rs. } 824076} = 1.11$$

This ratio is the same as the current ratio, except that it excludes inventories—presumably the least liquid portion of current assets—from the numerator. The ratio concentrates on cash, marketable securities, and receivables in relation to current obligations and thus provides a more penetrating measure of liquidity than does the current ratio.

## Liquidity of receivables

Sometimes there are suspected imbalances or problems in various components of the current assets. In these situations, the financial analyst will want to examine these components separately in assessing liquidity. Receivables, for example, may be far from current. Regarding all receivables as liquid when in fact a sizable portion may be past due, overstates the liquidity of the firm being analyzed. Receivables are liquid assets only insofar as they can be collected in a reasonable amount of time. For our analysis of receivables, we have two basic ratios, the first of which is the average collection period:

$$\frac{\text{Receivables} \times \text{Days in year}}{\text{Annual credit sales}} \quad (3)$$

If we assume for Hypothetical that all sales are credit sales, this ratio is

$$\frac{\text{Rs. } 678279 \times 365}{\text{Rs. } 3992758} = 62 \text{ days}$$

The average collection period tells us the average number of days receivables is outstanding, that is, the average time it takes to convert them into cash.

The second ratio is the receivable turnover ratio:

$$\frac{\text{Annual credit sales}}{\text{Receivables}} \quad (4)$$

For Hypothetical Co., this ratio is

$$\frac{\text{Rs. } 3992758}{\text{Rs. } 678279} = 5.89$$

These two ratios are reciprocals of each other. The number of days in the year, 365, divided by the average collection period, 62 days, gives the receivable turnover ratio, 5.89. The number of days in the year divided by the turnover ratio gives the average collection period. Thus, either of these two ratios can be employed.

**Year-end versus average receivables-** The receivable figure used in the calculation ordinarily represents year-end receivables. When sales are seasonal or have grown considerably over the year, using the year-end receivable balance may not be appropriate. With seasonality, an average of the monthly closing balances may be the most appropriate

figure to use. With growth, the receivable balance at the end of the year will be deceptively high in relation to sales. The result is that the collection period calculated is a biased and high estimate of the time it will take for the receivable balance at year end to be collected. In this case, an average of receivables at the beginning and at the end of the year might be appropriate if the growth in sales were steady throughout the year. The idea is to relate the relevant receivable position to the relevant credit sales.

**Interpreting the information-** The average collection period ratio or the receivable turnover ratio indicates the slowness of receivables. Either ratio must be analyzed in relation to the billing terms given on the sales. If the average collection period is 45 days and the terms are 2/10, net 30<sup>1</sup> the comparison would indicate that a sizable proportion of the receivables is past due beyond the final due date of 30 days. On the other hand, if the terms are 2/10, net 60, the typical receivable is being collected before the final due date. Too low an average collection period may suggest an excessively restrictive credit policy. The receivables on the books may be of prime quality, yet sales may be curtailed unduly- and profits less than they might be- because of this policy. In this situation, credit standards for an acceptable account should be relaxed somewhat. On the other hand, too high an average collection period may indicate too liberal a credit policy. As a result, a large number of receivables may be past due- some uncollectible. Here, too, profits may be less than those possible, because of bad-debt losses and the need to finance a large investment in receivables. In this case, credit standards should be raised.

**Aging of accounts-** Another means by which we can obtain insight into the liquidity of receivables is through an aging of accounts. With this method, we categorize the receivables at a moment in time according to the proportions billed in previous months. We might have the following hypothetical aging of accounts receivable at December 31.

Month	December	November	October	September	August and before	Total
Proportion of Receivables billed	67%	19%	7%	2%	5%	100%

If the billing terms are 2/10, net 30, this aging tells us that 67 per cent of the receivables at December 31 are current, 19 per cent are up to 1 month past due, 7 per cent are 1 to 2 months past due, and so on. Depending on the conclusions drawn from our analysis of the aging, we may want to examine more closely the credit and collection policies of the company. In the example, we might be prompted to investigate the individual receivables that were billed in August and before, in order to determine if any should be charged off. The receivables shown on the books are only as good as the likelihood that they will be collected. An aging of accounts receivables gives us considerably more information than the calculation of the average collection period because it pinpoints the trouble spots more specifically.

## Duration of payables

From a creditor's standpoint, it would be desirable to obtain an aging of accounts payable. However, few customers are willing to provide such information, and many will resent being asked. Nonetheless, we often are able to compute the average age of a company's accounts payable. The average payable period is

$$\frac{\text{Accounts payable} \times 365}{\text{Purchases}} \quad (5)$$

where accounts payable is the average balance outstanding for the year and the denominator is external purchases during the year.

<sup>1</sup> The notation means that the supplier gives a 2 per cent discount if the receivable invoice is paid within 10 days and that payment is due within 30 days if the discount is not taken.

When information on purchases is not available, one can occasionally use the cost of goods sold in the denominator. A department store chain, for example, typically does no manufacturing. As a result, the cost of goods sold consists primarily of purchases. However, in situations where there is sizable value added, such as with a manufacturer, the use of the cost of goods sold is inappropriate. One must have the amount of purchases if the ratio is to be used. Another caveat has to do with growth. As with receivables, the use of a year-end payable balance will result in a biased and high estimate of the time it will take a company to make payment on its payables if there is strong underlying growth. In this situation, it may be better to use an average of payables at the beginning of the year and at the end.

The average payable period is valuable in evaluating the probability that a credit applicant will pay on time. If the average age of payables is 48 days, and the terms in the industry are net 30, we know that a portion of the applicant's payables are not being paid on time. A credit check of other suppliers will give insight into the severity of the problem.

## **Liquidity of inventories**

We may compute the inventory turnover ratio as an indicator of the liquidity of inventory

$$\frac{\text{Cost of goods sold}}{\text{Average inventory}} \quad (6)$$

For Hypothetical, the ratio is

$$\frac{\text{Rs. } 2680298}{(\text{Rs. } 1328963 + \text{Rs. } 1234725)/2} = 2.09$$

The figure for cost of goods sold used in the numerator is for the period being studied—usually 1 year; the average inventory figure used in the denominator typically is an average of beginning and ending inventories for the period. The inventory turnover ratio tells us the rapidity with which the inventory is turned over into receivables through sales. This ratio, like other ratios, must be judged in relation to past and expected future ratios of the firm and in relation to ratios of similar firms, the industry average, or both.

Generally, the higher the inventory turnover, the more efficient the inventory management of a firm. Sometimes a relatively high inventory turnover ratio may be the result of too low a level of inventory and frequent stockouts. It might also be the result of too many small orders for inventory replacement. Either of these situations may be more costly to the firm than carrying a larger investment in inventory and having a lower turnover ratio. Again, caution is necessary in interpreting the ratio. When the inventory turnover ratio is relatively low, it indicates slow-moving inventory or obsolescence of some of the stock. Obsolescence may necessitate substantial write-downs, which, in turn, would negate the treatment of inventory as a liquid asset. Because the turnover ratio is a somewhat crude measure, we would want to investigate any perceived inefficiency in inventory management. In this regard, it is helpful to compute the turnover of the major categories of inventory to see if there are imbalances, which may indicate excessive investment in specific components of the inventory. Once we have a hint of a problem, we must investigate it more specifically to determine its cause.

### **3.4.2. Debt (or leverage) ratios**

Extending our analysis to the long-term liquidity of the firm (that is, its ability to meet long-term obligations), we may use several debt ratios. The debt-to-equity ratio is computed by simply dividing the total debt of the firm (including current liabilities) by its shareholders' equity:

$$\frac{\text{Total debt}}{\text{Shareholders' equity}} \quad (7)$$

For Hypothetical, the ratio is

$$\frac{\text{Rs. } 1454859}{\text{Rs. } 1796621} = 0.81$$

When intangible assets are significant, they frequently are deducted from shareholders' equity.

The ratio of debt to equity varies according to the nature of the business and the volatility of cash flows. An electric utility, with very stable cash flows, usually will have a higher debt ratio than will a machine tool company, whose cash flows are far less stable. A comparison of the debt ratio for a given company with those of similar firms gives us a general indication of the creditworthiness and financial risk of the firm.

In addition to the ratio of total debt to equity, we may compute the following ratio, which deals with only the long-term capitalization of the firm:

$$\frac{\text{Long-term debt}}{\text{Total capitalization}} \quad (8)$$

where total capitalization represents all long-term debt, preferred stock, and share-holders' equity. For Hypothetical, the ratio is

$$\frac{\text{Rs. } 630783}{\text{Rs. } 2427404} = 0.26$$

This measure tells us the relative importance of long-term debt in the capital structure. The ratios computed here have been based on book-value figures; it is sometimes useful to calculate these ratios using market values. In summary, debt ratios tell us the relative proportions of capital contribution by creditors and by owners.

## Cash flow to debt and capitalization

A measure of the ability of a company to service its debt is the relationship of annual cash flow to the amount of debt outstanding. The cash flow of a company often is defined as the cash generated from the operation of the company. This is defined as earnings before interest, taxes and depreciation (EBITD). The cash-flow-to-total-liabilities ratio is simply

$$\frac{\text{Cash flow (EBITD)}}{\text{Total liabilities}} \quad (9)$$

For Hypothetical Co., the ratio is

$$\frac{\text{Rs. } 511065}{\text{Rs. } 1454859} = 0.35$$

The cash flow is composed of earnings before taxes, Rs. 314282, plus interest, Rs. 85274, and depreciation, Rs. 111509. This ratio is useful in assessing the creditworthiness of a company seeking debt funds.

Another ratio is the cash-flow-to-long-term-debt ratio-

$$\frac{\text{Cash flow (EBITD)}}{\text{Long-term debt}} \quad (10)$$

Here we have the following for Hypothetical Co. Ltd.:

$$\frac{\text{Rs. } 511065}{\text{Rs. } 630783} = 0.81$$

This ratio is used to evaluate the bonds of a company. The two cash-flow ratios just described have proven useful in predicting the deteriorating financial health of a company.

This is particularly helpful in corporate restructuring, where heavily levered transactions occur. Another ratio often used in this regard is total interest-bearing debt plus equity in relation to operating cash flows. Known as the enterprise value-to-EBITD ratio, it can be expressed as

$$\frac{\text{Total borrowings + Equity}}{\text{Cash flow (EBITD)}} \quad (11)$$

For Hypothetical Co., this ratio is

$$\frac{\text{Rs. } 2875912}{\text{Rs. } 511065} = 5.63$$

where bank loans, notes payable, and long-term debt represent total borrowings. The higher this ratio, the greater the value that is being placed on the securities. Lenders in highly levered transactions become concerned when the ratio exceeds 8, as the possibility of default has been found to be significant at this point.

### 3.4.3. Coverage ratios

Coverage ratios are designed to relate the financial charges of a firm to its ability to service them. Bond-rating services, such as CRISIL, ICRA, Moody and Standard and Poor's, make extensive use of these ratios.

#### Interest coverage ratio

Interest coverage ratio is one of the most traditional of the coverage ratios. The ratio of earnings before interest and taxes for a particular reporting period to the amount of interest charges for the period is known as interest coverage ratio. We must differentiate which interest charges should be used in the denominator. The *overall coverage method* stresses a company's meeting all fixed interest, regardless of the seniority of the claim. We have the following financial data for a hypothetical company:

Average earnings before interest and taxes	Rs. 2,000,000
Interest on senior 7% bonds	- 400,000
	Rs. 1,600,000

Interest on junior 8% bonds 160,000

The overall interest coverage would be Rs. 2,000,000/Rs. 560,000, or 3.57. This method implies that the creditworthiness of the senior bonds is only as good as the firm's ability to cover all interest charges.

Of the various coverage ratios, the most objectionable is the prior deductions method. Using this method, we deduct interest on the senior bonds from average earnings and then divide the residual by the interest on the junior bonds. We find that the coverage on the junior bonds in our example is 10 times (Rs. 1600000/Rs. 160000). Thus, the junior bonds give the illusion of being more secure than the senior obligations. Clearly, this method is inappropriate. The cumulative deduction method, perhaps, is the most widely used method of computing interest coverage. Under this method, coverage for the senior bonds would be 5 times. Coverage for the junior bonds is determined by adding the interest charges on both bonds and relating the total to average earnings. Thus, the coverage for the junior bonds would be Rs. 2000000/Rs. 560000 = 3.57 times.

#### Cash-flow coverage ratios

This ratio involves the relation of earnings before interest, taxes, and depreciation (EBITD) to interest and to interest plus principal payments. For the cash-flow coverage of interest we have

$$\frac{\text{EBITD}}{\text{Annual interest payments}} \quad (12)$$

Cash flow is very useful in determining whether a borrower is going to be able to service interest payments on a loan. Even for highly levered transactions, lenders want a coverage ratio comfortably above 2.0. The EBITD interest coverage ratio is highly correlated with

bond ratings and the market's assessment of risk. To be investment grade, that is, AAA, AA, A, or BBB, the ratio for an industrial corporation usually must be above 4.0.

The limitations of an interest coverage ratio are that a firm's ability to service debt is related to both interest and principal payments. Moreover, these payments are not met out of earnings per se, but out of cash. Hence, a more appropriate coverage ratio relates the cash flow of the firm to the sum of interest and principal payments. The cash-flow coverage of interest and principal ratio may be expressed as-

$$\frac{\text{EBITD}}{\text{Interest} + \text{Principal payments} [1/(1 - t)]}$$

where  $t$  is the income tax rate and principal payments are annual. Because principal payments are made after taxes, it is necessary to gross them up so that they correspond to interest payments, which are made before taxes. If the tax rate were 40 per cent and annual principal payments Rs. 120,000, before-tax earnings of Rs. 200,000 would be needed to cover these payments. If the company has preferred stock outstanding, the stated dividend on this stock, grossed up by 1 minus the tax rate, should appear in the denominator of Equation 13.

For measuring the financial risk of a firm, the financial analyst should first compute the debt ratios as a rough measure of financial risk. Depending on the payment schedule of the debt and the average interest rate, debt ratios may or may not give an accurate picture of the ability of the firm to meet its financial obligations. Therefore, it is necessary to analyze additionally the cash-flow ability of the company to service debt. This is done by relating cash flow not only to the amount of debt outstanding but also to the amount of financial charges. Neither debt ratios nor coverage ratios are sufficient by themselves.

### 3.4.4. Profitability ratios

There are two types of profitability ratios: (i) those showing profitability in relation to sales, and (ii) those showing profitability in relation to investment. Together these ratios indicate the firm's efficiency of operation.

#### Profitability in relation to sales

$$\text{Gross profit margin} = \frac{\text{Sales less cost of goods sold}}{\text{Sales}} \quad (14)$$

For Hypothetical, the gross profit margin is

$$\frac{\text{Rs. } 1312460}{\text{Rs. } 3992758} = 32.9\%$$

Gross profit margin ratio tells us the profit of the firm relative to sales after we deduct the cost of producing the goods sold. It indicates the efficiency of operations as well as how products are priced. A more specific ratio of profitability is the net profit margin:

$$\frac{\text{Net profits after taxes}}{\text{Sales}} \quad (15)$$

For Hypothetical, this ratio is

$$\frac{\text{Rs. } 201242}{\text{Rs. } 3992758} = 5.04\%$$

This ratio tells us the relative efficiency of the firm after taking into account all expenses and income taxes, but not extraordinary charges.

#### Profitability in relation to investment

The group of profitability ratios relates profits to investments. One of these measures is the rate of return on equity, or the ROE:

$$\frac{\text{Net profits after taxes} - \text{Preferred stock dividend}}{\text{Shareholders' equity}}$$

For Hypothetical Co., the rate of return is

$$\frac{\text{Rs. } 201242}{\text{Rs. } 1796621} = 11.2\%$$

The rate of return on equity tells us the earning power on shareholders' book investment and is frequently used in comparing two or more firms in an industry. The figure for shareholders' equity used in the ratio may be expressed in terms of market value instead of book value. When we use market value, we obtain the earnings/price ratio of the stock.

A more general ratio used in the analysis of profitability is the return on assets, or the ROA:

$$\frac{\text{Net profits after taxes}}{\text{Total assets}} \quad (16)$$

For Hypothetical Co., the ratio is

$$\frac{\text{Rs. } 201242}{\text{Rs. } 3251480} = 6.19\%$$

ROA ratio is somewhat inappropriate, inasmuch as profits are taken after interest is paid to creditors. Because these creditors provide means by which part of the total assets are supported, there is a fallacy of omission. When financial charges are significant, it is preferable, for comparative purposes, to compute a net operating profit rate of return instead of a return on assets ratio. The net operating profit rate of return may be expressed as

$$\frac{\text{Earnings before interest and taxes}}{\text{Total assets}} \quad (17)$$

Using this ratio, we are able to abstract from differing financial charges (interest and preferred stock dividends). Thus, the relationship studied is independent of the way the firm is financed.

## Assets turnover ratio

Generally, the financial analyst relates total assets to sales to obtain the asset turnover ratio:

$$\frac{\text{Sales}}{\text{Total assets}} \quad (18)$$

Hypothetical Co. turnover for the 2005 fiscal year was

$$\frac{\text{Rs. } 3992758}{\text{Rs. } 3251480} = 1.23$$

Assets turnover ratio tells us the relative efficiency with which the firm utilizes its resources in order to generate output. It varies according to the type of company being studied. A food chain has a considerably higher turnover, for example, than does an electric utility. The turnover ratio is a function of the efficiency with which the various asset components are managed: receivables as depicted by the average collection period, inventories as portrayed by the inventory turnover ratio, and fixed assets as indicated by the plant or the sales to net fixed asset ratio.

## Earning power

When we multiply the asset turnover of the firm by the net profit margin, we obtain the return on assets ratio, or earning power on total assets:

$$\begin{aligned} \text{Earning power} &= \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Net profits after taxes}}{\text{Sales}} \\ &= \frac{\text{Net profits after taxes}}{\text{Total assets}} \end{aligned} \quad (19)$$

For Hypothetical Co., we have

$$\frac{\text{Rs. } 3992758}{\text{Rs. } 3251480} \times \frac{\text{Rs. } 201242}{\text{Rs. } 3992758} = 6.19\%$$

None of these two ratios (the net profit margin and the turnover ratio) by itself provides an adequate measure of operating efficiency. The net profit margin ignores the utilization of assets, whereas the turnover ratio ignores profitability on sales. The return on assets ratio, or earning power, resolves these shortcomings. An improvement in the earning power of the firm will result if there is an increase in turnover, an increase in the net profit margin, or both. Two companies with different asset turnovers and net profit margins may have the same earning power. Firm A, with an asset turnover of 4 to 1 and a net profit margin of 3 per cent, has the same earning power – 12 per cent- as firm B, with an asset turnover of  $1\frac{1}{2}$  to 1 and a net profit margin of 8 per cent.

Another way to look at the return on equity (ROE) is

$$\text{ROE} = \text{Earning power} \times \left( 1 + \frac{\text{Debt}}{\text{Equity}} \right) \quad (20)$$

In this equation, earning power is grossed up by the equity multiplier associated with the use of debt. For Hypothetical Co.

$$\text{ROE} = 6.19\% \times 1.81 = 11.20\%.$$

With all the profitability ratios, comparing one company with similar companies is valuable. Only by comparison are we able to judge whether the profitability of a particular company is good or bad, and why. Absolute figures provide insight, but relative performance is most revealing.

### 3.4.5. Market-value ratios

We do find several widely used ratios that relate the market value of a company's stock to profitability, to dividends, and to book equity.

#### Price/earnings ratio

The price/earnings ratio of a company is simply

$$\text{P/E ratio} = \frac{\text{Share price}}{\text{Earnings per share}} \quad (21)$$

Here, earnings per share (EPS) usually are the trailing 12 months of earnings. However, security analysts sometimes use estimated EPS for the next 12 months. Suppose Hypothetical Manufacturing Company has a share price of Rs. 38. With a par value of Rs. 5 per share at 2005 fiscal year end in Table 1, there are 84165600 shares outstanding. Therefore, earnings per share are earnings after taxes divided by number of shares outstanding, or Rs.  $201242000/84165600 = \text{Rs. } 2.39$ . The P/E ratio for Hypothetical Co. is

$$\frac{\text{Rs. } 38.00}{\text{Rs. } 2.39} = 15.9 \text{ times}$$

In fact, the P/E ratio is considered as one measure of relative value. The higher this ratio, the more the value of the stock that is being ascribed to future earnings as opposed to present earnings. That is to say, likely future growth is what is being valued. During the last 20 years, the P/E ratio for Standard and Poor's 500 stock indexes has ranged from 8 to 28. The ratio reflects a number of things including interest rates, growth expectations for stocks in general.

## Dividend Yield

The dividend yield for a stock relates the annual dividend to share price. Therefore,

$$\text{Dividend yield} = \frac{\text{Dividends per share}}{\text{Share price}} \quad (22)$$

Going to Tables 1 and 2, we determine that dividends per share for the 2005 fiscal year are Rs. 1.70. Therefore, the dividend yield for Hypothetical is

$$\frac{\text{Rs. } 1.70}{\text{Rs. } 38.00} = 4.47\%$$

Noteworthy it is that companies with good growth potential retain a high proportion of earnings and have a low dividend yield, whereas companies in more mature industries pay out a high portion of their earnings and have a relatively high dividend yield. Hypothetical Co. falls in the latter category.

## Market-to-Book Ratio

The final market-value ratio we consider relates market value per share to book value

$$\text{M/B ratio} = \frac{\text{Share price}}{\text{Book value per share}} \quad (23)$$

where M/B ratio is the market-to-book value ratio. Going again to Table 1, we divide shareholders' equity by the number of shares outstanding to get a book value per share of Rs. 21.35. Therefore, for Hypothetical Co., we have

$$\text{M/B ratio} = \frac{\text{Rs. } 38.00}{\text{Rs. } 21.35} = 1.78$$

The market-to-book value ratio is a relative measure of how the growth option for a company is being valued vis-à-vis its physical assets. The greater the expected growth and value placed on such, the higher this ratio. M/B ratios for established companies range from as little as 0.5 to as high as 8.0. The former often is associated with a company that earns less than what the financial markets require, a harvest situation, and the latter with a company that earns substantially more through industry attractiveness and/or competitive advantage.

### 3.5. Illustrative problems

**Problem 1.** X Co. has made plans for the next year. It is estimated that the company will employ total assets of Rs. 8, 00,000; 50 per cent of the assets being financed by borrowed capital at an interest cost of 8 per cent per year. The direct costs for the year are estimated at Rs. 4, 80,000 and all other operating expenses are estimated at Rs. 80,000. The goods will be sold to customers at 150 per cent of the direct costs. Tax rate is assumed to be 50 per cent. You are required to calculate: (i) net profit margin; (ii) return on assets; (iii) assets turnover and (iv) return on owners' equity.

#### Solution.

The net profit is calculated as follows:

	Rs.	Rs.
Sales (150% of Rs. 4, 80,000)		7, 20,000
Direct costs		4, 80,000
Gross profit		240000
Operating expenses	80,000	
Interest charges (8% of Rs. 4, 00,000)	32,000	1, 12,000
Profit before taxes		1, 28,000
Taxes (@ 50%)		64,000
Net profit after taxes		64,000

(i) Net profit margin =  $\frac{\text{Profit after taxes}}{\text{Sales}} = \frac{\text{Rs. } 64000}{\text{Rs. } 720000} = 0.089 \text{ or } 8.9\%$

(ii) Return on assets =  $\frac{\text{EBIT (1 - T)}}{\text{Assets}} = \frac{160000 (1 - 0.5)}{800000} = 0.10 \text{ or } 10\%$

(iii) Assets turnover =  $\frac{\text{Sales}}{\text{Assets}} = \frac{\text{Rs. } 720000}{\text{Rs. } 800000} = 0.9 \text{ times}$

(iv) Return on equity =  $\frac{\text{Net profit after taxes}}{\text{Owners' equity}} = \frac{\text{Rs. } 64000}{50\% \text{ of } \text{Rs. } 800000}$   
 $= \frac{\text{Rs. } 64000}{\text{Rs. } 400000} = 0.16 \text{ or } 16\%$

**Problem 2.** The total sales (all credit) of a firm are Rs. 6,40,000. It has a gross profit margin of 15 per cent and a current ratio of 2.5. The firm's current liabilities are Rs. 96,000; inventories Rs. 48,000 and cash Rs. 16,000. (a) Determine the average inventory to be carried by the firm, if an inventory turnover of 5 times is expected? (Assume a 360-day year), (b) Determine the average collection period if the opening balance of debtors is intended to be of Rs. 80,000? (Assume a 360-day year).

**Solution.**

(a) Inventory turnover =  $\frac{\text{Cost of goods sold}}{\text{Average inventory}}$

Since gross profit margin is 15 per cent, the cost of goods sold should be 85 per cent of the sales.

Thus, Cost of goods sold =  $0.85 \times \text{Rs. } 640000 = \text{Rs. } 544000$ .

$$= \frac{\text{Rs. } 544000}{\text{Av. inventory}} = 5$$

$$\text{Average inventory} = \frac{\text{Rs. } 544000}{5} = \text{Rs. } 1,08,800$$

(b) Average collection period:  $\frac{\text{Average debtors}}{\text{Credit sales}} \times 360$

Average debtors = (op. debtors + cl. Debtors)/2

Closing balance of debtors is found as follows:

Current assets (2.5 of current liabilities)		Rs. 2,40,000
Less: Inventories	Rs. 48,000	
Cash	16,000	64,000
∴ Debtors		Rs. 1,76,000

$$\text{Average debtors} = (\text{Rs. } 1,76,000 + \text{Rs. } 80,000)/2 = \text{Rs. } 1,28,000$$

$$\text{Average collection period} = \frac{\text{Rs. } 128000}{\text{Rs. } 640000} \times 360 = 72 \text{ days}$$

**Problem 3.** The following figures relate to the trading activities of Hind Traders Limited for the year ended 30<sup>th</sup> June, 2004:

**Table 3. Hind Traders Limited**

	Rs.	Rs.
Sales	15,00,000	<i>Administrative expenses</i>
Purchases	9,66,750	Salaries
Opening stock	2,28,750	Rent
Closing stock	2,95,500	Stationery, postage, etc.
Sales returns	60,000	Depreciation
Selling and distribution expenses		Other charges
Salaries	45,900	Provision for taxation
		1,20,000

Advertising	14,100	Non-operating income	
Travelling	6,000	Dividend on shares	27,000
Non-operating expenses		Profit on sale of shares	9,000
Loss on sale of assets	12,000		

You are required to (1) rearrange the above figures in a form suitable for analysis, and (2) show separately the following ratios: (i) gross profit ratio; (ii) operating ratio; (iii) stock turnover ratio.

**Solution.**

**Table 4. Hind Traders Ltd.**

**Profit and Loss Statement**

		Rs.
Sales (less returns)		15,00,000
<i>Less: Cost of goods sold:</i>		
Opening stock	2,28750	
Purchases	9,66,750	
	<u>11,95,500</u>	
<i>Less: Closing stock</i>	<u>2,95,500</u>	9,00,000
Gross profit		<u>6,00,000</u>
<i>Operating expenses</i>		
Selling and distribution expenses	66,000	
Administrative expenses	1,74,000	2,40,000
Operating net profit		<u>3,60,000</u>
Non-operating income	36,000	
Non-operating expenses	12,000	24,000
Profit before tax		<u>3,84,000</u>
Provision for taxes		<u>1,20,000</u>
		<u>2,64,000</u>

$$(a) \text{ Gross profit ratio} = \frac{\text{Rs. } 600000}{\text{Rs. } 1500000} = 0.40 \text{ or } 40\%$$

$$(b) \text{ Operating ratio} = \frac{\text{Cost of goods+Operating expenses}}{\text{Sales}} = \frac{\text{Rs. } 1140000}{\text{Rs. } 1500000} = 0.76 \text{ or } 76\%$$

$$(c) \text{ Stock turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average stock}} = \frac{\text{Rs. } 900000}{\text{Rs. } 262125} = 3.43 \text{ times}$$

**Problem 4.** Towards the end of 2004 the directors of Wholesale Merchants Ltd. decided to expand their business. The annual accounts of the company for 2004 and 2005 may be summarised as follows:

**Table. Wholesale Merchants Ltd**

	Financial statements	(Rs.)	
		Year 2004	Year 2005
<b>Sales:</b>			
Cash	42,000	44,800	
Credit	3,78,000	4,78,800	
	4,20,000		5,23,600
Cost of sales	3,30,400		4,17,200
Gross margin	89,600		1,06,400

Expenses:

Warehousing	18,200	19,600
Transport	8,400	14,000
Administration	26,600	26,600
Selling	15,400	19,600
Debenture interest	-	2,800
	68,600	82,600
Net profit	<u>21,000</u>	<u>23,800</u>
Fixed assets (Less: depreciation)	42,000	56,000
Current assets		
Stock	84,000	1,31,600
Debtors	70,000	1,14,800
Cash	14,000	1,68,000
	9,800	2,56,200
<i>Less: Current liabilities</i>	70,000	1,06,400
Net current assets	98,000	1,49,800
Net assets	1,40,000	2,05,800
Share capital	1,05,000	1,05,000
Reserves and undistributed profit	35,000	58,000
Debenture loan	-	42,000
Capital employed	1,40,000	2,05,800

You are informed that: (a) All sales were from stocks in the company's warehouse. (b) The range of merchandise was not changed and buying prices remained steady throughout the two years. (c) Budgeted total sales for 2002 were Rs. 3,90,000. (d) The debenture loan was received on 1<sup>st</sup> January 2002, and additional fixed assets were purchased on that date.

You are required to state the internal accounting ratios that you would use in this type of business to assist the management of the company in measuring the efficiency of its operation, including its use of capital.

Your answer should name the ratios and give the figures (calculated to one decimal place) for 2004 and 2005, together with possible reasons for changes in the ratios for the two years.

Ratios relating to capital employed should be based on the capital at the end. Ignore taxation.

**Solution.** The following ratios are calculated for Wholesale Merchants Ltd.:

**Table. Ratios for wholesale merchant ltd.**

Ratios	(Rs. '000)	Year	(Rs' 000)	Year 2005
		2004		
1. Net margin: EBIT/Sales	21,000/4,20,000	5.0%	26,600/5,23,600	5.1%
2. Sales to capital employed	4,20,000/1,40,000	3.0 times	5,23,600/2,05,800	2.5 times
3. Return on capital employed:	21,000/1,40,000	15.0%	26,600/2,05,800	12.9%
EBIT/CE				
4. Gross margin: gross profit/sales	89,600/4,20,000	21.3%	1,06,400/5,23,600	20.3%
5. Expenses (excluding interest) to sales	68,600/4,20,000	16.3%	79,800/5,23,600	15.2%
6. Stock turnover: CGS/Stock	3,30,400/84,000	3.9 times	4,17,200/1,31,600	3.2 times
7. Debtors turnover: credit	3,78,000/70,000	5.4 times	4,78,800/1,14,800	4.2 times

sales/debtors				
8. Current ratio: CA/CL	1,68,000/70,000	2.4 times	2,56,200/1,06,400	2.4 times
9. Quick ratio: CA-Stock/CL	84,000/70,000	1.2 times	1,24,600/1,06,400	1.2 times
10. Long-term debt-equity	0	42,000/1,63,800	0.3	

Note: EBIT for 2004 and 2005 respectively is: Rs. 21,000 + 0 = Rs. 21,000 and Rs. 23,800 + 2,800 = Rs. 26,600.

**Comments.** The return on capital employed has fallen from 15% in 2004 to 12.9% in 2005.

The reason lies in the sales to capital ratio which has also fallen in 2005. The increase in capital employed has not been profitably utilised. The increased capital seems to have been blocked in stock and debtors.

It will be noticed that the gross margin ratio decreased from 21.3% in 2004 to 20.3% in 2005. This may be attributed to reduced selling price or granting of trade discounts on bulk orders. The operating ratio (expense to sales ratio) has fallen in 2004 by 1% and this had a slight impact on net profit ratio which has increased by 0.1%.

The short-term solvency of the company, reflected by current ratio and quick ratio, is more or less constant. However, there has been deterioration in the stock turnover and debtors turnover ratios. This implies the company is holding stocks for longer periods and allowing longer credit periods to customers.

There is no threat to the long-term solvency of the company. It did not use any long-term debt in 2004. A debenture loan of Rs. 42,000 is taken in 2005 and is about 0.26 of the equity funds. By a normal criterion, the company could have a debt equity ratio of 2: 1.

### 3.6. Summary

Financial ratios can be derived from the balance sheet and the income statement. They are categorized into five types: liquidity, debt, coverage, profitability, and market value. Each type has a special use for the financial or security analyst. The usefulness of the ratios depends on the ingenuity and experience of the financial analyst who employs them. By themselves, financial ratios are fairly meaningless; they must be analyzed on a comparative basis.

A comparison of ratios of the same firm over time uncovers leading clues in evaluating changes and trends in the firm's financial condition and profitability. The comparison may be historical and predictive. It may include an analysis of the future based on projected financial statements. Ratios may also be judged in comparison with those of similar firms in the same line of business and, when appropriate, with an industry average. From empirical testing in recent years, it appears that financial ratios can be used successfully to predict certain events, bankruptcy in particular. With this testing, financial ratio analysis has become more scientific and objective than ever before, and we can look to further progress in this regard.

### 3.7. Review questions

1. Explain the need for the financial analysis. How does the use of ratios help in financial analysis?
2. Is it possible for a firm to have a high current ratio and still find difficulties in paying its current debt? Explain with illustration.
3. What are the leverage, or capital-structure, ratios? Explain the significance and limitations of the debt-equity ratio as a measure of the firm's solvency?
4. Why is it necessary to calculate the profitability ratios in relation to sales? Illustrate your answer.
5. Explain the calculation and significance of the various measures of rate of return on investment.
6. Explain the ratios which you, as an analyst, will focus your attention to in the following cases:

(i) A bank is approached by a company for a loan of Rs. 50 lakh for working-capital purposes.

(ii) A company requests a financial institution to grant a 10-year loan of Rs. 5 crore.

7. Which of the financial ratios of a company would you most likely refer to in each of the following situations? Give reasons.

(i) The company asks you to sell material on credit.

(ii) You are thinking of investing Rs. 25,000 in the company's debentures.

(iii) You are thinking of investing Rs. 25,000 in the company's shares.

8. "A higher rate of return on capital employed implies that the firm is managed efficiently." Is this true in every situation? What or why not?

9. Ratios are generally calculated from historical data. Of what use are they in assessing the firm's future financial condition?

10. A firm's sales are Rs. 4,50,000, cost of goods sold is Rs. 2,40,000 and inventory is Rs. 90,000. What is its turnover? Also, calculate the firm's gross margin.

11. The only current assets possessed by a firm are: cash Rs. 1,05,000, inventories Rs. 5,60,000 and debtors Rs. 4,20,000. If the current ratio for the firm is 2-to-1, determine its current liabilities. Also, calculate the firm's quick ratio.

12. High-Low Plumbing Company sells plumbing fixtures on terms of 2/10 net 30. Its financial statements over the last 3 years follow:

	<b>Amount (Rs.)</b>		
	<b>2003</b>	<b>2004</b>	<b>2005</b>
Cash	30,000	20,000	5,000
Accounts receivable	200,000	260,000	290,000
Inventory	400,000	480,000	600,000
Net fixed assets	800,000	800,000	800,000
	<b>1,430,000</b>	<b>1,560,000</b>	<b>1,695,000</b>
Accounts payable	230,000	300,000	380,000
Accruals	200,000	210,000	225,000
Bank loan, short term	100,000	100,000	140,000
Long-term debt	300,000	300,000	300,000
Common stock	100,000	100,000	100,000
Retained earnings	500,000	550,000	550,000
	<b>1,430,000</b>	<b>1,560,000</b>	<b>1,695,500</b>
Sales	4,000,000	4,300,000	3,800,000
Cost of goods sold	3,200,000	3,600,000	3,300,000
<b>Net profit</b>	<b>300,000</b>	<b>200,000</b>	<b>100,000</b>

Using the ratios taken up in the chapter, analyze the company's financial condition and performance over the last 3 years. Are there any problems?

13. Assume that a firm has owners' equity of Rs. 1,00,000. The ratios for the firm are:

Current debt to total debt 0.40

Total debt to owners' equity	0.60
Fixed assets to owners' equity	0.60
Total assets turnover	2 times
Inventory turnover	8 times

Complete the following balance sheet, given the information above.

<b>Liabilities</b>	<b>Rs.</b>	<b>Assets</b>	<b>Rs.</b>
Current debt	.....	Cash	.....
Long-term debt	.....	Inventory	.....
Total debt	.....	Total current assets	.....
Owners' equity	.....	Fixed assets	.....
Total capital	.....	Total assets	.....

### **3.8. Suggested readings**

1. Jain and Khan: Management Accounting, TMH, Delhi.
2. Pandey, I.M.: Financial Management, Vikas Publishing House, Delhi.
3. Periasamy, P.: Financial, Cost and Management Accounting, HPH, Delhi.
4. Maheshwari, S.N.: Accounting for Management and Control, Sultan Chand and Sons, Delhi.
5. Van Horne: Financial Management and Analysis, Pearson Publication, Delhi.

## **Subject: Management Accounting**

Subject Code: 105

Author: Ashish Garg

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### **FUNDS FLOW STATEMENT**

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statement of changes in working capital; make out a statement of sources and application of funds; and understand that why non-cash transactions do not affect funds.

#### **Lesson Structure:**

- 4.1 Introduction
- 4.2 Meaning & Definitions
- 4.3 Objectives
- 4.4 Limitations
- 4.5 Procedure of Preparing Funds Flow Statement
- 4.5.1 Statement of Changes in Working Capital
- 4.5.2 Funds Flow Statement
- 4.6 Parties Interested in Funds Flow Statement
- 4.7 Typical Items Which Require Particular Care
- 4.8 Self Assessment Questions
- 4.9 Suggested Readings

#### **4.1 INTRODUCTION**

The balance sheet and income statement are the traditional basic financial statements of a business enterprise. Balance sheet gives the summary of the firm's resources and obligations at a point of time; profit & loss account reflects the results of the business

operations by summarizing revenue and expenses during a period of time. While they do furnish useful financial data regarding operations, a serious limitation of these statements is that they do not provide information regarding changes in the firm's financial position during particular period of time. They fail to provide the information regarding causes of changes or the movements of finances between two-time period or determine the various causes that lead changes in financial position of a concern.

Therefore, an additional statement should be prepared to show the changes in assets, liabilities and owner's equity between dates of two balance sheets. Such a statement referred to as the statement of changes in financial positions. The statement of changes in financial position overcomes these limitations of basic financial statements. The most commonly used forms of the statement of changes in financial position are called the Funds Flow Statement and the Cash Flow Statement. Present chapter is oriented on the concept of Funds Flow Statement

#### **4.2 MEANING & DEFINITIONS**

The Funds Flow Statement is combination of three words Funds, Flow and Statement.

**Funds** mean working capital. There are mainly two concepts regarding the meaning of the working capital. First, the broad concept according to which working capital refers to the gross working capital and represents the amount of funds invested in current assets. Thus, the gross working capital is the capital investment in total current assets of the enterprise. Current assets are those assets, which in the ordinary course of business can be converted onto cash within a short period of time normally one accounting year. Second, the narrow sense, which termed working capital as the excess of current asset over current liabilities or that part of the current asset, which is

financed by the long-term source of finance. In case of the Funds Flow Statement we will use the narrow concept of the working capital.

**Flow** means movement. If we take the flow of funds it means changes in the position of the funds due to any transaction. As a result of the transaction the funds may increase or decrease. The increase in funds is called funds inflow and if funds decrease, it is called funds outflow. The one important point to be noted here is that the flow of funds only occurs when a transaction affects on the one hand a non current account and on the other a current account and vice-versa. If a transaction only two current account or only two non-current accounts then flow of funds does not take place because here funds means the difference of the current assets and current liabilities.

**Statement** means the written description about some thing or a detail note, which provide the informations. The Funds Flow Statement means a summary of the sources and uses of the working capital.

#### **Definitions:**

“A statement of sources and application of funds is a technical device designed to analyze the changes in the financial condition of a business enterprise between two dates.” **Foulke**

According to I.C.W.A. “Funds Flow Statement is a statement either prospective or retrospective, setting out the sources and applications of the fund of an enterprise. The purpose of the statement is to indicate clearly the requirement of funds and how they are proposed to be raised and the efficient utilization and application of the same.”

Anthony defines the Funds Flow Statement as

the sources from which additional funds were derived and the use to which these sources were put.

Thus, Funds Flow Statement is a statement, which indicates various means by which the funds have been obtained during a certain period and the ways to which these funds have been used during that period.

#### **4.3 OBJECTIVES OF FUNDS FLOW STATEMENT**

As it is clear from the above discussion the main objective of the Funds Flow Statement is to know the sources and applications of the funds within a specific time period. Some other questions are also there which can be sorted out by the help of Funds Flow Statement. These questions are:

- What happened to the net profit? Where did they go?
- How the higher dividend can be paid in case of shortage of funds?
- What are causes of the shortage of fund in spite of higher profit?
- How the fixed assets have been financed?
- How the obligations are fulfilled?
- How was the increase in working capital financed and how it will be financed in future?

Importance of funds flow statement is as follows:

##### **1. Provide the information regarding changes in funds position**

Funds Flow Statement provides the information regarding the funds, from where they have procured and where they have invested meanwhile two specific dates.

##### **2. It helps in the formation of future dividend policy**

Sometimes a firm has sufficient profit available for distribution as dividend but yet it may not be advisable to distribute dividend for lack of liquid or cash resources. In such cases, funds flow statement helps in the formation of a realistic dividend policy.

### **3. It helps in proper allocation of resources**

The resources of a concern are always limited and it wants to make the best use of these resources. A projected funds flow statement constructed for the future helps in making managerial decisions. The firm can plan the deployment of its resources and allocate them among various applications.

### **4. It act as future guide**

A projected funds flow statement also acts as a guide for future to the management. The management can come to know the various problems it is going to face in near future for want of funds. The firm's future needs of funds can be projected well in advance and also the timing of these needs. The firm can arrange to finance these needs more effectively and avoid future problems.

### **5. It helps in appraising the use of working capital**

It helps to appraise the performance of a financial manager in utilization of the working capital and also suggested the right way to use the working capital efficiently.

### **6. It helps to the overall credit worthiness of a firm**

The financial institutions and banks such as SFI, IDBI, IFCI etc. all ask for funds flow statement constructed for a number of years before granting loans to know the creditworthiness and paying capacity of the firm. Hence, a firm seeking financial assistance firm these institutions has no alternative but to prepare funds flow statements.

7. It helps to know about the utilization of the sources

It also provides the information to the managers and the another interested parties that the sources they have collected or provided where they have allocated.

#### 4.4 LIMITATIONS

The funds flow statement also suffers from some of the limitations, which are as follows:

1. Prepared from the final statements: The funds flow statement is prepared with the help of final statements. So all the limitations of the final statements are inherent in it.
2. Only rearrangement: The funds flow statement is only the rearrangement of the data provided by the final statements so this is not providing the actual figure and facts.
3. Past oriented: The funds flow statements provides only the historical information. They are not guiding about the future.
4. Working capital oriented: It concentrates on the concept of the working capital and show the position of the working capital in the concern while changes in cash are more important and relevant for financial management than the working capital.
5. Periodic in nature: It only reveals the changes in the working capital position in the concern between to specific dates. It cannot reveal continuous changes.
6. Not a substitute: It is not a substitute of an income statement or a balance sheet, it provide only some additional information as regards changes in working capital.

#### 4.5 PROCEDURE FOR PREPARING FUNDS FLOW STATEMENT

Funds flow statement can be prepared by comparing two balance sheets and other information derived from various accounts as may be needed. While preparing the funds flow statement mainly two statements are prepared:

- 1) Schedule of Changes in Working Capital
- 2) Funds Flow Statement

##### 4.5.1 SCHEDULE OF CHANGING IN WORKING CAPITAL

As earlier stated, here we are using the narrow concept of the working capital it means working capital means the surplus of current assets over current liabilities. This statement is made to recognize the changes in the amount of working capital among the dates of two balance sheets. This statement is prepared by deriving the values of

current assets and current liabilities from the balance sheet. Current assets are those assets, which can be converted into cash into a short time period in the ordinary course of the business. Similarly current liability means those obligations, which are to be fulfilled in a short time period, generally a financial year.

The schedule of changes in working capital can be prepared by comparing the balance sheets of two dates. Firstly we have to recognize the current assets and current liabilities of the concern and then compare them between two dates if the current assets of current year are more than the previous year that is recognized as an increase in working capital or vice-versa. On the other hand if current liabilities of current year is more than the previous year it will recognize as decrease in working capital or vice-versa because  $\text{Working Capital} = \text{Current Assets} - \text{Current Liabilities}$ .

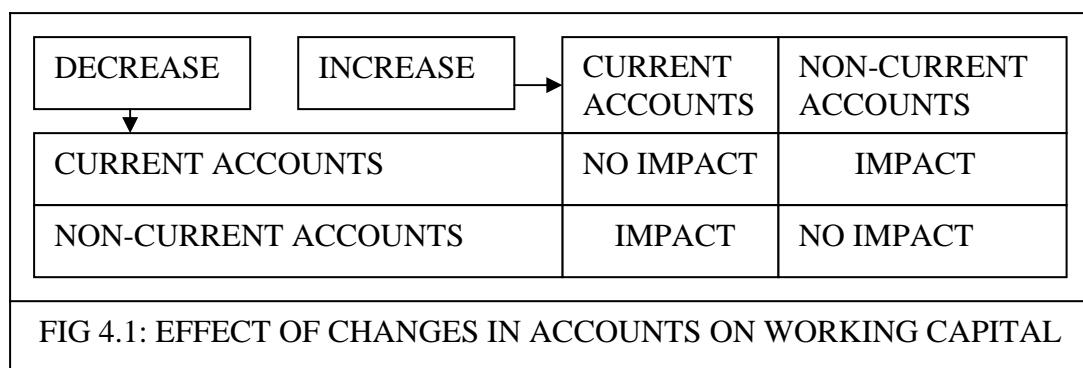


Figure 4.1 shows that if two current accounts increases and decreases simultaneously it puts no effect on the working capital but if any transaction affects a current account or a non-current account it affects the position of the working capital of concern.

The Performa of the Schedule of Changes in Working Capital is as follows.

Schedule of Changes in Working Capital				
Particulars	Previous Year	Current Year	Changes in Working Capital	
			Increase	Decrease
<b>Current Assets:</b> Cash in Hand				

Cash at Bank			
Sundry Debtors			
Temporary Investment			
Stock/Inventories			
Prepaid Expenses			
Accrued Income			
<b>Total Current Assets</b>			
<b>Current Liabilities:</b>			
Bills Payable			
Sundry Creditors			
Outstanding Expenses			
Bank Overdraft			
Short-term Advances			
Dividend Payable			
Proposed Dividend*			
Provision for Taxation*			
<b>Total Current Liabilities</b>			
Working Capital (CA-CL)			
<b>Net Increase/Decrease</b>			
Working Capital			

\* Proposed dividend and Provision for taxation may be considered as current liabilities or long-term liabilities. If they are considered as current liabilities then these will be shown in Schedule of changing in working capital.

**Illustration 4.1:** Prepare a Statement of change in working capital from the following Balance Sheet of Rohan Steel Co.

Balance Sheet of Rohan Steel Ltd. as on 31st Dec.					
Liabilities	2003	2004	Assets	2003	2004
Creditors	15,000	18,000	Cash	11,200	8,500
Bills Payable	10,000	7,500	Debtors	21,300	23,500
Loan on Mortgage	40,000	40,000	Stock	35,000	30,600
Capital	50,000	45,000	Sinking Fund Investment	16,000	12,000
Sinking Fund	16,000	12,000	Land	10,000	10,000
Profit & Loss a/c	13,950	16,275	Building	60,000	60,000

Provision for Doubtful Debts	1,350	1,425	Furniture & Fixture	8,000	7,000
Depreciation Fund	15200	11400			
	1,61,500	1,51,600		1,61,500	1,51,600

**Solution:**

<b>Schedule in Changes in Working Capital</b>			
	<b>2003</b>	<b>2004</b>	<b>Changes in Working Capital</b>
			<b>Increase      Decrease</b>
<b>Current Assets:</b>			
Cash	11,200	8,500	2,700
Debtors less provision	19,950	22,075	2,125
Stock	35,000	30,600	4,400
<b>Total</b>	<b>66,150</b>	<b>61,175</b>	
<b>Current Liabilities</b>			
Creditors	15,000	18,000	3,000
Bills Payable	10,000	7,500	2,500
<b>Total</b>	<b>25,000</b>	<b>25,500</b>	<b>10,100</b>
<b>Working Capital (CA-CL)</b>	<b>41,150</b>	<b>35,675</b>	
<b>Increase in Working Capital</b>		<b>5,475</b>	<b>5,475</b>
	<b>41,150</b>	<b>41,150</b>	<b>10,100</b>

#### 4.5.2 FUNDS FLOW STATEMENT

Funds flow statement is a statement, which shows the sources and application of the funds during a particular time period. This statement shows that during that period from where the funds have been procured and where have been invested. This statement can be prepared in two forms:

- 1) Report Form
- 2) T Form or Account Form

Specimens of the both of the form are as follows:

<b>Specimen of T Form of Funds Flow Statement (for the year ended .....</b> )			
<b>Sources of Funds</b>	<b>Amount</b>	<b>Applications of Funds</b>	<b>Amo unt</b>
Funds from operations Issue of Share Capital Raising of Long term Loans Receipts from partly paid shares Sales of non-current assets Non-trading receipts Sale of Investment Decrease in working capital		Funds Lost in Operations Redemption of Preference Share Redemption of Debentures Repayment of Long-term loan Purchase of non-current assets Non-trading payments Payment of Dividend* Payment of Tax* Increase in working capital	

\*Note Payment of dividend and tax will appear as an application of the funds only when these items are considered as non-current item. If no thing is specified in question then that depends on the discretion of the student how to treat these items.

<b>Specimen of Report Form of Funds Flow Statement</b>	
<b>Sources of Funds</b>	<b>Amount</b>
Funds from operations	
Issue of Share Capital	

Raising of Long term Loans	
Receipts from partly paid shares	
Sales of non-current assets	
Non-trading receipts	
Sale of Investment	
Decrease in working capital	
<b>Total</b>	
<b>Applications of Funds</b>	
Funds Lost in Operations	
Redemption of Preference Share	
Redemption of Debentures	
Repayment of Long-term loan	
Purchase of non-current assets	
Non-trading payments	
Payment of Dividend	
Payment of Tax	
Increase in working capital	
<b>Total</b>	

Let us put a light on the items of the Funds Flow Statement.

### **Sources of the Funds**

Under this heading we will show all the sources of the funds from where the funds are procured. These sources can be classified in two categories.

- 1) Internal Source
- 2) External Source

**1. Internal Source:** Funds from Operations is only single internal source of funds. Funds from operations means the funds obtained by the general business of the organization. It is equal to the difference of revenue obtained by the sale of goods and the total cost of manufacturing them. As example if a businessman is selling 1000 units of a good @ Rs. 7 per unit and the direct and indirect expenses incurred on the production of a unit is Rs. 5 per unit.

Then funds from operations will be  $1000 \times 7 - 1000 \times 5 = \text{Rs. 2000}$ . During the calculation of funds from operations following things should be considered.

The profit or loss shown by the Profit & Loss a/c is not always equal to the funds from operations because in the some non-cash items are included in the Profit & Loss a/c, which does not affect the working capital such as Depreciation and amortization or written off Preliminary Expenses, Discount on Debentures, goodwill, Patent Rights, Advertisement Expenses, Underwriting Commission etc. All the expenses, which do not affect the position of the funds, should be added back in the profit.

With the non cash expenses some exceptional items are also there which are not concerning with the operations of the business such as profit or loss arise from the sale of fixed assets and investment and non business incomes such as dividend received, interest received, rent received, refund of income tax and appreciation in the value of fixed assets etc. These items should be deducted from the profit to calculate the funds from operations. There are two methods to prepare the funds from operations, which are as follows:

A) The First method is to proceed from the figure of net profit or net loss as arrived at from the profit and loss account already prepared. Funds from operations by this method can be calculated as below.

## **Calculations if Funds from Operations**

Closing balance of P &L A/c or Retained Earning

Add: Non fund and Non operating items which have been already debited in P &L A/c

- 1) Depreciation and Depletion
- 2) Amortization of fictitious or intangible assets such as:
  - i) Goodwill
  - ii) Patents
  - iii) Trade Mark
  - iv) Preliminary Exp.
  - v) Discount in Issue of Shares Etc.
- 3) Appropriation of Retained Earning such as:
  - i) Transfer to General Reserve
  - ii) Dividend Equalization Fund
  - iii) Transfer to Sinking Fund
  - iv) Contingency Reserve etc.
- 4) Loss on Sale of any Non Current assets such as:
  - i) Loss of sale of Land and Building
  - ii) Loss of sale of Machinery

B) The second method is to prepare the Profit & Loss account afresh by taking into consideration only funds and operational items, which involves funds and are related to the normal operations of the business. The balancing figure in this case will be either funds from operation or funds lost in operations depending upon whether income or credit side of profit and loss a/c exceeds the expenses or debit side of the profit and loss a/c or vice-versa.

Funds from operations can also be calculated by preparing Adjusted Profit & Loss A/c

<b>Adjusted Profit and Loss Account</b>			
Particulars	Amount	Particulars	Amount
To Depreciation & Depletion		By Opening Balance of P & L A/c	

To Appropriation of retained earnings	By Transfer from excess provisions
To Loss on sale of fixed assets	By Appreciation in the value of fixed assets
To Dividend	By Dividend received
To Proposed Dividend	By Profit on the sale of fixed assets
To Provision for Taxation	By Funds from Operations
To Closing Balance of P & L A/c	
To Funds lost in Operations (B/F)	

Let us take an example of the funds from operations.

**Illustration 4.2:** Following are Balance Sheet of a Limited Co. as on 31<sup>st</sup> Dec.2003 and 2004.

Balance Sheet					
Liabilities	2003	2004	Assets	2003	2004
Share Capital	61,000	74,000	Plant	45,000	43,000
Reserves	13,000	15,500	Building	50,950	48,000
Creditors	28,000	24,000	Stock	20,500	18,800
Bank Overdraft	18,000		Debtors	20,000	16,200
Provision for Taxation	8,000	8,500	Cash	150	180
Profit & Loss A/c	8,600	8,800	Cash at Bank		2,100
			Goodwill		2,520
	1,36,600	1,30,800		1,36,600	1,30,800

Taking into account the following information, calculate funds from operations: -

- 1) Interim Dividend was paid Rs.2,000.
- 2) Dividend proposed for Rs. 4,000.
- 3) Provision of Rs.9,000 was made for Income Tax.
- 4) Rs. 2000 was written off as depreciation on Plant and Rs.2,950 on Building.
- 5) Profit on Sale of Fixed Investment Rs. 1,500.

Solution:

#### Calculation of net profit for 2003

	Rs.	Rs.
Credit balance of P & L A/c on 31Dec. 2003		8,800
Less: Credit Balance of P& LA/c on 31Dec.2002		8,600
		<u>200</u>

Add:

Interim Dividend	2,000
Proposed Dividend	4,000
Provision made for Income Tax	9,000
Provision Made for Reserve	2,500
Net Profit During the Year	<u>17,500</u>
	<u>17,700</u>

#### Calculation of Funds From Operations

Net Profit During the Year	17,700
Add:	
Depreciation on Building	2,950
Depreciation on Plant	2,000
	4,950
	22,650
Less:	
Profit on sale of Fixed Investment	1,500
Profit from Business Operations	21,150

The alternative method for calculation of Funds from operations is as follows:

Adjusted Profit and Loss A/c			
To Interim Dividend	2,000	By Opening Balance	8,600
To Dividend Proposed	4,000	By Profit on Sale of Investment	1,500
To Provision for Income Tax	9,000	By Profit From Business Operations	21,150
To Provision for Reserve	2,500	(Balancing Figure)	
To Plant A/c(Depreciation)	2,000		
To Building A/c (Depreciation)	2,950		
To Closing Balance	8,800		
	31,250		31,250

**2. External Source:** These sources include:

- i) **Issue of Share Capital:** One of the source of collection of the funds is issuance of the new share that may be preference share issue or equity share issue. Not only the new issue but also the call made on the partly paid share is also considered as the source of the funds because it generates inflow of funds. The premium charged on the time of issue is also considered, as inflow of funds and similarly the adjustment for the discount provided on the time of issue should be made. If the shares are issued in respect of another consideration rather than cash then it will not be considered as a source of funds.
- ii) **Issue of Debenture and Raising of Loans:** Just like the shares issue of debenture and raising of loans are also a source of funds and the same adjustment regarding the premium and discount should be made as in case of the issuance of the share.
- iii) **Sale of the Fixed Assets and Long-term Investments:** One can increase the funds in the concern by selling their investment they have made in different alternatives and in fixed assets just like plant, machinery, building etc. but one

thing that should be remembered that if the assets are exchanged with rather than cash that will not a source of funds.

- iv) **Non-Trading Receipts:** Any non-trading receipts just as rent received, interest received, dividend received and refund of tax or any another non-operating income generates the inflow of cash will be treated as source of funds.
- v) **Decrease in Working Capital:** If the working capital decreases in comparison of previous year in the release of funds from the working capital so that will be termed as source of funds.

## **Application or Uses of Funds**

The other side of the funds flow statement is application of funds that side shows how the funds procured from different sources are allocated or used. There may be following uses or applications of the funds:

- 1) **Funds lost in Operations:** Sometimes the result of trading in a certain year is a loss and some funds are lost during that trading period. Such loss of funds means outflow of funds so that item if treated as an application of funds.
- 2) **Redemption of the Preference Share Capital:** A company can't redeem its equity share within its life time but can redeem their preference share as the result of redemption of preference share an outflow of funds takes place. So the redemption of the shares is written in the application side of the funds flow statement. One thing should be remembered is that the premium provided on the redemption will also be considered as an application.
- 3) **Repayment of Loans & Redemption of Debentures:** As share the repayment of loans and redemption of debenture also leads a outflow of cash so these items are also treated as application of the funds.

- 4) **Purchase of any Non-current or Fixed Asset:** If the businessman purchases any fixed asset or making investment for the long time period that will also generate a outflow of funds and treated as an application of funds. But if the fixed asset is purchased in exchange of any other consideration rather than cash that will not treated as application of funds.
- 5) **Payment of Dividend & Tax:** Payment of dividend and tax are also applications if funds. It is the actual payment of dividend and tax, which should be taken as an outflow of funds and not the mere declaration of the dividend or creation of a provision for taxation.
- 6) **Any other Non-trading Payment:** Any payment or expenses not related to the trading operations of the business amounts to outflow and is taken as an application of funds. The examples could be drawing in case of sole trader or partnership firm, loss of cash.

#### **4.6 PARTIES INTERESTED IN FUND FLOW STATEMENT**

Funds flow statement is useful for different parties interested in the business. They include owner or shareholder, financial institutions, employees etc.

**1. Owners or Shareholders:** Owners and Shareholders are interested in ascertaining the financial position of the concern. Funds flow statement helps them to find out:

- i) Whether the business has enough funds to pay dividend at reasonable rates?
- ii) Whether the business is in a position to meet its present liabilities in time?
- iii) Whether the management is making effective use of funds at their disposal?

**2. Financial Institutions:** The financial institutions are interested in the safety of their funds. A careful analysis of the fund flow statement will help them in ascertaining:

- i) Overall creditworthiness of the enterprise.
- ii) The resources from which the enterprise will be in a position to make repayments of the loans taken.

**3. Employees:** The employees have also a stake in the business. Their growth and security of job depends upon the profitability of the firm which is directly related to effective utilisation of the funds by the enterprise. The employees can ascertain from the funds flow statement regarding effective use of funds by the management during a particular period. The funds should be managed in a manner that the business is in a position to make payment of salaries to the employees in the time beside meeting other business costs.

It is a useful practice in business firms to prepare projected funds flow statement for a number of years to predict the future availability of the funds and their utilization. All this will help the firm in better planning of its resources and their utilizations.

#### **4.7 SOME TYPICAL ITEMS WHICH REQUIRE PARTICULAR CARE**

The following items require particular care while preparing a funds flow statement.

1. **Digging out the hidden information:** While preparing a funds flow statement one has to analyze the given balance sheet. Items relating to current account to be shown in the schedule of change in working capital. But the non-current items have to be further analyzed to find out the hidden information in regard to sale or purchased of non current assets, issue or redemption of share capital, raising or repayment of long-term loans, transfer to reserves and provisions etc. the hidden information can be digged out either by preparing working notes in the statement form or preparing concerned accounts of non-

current assets and non-current liabilities. Both of these methods have been clarified by following illustration:

**Illustration 4.3** The following is the Balance Sheet of Anil Corporations Ltd. as on 31<sup>st</sup> Dec. 2003 and 2004. You are required to prepare a Schedule of Changes in Working Capital and a Funds Flow Statement.

Balance Sheet of Anil Corporation Ltd.					
Liabilities	2003	2004	Assets	2003	2004
Share Capital (Paid up):			Land & Buildings	60,000	50,000
11% Cumulative Preference Share		30,000	Plant and Machinery	30,000	50,000
Equity Shares	1,10,000	1,20,000	Sundry Debtors	40,000	48,000
General Reserve	4,000	4,000	Stock	60,000	70,000
Profit & Loss A/c	2,000	2,400	Bank	2,400	7,000
9% Debentures	12,000	14,000	Cash	600	1,000
Provision for Taxation	6,000	8,400			
Proposed Dividend	10,000	11,600			
Current Liabilities	49,000	35,600			
	1,93,000	2,26,000			
				1,93,000	2,26,000

**Solution:**

Schedule of Changes in Working Capital				
Particulars	2003	2004	Increase	Decrease
Current Assets:				
Sundry Debtors	40,000	48,000	8,000	
Stock	60,000	70,000	10,000	
Bank	2,400	7,000	4,600	
Cash	600	1,000	400	
	1,03,000	1,26,000		
Current Liabilities:				
Current Liabilities	49,000	35,600		13,400
	49,000	35,600		
Working Capital (CA-CL)	54,000	90,400		
<b>Net increase in Working Capital</b>	36,400			36,400
	90,400	90,400	36,400	36,400

Funds Flow Statement			
Sources	Rs.	Applications	Rs.
Issue of the Preference Shares	30,000	Purchase of Plant and Machinery	20,000

Issue of the Equity Shares	10,000	Provision for Taxation*	6,000
Issue of the Debentures	2,000	Proposed Dividend**	10,000
Sale of the Land and Buildings	10,000	Net Increase in Working Capital	36,400
Funds from Operations	20,400		
	72,400		72,400

\* For 2003 assumed to be paid

\*\* For 2003 assumed to be paid

#### Working Notes:

- As current Liabilities are separately given, provision for taxation and proposed dividend has not been taken as current liabilities.

#### 2. Calculations of Issue of Preference Shares:

Preference share in beginning of 2004	-----
Preference share raised during the year 2004	30,000
Preference share at the end of 2004	30,000

#### 3. Calculation of Issue of Equity Share:

Equity Share Capital In the beginning of 2004	1,10,000
Equity Share Capital at the end of 2004	1,20,000
Equity Share Capital issued during the year 2004	10,000

#### 4. Issue of Debenture:

9% Debenture in the beginning of 2004	12,000
9% Debenture at the end of the year 2004	14,000
9% Debenture issued during the year 2004	2,000

#### 5. Provision for taxation and proposed dividend for 2003 have been presumed to be paid in 2004.

#### 6. Calculations of Sale of Land and Buildings:

Opening Balance of Land & Building in 2004	60,000
Closing Balance of Land & Building in 2004	50,000
Land and Building purchased during the year 2004	10,000

#### 7. Purchase of Plant & Machinery:

Opening Balance in 2004	30,000
Closing Balance in 2004	50,000
Purchased during the year	20,000

#### 8. Calculation of Funds from Operations:

Closing Balance of P & L A/c in 2004	2,400
Add: Non-fund and Non-operating items	
Debited to P & L A/c:	
Provision for taxation	8,400
Proposed Dividend	11,600
	22,400
Less: Opening Balance of P & L A/c	2,000

<i>Funds from Operations</i>	20,400
------------------------------	--------

2. **Investments:** The treatment of the investment depends on the nature of the investment. If the investment is made in short term investment instrument then it is considered as current assets and shown in the schedule of changing in working capital. Or if the investment is made in long term instrument then the difference between opening and closing balance is treated as purchase or sale of investment and will be shown in the funds flow statement and appropriate adjustment regarding the profit or loss on sale of investment is made during the calculation of funds from operations.
3. **Provision for Taxation:** If the provision for taxation is treated as current liability then it should be shown in the schedule of changing in working capital. If it treated, as non-current liability then opening balance will be shown in the funds flow statement by assuming it as paid for last year and closing balance will be added back in the profit if it is debited earlier in P & L A/c for calculation of Funds from Operations.
4. **Proposed Dividend:** Proposed dividend also can be treated in two ways as same as provision for taxation. And adjustment will be same as in the case of provision for taxation.
5. **Interim Dividend:** The expression interim dividend denotes a dividend paid to the members of the company during a financial year, before the finalization of annual accounts. The dividend paid or declared in between the two annual general meeting should be added back while calculating funds from operations. However, if the figure of profit is taken prior to the debit of interim dividend this adjustment is not required. The interim dividend is also an application of funds and has to appear on the applications side of funds flow statement.

6. **Provision against Current Assets:** The provision against the current assets either deducted from their respective opening and closing balances before entering in the schedule of changes in working capital or the difference between the opening and closing balance if excess provision has been created may be treated as appropriation of profit and should be added back while calculating the funds from operations. The amount of excess provision will not be shown in the schedule of changes in working capital.

7. **Depreciation:** depreciation means decrease in the value of an asset due to wear and tear, lapse of time, obsolesce and accident. Depreciation is taken as an operating expense while calculating operating profit. When we make the entry of depreciation profit and loss account is debited while fixed asset account is credited with the amount of depreciation. Since, both the accounts are non-current accounts so depreciation is treated as a non-fund item. It is neither a source nor a application of funds so it is added back to operating profit to find out funds from operations.

**Illustration 4.4:** The following schedule shows the balance sheets in condensed form of Bharat Carbons Limited at the beginning and end of the year:

Particulars	1/1/2002	31-12-2002
Cash	50,409	40,535
Sundry Debtors	77,180	73,150
Temporary Investment	1,10,500	84,000
Prepaid Expenses	1,210	1,155
Inventories	92,154	1,05,538
Surrender Value of Life Policies	4,607	5,353
Land	25,000	25,000
Other Fixed Assets(Including Machinery)	1,47,778	1,82,782
Debenture Discount	4,305	2,867
	5,13,143	5,20,380
Sundry Creditors	1,03,087	95,656

Outstanding Expenses	12,707	21,663
4% Mortgage Debentures	82,000	68,500
Accumulated Depreciation	96,618	81,633
Allowance for Inventory Loss	2,000	8,500
Reserve for Contingency	1,06,731	1,34,178
Surplus in P/L A/c	10,000	10,250
<b>Equity Share Capital</b>	<b>1,00,000</b>	<b>1,00,000</b>
	<b>5,13,143</b>	<b>5,20,380</b>

Additional Information:

1. Net profit for the year 2002 as P/L A/c is Rs. 49,097.
2. 10% cash dividend was paid during the year.
3. The premium on life policies Rs. 2,773 was paid during the year, which Rs. 1,627 has been written off from P/L A/c.
4. New machinery was purchased for Rs. 31,365 and machinery costing Rs. 32,625 was sold during the year. Depreciation on machinery sold had accumulated to Rs. 29,105 at the date of the sale. It was sold as scrap for Rs. 1,500.
5. The Mortgage debentures mature at the rate of Rs. 5,000 per year. In addition to the above The Company purchased and retired Rs. 8,500 of the debentures at Rs. 103. Both the premium on retirement and the applicable discount were charged to P/L A/c.
6. The allowance for inventory loss was credited by a charge to expenses in each year to provide for obsolete items.
7. A debit to reserve for contingencies of Rs. 11,400 was made during the year. This was in respect of settlement of past tax liability.

You are required to prepare a statement showing the sources and applications of funds for the year 2002.

Solution:

**Statement of Changes in Working Capital**

Particulars	1/1/2002	31/12/02	Increase	Decrease
<i>Current Assets:</i>				
Cash	50,409	40,535		9,874
Sundry Debtors	77,180	73,150		4,030
Temporary Investment	1,10,500	84,000		26,500
Prepaid Expenses	1,210	1,155		55
Inventories	92,154	1,05,538	13,384	
	<b>3,31,453</b>	<b>5,20,380</b>		
<i>Current Liabilities:</i>				
Sundry Creditors	1,03,087	95,656	7,431	
Outstanding Expenses	12,707	21,663		8,956

Allowance for Inventory Loss	2,000	8,500		6,500
	1,17,794	1,25,819		
Working Capital	2,13,659	1,78,559		
Net Decrease in W.C.		35,100	35,100	
	2,13,659	2,13,659	59,915	59,915

Note :

- 1) Surrender value of the life insurance policy is not considered as a current asset.
- 2) Allowance for inventory loss which is a provision against the current asset has been treated as a current liability like provision for doubtful debts not to be an appropriation of profits.

<b>Statement of Sources and Applications of Funds for the year ended 31/12/02</b>			
<b>Sources</b>	<b>Rs.</b>	<b>Applications</b>	<b>Rs.</b>
Funds from Operation	68,957	Redemption of debentures	13,755
Sale of Machinery as scrap	1,500	Purchase of machinery	31,365
Net Decrease in W.C.	35,100	Purchase of other fixed assets	36,264
		Payment of life insurance premium	2,773
		Payment of Tax	11,400
		Payment if Dividend	10,000
	1,05,557		1,05,557

Working Notes:

**4% Mortgage Debentures A/c**

To Cash	5,000	By Balance b/d	82,000
To cash	8,755	By Adjusted P/L A/c(Premium)	255
To Balance c/d	<u>68,500</u>		
	<u>82,255</u>		<u>82,255</u>

**Other Fixed Assets (including machinery)**

To Balance b/d	1,47,778	By Accumulated Depreciation	20,105
To Cash(Purchase)	31,365	By Cash (Sale)	1,500
To Cash(Purchase)balancing figure	36,264	By Adjusted P/L A/c(loss)	2,020
	<u>BY Balance c/d</u>		<u>1,82,782</u>
	<u>2,15,407</u>		<u>2,15,407</u>

**Accumulated Depreciation A/c**

To Other Fixed Assets A/c	29,105	By Balance b/d	96,618
To Balance c/d	<u>81,633</u>	By Adjusted P/L A/c(b/f)	<u>14,120</u>
	<u>1,10,738</u>		<u>1,10,738</u>

**Reserve for Contingency A/c**

To Tax Paid	29,105	By Balance b/d	1,06,731
To Balance c/d	<u>1,34,178</u>	By Adjusted P/L A/c(b/f)	<u>28,847</u>
	<u>1,45,578</u>		<u>1,45,578</u>

<b>Debenture Discount A/c</b>		
To Balance b/d	4,305	By Adjusted P/L A/c(b/f) 1,438
		By Balance c/d 2,867
	4,305	4,305

<b>Life Policy A/c</b>		
To Balance b/d	4,607	By Adjusted P/L A/c 1,627
To Cash (Premium Paid)	2,773	By Adjusted P/L A/c 400 ( Rs 1,627 given to be transferred to P/L A/c and Rs.400 B/F being excess of book value over surrender value)
		By Balance c/d 5,353
	7,380	7,380

<b>Adjusted Profit &amp; Loss A/c</b>		
To 4% Mortgage debenture a/c		By Balance b/d 10,000
Premium on redemption	255	By Funds From Operation 68,957
To Accumulated Dep. A/c	14,120	
To Other Fixed Assets A/c- loss on sale	2,020	
To Reserve for Contingency A/c	38,847	
To Debenture Discount A/c	1,438	
To Dividend	10,000	
To Life Insurance Policy	2,027	
To Balance c/d	10,250	
	78,957	78,957

Note: If allowance for Inventory Loss is not treated as a currently liability net decrease in working capital shall be Rs. 28,600.

**Illustration 4.5: From the following Comparative Balance Sheet and Income Statement of ABC Ltd. prepare a Statement of Changes in Financial Position:**

<b>ABC Limited</b> <b>COMPARATIVE BALANCE SHEET</b> For the year ended 31st Dec. 2003 and 2004		
<b>Particular</b>	<b>2003</b>	<b>2004</b>
<b>Current Assets:</b>		
Cash	70,000	50,000
Debtors	40,000	45,000
Stock	1,25,000	90,000

Total Current assets	2,35,000	1,85,000
<b>Fixed Asset:</b>		
Land and Building	1,50,000	1,00,000
Plant and Machinery	22,000	2,00,000
Less: Accumulated Depreciation	82,000	80,000
Total Fixed Assets	2,88,000	2,20,000
Total Assets	5,23,000	4,05,000
<b>Current Liabilities:</b>		
Creditors	25,000	30,000
Salaries Payable	15,000	10,000
Provision for tax	50,000	60,000
Provision for Dividend	40,000	40,000
Total Current Liabilities	1,30,000	1,40,000
<b>Long Term Liabilities:</b>		
Bank Loan	23,000	15,000
Debentures	1,20,000	1,50,000
Total Long term Liabilities	1,43,000	1,65,000
Total Liabilities	2,73,000	3,05,000
<b>Owner's Equity:</b>		
Share Capital	175,000	75,000
Share Premium	12,500	7,500
Reserve and surplus	62,500	17,500
Total Equities	2,50,000	1,00,000
	5,23,000	4,05,000

ABC Limited

**Income Statement**  
For the year ended 31st Dec. 2004

<b>Particulars</b>	<b>Rs.</b>	<b>Rs.</b>
Sales		5,00,000
Less: Cost of Goods Sold		2,10,000
Gross Profit		2,90,000
Less: Operating Expenses:		
Office and Administration Exp.	45,000	
Selling and Distribution Exp.	25,000	
Interest	12,000	
Depreciation	22,000	1,04,000
Operating Profit		1,86,000
Add: Gain on sale of Plant		6,000
Total Profit		1,92,000
Less: Income Tax		85,000
Net Profit		1,07,000

Additional Information:

- 1) During the year plant Rs. 50,000 (accumulated depreciation Rs. 20,000) was sold
- 2) The debentures of Rs. 30,000 were converted into share capital at per.
- 3) The company declared a cash dividend of Rs.40, 000 and a stock dividend of Rs. 20,000 for the year.
- 4) The company issued 5,000 additional shares, par value Rs.10 per share, at premium of 10% during the year.

**Solution:**

<b>Schedule of Changes in Working Capital</b>				
<b>Particulars</b>	<b>2003</b>	<b>2004</b>	<b>Increase</b>	<b>Decrease</b>
<b>Current Assets:</b>				
Cash	50,000	70,000	20,000	
Debtors	45,000	40,000	-5,000	
Stock	90,000	1,25,000	35,000	
Total Current assets	<b>1,85,000</b>	<b>2,35,000</b>		
<b>Current Liabilities:</b>				
Creditors	30000	25000	-5,000	
Salaries Payable	10000	15000	5,000	
Provision for tax	60000	50000	-10,000	
Provision for Dividend	40000	40000	0	
Total Current Liabilities	<b>1,40,000</b>	<b>1,30,000</b>		
<b>Working Capital</b>	<b>45,000</b>	<b>1,05,000</b>	<b>70,000</b>	<b>10,000</b>
Increase in Working Capital	60,000			60,000
<b>Total</b>	<b>1,05,000</b>	<b>1,05,000</b>	<b>70,000</b>	<b>70,000</b>
Funds Flow Statement				
<b>Sources:</b>				
Funds from Operations			1,21,000	
Sales of plant			36,000	
Loan from bank			8,000	
Issue of share			55,000	
			<b>2,20,000</b>	
<b>Applications:</b>				
Purchase of land & Building			50,000	
Purchase of Plant & Machinery			70,000	
Payment of Dividend			40,000	
Increase in Working capital			60,000	
			<b>2,20,000</b>	

**Note:** Stock dividend and debenture converted into share do not find place in a funds flow statement because these items are not affecting the position of the funds in the concern.

**Working Notes:**

**Adjusted Reserve and Surplus A/c**

To proposed Dividend	60,000	By Balance b/d	17,500
To accumulated Depreciation	22,000	By Plant and Machinery	6,000
To Balance b/d	62,500	(Profit on Sale)	
		By Funds from Operations	1,21,000
	1,44,500		1,44,500

**Plant and Machinery A/c**

<b>To Balance b/d</b>	2,00,000	By Accumulated Depreciation	20,000
To Adjusted Reserve and Surplus A/c	6,000	By Cash (Sale)	36,000
To Cash (Purchase - B/F)	70,000	By Balance c/d	2,20,000
	2,76,000		2,76,000

**Accumulated Depreciation A/c**

To Plant A/c	20,000	By Balance b/d	80,000
<b>To Balance c/d</b>	82,000	To Adjusted Reserve and Surplus A/c (Depreciation)	22,000
	1,02,000		1,02,000

Further practice can be done with the help of textbooks.

**4.8 SELF-ASSESSMENT QUESTIONS**

1. What is the Funds Flow Statement? Examine its managerial uses.
2. “Funds flow statement represents a stock to flow linkage”, Justify.
3. Discuss the Procedure of making a Funds Flow Statement.
4. What are the Causes for Change in Working Capital? Discuss.
5. Briefly discuss the meaning, importance and objectives of the Funds Flow Statement.
6. From the following Balance Sheet of a company you are required to prepare 1) a statement showing changes in working capital 2) a statement of sources and applications of the funds.

### Balance Sheet

Particular	Jan.2003	Jan.2004
Cash	40,000	44,400
Account Receivable	10,000	20,700
Inventories	15,000	15,000
Land	4,000	4,000
Building	20,000	16,000
Equipment	15,000	17,000
Accumulated Depreciation	-5000	-2,800
Patents	1,000	900
	<hr/> 1,00,000	<hr/> 1,15,200
Current Liabilities	30000	32,000
Bonds Payable	22,000	22,000
Bonds Payable Discount	-2,000	-1,800
Capital Stock	35,000	43,500
Retained Earnings	15,000	19,500
	<hr/> 1,00,000	<hr/> 1,15,200

#### **Additional Information:**

1. Income for the period Rs.10,000
2. A building that cost Rs.4000 and which had a book value of Rs.1000 was sold for Rs. 1400.
3. The depreciation charge for the period was Rs. 800.
4. There was Rs. 5000 issue of common stock.
5. Cash Dividend Rs. 2000 and a Rs. 3500 stock dividend were declared.

[Ans. Net Increase in working capital: Rs. 13,100 , Source of Funds: Rs. 17,100, Application of funds: Rs. 4,000 Funds From Operations: Rs. 10,700]

7. A balance Sheet of retained earning of X Ltd. is given below:

Balance of retained earning, 1 <sup>st</sup> Jan. 2003	3,25,600
Add: Net Profit after tax.	6,48,480
Tax Refund	25,470
	<hr/> 9,99,550
Less: Loss on sale of Plant & Machinery	14,460
Goodwill written off	95,370
Dividend Paid	4,70,350
	<hr/> 5,80,180
Balance of Retained Earning, 31 <sup>st</sup> Dec.2003	4,19,370

#### **Additional Information:**

1. Plant and Machinery having a written off value of Rs.54,360 was sold on Oct. 200.
2. Depreciation of Rs.68,250 has been deducted while arriving at net profit for the year.
3. Plant and Machinery was purchased during the year at a cost of Rs. 1,60,000 but the payment was made in the form of 8% debentures of Rs. 100 Each for the same.
4. Rs. 72,800 dentures have been redeemed during year 2003.

You are required to prepare a statement of Sources and Applications of the funds for the Year ended on 31<sup>st</sup> Dec.2003.

[Ans. Funds from operations Rs. 7,16,730 Funds flow statement. Rs.7,82,100 increase in the working capital Rs.2,38,950]

8. The following is the Balance Sheet of Sri Krishna Limited:

As on 31/3/2002 (in Lakhs)		As on Liabilities 31/3/2003	As on 31/3/2002 (in Lakhs)	As on Assets 31/3/2003 (in Lakhs)
	Share capital:		15	Plant
	Equity Shares of Rs. 100 Each	15.00	6.00	Stock
100.00	9% redeemable preference Share of Rs. 100 each Rs.50		15.00	Debtors
5.00	Called up	Nil	1.00	Cash Balance
0.25	Share Premium	Nil		Misc. Expenditure
Nil	Capital Redemption Reserve	5.00		
10.00	General Reserve	7.00		
2.75	Profit & Loss A/c	3.00		
10.00	Other Liabilities	6.00		
38.00		36.00	38.00	36.00

#### **Further information furnished:**

1. The company declared a dividend of 20% to equity share on 30/6/2002.
2. The company issued notice to preference share for redemption at a premium of 5% on 1/7/2002 and the entire proceeding were completed before 15/8/2002/in accordance with the law after making a call of Rs. 50 per share, so as to make shares fully paid.
3. The company provided depreciation at 10% on the closing of Plant. During the year one plant of book value Rs. 1,00,000 was sold at loss of Rs. 25,000.

4. There was no change in the schedule of debtors as on 31/3/2002. However, as the company felt that certain debtors were doubtful of recovery, a provision was made in the account.
5. Miscellaneous expenditure included Es.5 lakh shares issue and other expenses paid during the year.

Prepare funds flow statement for the year ended 31/3/2003.

[ Ans. Net decrease in working capital. Rs. 4 lakh, funds flow statement Rs.24,06,250 funds from operations. Rs. 9,31,250]

#### **4.9 SUGGESTED READINGS**

1. Pandey, I.M., Management Accounting, Vikas Publishing House, N.Delhi
2. Horngren & Sundem, Introduction to Management Accounting, Prentice Hall of India, N.Delhi.
3. Anthony R.N. and Reece J.S., Management Accounting Principles, 6<sup>th</sup> ed., Homewood, Illinois, Richard D.Irwin, 1995.
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6. Mittal, S.N., Management Accounting and Financial Management, Shree Mahavir Book Depot, N.Delhi.
7. Jain, S.P and Narang, K.L., Advanced Cost Accounting, Kalyani Publishers, Ludhiana.
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9. Khan, M.Y. and Jain, P.K., Management Accounting, TMH, N.Delhi.

## **Subject: Management Accounting**

Subject Code: 105

Author: Ashish Garg

**Lesson No: 5**

**Vetter: Dr. B.S.Bodla**

### **CASH FLOW STATEMENT**

**Objectives:** After reading this chapter you will be able to: prepare a statement of changes in cash; make out a statement of sources and applications of cash; and understand that why after a high profit cash position become worst.

#### **Lesson Structure:**

- 5.1 Introduction
- 5.2 Meaning
- 5.3 Purpose and Uses
- 5.4 Structure of Cash Flow Statement
- 5.5 Treatment of Some Typical Items
- 5.6 Format of Cash Flow Statement
- 5.7 Procedure for preparing Cash Flow Statement
- 5.8 Limitations of Cash Flow Statement
- 5.9 Comparison between Cash Flow Statement and Funds Flow Statement
- 5.10 Self-Assessment Questions
- 5.11 Suggested Reading

## 5.1 INTRODUCTION

The statement of changes in financial position based on working capital is of immense use in long-range financial planning. The long-term financing and investment activities are specifically portrayed. The net working capital requirements are shown as residual figures. However, the working capital concept may conceal or exclude too much. It treats increases in inventories and account receivable as equaling to an increase in bank overdraft. This is not a correct treatment. In fact, accrued expenses like wages and salaries may become payable in next 10 days or so: sundry creditor's bills may fall due for payment during the next one month, where as bank overdraft may be for a longer period of, say three months or even more. Similarly, inventories and account receivables undergo a transformation before they become money assets. It is possible that there is sufficient net working capital as revealed by the statement of changes in financial position, and yet the firm may be unable to meet its current liabilities as and when they fall due. It may be due to a sizeable piling up of inventories and an increase in debtors. Caused by a slow-down in collections. The firm's failure to meet its short-term commitments, in spite of its sound long-range financial position and adequate profitability, may plunge it to technical insolvency. Therefore, in making plans for the more immediate future, the management is vitally concerned with a statement of cash flow, which provides more detailed information. Such a statement is useful for the management to assess its ability to meet obligation to trade creditors, to pay bank loans, to pay interest to debenture-holders and dividends to its shareholders. Furthermore, the projected cash flow statement prepared month wise or so can be useful in presenting information of excess cash in some months and shortage of cash in others. By making available such information in advance the statement of cash flow enables the management revise its plan. So

avoid the technical insolvency and to get aware about the short-term liquidity position management have to make Cash Flow Statement.

## **5.2 MEANING OF THE CASH FLOW STATEMENT**

Cash Flow Statement is a statement that describes the inflow (sources) and outflow (applications) of cash and cash equivalent in an enterprise during a specified period of time. Such a statement enumerates net effect of the various business transactions on cash and its equivalent and takes into account receipts and disbursement of cash. Cash flow statement summarizes the causes of changes in cash position of a business enterprise between dates of two balance sheets. According to AS-3 (revised), an enterprise should prepare a cash flow statement and should present it for each period for which financial statements are prepared. The term cash, cash equivalent and cash flow are used in the statement with the following meanings:

Cash comprises cash on hand and demand deposit with bank.

Cash Equivalents are short term highly liquid investments that are readily convertible into known amounts of cash and which are subject to an insignificant risk of changes in value. Cash equivalent are held for the purpose of meeting short term cash commitments rather than for investment or other purposes. An investment normally qualifies as a cash equivalent only when it has a short-maturity, of say, three months or less from the date of acquisitions.

Cash flow means movement of funds that may be toward outside called outflow of cash and that may be from outside to inside business called inflow of cash. In another words flow of cash is said to have taken place when any transaction makes changes in the amount of cash and cash equivalent before happening of the transaction.

Cash flows exclude movements between items that constitute cash or cash equivalent because these components are part of the cash

management of an enterprise rather than part of its operating, investing and financing activities. Cash management includes the investment of excess cash in cash equivalent.

In another words a cash flow statement is a statement depicting changes in cash position from one period to another. For example, if the cash balance of a business is shown by its Balance Sheet in 31<sup>st</sup> Dec. 2003 at Rs. 20,000 while the cash balance as per its Balance Sheet on 31<sup>st</sup> Dec. 2004 is Rs.30,000, there has been an inflow of cash of Rs.10,000 in the year 2004 as compared to the year 2003. The cash flow statement explains the reasons for such inflows or outflows of cash, as the case may be. It also helps management in making plans for the immediate future. A projected cash flow will be available to meet obligation to trade creditors, to pay bank loans and to pay dividend to the shareholders.

### **5.3 PURPOSE AND USES OF CASH FLOW STATEMENT**

The main purpose of the statement of cash flows is to provide relevant information about the cash receipts and cash payments of an enterprise during a period. The information will help users of financial statements to assess the amounts, timing and uncertainty of prospective cash flows to the enterprise. The statement of the cash flows is useful to them in assessing an enterprise's liquidity, financial flexibility, profitability and risk. It also provides a feedback about the previous assessments of these factors. Investors, analyst, creditors, managers and others will find the information in the statement of cash flows helpful in assessing the following:

1. It is very useful in the evaluation of cash position of a firm.
2. A projected cash flow statement can be prepared in order to know the future cash position of a concern so as to enable a firm to plan and coordinates its financial operations properly.

3. A comparison of historical and projected cash flow statement can be made so as to find the variation and deficiency or otherwise in the performance so as to enable the firm to take immediate and effective actions.
4. A series of intra firm and inter firm cash flow statement reveals whether the firm's liquidity is improving or deteriorating over a period of time.
5. Cash flow statement helps in planning the repayment of loans, replacement of fixed assets and other similar long term planning of cash.
6. Cash flow analysis is more useful and appropriate than funds flow analysis for short-term financial analysis as in a very short period it is cash, which is more relevant, than the working capital for forecasting the ability of the firm to meet its immediate obligations.
7. Cash flow statement prepared according to AS-3 is more suitable for making comparison than the funds flow statement, as there is no standards format used for the same.
8. Cash flow statement provides information of all activities classified under operating, investing and financing activities.

#### **5.4 STRUCTURE OF CASH FLOW STATEMENT**

According to AS-3, the cash flow statement should report cash flows during the period classified by operating, investment and financing activities as follows:

- Cash flow from operating activities
- Cash flow from investing activities

- Cash flow from financing activities

1. **Cash flow from operating activities** involves cash generated by producing and delivering goods and providing services. Cash inflow includes receipts from customers for sales of goods and services (including collection of debtors). Cash outflow from operating activities include payments to suppliers for purchase of material and for services, payment to employees for services and payment to governments for taxes and duties. Then by comparing the inflow and outflow of cash we can determine the net value of cash flows. If the inflows are more than outflows then it is called cash generated from operating activities or if cash outflows are more than cash inflows then it is called cash lost in operating activities. This cash flow is a key indicator of the extent to which the operations of the enterprise have generated sufficient cash flows to maintain the operating capability of the enterprise, pay dividend, repay loans and make new investments without recourse to external sources of financing. Information about the specific component of historical operating cash flows is useful, in conjunction with other information, in forecasting future operating cash inflows.

Examples of cash flows from operating activities are:

- Cash receipts from the sale of goods and rendering the services.
- Cash receipts from royalties, fees, commission and other revenue.
- Cash payment to suppliers of goods and services.
- Cash payment to and on behalf of employees.
- Cash receipts and cash payment of an insurance enterprise for premium and claims, annuities and other policy benefits.

Cash payment and refund of income tax unless can be specifically identified with financing and investing activities.

- Cash receipts and payments relating to futures contract, forward contracts, option contracts and swap contracts when the contracts are held for dealing or trading purpose.

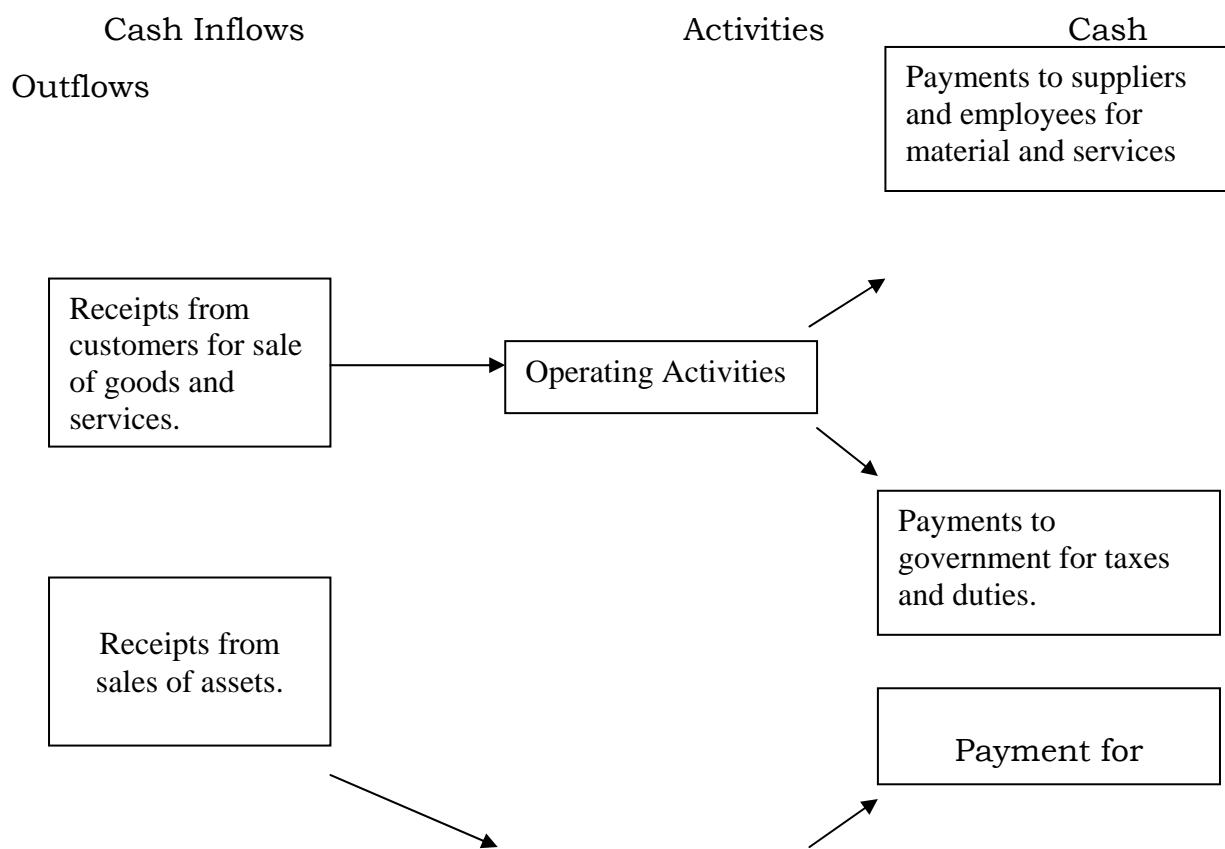
Some transactions, such as the sale of an item of plant, may rise to a gain or loss that is included in the determination of the net profit or loss. However, the cash flow relating to such transactions are cash flows from investing activities.

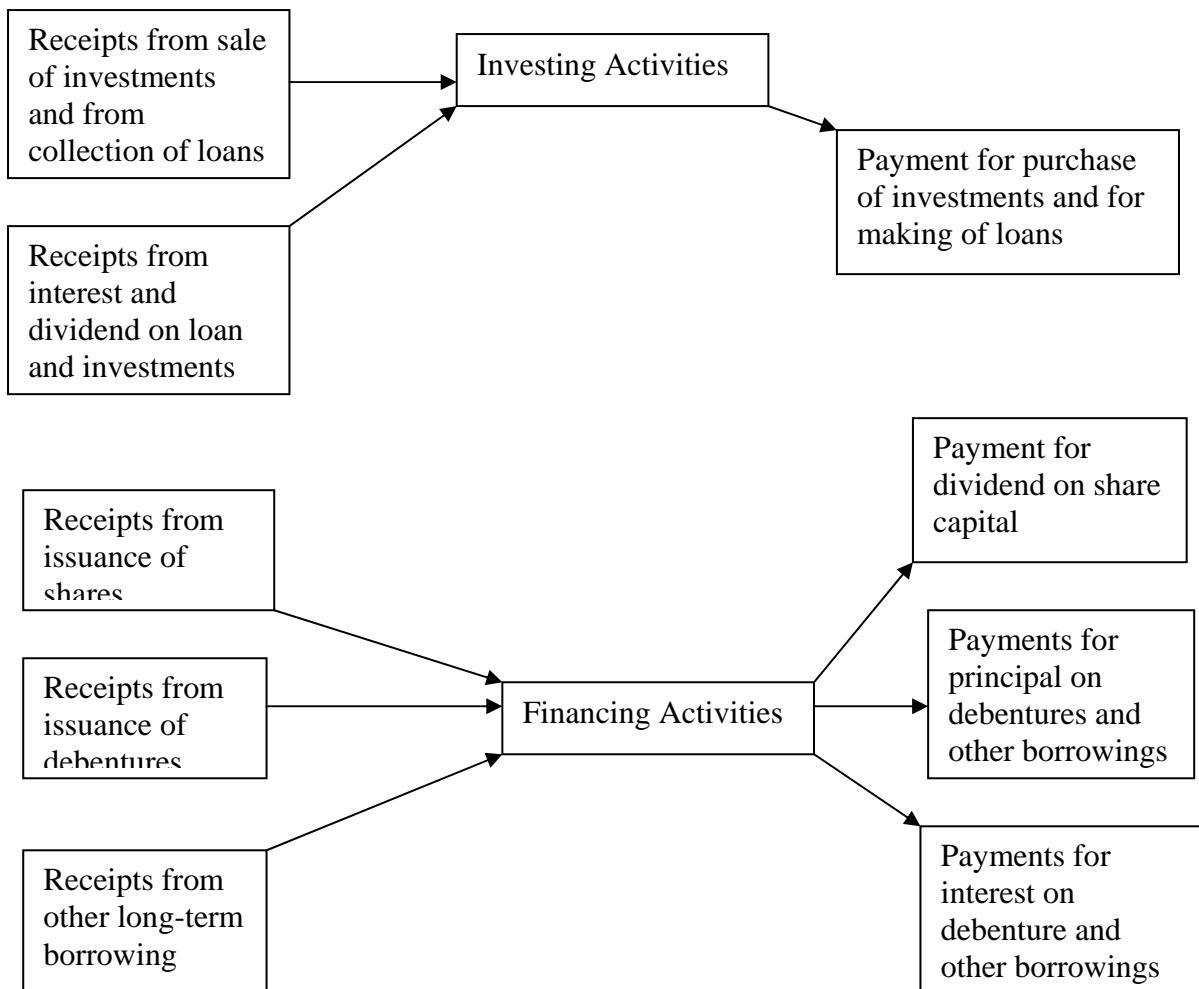
2. **Cash flow from investing activities involves** the cash generated by making and collecting loans and acquiring and disposing of debts and equity instruments and fixed assets. Cash inflows from investing activities are receipts from collection of loans, receipts from sales of shares, debts or similar instruments of other enterprises, receipts from sale of fixed assets and interest and dividend received from loans and investments. Cash outflows from investing activities are disbursement of loans, payments to acquire share debts or similar instruments of other enterprise and payment to acquire fixed assets. Cash receipts and payments relating to futures contract, forward contracts, option contracts and swap contracts except when the contracts are held for dealing or trading purpose or the payments or receipts are classified as financing activities.
3. **Cash flows from financing activities** involves cash generated by obtaining resources from owners and providing them with a return on their investment, borrowing money and repaying amounts borrowed and obtaining and paying for other resources obtained from creditors on long-term credit. Cash flows from financing activities involve the proceeding from issuing share or other similar instrument, debentures, mortgages, bonds and other short term or long-term borrowings. Cash outflow from financing activities are payments of

dividend, payments to acquire or redeem shares to other similar instruments of the enterprise, payment of amount borrowed, principal payment to creditors who have extended long-term credit and interest paid.

It is important to note down that the classification of the cash flows into operating, investing and financing categories will depend upon the nature of the business. For example, for financial institutions like banks lending and borrowing are parts of their business operations. So the income and expenditure regarding the borrowing and lending will be included in the cash flow from operating activities.

**Figure 5.1 : Structure of Cash Flows**





## 5.5 TREATMENT OF SOME TYPICAL ITEMS

AS-3 (Revised) has also provided for the treatment of cash flow from some peculiar items as discussed below:

- 1) **Extraordinary items:** The cash flow from extraordinary items just like winning the lottery, loss by fire etc. either classified as arising from operating, investing or financing activities as appropriate and separately disclosed in the cash flow statement to enable users to understand their nature effect on the present and future cash flows of the enterprise.
- 2) **Interest and Dividend:** A great care have to be taken regarding the interest and dividend as receivable of the interest and dividend is a

result of investment so it is considered as cash inflow from investing activities while payment of dividend and interest arise due to collection of finance so it is termed as cash outflow from financing activities. But in case of a financial institution payment and receipts of interest and dividend are related to their main business so these items are treated under the head of cash flow from operating activities.

- 3) **Taxes on Income:** Taxes paid by the business should be treated as cash outflow generated by operating activities if nothing is stated in the problem but if it is specified in question that the tax arise due to financing and investing activities then that tax should be treated under respective activities.
- 4) **Acquisitions and Disposal of Subsidiaries and other Business Units:** The aggregate cash flows arising from acquisitions and from disposal subsidiaries or other business units should be presented separately and classified as investing activities. The separate presentation of the cash flow effects of acquisitions and disposal of subsidiaries and other business units as single line items helps to distinguish these cash flows from other cash flows. The cash flow effects of disposal are not deducted from those of acquisitions.
- 5) **Foreign Currency Cash Flow:** Cash flows arising from transactions in a foreign currency should be recorded in an enterprise's reporting currency by applying to the foreign currency amount the exchange rate between the reporting currency and the foreign currency at the date of the cash flow. The effect of the changes in exchange rates on cash and cash equivalents held in a foreign currency should be reported as a separate part of the reconciliation of the changes in cash and cash equivalents during the period.

Unrealized gains and loss arising from changes in foreign exchange rates are not cash flows. However, the effect of exchange rate changes on cash and cash equivalent held is reported in the cash flow

statement in order to reconcile the value of cash and cash equivalent at the beginning and the end of the period. This amount is presented separately from cash flows from operating, investing and financing activities and includes the difference, if any.

6) **Non-Cash Transactions:** There are some transactions, which do not affect the cash positions of the business directly but affect the capital and asset structure of an enterprise. Such as the conversion of debts into equity, the acquisitions of an enterprise by means of issue of shares etc. These transactions should not be included in the cash flow statement but due to their importance these can be shown as additional information under the statement.

## 5.6 FORMAT OF CASH FLOW STATEMENT

AS-3 (Revised) has not provided any specific format for preparing a cash flow statement. The cash flow statement should report cash flows during the period classified by operating, investing and financing activities. A widely used format of cash flow statement is given below.

**COMPANY'S NAME:.....**

### **Cash Flow Statement**

For the year ended.....

Particulars	Rs.	Rs.
<b>Cash flow from Operating Activities</b> (List of the individual inflows and outflows)	.....	.....
Net Cash Flow from Operating Activities	.....	.....
<b>Cash Flows from Investing Activities</b> (List of individual inflows and outflows)	.....	.....
Net Cash Flows from Investing Activities	.....	.....
<b>Cash Flows from Financing Activities</b> (List of individual inflows and outflows)	.....	.....
Net Cash Flows from Financing Activities	.....	.....
<b>Net increase (Decrease) in Cash and Cash Equivalents</b>	.....	.....
Cash and cash Equivalent at the Beginning of the period	.....	.....
Cash and cash Equivalent at the End of the period	.....	.....

## 5.7 PROCEDURE FOR PREPARING A CASH FLOW STATEMENT

Let us study how to construct the cash flow statement. As shown in the format of the cash flow statement all the cash inflows and outflows will be classified according to operating, investing and financing activities. Following are the procedures of the calculation of cash flow from different activities: -

**Determination of cash flow from operating activities:** The profit and loss accounts shows whether an enterprise's operations have results in profit or loss, but it does not indicate cash inflows and cash outflows from operating activities. This is because net profit is computed using the accrual basis of accounting. Revenue is recorded when earned although the cash for some of them may not have been collected, and expenses are recorded when incurred although all of them may not have been paid in cash. Further, depreciation, amortization and provision for doubtful debts do not reflect cash outflows in both current and future periods. Thus, the net profit will not indicate the net cash flow from operations. In order to arrive at net cash flow from operating activities, it is necessary to restate revenues and expenses on a cash basis. This is done by adjusting for the effects of transactions considered in preparing the profit and loss account that did not involve cash inflows or cash outflows. There are two methods for reporting the net cash flow from operating activities.

- 1) Direct method
- 2) Indirect method

**1) Direct method:** Under this method, cash receipts from operating activities and cash payments for operating expenses are calculated to arrive at cash flows from operating activities. The difference between

the cash receipts and cash payments is the net cash flow provided by operating activities. Cash flow from operating activities can be calculated as follows:

**Cash Flow from Operating Activities:**

Cash received from customers	XXX
Cash paid to suppliers and employees	<u>(XXX)</u>
Cash generated from operations	XXX
Income tax paid	<u>(XXX)</u>
Cash flow before extraordinary item	XXX
Extraordinary item	<u>(XXX)</u>
Net cash flow from operating activities	XXX

**Cash received from customers:** Cash receipts from customers from cash sales and collections of debtors arising from credit sales. Cash sales result in cash inflows in the current period. However, collections from customers require additional calculations, sales from an earlier period may be collected in the current period, sales from the current period may be collected in future period or some debtors may not be collected at all. As result, collections from customers in current period are seldom equal to credit sales. The relationship among the credit sales, change in debtors and collections from customers may be stated in equation form as follows:

Cash received from customers = Sales + Opening balance of trade debtors (Debtors & B/R) – Closing balance of trade debtors.

**Cash paid to suppliers and employees:** After calculation of cash received from customers the second thing that would be calculated is cash paid to suppliers and employees in lieu of services and goods received from them. Cash paid to customers and employees can be calculated by using following equation:

Cash Paid to suppliers and employees = Purchases for the year as per statement of profit + Opening trade creditors (Creditors & B/P) – Closing trade creditors + selling and administrative expenses + prepaid expenses at the end of the year – prepaid expenses in the beginning of the year.

**Income tax paid:** The amount of the income tax paid usually differs from the estimated income tax expense, appearing on the profit and loss account. Also a part of the income tax expenses for a year is paid in the following year. The difference between income tax payment and income tax expense result in a change in income tax payable. The following equation shows this relationship:

Tax paid during the year = Opening balance of tax unpaid + Provision made during the year – Closing balance of tax unpaid.

Let us take an example to understand these treatments.

**Illustration 5.1:** The Board of Director of Amit ltd. was not able to decide that why the Co. are not having adequate cash balance. The amount of profit of the company for the year 2003 was Rs. 90,000. This was highest amount as compared to previous years. You have been asked to prepare a Cash Flow Statement with the help of following information using direct method.

Balance Sheet					
	(Rs. in thousands)				
Liabilities	Dec.2002	Dec.2003	Assets	Dec.2002	Dec.2003
Issue and paid up capital	1,575.00	1,575.00	Long term assts	1,125.00	2,047.50
Profit and Loss A/c	157.00	225.00	Closing stock	337.50	900.00
Mortgage Loan		900.00	Prepayments	45.00	90.00
Tax unpaid	22.50	67.50	Trade debtors	112.50	450.00
Trade creditors	315.00	877.50	Cash	450.00	157.50
	2,070.00	3,645.00		2,070.00	3,645.00

#### Statement of Profit

(For the year ended Dec.2003)

Particulars	Rs. ,000	Rs. ,000
Sales		2,250.00
Opening stock	337.50	
Add. Purchases	2205.00	
	2,542.50	
Less Closing stock	900.00	1642.50
Gross profit		607.50
Less:		
Administrative expenses	247.50	
Depreciation	180.00	
Taxes (Provision)	90.00	517.50
Net Profit		90.00
Payment of dividends		22.50
		67.50
Add. Profit and loss a/c (Jan.2003)		157.50
Balance on Dec. 2003		225.00

You are also informed that a new building was purchased on 15<sup>th</sup> June 2003 for Rs. 11,02,500.

**Solution:**

Cash Flow Statement (For the year ended 31st Dec.2003)		
Particulars	Rs., 000	Rs., 000
<b>Cash Flow from Operating Activities</b>		
Cash Received from Customers (Note-1)	1,912.50	
Cash Paid to Suppliers and Employees (Note-2)	(1,935.00)	
Cash generated from Operating Activities	(22.50)	
Income Tax Paid (Note-3)	(45.00)	
Net Cash Used in Operating Activities		(67.50)
<b>Cash Flow from Investing Activities</b>		
Purchase of New Building	(1,102.50)	
Net Cash Used in Investing Activities		(1,102.50)
<b>Cash Flow from Financing Activities</b>		
Raising of Mortgage Loan	900.00	
Dividend Paid	(22.50)	
Net Cash Provided by Financing Activities		877.50
Net decrease in cash and cash equivalent		(292.50)
Opening balance of cash		450.00
Closing balance of cash		157.50

**Working Notes:**

1. Calculation of cash received from customers:

Sales for the year as per the statement	2,250.00
Add: Trade debtors in the beginning	112.50
	2362.50

Less: Trade debtors at the end	450.00
Cash received from customers	1912.50

2. Calculation of cash paid to suppliers and employees:

Purchase for the year as per the statement of profit	2,205.00
Add: Trade creditors in the beginning	315.00
	2520.00

Less: Trade creditors at the end	877.50
Cash paid to creditors for purchase of goods (A)	1642.50
Administrative expenses as per the statement of profit	247.50
Add: Prepaid exp. at the end	90.00
	337.50

Less: Prepaid Exp. In the beginning	45.00
Cash paid for services (B)	292.50
Cash paid to suppliers and employees (A+B)	1,935.00

**3.Calculation of tax paid:**

Opening balance of tax unpaid	22.50
Add: Provision made during the year	90.00
	112.50
<b>Less: Closing balance of tax unpaid</b>	<b>67.50</b>
Tax paid during the year	45.00

3) **Indirect Method:** Under the indirect method, the net cash flow from operating activities is determined by adjusting net profit or loss for the effect of:

- i) Non cash items such as depreciation, provision, deferred taxes and unrealized foreign exchange gains and losses
- ii) Changes during the period in inventories and operating receivables and payables.
- iii) All other items for which cash effects are investing or financing flows.

The indirect method is also called the reconciliation method as it involves reconciliation of net profit or loss as given in the profit and net cash flow from operating activities as shown in the cash flow statement. Cash flow from operating activities by using the indirect method can be calculated as follows:

Net Profit before Tax and Extraordinary Items	XXX
Add: Non-cash and non-operating items, which have already been	
Debited to P/L A/c;	
Depreciation	
Transfer to reserve and provisions	
Goodwill written off	
Preliminary expenses written off	
Other intangible assets written off just as discount or loss on issue of	
Shares, debentures and underwriting commission	
Loss on disposal of fixed assets	
Loss on sale of investment	
Foreign exchange loss	XXX
	XXX
Less: Non-cash and non-operating items, which have already been	
Credited to P/L A/c	
Gain on the sale of fixed assets	
Profit on sale of investment	
Income from interest or dividend	
Appreciation in values of fixed assets	
Reserve written back	
Foreign exchange gains	(XXX)
Operating profit before adjustment of working capital changes	XXX
Adjustment for changes in current operating assets and liabilities:	
Add: Decrease in accounts of current assets (except cash and cash equivalents)	XXX
Add: Increase in accounts of current operating liabilities (except Bank overdraft)	XXX
Less: Increase in accounts of current assets	(XXX)
Less: Decrease in accounts of current liabilities	(XXX)

Cash generated from operation before tax

XXX

Less: Tax paid (XXX)

Cash flow before extra-ordinary items XXX

Add/Less: Extra-ordinary items XXX

Net cash flow from operating activities XXX

Let us take an example to clear the above points.

**Illustration 5.2:** The following are the comparative Balance Sheet of Ashish Ltd. as on 31<sup>st</sup> Dec.2003 and 2004.

Balance Sheet					
	Assets				
Liabilities	2003	2004		2003	2004
Share capital (share of Rs.10 each)	3,50,000	3,70,000	Land	1,00,000	1,50,000
Profit & Loss A/c	50,400	52,800	Stock	2,46,000	2,13,500
9% Debentures	60,000	30,000	Goodwill	50,000	25,000
Creditors	51,600	59,200	Cash & Bank	42,000	35000
			Temporary Investment	3,000	4000
			Debtors	71,000	84,500
	5,12,000	5,12,000		5,12,000	5,12,000

Other particulars provided to you are: A) Dividend declared and paid during the year Rs.17,500 B) Land was revaluated during the year at Rs. 1,50,000 and profit on the revaluation transferred to P/L A/c. you are required to prepare a cash flow statement for the year ended 31/12/04.

**Solution:**

Cash Flow Statement (for the year ended 31St Dec.2004)		
Particulars	Rs.	Rs.
<b>Cash Flow from Operating Activities</b>		
Increase in the balance of P/L A/c	2,400	
Adjustment for non-cash and non-operating items:		
Profit on revaluation of land	(50,000)	
Goodwill written off	25,000	
Dividend declared	17,500	

Operating profit before working capital changes	(5,100)	
Adjustment for changes in current operating assets and liabilities:		
Increase in creditors	7,600	
Decreases in stock	32,500	
Increase in debtors	(13,500)	
Cash generated from operating activities	21,500	
Income tax paid	-----	
Cash flow from extra ordinary items	-----	
Net cash flow from operating activities	21,500	
<b>Cash flow from investing activities</b>	-----	
<b>Cash flow from financing activities</b>	-----	
Proceeds from issue of share capital	20,000	
Redemption of debentures	(30,000)	
Dividend paid	(17,500)	
Net cash used in financing activities	(27,500)	
Net decrease in cash and cash equivalent	(6,000)	
Cash and cash equivalent at the beginning of the year	45,000	
Cash and cash equivalent at the end of the year	39,000	

## 5.8 LIMITATIONS OF CASH FLOW STATEMENT

Despite a numbers of uses, cash flow statement suffers from the following limitations:

1. As cash flow statement is based on cash basis of accounting, it ignores the basic accounting concepts of accrual basis.
2. Some people feel that as working capital is a wider concept of funds flow statement provides a more complete picture than cash flow statement. So it is based on narrow concept.
3. Cash flow statement is not suitable for judging the profitability of a firm as non-cash charges are ignored while calculating cash flows from operating activities.

## 5.9 COMPARISON BETWEEN FUNDS FLOW AND CASH FLOW STATEMENT

The term funds have a variety of meaning. In narrow sense it means cash and the statement of changes in the financial position prepared on cash basis is called a cash flow statement. In the most popular sense, the term funds refer to working capital and a statement of

changes in the financial position prepared on this basis is called a funds flow statement. A cash flow statement is much similar to a funds flow statement as both are prepared to summarize the causes of changes in the financial position of a business. However the following are the main differences between funds and a cash flow statement.

<b>Difference between Funds Flow Statement and Cash Flow Statement</b>		
<b>Basis of Difference</b>	<b>Funds Flow Statement</b>	<b>Cash Flow Statement</b>
1. Basis of Concept	It is based on a wider concept of funds, i.e. working capital	It is based on a narrow concept of funds, i.e. cash
2. Basis of Accounting	It is based on accrual basis of accounting.	It is based on cash basis of accounting.
3. Schedule of changes in working capital	Schedule of changes in working capital is prepared to show the changes in current assets and current liabilities.	No schedule of changes in working capital is prepared.
4. Method of Preparing	Funds flow statement reveals the sources and applications of funds. The net difference between sources and applications of funds represents net increase in working capital.	It is prepared by classifying all inflows and outflows in term of operating, investing and financing activities. The net difference represents net increase or decrease
5. Basis of Usefulness	It is useful in planning intermediate and long term financing.	It is useful in planning intermediate and long term financing.
6. Description	It describes the reasons for change in working capital.	It describes the reasons for changes in cash and cash equivalent.

**Illustration 5.3:** Western Telecommunication Company's profit and loss account for the year

ended January 31,2004, and its balance sheet as on Dec.2003 and Dec.2004 are as follows:

### **Western Telecommunication Company: Profit and Loss Account**

(For the year ended Dec. 2004)

Sales	Rs 5,70,000
-------	-------------

Interest Income	2,000
-----------------	-------

Gain on sale of investment	7,000
Cost of goods sold	4,45,000
Depreciation Expenses	89,000
Selling and Distribution Exp.	46,000
Interest Exp.	14,000
Loss on sale of plant and machinery	3000
	<hr/>
Profit before income tax and extraordinary items	(18000)
Income Tax	<hr/>
Profit before extraordinary items	(18,000)
Extraordinary item: Insurance proceeds from Earthquake loss claim	<hr/>
Net Profit	(18,000)
	<hr/>

**WESTERN TELECOMMUNICATION COMPANY: Balance Sheet as on 31<sup>st</sup> December**

	<b>2003</b>	<b>2004</b>
<b>Sources of Funds</b>		
Shareholder funds		
Equity share capital	1,55,000	85,000
Profit and loss account	1,02,000	1,20,000
<b>Total share holder fund</b>	<hr/> 2,57,000	<hr/> 2,05,000
Loan funds		
Secured loans	97,000	57,000
Unsecured loans	1,81,000	1,91,000
<b>Total loan funds</b>	<hr/> 2,78,000	<hr/> 2,48,000
Current liabilities		
Bill payable	6,000	9,000
Creditors	24,000	1,78,000
Income tax payable	9,000	17,000
<b>Total current liabilities</b>	<hr/> 39,000	<hr/> 2,04,000
<b>Total source of funds</b>	<hr/> 5,74,000	<hr/> 6,57,000
<b>Applications of funds</b>		
Fixed assets		
Plant and machinery	7,20,000	5,40,000
Less accumulated depreciation	3,62,000	3,05,000
<b>Fixed assets (net)</b>	<hr/> 3,58,000	<hr/> 2,35,000
<b>Investment</b>	<hr/> 18,000	<hr/> 66,000
Current assets		
Inventories	1,51,000	1,19,000
Debtors (less provision of doubtful debts 8,000 & 12,000)	29,000	1,66,000
Prepaid expenses	6,000	2,000
Cash and cash equivalent	12,000	69,000

<b>Total current assets</b>	1,98,000	3,56,000
<b>Total application of funds</b>	5,74,000	6,57,000

**Additional information:**

- i. Purchased machinery costing Rs.1,50,000 with cash.
- ii. Sold machinery with cost of Rs.45,000 and accumulated depreciation of Rs.32,000 for Rs.10,000.
- iii. Purchased investment for Rs. 30,000.
- iv. Sold investment costing Rs. 78,000 for Rs.85,000
- v. Purchased machinery for Rs 75,000 in exchange for secured debentures.
- vi. Issued at par share for Rs. 50,000
- vii. Converted secured debentures of Rs. 20,000 to equity share of Rs. 10 at par
- viii. Repaid unsecured debentures of Rs. 10,000.
- ix. Redeemed secured debentures of Rs. 15,000 at par
- x. Wrote off Rs. 14,000 of debtors when a customer become insolvent and provided Rs. 10,000 for doubtful, included in selling and distribution expenses.

**Required**

1. Prepare the statement of cash flows according to direct method.
2. Prepare the statement of cash flows according to indirect method.

**Solution:**

**1. Statement of Cash Flows- Direct Method**

**WESTERN TELECOMMUNICATION COMPANY: Statement  
of Cash Flows**

(For the year ended Dec.2004)

**Cash Flow from Operating Activities**

Cash received from customers (I)	6,97,000
Cash paid to suppliers and employees (ii)	(674,000)
Cash generated from operations	23,000
Income tax Paid (iii)	(8,000)
Cash flow before extraordinary items	15,000
Extraordinary items	0
Net cash provided by Operating Activities	15,000

**Cash Flows from Investing Activities**

Purchase of plant and machinery	(150,000)
Proceeds from sale of plant and machinery	10,000
Purchase of investments	(30,000)
Proceeds from sale of investment	85,000

Interest received	2,000	
Net Cash Used in Investing Activities		(83,000)
<b>Cash Flows from Financing Activities</b>		
Proceeds from Issuance of share capital	50,000	
Repayment of unsecured loans	(10,000)	
Redemption of secured debentures	(15,000)	
Interest paid	<u>(14,000)</u>	
Net Cash Provided By Financing Activities		11,000
Net Decrease in Cash and Cash Equivalent		(57,000)
Cash and Cash Equivalent at beginning of period		69,000
Cash and Cash Equivalent at end of period		<u>12,000</u>

#### **Supplemental schedule of non-cash investing and financing activities**

1. The company purchased for Rs. 75,000 in exchange for secured debentures.
2. The company converted secured debentures of Rs. 20,000 to equity shares of Rs. 10 at par.

#### **Working Notes:**

- (5,70,000 + 1,78,000 - 37,000 - 14000)
- (4,45,000 + 46,000 - 1,19,000 - 2,000 + 9,000 + 1,78,000 + 1,51,000 + 6,000 - 6,000 - 24,000 - 10,000)
- (17,000 - 9,000)

#### **2. Statement of Cash Flows – Indirect Method**

### **WESTERN TELECOMMUNICATION COMPANY: Statement of Cash Flows**

(For the year ended Dec.2004)

<b>Cash Flow from Operating Activities</b>	(18,000)
Net profit before income tax and extraordinary items	
Adjustment to reconcile Net Profit to net cash flow from Operating Activities	
Depreciation	89,000
Provision for doubtful debts	10,000
Loss on sale of plant and machinery	3,000
Gain on sale of investment	(7,000)
Interest expenses	14,000
Interest income	<u>(2,000)</u>
Operating profit before working capital changes	89,000
Decrease in Debtors	1,27,000
Increase in inventories	(32,000)
Increase in Prepaid expenses	(4,000)
Decrease in bills payable	(3,000)

Decrease in creditors	(154,000)
Cash generated from operations	23,000
Income tax paid	(8,000)
Cash flow before extraordinary items	15,000
Extraordinary items: Proceed from Earthquake Insurance	
Claim	0
Net Cash Provided by Operating Activities	15,000
<b>Cash Flows from Investing Activities</b>	
Purchase of plant and machinery	(150,000)
Proceeds from sale of plant and machinery	10,000
Purchase of investments	(30,000)
Proceeds from sale of investment	85,000
Interest received	2,000
Net Cash Used in Investing Activities	(83,000)
<b>Cash Flows from Financing Activities</b>	
Proceeds from Issuance of share capital	50,000
Repayment of unsecured loans	(10,000)
Redemption of secured debentures	(15,000)
Interest paid	(14,000)
Net Cash Provided By Financing Activities	11,000
Net Decrease in Cash and Cash Equivalent	(57,000)
Cash and Cash Equivalent at beginning of period	69,000
Cash and Cash Equivalent at end of period	12,000

#### **Supplemental schedule of non-cash investing and financing activities**

1. The company purchased for Rs. 75,000 in exchange for secured debentures.
2. The company converted secured debentures of Rs. 20,000 to equity shares of Rs. 10 at par.

#### **5.10 SELF-ASSESSMENT EXERCISE**

1. Define the term 'Cash Flow'. Explain the objective of cash flow analysis.
2. How does the statement of cash flows differ from the funds flow statement?
- 3. What is the purpose of statement of cash flows? How is it prepared? Explain and illustrate.**

<b>4. Why is the statement of cash flow considered necessary in addition to the profit and loss account and balance sheet?</b>
--

5. Explain the procedure of preparing a cash flow statement.
6. The comparative balance sheet for Varun Ltd. are given below:

	<b>Dec.2002</b>	<b>Dec.2003</b>
<b>Assets:</b>		
Cash and Bank Balance	82,000	22,000

Debtors	1,04,000	24,000
Stock	1,12,000	60,000
Prepaid Expenses	22,000	14,000
Plant and Machinery	3,80,000	3,60,000
Goodwill	36,000	40,000
	<u>7,36,000</u>	<u>5,20,000</u>

**Liabilities:**

Creditors	30,000	14,000
Provision for Depreciation	1,00,000	60,000
Debentures	1,02,000	1,02,000
Premium on Debenture Issue	12,000	18,000
Share Capital	1,90,000	90,000
Share Premium	30,000	
Reserve and Surpluses	<u>2,72,000</u>	<u>2,36,000</u>
	<u>7,36,000</u>	<u>5,20,000</u>

The following additional informations is available from the accounting records for 2002.

1. Debenture premium of Rs. 6,000 was amortized during the year.
2. Dividend paid Rs. 6,000.

You are required to prepare a cash flow statement.

(Answer: Net cash used in operating activities Rs.44,000; Net cash used in investing activities Rs. 20,000; Net cash provided by financing activities Rs. 1,24,000; net increase in cash and cash equivalent Rs. 60,000)

7. Prepare a cash flow statement of Anoop Business Corporation from the following informations:

**Balance Sheet**

As on Jan, 1st & Dec. 31<sup>st</sup> 2002

	<b>Jan.1</b>	<b>Dec.31</b>
<b>Assets</b>		
Cash and Bank	40,000	44,400
Account Receivables	10,000	20,700
Inventories	15,000	15,000
Land	4,000	4,000
Business Premises	20,000	16,000
Plant and Equipment	15,000	17,000
Accumulated Depreciation	(5,000)	(2,800)
Patents and Trade marks	1,000	900
<b>Total Assets</b>	<u>1,00,000</u>	<u>1,15,200</u>
<b>Liabilities:</b>		
Current Liabilities	30,000	32,000
Bonds Payable	22,000	22,000
Bonds Payable Discount	(2,000)	(1,800)
Capital Stock	35,000	43,500
Retained Earning	15,000	19,500

<b>Total Liabilities</b>	<b>1,00,000</b>	<b>1,15,200</b>
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Additional Information

- Income for the period Rs.10,000.
- A building the cost Rs.4,000 and which had a book value of Rs. 1,000 was sold for Rs. 1,400.
- Depreciation charged for the year Rs. 800
- There was Rs. 5,000 issue of capital stock
- Cash dividend of Rs. 2,000 and stock dividend of Rs. 3,500 was declared.

(Answer: Net cash operating activities Rs2,000; Net cash used in investing activities Rs. 600; Net cash from financing activities Rs. 3,000; net increase in cash and cash equivalent Rs. 4,000)

8. From the following particulars, prepare a cash flow statement for the year ended 31<sup>st</sup> March 2004

- Total sale for the year were Rs. 20,50,000 out of which cash sales amounted to Rs. 14,20,000.
- Total purchases for the year were Rs. 15,30,000 out of which cash purchases amounted to Rs. 10,20,000.
- Cash collected from creditors during the year amounted to Rs. 4,80,000.
- Cash paid to suppliers was Rs.4, 50,000.
- Income tax paid Rs. 80,000.
- Equity shares of the face value of Rs. 2,00,000 were issued at a premium of 5% during the year.
- Rs. 25,000 was paid as dividend for the year ended 31<sup>st</sup> March 2004.
- Redeemable preference share of the face value of Rs. 1,00,000 were redeemed during the year at a premium of 10%.
- New machinery war purchased for Rs. 30,000on 1<sup>st</sup> Jan. 2004.
- Depreciation for the year was Rs. 40,000 where as salary and other expenses amounted to Rs. 1,80,000 out of which Rs. 20,000 are outstanding.
- The balance of the cash & bank as on 1<sup>st</sup> April 2003 was Rs. 85000.

(Answer: Net cash flows from operating activities Rs 1,90,000; Net cash used in investing activities Rs. 30,000; Net cash from financing activities Rs. 75,000; net increase in cash and cash equivalent Rs. 2,35,000)

9. The following are the Balance Sheets of GOYAL enterprises

	<b>Jan.1</b>	<b>Dec.31</b>
<b>Assets</b>		
Cash and Bank	5,000	8,000
Account Receivables	35,000	38,000
Inventories	25,000	22,000
Land	20,000	30,000
Business Premises	50,000	5,50,000
Machinery less Dep.	80,000	87,000

Delivery van		25,000
<b>Total Assets</b>	<b>2,15,000</b>	<b>2,65,000</b>
<b>Liabilities:</b>		
Current Liabilities	35,000	40,000
Loan from Banks	30,000	25,000
Mrs. Goyal's Loan		20,000
Capital	1,00,000	1,60,000
Hire Purchase vendor		20,000
<b>Total Liabilities</b>	<b>2,15,000</b>	<b>2,65,000</b>

**Additional Information**

The delivery van was purchased on hire purchase basis on Dec.2003, Payment of Rs. 5,000 was made at the time of agreement and the balance of amount is to be paid in 20 monthly installments of Rs. 1,000 each together with interest @10% per annum. During the year the proprietor withdraw Rs. 25,000 for household expenses. The provision for depreciation on machinery on 1/1/03 was Rs. 27,000 and on 31/12/03 was Rs. 35,000. You are required to prepare the cash flow statement.

(Ans. Cash operating Profit Rs. 43,000)

## 5.11 SUGGESTED READINGS

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## **COURSE: MANAGEMENT ACCOUNTING**

**COURSE CODE: MC-105  
LESSON: 06**

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## **MARGINAL COSTING AND PROFIT PLANNING**

**Objective:** The present lesson explains the CVP analysis. Further, it discusses the use of the marginal costing technique for tactical decisions in different manufacturing concerns.

### **LESSON STRUCTURE**

- 6.1 Introduction
- 6.2 CVP Assumptions and Uses
- 6.3 Break-Even Point and Margin of Safety Equation Method
- 6.4 Graphical Representation of CVP Relationship
- 6.5 Marginal Costing Techniques
- 6.6 Summary
- 6.7 Self-Test Questions
- 6.8 Suggested Readings

#### **6.1 INTRODUCTION**

It is important for managers to ascertain the cost behavior pattern and use it to estimate the total cost, total revenues and thereby profits at various sales volumes.

The cost revenue relationship holds for a short period. Therefore, this relationship cannot be used to estimate long-term performance of the firm. However, this short-term validity helps to maximise profit with given resources. For the purpose of taking tactical decisions managers use the marginal costing techniques because these short-term decisions influence fixed costs. To understand the use of Marginal costing techniques, we have to study Cost-volume-profit (CVP) analysis. The Cost-volume-profit (CVP) analysis is the study of the effects on future profit of changes in fixed

cost, variable cost, sales price, quantity and mix. The aim of CVP analysis is to estimate the total cost, total revenue and thereby profit of various sales volumes. Managers use this technique extensively to determine the break-even point and margin of safety. Break-even point is the level of activity at which there is neither profit nor loss. Margin of safety ratio indicates the percentage by which forecast turnover exceeds or falls short of breakeven turnover. The CVP analysis assumes that output is the only cost and revenue driver.

## **6.2 CVP ASSUMPTIONS AND USES**

The assumptions of the CVP analysis are: (a) Fixed and variable cost patterns can be established with reasonable accuracy, (b) Total fixed costs and variable cost per unit will not change during the period under consideration, (c) Selling price will remain constant at all sales volumes, (d) Factor price per unit (e.g. material prices, wage rates) will remain constant at all sales volumes, (e) Efficiency and productivity will remain unchanged during the period under consideration, (f) In a multi-product situation, sales-mix will remain unchanged during the period, (g) Output is the only relevant factor affecting costs and revenue, and (h) The volume of production will be equal to the volume of sales that is accretion decoration to inventory level will be insignificant during the period.

The uses of CVP analysis are: (a) To determine the 'Break-even point' in terms of sales volume or sales value, (b) To ascertain the Margin of safety ratio, (c) To estimate profits or losses at various activity levels, (d) To assess the likely effect of management decisions such as an increase or a reduction in selling price, adoption of a new method of production which will reduce fixed costs and increase variable costs on the profitability of the firm, and (e) To determine the optimum selling price.

### **6.3 BREAK-EVEN POINT AND MARGIN OF SAFETY EQUATION METHOD**

Break-even point is the sales volume or sales value at which the firm neither makes

profit nor incurs loss. In other words, at the break-even point, revenue equals total costs.

### 6.3.1 Marginal Cost Equation

Revenue - Variable costs - Fixed costs = Operating income

Or  $S - V - F = P$

Or  $S - V = F + P = C$

Where  $S$  = revenue,  $V$  = total variable cost,  $C$  = total contribution  $F$  = total fixed cost

### 6.3.2 Contribution/Sales Ratio (C/S Ratio)

$C/S$  = Total contribution/Total turnover x 100

Or  $(S - V)/S \times 100$  or  $(F + P)/S \times 100$

The  $C/S$  ratio represents the percentage of sales, which contributes towards fixed costs and operating profit. CVP analysis assumes that  $C/S$  ratio does not change with changes in output or sales volumes. It is also termed as Profit Volume ratio or PV ratio.

### 6.3.3 Break-even Sales

In determining break-even sales, we need to know

(a) Fixed costs and (b) Contribution per unit or the  $C/S$  ratio.

At break-even point (BEP), total contribution equals fixed costs. Therefore, BEP in terms of unit is calculated by dividing total fixed costs by contribution per unit. BEP in terms of sales value is calculated by dividing total fixed costs by the  $C/S$  ratio.

**Example 6.1:** The following information is available from the annual budget of a company manufacturing only one item.

Budgeted output and sales 5000 units

Budgeted selling price per unit Rs. 40

Budgeted cost per unit:

Material Rs. 15

Direct labour Rs. 5

Variable overhead	Rs. 10	
Fixed cost per unit	<u>Rs. 5</u>	<u>(35)</u>
Budgeted profit per unit		<u>Rs. 5</u>

Calculate the break-even point both in terms of the number of units and sales value.

**Solution:**

Contribution per unit of the given product is as follows:

Selling price Rs. 40; Variable cost: Material Rs.15; Direct labour Rs.5; Variable overhead Rs.10 and Contribution margin per unit Rs.10. Fixed cost per unit, included in the total cost per unit, is the average fixed cost per unit, calculated on the basis of budgeted fixed cost (total) and budgeted output. Therefore, budgeted fixed cost (total) = Rs. 5 x 5,000 = Rs. 25,000.

The two factors (e.g. fixed costs and contribution margin per unit) are now known to us, and, therefore, we can calculate the BEP

$$\begin{aligned} \text{BEP} &= \text{Fixed Cost}/\text{Contribution per unit} \\ &= 25000/10 = 2500 \text{ units.} \end{aligned}$$

At BEP, total contribution (2,500 x Rs. 10), that is, Rs. 25,000 is equal to fixed costs.

$$\begin{aligned} \text{C/S ratio} &= \text{C per unit}/ \text{Selling price per unit} \\ &= 10/40 \times 100 = 25\%. \end{aligned}$$

$$\begin{aligned} \text{BEP} &= \text{Fixed cost}/ \text{C/S ratio} \\ &= 25000/25\% = \text{Rs. 1,00,000.} \end{aligned}$$

### 6.3.4 Margin of Safety

Margin of safety is the difference between the estimated sales and sales at BEP. It provides very useful information to management, i.e. by how much can sales drop below the budgeted sales before a loss is incurred. Margin of safety is usually expressed as a percentage of budgeted sales.

In the example 6.1, margin of safety is  $(5,000 - 2,500)$  units or 2,500 units that is 50% of the budgeted sales.

### 6.3.5 C/S Ratio and Break-even Point in a Multi-Product Situation

In a multi-product situation, it is not possible to express the break-even point in terms of units. It is quite likely that different measuring units are used to measure sales

quantity of different products. Even if a single unit is used, products may not be comparable and contribution per unit would be different. Therefore, under a multi-product situation, BEP is calculated in terms of sale value by using weighted average C/S ratio. Weight of each product in the sales-mix is used to calculate the weighted average C/S ratio. The underlying assumption is that the same percentage movement in sales of all the products in the product-mix accompanies a percentage movement in total sales.

Break-even point is calculated with the following assumptions: (a) Constant C/S ratio for each product; (b) Constant sales-mix; and (c) Constant fixed cost. The steps involved in calculating the break-even points are: (a) Calculate the C/S ratio for each product; (b) Calculate weighted average C/S ratio in relation to estimated proportion of sales; and (c) Use the weighted average C/S ratio to calculate break-even point in terms of sale-value.

**Example 6.2:** (A) SSK manufactures and sells four types of products under the brand names A, B, C and D. The sales-mix in value comprises  $33\frac{1}{3}\%$ ,  $41\frac{2}{3}\%$ ,  $16\frac{2}{3}\%$  and  $8\frac{1}{3}\%$  of A, B, C and D respectively. The total budgeted sales (100%) are Rs. 60,000 per month. Operating costs are:

Variable costs: Product: A 60% of selling price; B 68% of selling price; C 80% of selling price; D 40% of selling price; and Fixed cost Rs. 14,700 per month. Calculate the break-even point for the products on an overall basis.

(B) It has been proposed to introduce a change in the sales mix as follows, the total sales per month remaining Rs. 60,000:

Product	A	25%
	B	40%
	C	30%
	D	5%

Assuming that the proposal is implemented, calculate the break-even point

**Solution:**

### C/S ratio for each product

Product	Variable cost to sales ratio	C/S ratio (100- variable cost to sales ratio)
A	60%	40%
B	68%	32%
C	80%	20%
D	40%	60%

Weighted average C/S ratio:

Product	C/S ratio (Percentage)
A $33\frac{1}{3} \times 40\%$	13.33
B. $41\frac{2}{3} \times 32\%$	13.44
C $16\frac{2}{3} \times 20\%$	3.33
D $8\frac{1}{3} \times 60\%$	5.00
Weighted average c/s ratio	

$$BEP = \frac{Fixed\ costs}{C/S\ ratio} = \frac{Rs.\ 14,700}{35\%} = 42,000 \text{ per month}$$

Weighted average C/S ratio with changed sales-mix, without any change in individual C/S ratio.

Weighted average C/S ratio:

Product	C/S ratio (Percentage)
A $25\% \times 40$	10.00
B. $40\% \times 32$	12.80
C $30\% \times 20$	6.00
D $5\% \times 60$	3.00
Weighted average c/s ratio	

$$BEP = \frac{Fixed\ costs}{C/S\ ratio} = \frac{14,700}{31.80\%} = 46,226 \text{ per month}$$

Proof (Not required in examination)

Product	Old sales-mix		New sales-mix	
	Sales(Rs.)	Contribution(Rs.)	Sales(Rs.)	Contribution(Rs.)
A	$60,000 \times 33\frac{1}{3}\%$ i.e. 20,000	$20,000 \times 40\%$ i.e. 8,000	$60,000 \times 25\%$ i.e. 15,000	$15,000 \times 40\%$ i.e. 6,000
	$60,000 \times 41\frac{2}{3}\%$ i.e. 25,000	$25,000 \times 32\%$ i.e. 8,000	$60,000 \times 40\%$ i.e. 24,000	$24,000 \times 32\%$ i.e. 7,680

C	$60,000 \times 16 \frac{2}{3}$ i.e. 10,000	10,000 x 20% i.e. 2,000	60,000 x 30% i.e. 18,000	18,000 x 20% i.e. 3,600
D	$60,000 \times 8 \frac{1}{3}$ i.e. 5,000	5,000 x 60% i.e. 3,000	60,000 x 5% i.e. 3,000	3,000 x 60% i.e. 1,800
Total	Rs. 60,000	Rs. 21,000	Rs. 60,000	Rs. 19,080
	Weighted average C/S ratio $\frac{21,000}{60,000} \times 100$ i.e. 35%		Weighted average C/S ratio $\frac{19,080}{60,000} \times 100$ i.e. 31.80%	

## 6.4 GRAPHICAL REPRESENTATION OF CVP RELATIONSHIP

As an aid to management, CVP analysis is presented in graphical form. This graph is popularly known as the 'break-even chart'. Break-even chart can be drawn in many ways. The construction of break-even chart is exemplified in Graphs 6.1 to 6.5.

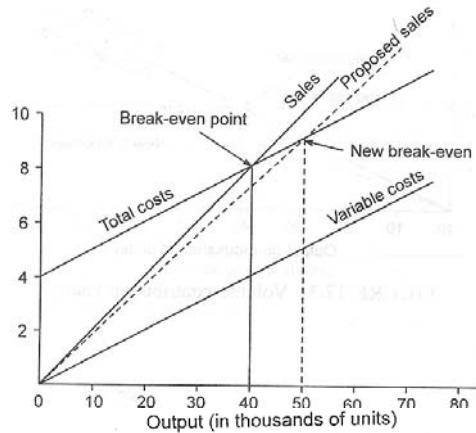
**Example 6.3:** You are given the following data for the coming year for a factory.

Budgeted output 80000 units; Fixed expenses Rs. 400000; Variable expenses per unit Rs. 10; Selling price per unit Rs. 20; 80,000 units Rs. 4, 00,000. Draw a break-even chart showing the break-even point. If the selling price be reduced to Rs. 18 per unit, what will be the new break-even point?

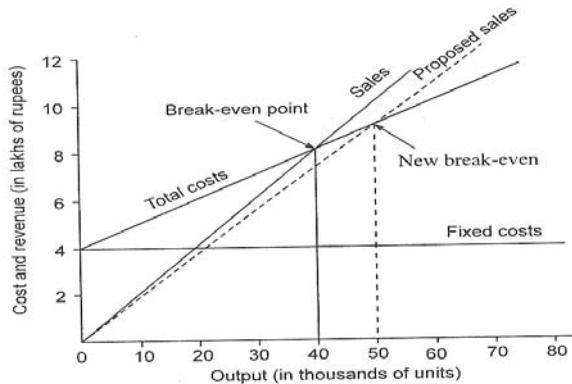
**Solution:**

**Detailed notes:** (i) The horizontal axis shows the units of output; (ii) The vertical axis shows the cost and revenue in terms of value; (iii) The fixed cost line at Rs. 4, 00,000 is assumed to be same at all output levels; (iv) The revenue line (assuming the same selling price per unit at all output levels) starts at nil and progresses evenly; (v) The total cost line commences at the fixed cost of Rs. 4, 00,000 (fixed cost is incurred even at nil production) and increase by the addition of variable cost per unit as output increases; (vi) The break-even point is the point of intersection (which reads at 40,000 units on the graph) between total cost and revenue lines. This can be proved

arithmetically. Contribution at 40,000 units is  $40,000 \times \text{Rs. } (20 - 10)$ , i.e. Rs. 4,00,000 which is equal to the fixed cost; and (vii) Revised revenue (revised on account of reduction in selling price) shown by dotted line intersects total cost line at an output of 50,000 units. The new break-even point is 50,000 units.



**Graph 6.1: Break-even Chart**



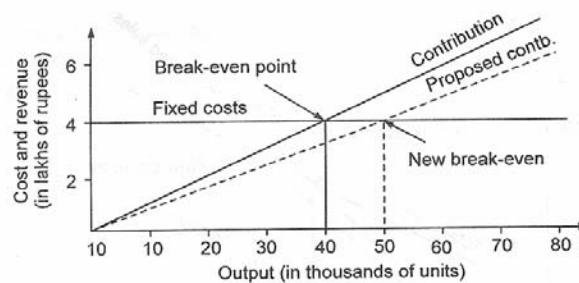
**Graph 6.2: Break-even Chart with variable cost line**

**Detailed notes:** (i) As in the conventional chart, the horizontal axis shows the units of output and the vertical axis shows the cost and the revenue; (ii) The variable cost line starts at nil and progresses evenly as the output increases. The conventional chart does not show the variable cost line; (iii) Total cost line is parallel to variable cost line; the gap between the two represents the fixed cost (Rs. 4,00,000); and (iv) Revenue line has been drawn in the same way as is drawn on conventional chart.

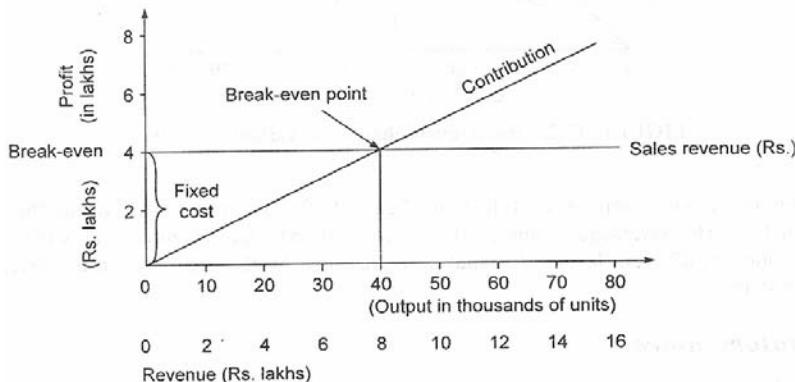
**6.4.1 Volume contribution** chart in Graph 6.3 is another way of presenting the

break-even point. Information in Example 6.3 has been used to draw the chart.

In this chart the contribution line starts at nil for nil output and progresses evenly with increase in output. Break-even point is the point of intersection between the contribution line and the fixed cost line. The advantage of this method is that several lines at various selling prices and variable costs may be drawn without the chart becoming too overburdened.



**Graph 6.3: Volume contribution chart**



**Graph 6.4: Volume contribution break-even chart.**

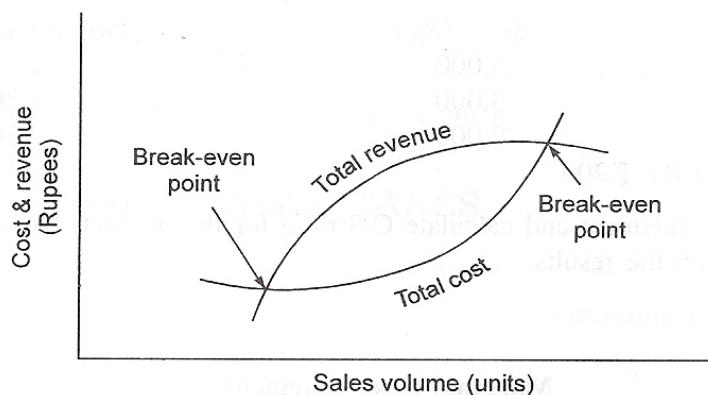
Graph 6.4 shows another method of depicting the break-even point. The horizontal axis not only shows the sales volume in quantities, it shows the revenue (in rupee) too. The chart clearly shows the profit or loss area, which starts at Rs. 4, 00,000 below the break-even line (because Rs. 4, 00,000 being the fixed costs to be recovered to break-even). Contribution line starts at nil with nil output and progresses evenly with increase in sales. The point of intersection between the fixed cost line and the

contribution line shows the break-even point.

The chart with reduction in selling price has to be drawn separately to avoid confusion. (It will be a good practice for the reader to draw the chart with a reduced selling price.) The fixed cost line and the revenue line will look the same as in Graph 6.4 except a change in the scale for revenue (Rs.) at the horizontal axis.

#### 6.4.2 Limitation of break-even chart

In actual practice, Break-even charts are quite unlikely to resemble the chart shown above because underlying assumptions in CVP analysis do not hold good in real-life situations. The cost and revenue lines are not straight lines. They are rather curvilinear and the chart might show more than one break-even point. Such a break-even chart may look like the chart given in Graph 6.5.



Graph 6.5: Curvilinear break- even chart.

#### 6.4.3 Angle of incidence

This is the angle at which the sales line cuts the total cost line (Graphs 6.1 and 6.2). If the angle is large, the firm (or product) is earning profit at a high rate. If used in conjunction with the margin of safety, it indicates an extremely favourable condition. A small angle of incidence shows that although the firm (or the product) is making profit, it is being achieved under less favorable conditions.

#### 6.4.4 MULTI-PRODUCT PROFIT GRAPH

When a firm manufactures and sells more than one product of varying profitability; a

CVP chart may be drawn to show the relative profitability of different products. This graph is known as ‘Sequential profit graph’ or ‘Profit path chart’. The following steps are involved in drawing the graph: (a) The C/S ratio is determined for different products and products are arranged in order of the descending C/S ratio, i.e. the product showing the highest C/S ratio is shown first and so on; (b) A statement is prepared showing the cumulative sales and the cumulative profit; (c) Sales are plotted on horizontal axis; (d) Fixed cost is plotted on vertical axis below the horizontal axis; (e) Starting from the fixed cost point a profit path is drawn which terminates at the profit point reached by the last product; (f) The end of the profit path is connected with the fixed cost point. This line is called the total profit line; (g) The point of intersection between the total profit line and the total sale line is called the break-even point for a group of products.

**Example 6.4:** A manufacturing company produces three products: P, Q and R. The following are the results for 2003.

Product	Sales (Rs.)	Variable cost (Rs.)
P	5000	2000
Q		3000
R		1800
		2500

Fixed Costs Rs. 2200

Prepare a marginal cost statement and calculate C/S ratio for the product. Draw a profit-graph of products and comment on the results.

**Solution:**

Product	P (Rs.)	Q (Rs.)	R (Rs.)	Total (Rs.)
Sales	5,000	3,000	2,000	10,000
Variable cost	(2,000)	(1,800)	(2,500)	(6,300)
Contribution	3,000	1,200	(500)	3,700
C/S ratio	$\frac{3000}{5000} \times 100$	$\frac{1200}{3000} \times 100$	$\frac{500}{2000} \times 100$	$\frac{3700}{10000} \times 100$
	= 60%	= 40%	= 25%	= 37%

Break-even point = Fixed cost/ c/s ratio = 2,200/37% = Rs. 5,946.

## Data for graph

Products are arranged in order of descending C/S ratio.

Product	Sales (Rs.)	Cumulative sales (Rs.)	Contribution (Rs.)	Cumulative contribution (Rs.)	Fixed cost (Rs.)	Cumulative profit
P	5,000	5,000	3,000	3,000	2,200	800
Q	3,000	8,000	1,200	4,200	2,200	2,000
R	2,000	10,000	(500)	3,700	2,200	1,500

Product R's contribution is negative. Therefore, it should be discontinued, if possible. The production of P, which has the highest contribution, should be increased. However, non-cost factors should also be considered before taking the final decision.

### 6.4.5 Effects of Income Taxes

Generally, we know  $S-V-F = P$  or operating income,

After income tax effects, it will

Net income = Operating income - [(Operating income) x (Tax-rate)]

Or      Net income = (Operating income) x (1 - Tax rate)

Or       $\text{Operating income} = \text{Net Income} / (1 - \text{Tax rate})$

Thus, Revenue - Variable costs - Fixed costs = Net Income/ (1 - Tax rate)

**Example 6.5:** Football Shoe Company produces different products-all of which has the same C/S ratio of 20%. The present sale is Rs. 60,000 per month and fixed cost is Rs. 80,000 per annum. The following information is available from the budgeted forecasts for the coming year:

Volume of sales	No change
Increase in variable cost	5%
Estimated fixed cost	Rs. 90,000

You are required to calculate: (a) The present yearly profit and (b) The percentage increase required in selling prices during the forthcoming budget year in order to maintain the existing level of profit.

### Solution:

(a) The present yearly profit:	Rs.
Sales for the current year $60,000 \times 12$	720000
Variable cost (80% of sales) Contribution	(576000)
Fixed cost	144000

Present yearly profit	(80000)
	<u>64000</u>

(b) Percentage increase required in selling price:

Budgeted fixed cost	90000
Required profit	64000
Required contribution	154000
Variable cost (5, 76,000 + 5%)	604800
Required revenue	<u>758800</u>

$$\text{Increase in price: } \frac{(758800 - 720000) \times 100}{720000} = 5.39\% \text{ increase}$$

#### 6.4.6 Break-even point and profit planning

Now, in the ensuing examples, we will explain the profit planning decisions.

**Example 6.6:** A company sells its product at Rs. 15 per unit. In a period, if it produces and sells 8000 units, it incurs a loss of Rs. 5 per unit; if the volume is raised to 20000 units, it earns a profit of Rs. 4 per units. Calculate break-even point both in terms of rupees as well as units.

**Solution:**

Suppose, the contribution margin is  $c$  and fixed cost of  $F$ ; therefore, contribution on sale of 8000 units is 8000  $c$ .

Thus,

$$8000c = F - 8000 \times \text{Rs. } 5 \text{ or } 8000c = F - \text{Rs. } 40000 \quad (1)$$

Similarly, on sale of 20000 units, contribution is 20000  $c$

Thus,

$$20000c = F + 20000 \times \text{Rs. } 4 \text{ or } 20000c = F + \text{Rs. } 80000 \quad (2)$$

Deducting Eq. (1) from Eq. (2) we get:

$$12000c = \text{Rs. } 120000 \text{ or } c = \text{Rs. } 10$$

Substituting  $c = \text{Rs. } 10$  in Eq., (1) we get  $F = \text{Rs. } 120000$

Break-even point in units =  $\text{Rs. } 120000 / \text{Rs. } 10$  units = 12000 units,

Break-even point in rupees = 1200 units  $\times$   $\text{Rs. } 15$  =  $\text{Rs. } 180000$ .

**Example 6.7:** Indian Traders and Indian Corporation sell the same type of products in same type of market. Their budgeted profit and loss account for the ending 2003 are as follows:

	<u>Indian Traders</u>	<u>Indian Corporation</u>
	Rs.	Rs.
Sales	300000	300000
Variable cost	240000	200000
Fixed costs	<u>30000</u>	70000
Net Profit	30000	30000

You are required to:

a) Calculated the break-even points of each business; b) Calculated the sales-volume at which each of the business will earn Rs. 10000 profit; and state which business is likely to earn greater profit in condition of: Heavy demand for the profit; and Low demand for the product. Give your reasons.

**Solution:**

(a) Break-even point

	Indian Traders (Rs.)	Indian Corporation (Rs.)
Sales	300000	300000
Variable cost	(240000)	(200000)
Contribution	60000	100000
C/S ratio=	$60000 \times 100/300000 = 20\%$	$100000 \times 100/3000000 = 33.33\%$
Break-even point	$\frac{\text{Rs. } 30000}{20\%} = \text{Rs. } 150000$	$\frac{\text{Rs. } 70000}{33\%} = \text{Rs. } 21000$

(b) Total contribution required:

Fixed costs	30000	70000
Profit required	10000	10000
	40000	80000
	$Rs. 40000/20\%$	$Rs. 80000/33.33\%$
	$= \text{Rs. } 200000$	$= \text{Rs. } 240000$

(c) Sales-volume at which both the firms would earn equal profit:

Let the sales volume be a

Profit of Indian Traders:  $a \times 20\% - \text{Rs. } 30000 = 0.20 a - 30000$

Profit for Indian Corporation:  $a \times 33\% - \text{Rs. } 70000$

The profit for both the firms being equal,

$$0.20a - a/3 - \text{Rs. } 30000 + \text{Rs. } 70000 = 0 \text{ or } a = \text{Rs. } 300000$$

The C/S ratio of Indian Corporation at 33.33% is higher than that of Indian Traders at 20%. Therefore, Indian Corporation will earn a higher profit if the sales volume exceeds Rs. 300000 level. However, below that level profit for Indian Traders will be higher. It may be concluded that Indian Corporation is likely to earn a higher profit under conditions of heavy demand for the product. Similarly, Indian Traders is likely to earn a higher profit under conditions of low demand for the product.

**Example 6.8:** Two manufacturing companies, which have the following operating details, decide to merge.

Company 2	Company 1	
Capacity utilization %	90	60
Sale (Rs. Lakh)	540	300
Variable costs (Rs. Lakh)	396	225
Fixed costs (Rs. Lakh)	80	50

Assuming that proposal is implemented, calculate:

- Break-even sales of the merged plant and the capacity utilization at that stage
- Profitability of the merged plant at 80% capacity utilization
- Sales turnover of the merged plant to earn a profit of Rs. 75 lakh
- When the merged plant is working at a capacity to earn a profit of Rs. 75 lakh, what percentage increase in selling price is required to sustain as increase of 5 % in fixed overhead?

**Solution:** Operating data of the merged plant at 100% capacity:

	Company 1	Company 2	Total merged plant
Capacity	100%	100%	100%
	(Rs. lakh)	(Rs. lakh)	(Rs. lakh)
Sales	$540/0.90 = 600$	$300/0.60 = 500$	1,100
Variable cost	$396/0.90 = (440)$	$225/0.60 = (375)$	(815)
Contribution	160	125	285
Fixed cost	(80)	(50)	( 130)
Profit	80	75	155

- Break-even point of the merged plant:

C/S ratio: Contribution x 100/Sales =  $285 \times 100/1100 = 25.91\%$

Break-even point of the merged plant:

Fixed cost of the merged plant/ (c/s ratio) =  $130/25.91\% = \text{Rs. } 501.74 \text{ lakh}$

Capacity utilization at break-even level:

$$\begin{aligned} &= \text{Sale value at break-even level} / \text{Sale value at 100% capacity} \\ &= \text{Rs. } 501.74 \text{ lakh} \times 100/1100 = 45.6\% \end{aligned}$$

(b) Profitability of the merged plant at 80 % capacity utilization:

Sales at 80% capacity utilization	= Rs. 1,100 lakh x 80%	<u>Rs. 880 lakh</u>
Contribution at 80% capacity	= Rs. 880 x 25.91 %	Rs. 228 lakh
Fixed cost		(Rs. 130 lakh)
Profit		<u>Rs. 98 Lakh</u>
Profitability at 80% level	$98 \times 100/880 = 11.14\%$	

(c) Sales to earn profit of Rs. 75,000:

Required contribution:  $(\text{Rs. } 75,000 + 1,30,000) = \text{Rs. } 205 \text{ lakh}$

Sales turnover required:  $\text{Required contribution} = \text{Rs. } 205 \text{ lakh} = \text{Rs. } 781.20$   
C/S ratio  $25:91\%$

(d) Required percentage increase in selling price to sustain 5% increase in relaxed cost:

Fixed cost at current level: Rs. 130 lakh

Increase in fixed cost 5% of Rs. 130 lakh Rs. 6.50 lakh

Hence, additional contribution required Rs. 6.50 lakh

Increase in selling price required =  $6.5 \times 100/791.20 = 0.8215\%$

**Example 6.9:** X limited has been offered an order from A Ltd. for 10,000 units of output @ Rs. 100 each which has a variable cost of Rs. 60 and will involve an outlay of Rs. 60,000 to set-up jigs and dies. At the same time, there is another offer of B Ltd., for 8,000 units of output at Rs. 110 each. Variable costs are estimated at Rs. 68 each and involve an outlay of Rs. 50,000 to set-up jigs and dies. Which offer should the company accept?

**Solution:**

a) Contribution per units:

Price per unit	Rs. 100	Rs. 110
Variable cost per unit	(60)	(68)
Contribution per unit	Rs. 40	Rs. 42

b) Statement of profitability:

A Ltd. B Ltd.

Output of units	10000	8000
Total contribution per unit	Rs. 400000	Rs. 336000
Net profit	<u>(60000)</u>	<u>(50000)</u>
Net profit	Rs. 340000	Rs. 286000

Profit from the offer of A Ltd., would be higher as compared to profit from the offer

of B Ltd. Therefore, the offer of A Ltd. should be accepted.

## 6.5 MARGINAL COSTING TECHNIQUES

Marginal costing technique assumes that fixed costs are given and only variable costs and revenue can be influenced by short-term managerial actions. Therefore, in the short-term, profit can be maximised by maximising total contribution, which is the difference between total revenue and total variable costs. Managers decide the use of scarce resources to maximise total contribution by evaluating alternative uses of available resources. Underlying assumptions that fixed costs do not change with change in the activity level and that there is a linear relationship between revenue and variable costs, which do not hold good beyond the relevant range. Similarly, in practice, it is difficult to segregate the total cost into fixed and variable elements accurately. All these limit the reliability of marginal costing techniques. In spite of these limitations, the marginal costing technique has emerged as an important management tool.

### 6.5.1 PRODUCT MIX

#### 6.5.1.1 Product Profitability

If the same facilities can be used to produce more than one product, contribution per unit is taken as the profitability index for each product. The assumption is that there is no limiting factor and there is no limit on the number of units of each product, which can be produced and sold. In normal absorption costing, fixed costs are apportioned equitably over products to determine each product's profitability. Apportionment is based on the estimated usage of common resources by each product. The result may

be misleading because it may lead to the conclusion that products, which show a net loss, should be discontinued.

#### **6.5.1.2 Limiting Factor Analysis**

Limiting factor or key factor is defined as anything which limits the activity of an entity. An entity seeks to optimize the benefit it obtains from the limiting factor. Examples are a shortage of supply of a resource and a restriction on sales at a particular price. Limiting factors restrict the number of units that can be produced or sold. Typical examples of limiting factors are: a) Sales demand in quantity, b) Sales demand in value, c) A limit to availability of material, d) A limit to availability of a particular grade of labour, e) A limit to machine capacity, and f) A shortage of working capital. More than one limiting factor may operate at a particular point in time. Under such a situation, the factor, which keeps the activity level at the minimum, should be considered as the key factor. However, the impact of other factors should also be considered in arriving at the final decision. Optimal utilization of a scarce resource implies that all the available supply of that resource is used up. Therefore, the contribution fund can be maximised by maximising the production and sale of the product, which earns the highest contribution per unit of the limiting factor. Thus, to determine the optimum production plan, the contribution per unit of the limiting factor for each product is calculated and products are ranked in descending order of contribution per unit of the limiting factor.

**Example 6.10:** A firm can produce two products A and B. The following are the cost structures:

	Product A (Rs.)	Product B (Rs.)
Selling price per unit	20	22
Variable manufacturing cost per unit	5	6
Variable selling expenses per unit	3	2
Labour hours per unit	2	3

Total available labour hours are 1,200 per week. Assuming that the availability of labour hours is the only limiting factor, determine which product should be manufactured and sold.

**Solution:**

<b>Contribution Statement</b>		
	<b>Product A</b>	<b>Product B</b>
(a) Selling price	<u>Rs.20</u>	<u>Rs.22</u>
(b) Variable costs:		
Manufacturing	5	6
Selling expenses	<u>3</u>	<u>2</u>
Total cost per unit	<u>Rs. 8</u>	<u>Rs. 8</u>
(c) Contribution per unit (a - b)	<u>Rs. 12.</u>	<u>Rs. 14</u>
(d) Labour hours per unit	2	3
(e) Contribution per labour hour (c/d)	Rs. 6	Rs. 4.67

If the firm utilizes all the available machine hours to produce product A, it will earn a total contribution of  $Rs. 6 \times 1,200$ , i.e. Rs. 7,200. On the other hand, if it uses the available labour hours to produce product B, it will earn a total contribution of  $Rs. 4.67 \times 1,200$ , i.e. Rs. 5,600. Therefore, product A should be manufactured. This can also be verified as follows:

	<b>Product A</b>	<b>Product B</b>
(a) Available labour hour	Rs. 1200	Rs. 1200
(b) Labour hours per unit	2	3
(c) Maximum output (a/b)	600 Units	400 Units
(d) Contribution per unit	Rs. 12	Rs. 14
<b>Total contribution (c x d)</b>	<b>Rs. 7200</b>	<b>Rs. 5600</b>

These calculations show that product A is more profitable than B. The same result was reflected by the method of ranking products based on the contribution per labour hour. Determination of the limiting factor poses problems because it changes rapidly. A detailed analysis of the economic environment and the supply market of various resources as well as internal factors are necessary to identify potential limiting factors. Identification of limiting factors facilitates performance planning. The determination

of limiting factor is comparatively simple when only one product is produced or when more than one product is produced using the same raw materials, labour and other resources using the same process. However, it becomes very complex when a number of products are manufactured from a variety of materials with different types of labour using different types of machines or applying different processes. When there is more than one limiting factor operating at a particular point in time, the profit maximising budget could be determined by formulating and solving a linear programming problem. This is beyond the scope of this book. However, simpler decision models may be used when activities are restricted by only two limiting factors.

### **6.5.2 MAKE OR BUY DECISION**

If no limiting factor is in operation, the decision to buy or to manufacture a product rests on whether the bought-out price of an article is lower than its marginal cost. The fixed cost is irrelevant for our decision because fixed cost will not change as a result of buying the product/component from outside. If the bought-out price of an article is lower than its marginal cost, it will be profitable to buy the article from outside in all circumstances. The firm will save marginal cost and will spend lower than the marginal cost to buy the article. If the bought-out price is higher than the marginal cost, the total cost of production will increase, if the firm decides to buy the article from outside. Therefore, if it has a choice, it will buy the article for which the difference between the bought-out price and the marginal cost is the lowest among article under consideration. If a limiting factor is in operation, the excess of bought-out price over marginal cost per unit of the limiting factor is to be considered. The article having the lowest excess of bought out price over its marginal cost per unit of the limiting factor will be selected for buying out from outside.

**Example 6.11:** The cost of manufacturing and bought-out prices of four articles is as follows:

Article	A	B	C	D
Production cost per article:				
Marginal cost	Rs. 10.00	Rs. 12.00	Rs. 15.00	Rs. 15.00
Fixed cost	2.00	4.00	5.00	15.00
Total cost	12.00	16.00	20.00	30.00
Production per-man hour	0.25	0.20	0.20	0.33
Production per machine hour	1.00	0.50	0.25	0.20
Bought-out price	Rs. 9.00	Rs. 17.00	Rs. 22.00	Rs. 26.00

Rank the products in the order of your preference for buying them from outside (a) when there is no limiting factor; (b) if man-hour is the limiting factor, (c) if machine capacity is the limiting factor.

### Solution:

Articles	A	B	C	D
Bought-out price per unit	Rs. 9.00	Rs. 17.00	Rs. 22.00	Rs. 26.00
Marginal cost (per unit) of production	10.00	12.00	15.00	15.00
Excess of bought-out price over marginal cost per article	-1.00	5.00	7.00	11.00
Excess per man-hour	$-1.00 \times 0.25$ $= -0.25$	$5.00 \times 0.20$ $= 1.00$	$7.00 \times 0.20$ $= 1.40$	$11.00 \times 0.33$ $= 3.63$
Excess per machine hour	$-1.00 \times 1$ $= -1.00$	$5.00 \times 0.50$ $= 2.50$	$7.00 \times 0.25$ $= 1.75$	$11.00 \times 0.20$ $= 2.20$

In case of article A, the bought-out price is lower than the marginal cost, hence to purchase A from outside is always profitable.

Ranking of products in order of preference for buying out:

(a) When there is no limiting factor      1st A,    2nd B,   3rd C,   4th D

(b) When man-power is the limiting factor      1st A,    2nd B,   3rd C,   4th D

(c) When machine capacity is the limiting factor      1st A,    2nd C,   3rd D,   4th B

### 6.5.3 DECISION ON METHODS OF MANUFACTURING

Marginal costing technique can be used to choose from alternative methods of manufacturing. The method, which generates the highest contribution, is the most desirable method. The decision, therefore, rests on the contribution per unit or the contribution per unit of the limiting factor, if a limiting factor is identified.

**Example 6.12:** An undertaking is producing an article, the selling price of which is Rs. 20 per unit. A decision has to be taken whether:

- (a) to produce by hand (Method A); or
- (b) to produce by machine, one operator to one machine (Method B); or
- (c) to produce by machine, one operator to two machines (Method C); or
- (d) to produce by machine, one operator to three machines (Method D).

The cost of manufacturing the article by different methods is as follows:

Method	A	B	C	D
Cost per article (Rs.):				
Material 1 unit	5.00	5.00	5.00	5.00
Direct labour @ Rs. 3 per man-hour	5.00	3.00	1.70	1.50
Variable overhead @ Rs. 2 per man-hour	3.30	2.00	1.10	1.00
Variable overhead @ Re. 1 per machine-Hour	-	1.00	1.10	1.50
Total marginal cost	13.30	11.00	8.90	9.00
Fixed overhead @ Re. 1 per man-hour	1.70	1.00	0.90	0.50
Fixed overhead @ Rs. 6 per machine-Hour	-	6.00	6.60	9.00
Total cost	15.00	18.00	16.40	18.50
Production per man-hour	0.60	1.00	1.75	2.00
Production per machine-hour	-	1.00	0.875	0.66

**Solution:**

Method	A	B	C	D
Selling prices per unit (Rs.)	20.00	20.00	20.00	20.00
Marginal cost per unit (Rs.)	(13.30)	(11.00)	(8.90)	(9.00)
Contribution per unit	6.70	9.00	11.10	11.00
Contribution per unit of material	6.70/1 = Rs. 6.70	9.00/1 = Rs. 9.00	11.10/1 = Rs. 11.00	11.00/1 = Rs. 11.00
Contribution per man hour	6.70 x 0.6 = Rs. 4.20	9.00 x 1 = Rs. 9.00	11.10 x 1.75 = Rs. 19.40	11.00 x 2 = Rs. 22.00
Contribution per machine hour		9.00 x 1 = Rs. 9.00	11.10 x 0.875 = Rs. 9.70	11.00 x 0.66 = Rs. 7.30

If there is no limiting factor, Method C should be selected as it generates the highest contribution per unit. If a limiting factor is in operation, the method to be adopted should be the one, which gives the highest contribution per unit of the limiting factor.

Thus,

- (a) If material is the limiting factor, method C should be adopted.

- (b) If man-power is the limiting factor, method D should be adopted.
- (c) If machine capacity is the limiting factor, method C should be adopted.

#### 6.5.4 SHUTTING DOWN DECISIONS

Marginal costing technique can be used in deciding whether to discontinue a section of the business. If we assume that discontinuance will not influence the total fixed costs of the firm, the decision will hinge on whether the particular section of the business is contributing towards fixed overheads. Closure of an activity, which generates positive contribution, reduces the current operating profit or increases the operating loss. In certain situations, a part of the fixed cost is avoided by temporary closure. In such a situation, if avoidable fixed cost is higher than expected contribution, the business segment should be closed.

**Example 6.13:** A company making a single product has a factory at Howrah (near Kolkata) and distributes its product through three depots situated in Kolkata, Kanpur and Chennai. It is estimated that during the year 1, 00,000 units will be manufactured and sold at a price of Rs. 30 per unit, the sales being spread is as follows:

Kolkata	70,000 units
Kanpur	20,000 units
Chennai	10,000 units

Standard costs of production are:

Direct materials	Rs. 6 per unit
Direct wages	Rs. 5 per unit

Factory variable overheads 160% of direct wages

Factory fixed overheads      Rs. 6, 00,000 per annum

The cost of selling and distribution incurred by the depots are:

	Calcutta	Kanpur	Chennai
Fixed Cost per annum	100000	70,000	30000
Variable cost (% of sales value)		10%	8%      7%

The budget for the business prepared from these figures caused the management to consider the closure of Kanpur and/or Chennai depots. If this is done, all sales in these areas will be lost, but sales from the Kolkata depot will remain unaffected.

You are required to

- (a) Prepare a budget for the business from the figures provided; and
- (b) Advise the management on the desirability of closing down Kanpur and Chennai depots.

**Solution:**

	Calcutta	Kanpur	Chennai	Total
Unit	70,000	20,000	10,000	100,000
Sales	Rs. '000	Rs. '000	Rs. '000	Rs. '000
	2,100	600	300	3000
Production Cost :				
Direct Material				600
Direct Wages				500
Factor Variable overheads				800
Factory fixed overheads				600
Allocated pro-rata to units	1,750	500	250	2500
Gross Profit	350	100	50	500
Selling and distribution				
Variable	210	48	21	279
Fixed	100	70	30	200
Local costs	310	118	51	479
Net Profit/(loss)	40	(18)	(1)	21

This presentation shows that operations of Kanpur and Chennai depots have resulted in losses and this leads the management to consider their closure. An alternative presentation using the marginal cost approach helps the management to take correct decision.

	Kolkata	Kanpur	Chennai	Total
Sales	2100	600	300	3000
Variable costs of production				
Direct materials				600
Direct wages				500
Variable factory overheads				800
Allocated pro-rata to units	1330	380	190	1900
	770	220	110	1,100
Variable costs of selling and distribution	210	48	21	279
Contribution to all fixed expenses	560	172	89	821
Fixed costs of selling and distribution assuming that they are specific to each depot	100	70	30	200
Contribution to fixed factory overheads	460	102	59	621
Fixed factory overheads				600
Net profit.				21

This presentation shows that sales at Kanpur and Chennai depots make contribution of Rs. 1, 02,000 and Rs. 59,000 respectively, towards fixed factory overheads. Therefore, none of those two depots should be closed down. In the above presentation, it is assumed that fixed selling and distribution costs could be avoided by closing those depots. This may not happen in the short term.

#### **6.5.5 MARGINAL COST AND PRODUCT PRICING**

A long-term pricing policy should aim to recover more than the 'full cost' to ensure a reasonable return on capital employed. A firm cannot survive if it has to sell its products continuously below 'full cost'. Marginal cost may be used as a basis for short-term pricing decisions. Usually, marginal cost is used to determine prices for non-repetitive orders under difficult business conditions or to use spare capacity when acceptance of lower contributions and profit margins may be necessary. When capacity is unused, acceptance of an order with lower contribution helps partial recovery of the fixed cost. Factors to be considered in fixing selling prices when demand is below normal are the amount and the rate of contribution which the proposed selling price would yield; probability of securing an order with higher contribution during the period of execution of the order; proposed concession, when compared with the normal selling price on full cost basis; probable adverse effects on future sales. When one or more resources are scarce, (e.g. material is scarce), the first consideration must be to reserve the same for orders that would yield the highest contribution per unit of the scarce resource (the limiting factor). A decision to sell at a lower price might also have an adverse effect on the firm's general level of selling prices in its established market. This aspect should also be carefully examined before accepting an order with contribution lower than the normal contribution.

Other factors, which strongly justify acceptance of an order with lower contribution at the time adverse trade situations, are to: (a) hold together the skilled labour force; (b) keep the plant and machinery in operation and the workers busy; (c) utilize materials already received; (d) avoid costs involved in the closing and re-opening of the plant; (e) maintain the sales of complementary products at a satisfactory level; and (f) maintain position in established markets to avoid additional sales promotion expenses in reestablishing the markets.

Selling below full cost prices, even under a normal situation, may be adopted in order to: (a) introduce a new product, (b) execute an order in a special market segment (say, defense supply) which is immune from other market segments; (c) expand the export market; and (d) dispose of a product which deteriorates fast.

**Example 6.14:** The Everest Snow company manufactures and sells direct to consumers 10,000 jars of 'Everest Snow' per month at Rs. 1.25 per jar. The company's normal production capacity is 20,000 jars of snow per month. An analysis of cost for 10,000 jars is given below:

Direct material	Rs.	1000
Direct labour		2475
Power		140
Miscellaneous supplies		430
Jars		600
Fixed expenses of manufacturing, selling and administration		7955
Total	Rs.	12600

The company has received an offer for the export, under a different brand name for 1, 20,000 jars of snow at 10,000 jars per month at 75 paise a jar. Write a short report on the advisability or otherwise of accepting the offer.

**Solution:**

#### Statement of Contribution from the Export Order

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Selling price per unit		Rs. 0.7500
Variable cost per unit:		
Direct material	Rs. 1,000/10,000	0.1000

Direct labour	Rs. 2,475/10,000	0.2475
Power	Rs. 140/10,000	0.0140
Misc. supplies	Rs. 430/10,000	0.0430
Jars	Rs. 600/10,000	0.0600
Contribution margin per unit		(0.4645)
Contribution per month:	Rs. 0.2855 x 10,000	Rs. 2855
		Rs. 2855

Acceptance of the export order would result in incremental contribution of Rs. 2,855 per month. The following statement reveals monthly profit, with and without acceptance of order.

	Present position (10,000 jars)	Proposed offer (10000 jars)	Total (20000 jars)
Sale Value	Rs. 12,500	7500	20000
Variable cost of sales @ Rs. 0.4645	(4,645)	(4,645)	(9290)
Contribution	7,855	2855	10710
Fixed Cost	(7,955)	-	(7955)
Profit	-100	2855	2755

It is advisable to accept the order provided:

- (a) interest on incremental working capital would be lower than the total contribution from the export order;
- (b) acceptance of the export order with lower contribution would not adversely affect the price in home-maker or the future sales;
- (c) there is no possibility for dumping, i.e. re-export by the supplier; and
- (d) there is no possibility of securing an order with higher contribution during the period of execution of the order.

**Example 6.15:** AB Ltd. manufactures three products X, Y, and Z. Standard selling process and costs have been established for 2003 as follows:

	X	Y	Z
Selling price per unit	Rs. 28	Rs. 60	Rs. 125
Direct materials per unit	8	15	20
Direct wages per unit	10	20	50
Variable overheads per unit	5	10	25

Direct wages are paid at the rate of Rs. 2 per hour in each case. Fixed overheads are budgeted at Rs. 25,000 for the coming year.. In the short run, the company cannot increase its direct labour strength and as a result, only 35,000 direct labour hours will be available in the coming year. The company has commitments to produce 500 units of each product. It has been suggested that after meeting the minimum requirements for X, Y and Z, the balance of available direct labour hours should be used to produce product Z. You are required:

- A) To prepare an income statement showing the expected results if the proposal is adopted.
- B) Comment on the statement you have produced in (a) and prepare an income statement for any alternative policy, which you consider would be more profitable.
- C) Basing your calculations on your suggestion in (b), show the company's break-even point in terms of units and sales value.
- D) Show the sale value which is required to produce an after tax return of 10% on capital employed of Rs. 1, 00,000 assuming tax rate of 50%.

**Solution:**

**(a) Income Statement Showing Results if the Proposal is Adopted (Rs. '000)**

	Product X	Product Y	Product Z	Total
1. Sales value	14.00	30.00	137.50	181.50
2. Variable costs:				
Direct materials	4.00	7.50	22.00	33.50
Direct wages	5.00	10.00	55.00	70.00
Variable overheads	2.50	5.00	27.50	35.00
Total	11.50	22.50	104.50	138.50
3. Contribution fund (1 - 2)	2.50	7.50	33.00	43.00
4. Fixed overheads				25.00
5. Operating profit (3 - 4)				18.00

Thus, the operating profit will be Rs. 18,000.

Notes: (i) Total available direct labour hours 35,000

Labour hours to be utilized to meet commitments:

(500 x 5 + 500 x 10 + 500 x 25)	20,000
Balance hours available	15,000

(ii) Additional units of Z to be produced  $15,000/25$ , i.e. 600 units

Thus, total production of Z will be  $(500 + 600)$ , i.e. 1,100 units

(iii) Required direct labour hours for each unit of production of

X:  $10/12$ , i.e. 5 hours, Y:  $20/2$ , i.e. 10 hours and Z:  $50/2$ , i.e. 25 hours.

### **(b) Profitability Statement**

	Product X	Product Y	Product Z
1. Selling price	Rs.28	Rs.60	Rs. 125
2. Variable costs per unit:			
Direct materials	8	15	20
Direct wages	10	20	50
Variable overheads	5	10	25
Total	Rs.23	Rs.45	Rs.95
3. Contribution per unit (1 - 2)	Rs. 5	Rs.15	Rs.30
4. Required labour hours per unit	5	10	25
5. Contribution per labour hour (3/4)	Rs. 1.00	Rs. 1.50	Rs. 1.20
6. Ranking	III	I	II

Availability of labour hours being limited, AB Ltd. should produce as many units of T as possible. There being no restriction on the units of Y that can be sold, available labour hours, after meeting the commitments for products X and Z should be allocated to Y. Thus, optimal product mix is:

Product	Units to be produced	Allocated Labour hours
X	500	2500
Y	2,500	20000 (Balancing figure)
Z	500	12500
		35,000

### **Income Statement with the above Alternative**

Products	Total
----------	-------

	X	Y	Z	(Rs. '000)
Contribution	2.5	30.00	15.00	47.50
Fixed costs				25.00
Operating profit (1 - 2)				22.50

**(c) Break-even point in terms of units and sales**

Contribution from committed production and sales:

Production X:	500 x Rs. 05.00	Rs. 2,500
Production Y:	500 x Rs. 15.00	7,500
Production Z:	500 x Rs. 30.00	15,000
<hr/>		
Rs. 25,000		

Fixed cost being Rs. 25,000, break-even sales of AB Ltd. is sales of 500 units of each of the three products X, Y and Z. Break-even sales in terms of value is  $(500 \times 28 + 500 \times 60 + 500 \times 125)$ , i.e. Rs. 1,06,500.

**(d) Sales value to earn a post-tax return of 10% on capital employed**

Required return 10% of Rs. 1,00,000 i.e. Rs. 10,000

$$\text{Required operating profit} = \frac{\text{Required return}}{(1 - \text{tax rate})} = \frac{\text{Rs.} 10,000}{(1 - 0.50)} = \frac{\text{Rs.} 10,000}{0.50} = \text{Rs.} 20,000$$

Committed sales will earn contribution enough to meet fixed costs. Therefore, to earn an operating profit of Rs. 20,000 additional units of Y is to be sold to earn a contribution of Rs. 20,000. Thus, the total number of units of Y to be sold is  $(500 + \text{Rs.} 20,000/15)$  i.e. 1,833.33 or 1,834 units.

Thus, total sale value is

X:	500 x Rs. 28	= Rs. 14,000
Y:	1,834 x Rs. 60	= Rs. 1,10,040
Z:	500 x Rs. 125	= Rs. 62,500
Total	<hr/>	= Rs. 1,86,540

**Example 6.16:** The costs per unit of the three products A, B and C of a company are given below:

	Product A	Product B	Product C
Direct material	Rs.20	Rs.16	Rs. 18
Direct labour	12	14	12
Variable expenses	8	10	6
Fixed expenses	6	6	4
	46	46	40
Profit	18	14	12
Selling price	64	60	52
No. of units produced	10,000	5,000	8,000

Production arrangements are such that if one product is given up the production of the other can be raised by 50%. The directors propose that C should be given up because the contribution from the product is the lowest. Present suitable analysis of the data indicating whether the proposal should be accepted.

**Solution:**

**Statement Showing Contribution per Unit**

	Product A	Product B	Product C
Selling price per unit	Rs. 64	Rs.60	Rs.52
Variable costs: Direct material	Rs.20	Rs. 16	Rs.18
Direct labour	12	14	12
Variable expenses	8	10	6
	Rs.40	Rs.40	Rs.36
Contribution per unit	Rs.24	Rs.20	Rs. 16

In the absence of any limiting factor, the company should produce as many units of A as possible. In case a limiting factor is in operation, contribution per unit of the limiting factor should be used to measure profitability. In this particular case, the limiting factor is not clearly spelt out, although a restrictive condition is specified. It indicates the discontinuance of a product, which will result in the increase in production of other products by 50%. In this situation, a decision to abandon a product line should consider incremental contribution from each of the three alternatives, giving up either product A or product B or product C.

**Alternative I- Discontinue product A**

Additional contribution:

Product B:  $0.5 \times 5,000 \times \text{Rs. } 20 = \text{Rs. } 50,000$

Product C:  $0.5 \times 8,000 \times \text{Rs. } 16 = \text{Rs. } 64,000$  Rs. 1,14,000

Loss of contribution A:  $10,000 \times \text{Rs. } 24$  (Rs. 2, 40,000)

Incremental contribution (Rs. 1, 26,000)

### **Alternative II-Discontinue product B**

Additional contribution:

Product A:  $0.5 \times 10,000 \times \text{Rs. } 24 = \text{Rs. } 1,20,000$

C:  $0.5 \times 8,000 \times \text{Rs. } 16 = \text{Rs. } 64,000$  Rs. 1, 84,000

Loss of contribution B:  $5,000 \times \text{Rs. } 20$  (1, 00,000)

Incremental contribution Rs. 84,000

### **Alternative III-Discontinue product C**

Additional contribution:

Product A:  $0.5 \times 10,000 \times \text{Rs. } 24 = \text{Rs. } 1,20,000$

B:  $0.5 \times 5,000 \times \text{Rs. } 20 = \text{Rs. } 50,000$  Rs. 1, 70,000

Loss of contribution A:  $8,000 \times \text{Rs. } 16$  (1, 28,000)

Incremental contribution Rs. 42,000

Incremental contribution is highest from alternative II (discontinuance of product B), and therefore, the decision to discontinue product C is sub-optimal. Product B should be discontinued for maximising profit and proposal to discontinue product C should not be accepted.

## **6.6 SUMMARY**

Cost-volume-profit (CVP) analysis is the study of the effect on future profit of changes in fixed cost, variable cost, selling price, sales quantity and sales mix. CVP analysis assumes that the cost structure and the relationships between fixed costs,

variable cost and selling price will remain valid during the period under consideration. Therefore, the analysis produces useful results for decisions within the 'relevant range' and the 'relevant period'. Moreover, there are certain simplistic assumptions underlying the CVP analysis which limit the precision and reliability of the result of the analysis. CVP analysis uses a simple equation, which captures the relationships between different variables. Graphical methods are also used for the study. A break-even chart represents the relationships between different variables. Managers use different variations of the simple breakeven chart.

In this chapter, we have discussed the use of cost information for tactical decisions. Tactical decisions are short-term decisions that aim at maximizing operating profit, with available facilities. Therefore, usually such decisions take into consideration marginal costs only. However, sometimes short-term decision influence fixed costs, e.g. additional advertising expenses. Thus, incremental fixed expenses cannot be ignored. Marginal costing technique is used to determine optimal product-mix. A firm maximizes operating profit by producing products, which contribute highest towards fixed costs and profit. Therefore, contribution per unit of the limiting factor is used as profitability index. The limiting factor is the scarce resource or any other factor, which restricts the activity level. Often other restrictive conditions determine the optimal product-mix. Marginal costing technique is used to decide whether a component is to be manufactured or to be purchased from outside. If spare capacity is available, the product should be manufactured only if variable-manufacturing cost is lower than purchase price. If spare capacity is not available, manufacturing decision results in the discontinuance of another product. Therefore, loss of contribution due to discontinuance should be added to the costs of manufacturing and the total should be compared with the purchase price. If the firm has no choice but to purchase some

components from outside, it decides in favour of the component, manufacturing of which generates savings lowest among the alternative products. For short-term decisions on methods of manufacturing or temporary shut down of plant/ business, managers use marginal costing technique-considerations are similar to those discussed above.

## **6.7 SELF-TEST QUESTIONS**

1. Define 'marginal costing'. How are variable costs and fixed costs treated in marginal costing? Give a journal entry for overhead accounts under marginal costing.
2. What are the important areas of management decisions opened up by the application of marginal costing technique? Answer briefly and to the point.
3. Explain CVP analysis and Break-even-point analysis.
4. In a purely competitive market, 10,000 pocket transistors can be manufactured and sold, and a certain profit is generated. It is estimated that 2,000 pocket transistors need to be manufactured and sold in a monopoly market to earn the same profit. Profit under both the conditions is targeted at Rs. 2, 00,000. The variable cost per transistor is Rs. 100 and the total fixed cost is Rs. 37,000. You are required to find out the unit selling prices both under monopoly and competitive conditions. (Ans: A: Rs. 218.50, B: Rs. 123.70).
5. Y Company has just been incorporated and plans to produce a product that will sell for Rs. 10 per unit. Preliminary market survey shows that demand will be around 10,000 units per year. The company has the choice of buying one of the two machines, each of which has a capacity of 10,000 units per year. Machine A would have fixed costs of Rs. 30,000 per year and would yield a profit of Rs. 30,000 per year on the sale of 10,000 units. Machine B would have fixed costs of

Rs. 18,000 per year and would yield a profit of Rs. 22,000 per year on the sale of 10,000 units. Variable costs behave linearly for both machines. Required:

(a) Break-even sales for each machine.

(b) Sales level where both machines are equally profitable.

(c) Range of sale where one machine is more profitable than the other.

(Ans.: (a) 5000 units, 4500 units; (b) 6,000 units; (c) As the C/S ratio in the case of Machine A (60%) is higher than the C/S ratio in the case of Machine B (40%), profit in the case of Machine A increases at a faster pace as compared to the increase in profit in the case of Machine B beyond the break-even point. From the fact that at the output level of 6,000 units both machines are equally profitable, it is obvious that below 6,000 units output level, profit from Machine B is higher as compared to profit from Machine A and beyond 6,000 units output level, profit from machine A is more).

6. A company has an opening stock of 6,000 units of output. The production planned for the current period is 24,000 units and expected sales for the current period amounted to 28,000 units. The selling price per unit of output is Rs. 10. Variable cost per unit is expected to be Rs. 6 per unit while it was only Rs. 5 per unit during the previous period. What is the break-even volume for the current period if the total fixed costs for the current period are Rs. 86,000? Assume that the first-in-first-out system is followed. (Ans.: 20,000 units).

7. (Closure of product line) A Ltd. manufactures three products and the cost particulars for a year are as follows:

	Product X (Rs.)	Product Y (Rs.)	Product Z
Sales	2,00,000	4,00,000	2,50,000
Material	1,00,000	1,50,000	1,25,000
Labour cost	30,000	50,000	40,000

Variable overheads	10,000	20,000	25,000
Fixed Overheads	35,000	50,000	25,000

The company imports one of the raw materials, which is used in the manufacture of all products. The consumption of material is as follows:

X - 2,000 kgs.

Y - 5,000 kgs.

Z - 3,000 kgs.

There is a restriction on the import of the material. The management is planning to close down one of the lines of product and utilize the material for other two lines to improve the profitability. As the secretary of the company, prepare a report for the closure of one line for improving the profitability.

(Ans.: Contribution per kg of imported material X: Rs. 30, Y: Rs. 36, Z: Rs. 20).

8. (Product-mix) Mega Corporation manufactures and sells three products to the automobile industry. All the products must pass through a machining process, the capacity of which is limited to 20,000 hours per annum, both by equipment design and government regulation. The following additional information is available:

	Product X (Rs.)	Product Y (Rs.)	Product Z
Selling price Rs./ unit	1,900	2,400	4,000
Variable cost Rs./ unit	700	1200	2800
Machine requirement hrs./ unit	3	2	1
Maximum possible sales units	10,000	2,000	1,000

Required: A statement showing the best possible production mix which would provide the maximum profit for Mega Corporation, together with supporting work.

(Ans.: Product-mix X: 5,000 units, Y: 2,000 units, Z: 1,000 units. Total contribution = Rs. 96,000).

8. (Acceptance of export order) A company produces a single product which is sold by it presently in the domestic market at Rs. 75 per unit. The present production and sales is 40,000 units per month representing 50% of the capacity available. The cost data of the product are as under:

Variable cost per unit Rs. 50

Fixed cost per month Rs. 10 lakh.

With a view to improve the profitability, the management has three proposals on hand as under: (a) to accept an export supply order for 30,000 units per month at a reduced price of Rs. 60 per unit, incurring additional variable costs of Rs. 5 per unit towards export packing, duties etc.; (b) to increase the domestic market sales by selling to a domestic chain stores 30,000 units at Rs. 55 per unit, retaining the existing sales at the existing price; (c) to reduce the selling price for the increased domestic sales as advised by the sales department as under:

Reduce selling price per unit by Rs.	Increase in sales expected (in units)
5	10,000
8	30,000
11	35,000

Prepare a table to present the results of the above proposals and give your comments and advise on the proposals.

**(Ans.:** Operating profits: Current Nil, Proposal (a) Rs. 1,50,000; Proposal (b) Rs. 1,50,000, Proposal (c) Selling price 70 Rs. Nil, S.P. Rs. 67, Rs. 1, 90,000, S.P. Rs. 64, Rs.50, 000).

## 6.8 SUGGESTED READINGS

1. Ashish K. Bhattacharya, Principles and Practices of Cost Accounting (3<sup>rd</sup>.), New Delhi: Prentice Hall of India Private Limited, 2004.
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## **COURSE: MANAGEMENT ACCOUNTING**

**COURSE CODE: MC-105**

**AUTHOR: SURINDER SINGH KUNDU**

**LESSON: 07**

**VETTER: PROF. H. L. VERMA**

## **STANDARD COSTING**

**Objective:** The present lesson explains the various facets of a standard costing system.

### **LWSSON STRUCTURE**

- 7.1 Introduction
- 7.2 Meaning of Standard Cost And Standard Costing
- 7.3 Steps involved in Standard Costing
- 7.4 Standard Costing Vs. Budgetary Control
- 7.5 Standard Costs and Estimated Costs
- 7.6 Advantages of Standard Costing
- 7.7 Limitations of Standard Costing
- 7.8 Preliminaries for Establishing Standard Costing System
- 7.9 Analysis of Variances
- 7.10 Accounting Treatment of Variances
- 7.11 Summary
- 7.12 Self-Test Questions
- 7.13 Suggested Readings

### **7.1 INTRODUCTION**

The basic function of management accounting is to facilitate the managerial control in a business unit or organisation. Management control is the process of evaluating performance and applying corrected measures, if required, so that performance takes place according to plans. The major aspect of managerial control is cost control. And the ‘Standard Costing’ is that technique which helps management to control costs and

business operations. It aims at eliminating wastes and increasing efficiency in performance through setting up standards or formulating different cost plans.

## 7.2 MEANING OF STANDARD COST AND STANDARD COSTING

The word 'standard' means a benchmark or gauge. The 'standard cost' is a predetermined cost which determines in advance what each product or service should cost under given circumstances. Backer and Jacobsen define "Standard cost is the amount the firm thinks a product or the operation of a process for a period of time should cost, based upon certain assumed conditions of efficiency, economic conditions and other factors". Chartered Institute of Management Accountants, London defines standard cost as "a predetermined cost which is calculated from management's standards of efficient operation and the relevant necessary expenditure". They are the predetermined costs based on technical estimate of material, labour and overhead for a selected period of time and for a prescribed set of working conditions.

The technique of using standard costs for the purposes of cost control is known as standard costing. Brown and Howard define "standard costing is a technique of cost accounting which compares the standard cost of each product or service with actual cost to determine the efficiency of the operation so that any remedial action may be taken immediately". The terminology of Cost Accountancy defines standard costing as "the preparation and use of standard costs, their comparison with actual costs, and the analysis of variance to their causes, and points of incidence". The London Institute of Cost and Works Accountants define it as "An estimate cost, prepared in advance of production or supply correlating a technical specification of material and labour to the price and wage rates estimated for a selected period of time, with an addition of the apportionment of overheads expenses estimated for the same period within a prescribed set of working conditions". Further, it is a system of cost accounting,

which is designed to find out how much should be the cost of a product under the existing conditions. The actual cost can be ascertained only when production is undertaken. The predetermined cost is compared to the actual cost and a variance between the two enables the management to take necessary corrective measures.

### **7.3 STEPS INVOLVED IN STANDARD COSTING**

The technique of standard costing involves the determination of cost before occurring.

The standard cost is based on technical information after considering the impact of current conditions. With the change in condition, the cost also can be modified so as to make it more realistic. The standard cost is divided into standards for materials, labour and overheads. The actual cost is recorded when incurred. The standard cost is compared to the actual cost. The difference between the two costs is known as variance. The variances are calculated element wise. The management can take corrective measures to set the things right on the basis of different variances.

The basic purpose of standard costing is to determine efficiency or inefficiency in manufacturing a particular product. This will be possible only if both standard costs and actual costs are given side by side. Though standard costing system will be useful for all types of commercial and industrial undertakings but it will be more useful in those undertakings where production is standardized. It will be of less use in job costing system because every job has different specifications and it will be difficult to determine standard costs for every job.

### **7.4 STANDARD COSTING Vs. BUDGETARY CONTROL**

In budgetary control, budgets are used as a means of planning and control. The targets of various segments are set in advance and actual performance is compared with predetermined objects. In this way management can assess the performance of different departments. On the other hand, standard costing also set standards and enables to determine efficiency on the basis of standards and actual performance.

Budgetary control is essential to determine standard costs, whereas, the standard costing system is necessary for planning budgets. In budgetary control the budgets are prepared for the concern as a whole whereas in standard costing the standards are set for producing a product or for providing a service. In standard costing, unit concept is used while in budgetary control total concept is used. The budgets are fixed on the basis of past records and future expectations. Standard costs are fixed on the basis of technical information. Standard costs are planned costs and these are expected in future. As far as scope is concerned, in case of budgetary control it is much wider than standard costing. Budgets are prepared for incomes, expenditures and other functions of the departments such as purchase, sale, production, finance and personnel department. In contrary, standards are set up for expenditures only and, therefore, for manufacturing departments standards are set for different elements of cost i.e., material, labour and overheads.

Further, in budgetary control, the targets of expenditure are set and these targets cannot be exceeded. In this system the emphasis is on keeping the expenditures within the budgeted figures. In standard costing the standards are set and an attempt is made to achieve these standards. The emphasis is on achieving the standards. Actual costs may be more than the standard costs and there can be no such thing in budgetary control. The budgetary control system can be applied partly or wholly. Budgets may be prepared for some departments and may not be prepared for all the departments. If a concern is interested in preparing production budget only, it is free to do so. Standard costing cannot be used partially; it will have to be used wholly. The standards will have to be set for all elements of cost. In fact, the systems operate in two different fields and both are complimentary in nature.

## **7.5 STANDARD COSTS AND ESTIMATED COSTS**

The standard costs and estimated costs both are used to determine price in advance. The purpose of both of them is to control cost. They follow the same accounting principles. Despite similarities, they differ in terms of objects and purpose. Estimated costs are based on historical accounting. It is an estimate of what the cost will be. It is a cost of guesswork or reasonable estimate for the costs in future. On the other hand standard costs are based on scientific analysis and engineering studies. Standard costing determines what the cost should be. Standard costs are used as a device for measuring efficiency. The standards are predetermined and a comparison of standards with actual costs enables to determine the efficiency of the concern. Estimated costs cannot be used to determine efficiency. It only determines the expected costs. An effort is made that estimated cost should almost be near to actual costs. The purpose of determining estimated costs is to find out selling price in advance to take a decision whether to produce or to make and also to prepare financial budgets. Estimated costs do not serve the purpose of cost control. On the other hand standard costs are helpful in cost control. The analysis of variance enables to take corrective measures, if necessary. Standard costs are not easily changed. The standards are set in such a way that small changes in conditions do not require a change in standards. Estimated costs are revised with the change in conditions. They are made more realistic by incorporating changes in prices. Standard costs are more static than estimated costs. Estimated costs are used by the concern using historical costing. Standard costing is used by those concerns which use standard costing system. Standard costing is a part of cost accounting process while estimated costs are statistical in nature and as such they may not become a part of accounting.

## **7.6 ADVANTAGES OF STANDARD COSTING**

Standard costing is not only helpful for cost control purposes but it is also useful in

production planning and policy formulation. It derives following advantages:

1. **Measurement of Efficiency:** It is a tool for assessing the efficiency after comparing the actual costs with standard costs to enable the management to evaluate performance of various cost centres. By comparing actual costs with standard costs variances are determined and management is able to identify the place of inefficiencies. It can fix responsibility for deviation in performance. A regular check on various expenditures is also ensured by standard costing system. The standards are being constantly analyzed and an effort is made to improve efficiency. Whenever a variance occurs the reasons are studied and immediate corrective measures are undertaken.
2. **Production and Price Policy Formulation:** It becomes easy to formulate production plans by taking into account standard costs. It is also supportive for finding prices of various products. In case, tenders are to be submitted or prices are to be quoted in advance then standard costing produces necessary data for price fixation.
3. **Reduction of Work:** In this system, management is supplied with useful information and necessary information is recorded and redundant data are avoided. The report presentation is simplified and only required information is presented in such a form that management is able to interpret the information easily and usefully. Therefore, standard costing reduces clerical work to a considerable extent
5. **Management by Exception:** Management by exception means that everybody is given a target to be achieved and management need not supervise each and everything. The responsibilities are fixed and every body tries to achieve his targets. If the things are going as per targets then the management needs not to bother. Management devotes its time to other important things. So, management by exception is possible only when targets of work can be fixed. Standard costing enables the

determination of targets.

## **7.7 LIMITATIONS OF STANDARD COSTING**

Besides all the above benefits derived from this system, it has a number of limitations, which are discussed as follows:

1. Standard costing cannot be used in those concerns where non-standard products are produced.
2. The time and motion study is required to be undertaken for the process of setting up standards. These studies require a lot of time and money. Further, the process of setting up standards is a difficult task, as it requires technical skill.
3. There are no inset circumstances to be considered for fixing standards. With the change in circumstances the standards are also to be revised. The revision of standard is a costly process.
4. This system is expensive and small concerns may not afford to bear the cost. For small concerns the utility from this system may be less than the cost involved in it.
5. The fixing of responsibility is not an easy task. The variances are to be classified into controllable and uncontrollable variances. The responsibility can be fixed only for controllable variances not in the case of uncontrollable.
6. The industries liable for frequent technological changes will not be suitable for standard costing system. The change in production process will require a revision of standard. A frequent revision of standard will be costly. So this system will not be useful for industries where methods and techniques of production are fast changing.

## **7.8 PRELIMINARIES FOR ESTABLISHING STANDARD COSTING SYSTEM**

The establishment of a standard costing system involves the following steps:

**1. Determination of Cost Centre:** A cost centre may be a department or part of a department or item of equipment or machinery or a person or a group of persons in respect of which costs are accumulated and one where control can be exercised. Cost centres are necessary for determining the costs.

**2. Classification of Accounts:** Classification of accounts is necessary to meet a required purpose i.e., function, asset or revenue item. Codes can be used to have a speedy collection of accounts. A standard is a predetermined measure of material, labour and overheads. It may be expressed in quantity and its monetary measurements in standard costs.

**3. Types of Standards:** The standards are classified into three categories:

**(i) Current Standard.** A current standard is a standard which is established for use over a short period of time and is related to current condition. It reflects the performance which should be accomplished during the current period. The period for current standard is normally one year. It is supposed that the conditions of production will remain unchanged. In case there is any change in price or manufacturing condition, the standards are also revised. Current standard may be ideal standard and expected standard.

**(a) Ideal Standard.** The standard represents a high level of efficiency. It is fixed on the assumption that favourable conditions will prevail and management will be at its best. The price paid for materials will be lowest and wastages cost of labour and overhead expenses will be minimum possible.

**(b) Expected Standard.** This standard is based on expected conditions. It is the target which can be achieved if expected conditions prevail. All existing facilities and expected changes are taken into consideration while fixing these standards. An allowance is given for human error and normal deficiencies. It is realistic and an

attainable and it is used for fixing efficiency standard.

**(ii) Basic Standard:** A basic standard is established for use for an indefinite period or a long period. These standards are revised only on the changes in specification of material and technology production.

**(iii) Normal Standard:** Normal standard is a standard which is anticipated can be attained over a future period of time, preferably long enough to cover one trade cycle. This standard is based on the conditions which will cover a future period, say 5 years, concerning one trade cycle. If a normal cycle of ups and downs in sales and production is 10 years then standard will be set on average sales and production which will cover all the years.

**4. Organisation for Standard Costing:** In a business concern a standard costing committee is formed for the purpose of setting standards. The committee includes production manager, purchase manager, sales manager, personnel manager, chief engineer and cost accountant. The Cost Accountant acts as a coordinator of this committee. He supplies all information for determining the standard and later on coordinates the costs of different departments. He also informs the committee about the change in price level, etc. The committee may revise the standards in the light of the changed circumstances.

**5. Setting of Standards:** The standard for direct material, direct labour and overhead expenses are fixed. The standards for direct material, direct labour and overheads should be set up in a systematic way so that they can be used as a tool for cost control easily.

## **7.9 ANALYSIS OF VARIANCES**

The divergence between standard costs, profits or sales and actual costs, profits or sales respectively will be known as variances. The

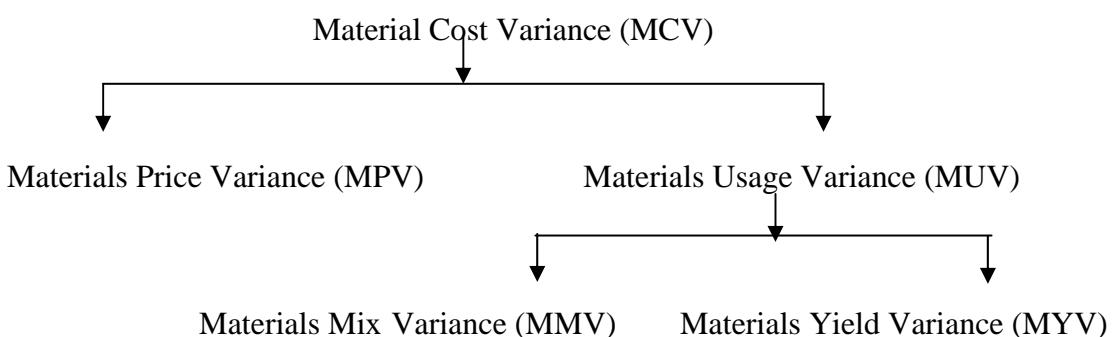
variances may be favourable and unfavourable. If actual cost is less than the standard cost and actual profit and sales are more than the standard profits and sales, the variances will be favourable. On the contrary if actual cost is more than the standard cost and actual profit and sales are less than the standard profits and sales, the variances will be unfavourable. The variances are related to efficiency. If variances are favourable, it will show efficiency and if variances are unfavourable it will show inefficiency. The variances may be classified into four categories such as Direct Materials Variances, Direct Labour Variances, Overheads Cost Variances and Sales or Profit Variances.

### 7.9.1 DIRECT MATERIAL VARIANCES

Direct material variances are also known as material cost variances. The material cost variance is the difference between the standard cost of materials that should have been incurred for manufacturing the actual output and the cost of materials that has been actually incurred. Material Cost Variance comprises of: (i) Material Price Variance and (ii) Material Usage Variance: Material usage variance may further be subdivided into material Mix Variance and Material Yield Variance.

The Chart 7.1 depicts the divisions and subdivisions of material variances.

**Chart 7.1**



The following equations may be used for verification of material cost variances.

$$(i) \quad MCV = MPV + MUV \text{ or } MPV + MMV + MYV$$

$$(ii) \quad MUV = MMV + MYV$$

(a) **Materials Cost Variance:** Material cost variance is the difference

between standard materials cost and actual materials cost. Material cost variance arises due to change in price of materials and variations in use of quantity of materials. Material cost variance is ascertained as such:

Materials Cost Variance = Standard Material Cost – Actual Material Cost

Standard Material Cost = Standard Price per unit x Standard Quantity of materials

Actual Material Cost = Actual price per unit x Actual quantity of materials.

If the standard cost is more than the actual cost, the variance will be favourable and on the other hand, if the actual cost is more than the standard cost, the variance will be unfavourable or adverse.

**(b) Materials Price Variance:** Materials price variance arises due to the standard price specified and actual price paid. It may also arise due to: (i) Changes in basic prices of materials, (ii) failure to purchase the quantities anticipated at the time when standards were set, (iii) failure to secure discount on purchases, (iv) failure to make bulk purchases and incurring more on freight, etc., (v) failure to purchase materials at proper time, and (vi) Not taking cash discount when setting standards.

Materials Price Variance= Actual Quantity (Standard price–Actual price)

In this case actual quantity of materials used is taken. The price of materials is taken per unit. If the answer is in plus, the variance will be favourable and it will be unfavourable if the result is in negative.

**(c) Material Usage Variance.** Material usage (or quantity) variance arises due to the difference in standard quantity specified and actual quantity of materials used. This variance may also arise due to: (i) Negligence in use of materials, (ii) More wastage of materials by untrained workers or defective methods of production, (iii) Loss due to pilferage, (iv) Use of material mix other than the standard mix, (v) More

or less yield from materials than the standard set, and (vi) Defective production necessitating the use of additional materials.

Materials usage variance= Standard Price (Standard Quantity – Actual Quantity)

The quantities of material specified and actually used are taken and standard price per unit is used. If the answer from the above mentioned formula is in plus, the variance will be a favourable variance but if the answer is in minus the variance will be unfavourable or adverse.

**Example 7.1:** Following is the data of a manufacturing concern. From the figures given below, calculate (i) Materials Cost Variance, (ii) Material Price Variance, and (iii) Material Usage Variance. The standard quantity of materials required for producing one ton of output is 40 units. The standard price per unit of materials is Rs. 3. During a particular period 90 tons of output was undertaken. The materials required for actual production were 4,000 units. An amount of Rs. 14,000 was spent on purchasing the materials.

**Solution:**

Standard quantity of material (SQ) =  $(90 \times 40) = 3600$  units

Standard price per unit = Rs. 3

Actual price per unit =  $14000/4000 =$  Rs. 3.50

**(i) Material Cost Variance** = Standard material cost – Actual material cost

$$\begin{aligned} \text{Standard material cost} &= \text{Standard quantity} \times \text{Standard price} (3,600 \times 3 = \text{Rs. } 10,800) \\ &= 10,800 - 14,000 \\ &= (-) \text{Rs. } 3,200 \text{ Adverse} \end{aligned}$$

**(ii) Material Price Variance** = Actual Quantity (Standard price per unit – Actual price per unit)

$$\begin{aligned} &= 4,000 (3.00 - 3.50) \\ &= 4,000 (-0.50) \\ &= (-) \text{Rs. } 2,000 \text{ Adverse} \end{aligned}$$

**(iii) Material Usage Variance** = Standard Price per unit (SQ – AQ)

$$\begin{aligned} &= 3 (3,600 - 4,000) \end{aligned}$$

$$= 3 (-400) = (-) \text{Rs. } 1,200 \text{ Adverse}$$

**Verification:**  $\text{MCV} = \text{MPV} + \text{MUV}$

$$- 3,200 = - 2,000 - 1,200$$

$$- 3,200 = - 3,200$$

**Example 7.2:** From the data given below, calculate: (i) Material Cost Variance, (ii) Material Price Variance, and (iii) Material Usage Variance.

Product	Standard Quantity (Units)	Standard Price Rs.	Actual Quantity (Units)	Actual Price Rs.
A	1,050	2.00	1,100	2.25
B	1,500	3.25	1,400	3.50
C	2,100	3.50	2,000	3.75

**Solution:**

**(i) Material Cost Variance** = Standard Cost – Actual Cost

$$\text{Or } (\text{SQ} \times \text{Std. Rate}) - (\text{AQ.} \times \text{Actual Rate})$$

$$\text{Material A} = (1,050 \times 2) - (1,100 \times 2.25)$$

$$2,100 - 2,475 = - \text{Rs. } 375$$

$$\text{Material B} = (1,500 \times 3.25) - (1,400 \times 3.50)$$

$$4,875 - 4,900 = - \text{Rs. } 25$$

$$\text{Material C} = (2,100 \times 3.50) - (2,000 \times 3.75)$$

$$7,350 - 7,500 = - \text{Rs. } 150$$

$$\text{Material Cost Variance} = \text{Rs. } 550 \text{ Unfavourable}$$

**(ii) Material Price Variance** = Actual Quantity (Standard Price – Actual Price)

$$\text{Material A} = 1,100 (2.00 - 2.25)$$

$$= 1,100 (-0.25) = \text{Rs. } 275$$

$$\text{Material B} = 1,400 (3.25 - 3.50)$$

$$= 1,400 (-0.25) = - \text{Rs. } 350$$

$$\text{Material C} = 2,000 (3.50 - 3.75)$$

$$= 2,000 (-0.25) = - \text{Rs. } 500$$

$$\text{Material Price Variance} = \text{Rs. } 1,125 \text{ Unfavourable}$$

**(iii) Material Usage Variance** = Standard Price (SQ – AQ)

$$\text{Material A} = 2 (1.050 - 1,100)$$

$$= 2 (-50) = \text{Rs. } 100$$

$$\begin{aligned}
 \text{Material B} &= 3.25 (1,500 - 1,400) \\
 &= 3.25 (100) = \text{Rs. 325} \\
 \text{Material C} &= 3.50 (2,100 - 2,000) \\
 &= 3.50 (100) = \text{Rs. 350}
 \end{aligned}$$

Material Usage Variance = Rs. 575 Favourable

**Verification:** MCV = MPV + MUV

$$\begin{aligned}
 - \text{Rs. 550} &= - \text{Rs. 1125} + \text{Rs. 575} \\
 - \text{Rs. 550} &= - \text{Rs. 550}
 \end{aligned}$$

**(d) Material Mix Variance:** Materials mix variance is that part of material usage variance which arises due to changes in standard and actual composition of mix. Materials mix variance is the difference between standard price of standard mix and standard price of actual mix. The standard price is used in calculating this variance. The variance is calculated under two situations: (i) When actual weight of mix is equal to standard weight of mix, and (ii) When actual weight of mix is different from the standard mix.

**(i) When Actual Weight and Standard Weight of Mix is Equal**

In this case the formula for calculating mix variance is :

Standard cost of standard mix – Standard cost of actual mix.

$(\text{Standard Price} \times \text{Standard Quantity}) - (\text{Standard Price} \times \text{Actual Quantity})$

Or Standard unit cost  $(\text{Standard Quantity} - \text{Actual Quantity})$

In case standard quantity is revised due to shortage of one material, the formula will be equal to Standard unit cost  $(\text{Revised Standard Quantity} - \text{Actual Quantity})$ .

**Example 7.3:** Calculate material mix variance from the data given as such:

Materials	Standard		Actual	
	Quantity (Units)	Price per unit	Quantity (Units)	Price per unit
A	50	2.00	60	2.25

B	100	1.20	90	1.75
---	-----	------	----	------

Due to the shortage of material A, the use of material A was reduced by 10% and that of material B increased by 5%.

**Solution:**

In this question the standards will be revised. Revised standards will be :

$$\text{Material A} = 50 - 5 (50 \times 10/100) = 45$$

$$\text{Material B} = 100 + 5 (100 \times 5/100) = 105$$

**Material Mix Variance** = Standard Unit Price (Revised Standard Quantity – AQ)

$$\begin{aligned} \text{Material A} &= 2 (45 - 60) \\ &= 2 (-15) \quad = -\text{Rs. 30} \end{aligned}$$

$$\begin{aligned} \text{Material B} &= 1.20 (105 - 90) \\ &= 1.20 (15) \quad = \text{Rs. 18} \end{aligned}$$

Material Mix Variance = - Rs. 12 Unfavourable

**(ii) When Actual Weight and Standard Weight of Mix are Different**

When quantities of actual material mix and standard material mix are different, the formula will be:

$$\left\{ \frac{\text{Total Weight of Actual mix}}{\text{Total Weight of Standard mix}} \times \text{Standard cost of Standard mix} \right\} - (\text{Standard cost of actual mix})$$

In case the standard is revised due to the shortage of one material then revised standard will be used instead of standard, the formula will become:

$$\left[ \frac{\text{Total Weight of Actual mix}}{\text{Total Weight of Revised Standard mix}} \times \frac{\text{Standard cost of Revised Standard mix}}{\text{Standard cost of Standard mix}} \right] - (\text{Standard cost of Actual Mix})$$

**Example 7.4:** From the following data calculate various material variances:

Material	Standard		Actual	
	Quantity (units)	Price per unit Rs.	Quantity (units)	Price per unit Rs.
A	80	8.00	90	7.50
B.	70	3.00	80	4.00

**Solution:**

**(a) Material Cost Variance** = Standard Material Cost – Actual Material Cost

(Standard Qty. x Standard Price) – (Actual Qty. x Actual Price)

$$\begin{aligned}\text{Material A} &= (80 \times 8) - (90 \times 7.50) \\ &= 640 - 675 \\ &= -\text{Rs. } 35\end{aligned}$$

$$\begin{aligned}\text{Material B} &= (70 \times 3) - (80 \times 4.00) \\ &= 210 - 320 \\ &= -\text{Rs. } 110\end{aligned}$$

$$\text{Material Cost Variance} = \text{Rs. } 145 \text{ Unfavourable}$$

**(b) Material Price Variance** = Actual Quantity (Standard Price – Actual Price)

$$\begin{aligned}\text{Material A} &= 90 (8.00 - 7.50) \\ &= 90 (0.50) \\ &= +\text{Rs. } 45\end{aligned}$$

$$\begin{aligned}\text{Material B} &= 80 (3.00 - 4.00) \\ &= 80 (-1.00) \\ &= -\text{Rs. } 80\end{aligned}$$

$$\text{Material Price Variance} = \text{Rs. } 35 \text{ Unfavourable}$$

**(c) Material Usage Variance** = Standard Price (Standard Quantity – Actual Quantity)

$$\begin{aligned}\text{Material A} &= 8 (80 - 90) \\ &= 8 (-10) \\ &= -\text{Rs. } 80\end{aligned}$$

$$\begin{aligned}\text{Material B} &= 3 (70 - 80) \\ &= 3 (-10) \\ &= -\text{Rs. } 30\end{aligned}$$

$$\text{Material Usage Variance} = \text{Rs. } 110 \text{ Unfavourable}$$

**(d) Material Mix Variance:** In this question standard weight of mix is different from the actual weight of mix, so the formula will be :

$$\frac{\text{Total Weight of Actual Mix}}{\text{Total weight of Standard Mix}} \times \text{Standard cost of Standard Mix}$$

$$\begin{aligned}\left[ \frac{170}{150} \times 80 \times 8 + 70 \times 3 \right] - [90 \times 8 + 80 \times 3] \\ \left[ \frac{170}{150} \times 850 \right] - 960 = 963.3 - 960 = \text{Rs. } 3.3 \text{ Favourable}\end{aligned}$$

**(e) Materials Yield Variance.** This is the sub-variance of material usage variance. It results from the difference between actual yield and standard yield. It may be defined as that portion of the direct materials usage variance which is due to the standard yield specified and the actual yield obtained. It may arise due to low quality of materials, defective methods of production, carelessness in handling materials, etc.

Material yield variance is calculated with the following formula:

$$\text{Standard Rate} (\text{Actual yield} - \text{Standard yield})$$

Standard Rate is calculated as follows:

$$\text{Std. Rate} = \frac{\text{Standard Cost of Standard mix}}{\text{Net standard output i.e., Gross output} - \text{Standard Loss}}$$

There may be a situation where standard mix may be different from the actual mix. In this case the standard is revised in relation to actual mix and the question is solved with the revised standard and not with the original standard. The standard rate will be calculated as follows:

$$\text{Std. Rate} = \frac{\text{Standard Cost of revised Standard mix}}{\text{Net standard output}}$$

In the earlier variances if the standard was more than the actual, the variance was favourable. But, in case of material yield variance the case is different. When actual yield is more than the standard yield, the variance will be favourable.

**Example 7.5:** The standard mix of a product is as under:

A	60 units at 15 P. per unit	Rs. 9
B	80 units at 20 P. per unit	Rs. 16
C	100 units at 25 P. per unit	Rs. 25
	<u>240</u>	<u>Rs. 50</u>

Ten units of finished product should be obtained from the above mentioned mix. During the month of January, 1996 ten mixes were completed and the consumption was as follows:

A	640 units at 20 P. per unit	Rs. 128
B	960 units at 15 P. per unit	Rs. 144
C	840 units at 30 P. per unit	Rs. 252
	<u>2,440</u>	<u>Rs. 524</u>

The actual output was 90 units.

Calculate various material variances.

**Solution:**

**(i) Material Cost Variance:**

The standard has been given for producing 10 units in one mix. Ten mixes have been completed, so standard production will be 100 units..

Standard cost for 100 Units =  $50 \times 10 = \text{Rs. } 500$

Actual yield is 90 units, so standard cost will be adjusted accordingly.

Standard cost for actual yield =  $100 \times 90 = \text{Rs. } 450$

$$\begin{aligned}\text{Material Cost Variance} &= \text{Standard Cost} - \text{Actual Cost} \\ &= 450 - 524 = \text{Rs. } 74 \text{ unfavourable}\end{aligned}$$

**(ii) Material Price Variance** = Actual Quantity (Standard Price – Actual Price)

$$\begin{aligned}\text{Material A} &= 640 (0.15 - 0.20) \\ &= 640 (-0.05) = \text{Rs. } 32 \text{ unfavourable}\end{aligned}$$

$$\begin{aligned}\text{Material B} &= 960 (0.20 - 0.15) \\ &= 960 (0.05) = \text{Rs. } 48 \text{ favourable}\end{aligned}$$

$$\begin{aligned}\text{Material C} &= 840 (0.25 - 0.30) \\ &= 840 (-0.05) = \text{Rs. } 42 \text{ unfavourable}\end{aligned}$$

Material price Variance (A + B + C) =  $\text{Rs. } 26$  unfavourable

**(iii) Material Usage Variance:**

The standard quantity will be revised in proportion to actual production. Revised quantity will be :

$$A = \frac{600}{100} \times 90 = 540$$

$$B = \frac{800}{100} \times 90 = 720$$

$$C = \frac{1000}{100} \times 90 = 900$$

Standard Price (Standard Quantity – Actual Quantity)

Material A : 15 P. ( $540 - 640$ )

$15 (-100) = \text{Rs. } 5$  unfavourable

Material B : 20 P. ( $720 - 960$ )

$20 (-240) = \text{Rs. } 48$  unfavourable

Material C : 25 P. ( $900 - 840$ )

$25 (60) = \text{Rs. } 15$  favourable

Material usage Variance =  $\text{Rs. } 48$  unfavourable.

**(iv) Material Mix Variance**

There is a difference between standard quantity ( $240 \times 10 = 2,400$ ) and actual quantity (2,440), so the standard will be revised first.

Revised standard quantity will be :

$$A = \frac{60}{240} \times 2,440 = 610$$

$$B = \frac{80}{240} \times 2,440 = 813 \text{ (approximately)}$$

240

$$C = \frac{100}{240} \times 2,440 = 1,017 \text{ (approximately)}$$

Material Mix Variance: Standard Price (Revised Standard Quantity – AQ)

Material A: 15 P. (610 – 640)

$$.15 (-30) = \text{Rs. } 4.50 \text{ unfavourable}$$

Material B : 20 P. (813 – 960)

$$.20 (-147) = \text{Rs. } 29.40 \text{ unfavourable}$$

Material C : 25 P. (1017 – 840)

$$25 (177) = \text{Rs. } 44.25 \text{ favourable}$$

Material Mix Variance = Rs. 10.35 favourable

**(V) Material Yield Variance** = Standard Rate (Actual Yield – Standard Yield)

$$\text{Standard Rate} = \frac{\text{Standard Cost of revised Standard mix}}{\text{Net standard output}} \\ = 50/10 = \text{Rs. } 5$$

Standard Yield =  $10/240 \times 2440 = 101.67$  units

Yield Variance = 5 (90 – 101.67) = Rs. 58.35 unfavourable.

**Verification:** (i)  $MCV = MPV + MUV$  or  $-74 = -26 - 48 = -74$   
(ii)  $MUV = MMV + MYV$  or  $-48 = 10.35 - 58.35 = -48$

**Example 7.6:** KSS Ltd. produces an article by blending two basic raw materials. It operates a standard costing system and the following standards have been set for raw materials:

Materials	Standard Mix	Standard Price per kg.
A	40%	Rs.4.00
B	60%	Rs. 3.00

The standard loss in processing is 15%. During April, 1996, the company produced, 1,700 kg. of finished output.

The position of stock and purchases for the month of April, 1996 is as under:

Material	Stock on	Stock on	Purchased during	
	1-4-96	30-4-96	April, 1996	
	kg	kg	kg	Cost Rs.
A	35	5	800	3,400
B	40	50	1,200	3,000

Calculate the following variances:

(i) Material Price Variance; (ii) Material Usage Variance; (iii) Material Yield Variance; (iv) Material Mix Variance; (v) Total Material Cost Variance.

**Solution:**

#### **Calculation of Standard Cost of Standard Mix**

Material	Standard Quantity of Material required	Standard Price per kg.	Standard Cost
	kg.	Rs.	Rs.
A	800	4	3,200
B	<u>1,200</u>	3	<u>3,600</u>
Total	<u>2,000</u>		<u>6,800</u>

#### **Standard Cost**

The standard loss is 15% ; so to get 85 finished kgs. 100 kgs. of material are required.

Actual finished product is 1,700 kgs; so standard material required will be

$$\left( \frac{1,700 \times 100}{85} \right) = 2,000 \text{ kgs.}$$

Out of 2,000 kgs ; material A will be 800 kgs. (40%) and material B will be 1,200 kgs (60%).

#### **Calculation of Actual Cost of material used**

**Material A :**

Opening Stock	: 35 kgs @ Rs. 4 (standard rate)	Rs. 140.00
Out of Purchases	: 795 kgs @ Rs. 4.25 (actual rate)	Rs. 3,378.75
(Purchases – Closing Stock)		<u>Rs. 3518.75</u>

**Material B :**

Opening Stock:	: 40 kgs @ Rs. 3 (standard rate)	Rs. 120.00
Out of Purchases	: 1,150 kgs @ 2.50 (actual rate)	Rs 2,875.00
(Purchase – closing stock)		<u>Rs. 6513.75</u>

**Actual Rate:**

$$\text{Material A} = \frac{\text{Rs. 3400}}{800 \text{ kgs}} = \text{Rs. 4.25}, \text{Material B} = \frac{\text{Rs. 3000}}{1200 \text{ kgs}} = \text{Rs. 2.50}$$

**(i) Material Price Variance:**

$$\begin{aligned} \text{Material A} &= (830 \text{ kg} \times 4) - (35 \text{ kgs} \times 4 + 795 \text{ kgs} \times 4.25) \\ &= \text{Rs. } 3,320 - \text{Rs. } 3,518.75 \\ &= \text{Rs. } 198.75 \text{ Adverse.} \end{aligned}$$

$$\begin{aligned} \text{Material B} &= (1,190 \text{ kgs} \times 3) - (40 \text{ kgs} \times 3 + 1,150 \text{ kgs} \times 2.50) \\ &= \text{Rs. } 3,570 - \text{Rs. } 2,995 = \text{Rs. } 575 \text{ (Favourable)} \end{aligned}$$

Total Material Price Variance =  $-198.75 + 575 = \text{Rs. 376.25 Favourable.}$

**(ii) Material Usage Variance:**

Standard Price (Standard Usage—Actual Usage)

Material A : Rs. 4 (800 kgs – 830 kgs) = Rs. 120 Adverse

Material B : Rs. 3 (1,200 kgs – 1,190 kgs) = Rs. 30 Favourable

Total Material Usage Variance =  $-120 + 30 = 90 \text{ Adverse}$

**(iii) Material Yield Variance**

Standard Rate (Actual yield – Standard Yield)

= Rs. 4 (1,700 kgs – 1,717 kgs)

= Rs. 68 Adverse

Standard Rate =  $\frac{\text{Rs. 6,800}}{1,700 \text{ kgs}} = \text{Rs. 4}$

Standard Yield =  $\frac{1,700}{2,000} \times 2,020 = 1,717 \text{ kgs.}$

**(iv) Material Mix Variance:**

$$\left[ \frac{\text{Total Weight of Actual Mix}}{\text{Total Weight of Standard Mix}} \times \text{Standard Rate} \right] - (\text{Standard Cost of Actual Mix})$$

$$\left[ \frac{2,020 \times \text{Rs. 6,800}}{2,000} \right] - (830 \text{ kgs} \times 4 + 1,190 \text{ kgs} \times 4) = \text{Rs. 6,868} - \text{Rs. 6,890}$$
  
= Rs. 22 Adverse

**(v) Total Material Cost Variance:**

Standard Cost of Materials – Actual Cost of Materials

Rs. 6,800 – Rs. 6,513.75 = Rs. 286.25 Favourable.

## 7.9.2 DIRECT LABOUR VARIANCES

Labour Variances are discussed as follows:

**(a) Labour Cost Variance**

Labour Cost Variance or Direct Wage Variance is the difference between the standard direct wages specified for the activity and the actual wages paid. It is the function of labour rate of pay and labour time variance. It arises due to a change in either a wage rate or in time or in both. It is calculated as follows:

Labour Cost Variance = Standard Labour Cost – Actual Labour Cost (Standard time x Standard Wage Rate) – (Actual Time x Actual Wage Rate)

**(b) Labour Rate of Pay or Wage Rate Variance**

It is that part of labour cost variance which arises due to a change in specified wage rate. Labour rate variance arises due to (i) change in basic wage rate or piece-work rate, (ii) employing persons of different grades than specified, (iii) payment of more overtime than fixed earlier, (iv) new workers being paid different rates than the standard rates, and (v) different rates being paid to workers employed for seasonal work or excessive work load.

The wage rates are determined by demand and supply conditions of labour conditions in labour market, wage board awards, etc. So, wage rate variance is generally uncontrollable except if it arises due to the development of wrong grade of labour for which production foreman will be responsible. This variance is calculated by the formula: Labour Rate of Pay Variance = Actual time (Standard Rate – Actual Rate)

The variance will be favourable if actual rate is less than the standard rate and it will be unfavourable or adverse if actual rate is more than the standard rate.

**(c) Labour Efficiency or Labour Time Variance**

It is that part of labour cost variance which arises due to the difference between standard labour hours specified and the actual labour hours spent. It helps in controlling efficiency of workers. The reasons for this variance are: (i) lack of proper supervision, (ii) defective machinery and equipment, (iii) insufficient training and incorrect instructions, (iv) increase in labour turnover, (v) bad working Conditions, (vi) discontentment among workers due to unsatisfactory personnel relations, and (vii) use of non-standard material requiring more time to complete work.

Labour efficiency variance is calculated as: Labour efficiency variance = Standard Wage Rate (Standard Time – Actual Time).

If actual time taken for doing a work is more than the specified standard time, the

variance will be unfavourable. On the other hand, if actual time taken for a job is less than the standard time, the variance will be favourable.

**(d) Idle Time Variance**

This variance is the standard cost of actual time paid to workers for which they have not worked due to abnormal reasons. The Reasons for idle time may be power failure, defect in machinery, and non supply of materials, etc. Idle time variance should be segregated from the labour efficiency variance otherwise it will show inefficiency on the part of workers though they are not responsible for this. Idle time variance is always adverse and needs investigation for its causes. This variance is calculated as:

Idle Time Variance=Idle Hours x Standard Rate

**(e) Labour Mix or Gang Composition Variance**

This variance arises due to change in the actual gang composition than the standard gang composition. This variance shows to the management how much labour cost variance is due to the change in labour composition.

It may be calculated in two ways:

(i) When **standard and actual times of the labour mix are same**. In this case the variance is calculated as follows: .

Labour Mix Variance = Standard Cost of Standard Labour Mix – Standard Cost of Actual Labour Mix.

Due to the non-availability of one grade of labour, there may be a change in standard labour mix, and then revised standard will be used for standard mix. The formula will be: Labour Mix Variance = Standard cost of Revised Standard Labour Mix - Standard Cost of Actual Labour Mix.

(ii) When **standard and actual time of labour mix are different**:

In this case the variance will be calculated as follows:

$$\left[ \frac{\text{Total Time of Actual Labour Mix}}{\text{Total Time of Standard Labour Mix}} \times \text{Standard Cost of Standard Labour Mix} \right]$$

)

- (Standard Cost of Actual Labour Mix)

As in the earlier case, if labour composition is revised because of non-availability of one grade of labour then revised standard mix will be used instead of standard mix and the formula will become:

$$\left[ \left( \frac{\text{Total Time of Actual Labour Mix}}{\text{Total Time of Revised Standard Labour Mix}} \times \text{Standard Cost of Revised Standard Labour Mix} \right) - (\text{Standard Cost of Actual Labour Mix}) \right]$$

**Example 7.7:** The information regarding the composition and the weekly wage rates of labour force engaged on a job scheduled to be completed in 30 weeks:

Category of Workers	Standard		Actual	
	No. of workers	Weekly Wage rate per worker	No. of workers	Weekly Wage rate per worker
Rs.				
Skilled	75	60	70	70
Semi-skilled	45	40	30	50
Unskilled	60	30	80	20

The work was completed in 32 weeks. Calculate various labour variances.

**Solution:**

(i) **Labour Cost Variance** = Standard Labour Cost - Actual labour Cost

Standard Labour Cost : Rs.

Skilled :  $75 \times 60 \times 30 = 1,35,000$

Semi-skilled :  $45 \times 40 \times 30 = 54,000$

Unskilled :  $60 \times 30 \times 30 = 54,000$

Total 2,43,000

Actual Labour Cost:

Skilled :  $70 \times 70 \times 32 = 1,56,800$

Semi Skilled :  $30 \times 50 \times 32 = 48,200$

Unskilled :  $80 \times 20 \times 32 = 51,200$

Total 2,56,000

Total Labour Cost Variance:  $2,43,000 - 2,56,000 = \text{Rs. } 13,000$  Adverse

(ii) **Labour Rate Variance**= Actual Time (Standard Rate – Actual Rate)

Skilled : 2,240 (60 – 70)

2,240 (– 10) = Rs. 22,400 Adverse

Semi Skilled : 960 (40 – 50)

960 (–10) = Rs. 9,600 Adverse

Unskilled : 2,560 (30 – 20)

2,560 (10) = Rs. 25,600 Favourable

Labour Rate Variance = Rs. 6,400 Adverse

(iii) **Labour Efficiency Variance**= Standard Rate (Standard Time – Actual Time)

Skilled : 60(2,250 – 2,240)

60(10) = Rs. 600 Favourable

Semi Skilled : 40(1,350-960)

40(390) = Rs. 15,600 Favourable

Unskilled : 30(1,800 – 2,560)

30 ((-760)) = Rs. 22,800 Adverse.

Labour Efficiency Variance = Rs. 6,600 Adverse

### Verification:

Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance

– 13,000 = – 6,400 – 6,600

–13,000 = –13,000.

**Example 7.8:** The following data is taken out from the books of a manufacturing company:

Budgeted labour composition for producing 100 articles

20 Men @ Rs. 125 per hour for 25 hours

30 women @ 1.10 per hour for 30 hours

Actual labour composition for producing 100 articles

25 Men @ Rs. 1.50 per hour for 24 hours

25 Women @ Re.1.20 per hour for 25 hours

Calculate: (i) Labour Cost Variance, (ii) Labour Rate Variance, (iii) Labour Efficiency Variance, (iv) Labour Mix Variance.

### Solution:

(i) **Labour Cost Variance**= Standard Labour Cost – Actual Labour cost

Men :  $(20 \times 25 \times 1.25) - (25 \times 24 \times 1.50)$

625 – 900 = Rs.275 Adverse

$$\text{Women: } (30 \times 30 \times 1.10) - (25 \times 25 \times 1.20)$$

$$990 - 750 = \text{Rs. 240 Favourable}$$

$$\text{Labour Cost Variance} = -275 + 240 = \text{Rs. 35 Adverse.}$$

(ii) **Labour Rate Variance** = Actual Time (Standard Rate – Actual Rate)

$$\text{Men : } 600 (1.25 - 1.50)$$

$$600 (-0.25) = \text{Rs. 150.00 Adverse}$$

$$\text{Women : } 625 (1.10 - 1.20)$$

$$625 (-0.10) = \text{Rs. 62.50 Adverse}$$

$$\text{Labour Rate Variance} = \text{Rs. 212.50 Adverse.}$$

(iii) **Labour Efficiency Variance** = Standard Rate (Standard Time – Actual Time)

$$\text{Men : } 1.25 (500 - 600)$$

$$1.25 (-100) = \text{Rs. 125 Adverse}$$

$$\text{Women : } 1.10 (900 - 625)$$

$$1.10 (275) = \text{Rs. 302.50 Favourable}$$

$$\text{Labour Efficiency Variance} = \text{Rs. 177.50 Favourable}$$

(iii) **Labour Mix Variance:**

$$\text{Standard time for Men and Women} = 1,400 \text{ hours}$$

$$\text{Actual time for Men and Women} = 1,225 \text{ hours}$$

When standard time of labour mix is different from the actual time of labour mix, the formula for calculating labour mix variance is:

$$\left[ \frac{\text{Total Time of Actual Labour Mix}}{\text{Standard Time of Revised Standard Labour mix}} \times \text{Standard Cost of Revised Standard Labour Mix} - (\text{Standard Cost of Actual Labour Mix}) \right]$$

$$1225/1440 \times (20 \times 25 \times 1.25) + (30 \times 30 \times 1.10) - (25 \times 24 \times 1.25) + (25 \times 25 \times 1.10)$$

$$1413.12 - 1437.50 = \text{Rs. 24.38 Adverse.}$$

### 7.9.3 OVERHEAD VARIANCES

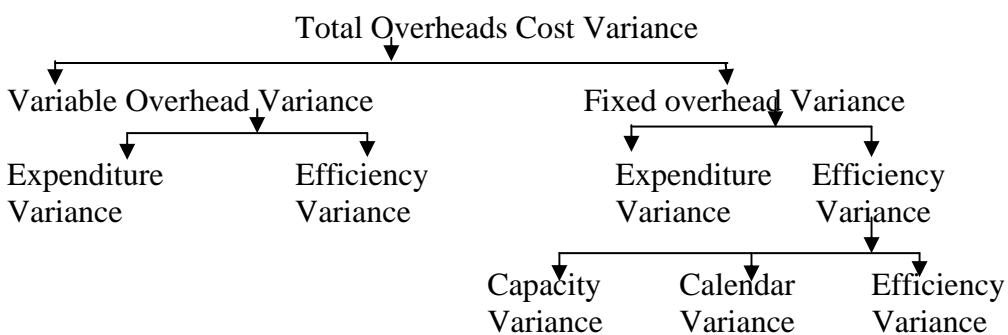
Overhead is the aggregate of indirect material cost, indirect wages (indirect labour cost) and indirect expenses. Thus, overhead costs are indirect costs and are important for the management for the purposes of cost control. Under cost accounting, overhead costs are absorbed by cost units on some suitable basis. Under standard costing, overhead rates are predetermined in terms of either labour hours (per hour) or production units (per unit of output). The formula for the calculation of overhead cost

variance is given below:

Overhead Cost Variance = Actual Output x Standard Overhead Rate per unit Actual Overhead Cost

or, = Standard Hours for Actual Output x Standard Overhead Rate per hour Actual Overhead Cost

An analytical study of the behaviour of overheads in relation to changes in volume of output reveals that there are some items of cost which tend to vary directly with the volume of Output whereas, there are others which remain unaffected by variations in the volume of output achieved or labour hours spent. The former costs represent the variable overhead and the latter fixed overheads. Therefore, overhead cost variances can be classified as:



(i) **Variable overhead variance:** Variable overheads vary directly with the volume of output and hence, the standard variable overheads very directly with the volume of output and hence, the standard variable overhead rate remains uniform. Therefore, computation of variable overhead variance, also known as variable overhead cost variance (VOCV) is the difference between the standard variable overhead cost for actual output and the actual variable overhead cost. It can be calculated as follows:

$VOCV = (\text{Actual Output} \times \text{Standard Variable Overhead Rate per unit}) - \text{Actual Variable Overheads}$  or, =  $(\text{Standard Hours for Actual Output} \times \text{Standard Variable Overhead Rate per hour}) - \text{Actual Variable Overheads}$

Overhead Rate per hour) –Actual Variable Overheads.

In case information relating to standard hours allowed, for actual output and the actual time (hours) taken is available, variable overhead cost variance can be further analysed into:

- (a) Variable Overhead Expenditure or Spending Variance, and
- (b) Variable Overhead Efficiency Variance.

(a) Variable Overhead Expenditure or Spending Variance: It is the difference between the standard variable overheads for the actual hours and the actual variable overheads incurred and can be calculated as:

Variable Overhead Expenditure Variance = (Actual Hours x Standard Variable Overhead Rate per hour)–Actual Variable Overhead or, = Actual Hours (Standard Variable Overhead Rate– Actual Variable Overhead Rate)

(b) Variable Overhead Efficiency Variance. It represents the difference between the standard hours allowed for actual production and the actual hours taken multiplied with the standard variable overhead rate. Symbolically:

Variable Overhead Efficiency Variance = Standard Variable Overhead Rate (Standard Hours) – Actual Hours for Actual Output.

**Example 7.9:** Calculate variable overhead variances from the following data:

Budgeted Production for January, 1996	3000 units
Budgeted Variable Overhead	Rs. 15,000
Standard Time for One Unit	2 hours
Actual Production for January, 1996	2,500 units
Actual Hours Worked	4500 hours
Actual Variable Overhead	Rs. 13,500.

### Solution:

## 1. Variable Overhead Cost Variance (VOCV) = Actual Output x Standard

Variable Overhead Rate– Actual Variable Overhead

$$= \text{Rs. } (2500 \times 5) - 13500$$

$$= \text{Rs. } 1000 \text{ (Adverse)}$$

(Standard Variable Overhead Rate =  $15000/3000 = \text{Rs. } 5 \text{ per unit}$ ).

## 2. Variable Overhead Expenditure or Spending Variance (VOSV)

= (Actual Hours x Standard Variable Overhead Rate)– Actual Variable Overhead

$$= \text{Rs. } (4500 \times 2.50) - 13500$$

$$= \text{Rs. } 11250 - 13500 = \text{Rs. } 2250 \text{ (Adverse)}$$

## 3. Variable Overhead Efficiency Variance (VOEV) = Standard Variable Overhead Rate (Standard Hours for Actual Output–Actual Hours)

$$= \text{Rs. } 2.50 (5000 - 4500)$$

$$= \text{Rs. } 1250 \text{ (Favourable)}$$

### Verification:

$$\text{VOCV} = \text{VOSV} + \text{VOEV}$$

$$-1000 = -2250 + 1250$$

$$\text{or } -1000 = -1000$$

## (ii) FIXED OVERHEADS VARIANCE

This variance is calculated as: Actual Output x Standard Fixed Overheads Rate– Actual Fixed Overheads. (The standard fixed overhead rate is calculated by dividing budgeted fixed overheads by standard output specified). It may be divided into expenditure and volume variances.

(a) Expenditure Variance = Budgeted Fixed Overheads – Actual fixed Overheads

(b) Volume Variance:

This variance shows a variation in overhead recovery due to budgeted production being more or less than the actual production. When actual production is more than the standard production, it will show an over-recovery of fixed overheads and the variance will be favourable. On the other hand, if actual production is less than the standard production it will show an under recovery and the variance will be unfavourable. Volume variance may arise due to change in capacity, variation in

efficiency or change in budgeted and actual number of working days. Volume variance is calculated as: Actual Output x Standard Rate – Budgeted Fixed Overheads  
Volume variance is sub-divided into following variances:

**(i) Capacity Variance:** It is that part of volume variance which arises due to over-utilization or under-utilization of plant and equipment. The working in the factory is more or less than the standard capacity. This variance arises due to idle time caused by strikes, power failure, and non-supply of materials, break down of machinery, absenteeism etc. Capacity variance is calculated as: Standard Rate (Revised Budgeted Units – Budgeted Units) or, Standard Rate (Revised Budgeted Hrs – Budget Hrs).

**(ii) Calendar Variance:** This variance arises due to the difference between actual number of days and the budgeted days. It may arise due to more public holidays announced than anticipated or working for more days because of change in holidays schedule, etc. If actual working days are more than budgeted, the variance will be favourable and it will be unfavourable if actual working days are less than the budgeted number of days. Calendar variance can be expressed as:

Decrease or Increase in number of units produced due to the difference of budgeted and actual days x Standard Rate per unit.

**(iii) Efficiency Variance:** This is that portion of the volume variance which arises due to increased or reduced output because of more or less efficiency than expected. It signifies deviation of standard quantity from the actual quantity produced. This variance is related to the efficiency variance of labour. Efficiency variance is calculated as: Standard Rate (Actual Quantity – Standard Quantity) or, Standard Rate per hour (Standard Hours Produced – Actual Hours). If Actual quantity is more than the budgeted quantity, the variance will be favourable and it will be vice versa if actual quantity is less than the budgeted quantity.

**Example 7.10:** From the following information calculate various overhead variances:

	Budget	Actual
Output in units	12,000	14,000
Number of working days	20	22
Fixed Overheads	36,000	49,000
Variable Overheads	24,000	35,000

There was an increase of 5% in capacity.

**Solution:**

Standard Fixed Overheads Rate =  $36000/12000 = \text{Rs. } 3$

Standard Variable Overheads Rate =  $24000/12000 = \text{Rs. } 2$

**(i) Total Overheads Cost Variance** = Actual Output x Standard Rate – Actual Overheads

$$\begin{aligned} & 14,000 \times (3 + 2) - (49,000 + 35,000) \\ & = 70,000 - 84,000 = \text{Rs. } 14,000 \text{ Adverse.} \end{aligned}$$

**(ii) Variable Overheads Variance** = Actual output x Standard Variable Overheads Rate – Actual Variable Overheads

$$\begin{aligned} & 14,000 \times 2 - 35,000 = 28,000 - 35,000 = \text{Rs. } 7,000 \text{ Adverse.} \end{aligned}$$

**(iii) Fixed Overheads Variance** = Actual Output x Standard Fixed Overheads Rate – Actual Standard Overheads

$$\begin{aligned} & 14,000 \times 3 - 49,000 \\ & 42,000 - 49,000 = \text{Rs. } 7,000 \text{ Adverse.} \end{aligned}$$

**(iv) Expenditure Variance** = Budgeted Fixed Overheads – Actual Fixed Overheads  
 $36,000 - 49,000 = \text{Rs. } 13,000 \text{ Adverse.}$

**(v) Volume Variance** = Actual Output x Standard Rate – Budgeted Fixed Overheads  
 $14,000 \times 3 - 36,000$   
 $42,000 - 36,000 = \text{Rs. } 6,000 \text{ Favourable.}$

**(vi) Capacity Variance** = Standard Rate (Revised Budgeted Units – Budgeted Units)  
 $= 3 (12,600 - 12,000)$   
 $= 3 (600) = \text{Rs. } 1,800 \text{ Favourable.}$

(Revised Budgeted Units =  $12,000 + 12,000 \times 5/100 = 12,600$ )

**(vii) Calendar Variance:**

Change in Number of units by change in actual and standard number of days x Standard Rate.

There is an increase of 2 working days than budgeted.

Increase in units in 2 days =  $12600/20 \times 2 = 1,260$  units

Calendar Variance =  $1,260 \times 3 = \text{Rs. } 3,780$  Favourable.

**(viii) Efficiency Variance** = Standard Rate (Actual Quantity – Standard Quantity)

Standard Quantity	= 12,000
Increase in production due to change in capacity	= 600
Increase in production due to increase in working days	= 1,260
Standard Quantity (Revised)	= <u>13,860</u>

$3 (14,000 - 13,860) = \text{Rs. } 420$  Favourable.

#### 7.9.4 SALES VARIANCES

A sales value variance exposes the difference between actual sales and budgeted sales. It may arise due to change in sales price, sales volume or sales mix. It is important to study profit variances. It may be classified as follows:

**1. Sales Value Variance:** A Sales Value Variance is the difference between budgeted sales and actual sales. It is calculated as:

$\text{Sales Value Variance} = \text{Actual Value of Sales} - \text{Budgeted Value of Sales}$ .

If actual sales are more than the budgeted sales, the variance will be favourable and on the other hand, the variance will be unfavourable if actual sales are less than the budgeted sales.

**2. Sales Price Variance:** A sales price variance arises due to the difference between the standard price specified and the actual price charged. It is calculated as:

$\text{Sales Price Variance} = \text{Actual Quantity} (\text{Actual Price} - \text{Standard Price})$ .

**3. Sales Volume Variance:** It is the difference between actual quantity of sales and budgeted quantity of sales. It is calculated as:

$\text{Sales Volume Variance} = \text{Standard Price} (\text{Actual Quantity of Sales} - \text{Standard Quantity of Sales})$ .

**4. Sales Mix Variance.** It is the difference of standard value of revised mix and

standard value of actual mix.

**Example 7.11:** The budget and actual sales for a period in respect of two products are as follows:

Product	Budgeted			Actual		
	Quantity (Units)	Price (Rs.)	Value (Rs.)	Quantity (Units)	Price (Rs.)	Value (Rs.)
X	600	3	1,800	800	4	3,200
Y	800	4	3,200	600	3	1,800

Calculate Sales Variances.

**Solution:**

(i) **Sales Value Variance** = Actual Value of Sales – Standard Value of Sales

Total Actual Value:  $3,200 + 1,800 = \text{Rs. } 5,000$

Total Standard Value:  $1,800 + 3,200 = \text{Rs. } 5,000$

Sales Value Variance =  $5,000 - 5,000 = \text{Nil}$

(ii) **Sales Price Variance** = Actual Quantity Sold (Actual Price – Standard Price)

Product A  $800 (4 - 3) = \text{Rs. } 800$  Favourable

Product B  $600(3 - 4) = \text{Rs. } 600$  Unfavourable

Sales Price Variance  $= \text{Rs. } 200$  Favourable

(iii) **Sales Volume Variance** = Standard Price (Actual Units – Standard Units)

Product A  $3 (800 - 600) = \text{Rs. } 600$  Favourable

Product B  $4(600 - 800) = \text{Rs. } 800$  Unfavourable

Sales Volume Variance  $= \text{Rs. } 200$  Unfavourable.

**Verification:**

Sales Value Variance = Sales Price Variance + Sales Volume Variance

$0 = 200 + (-200)$

**Example 7.12:** The information regarding budgeted and actual sales of two products has been given as follows:

	Budgeted		Actual	
	Quantity (units)	Sales Price (Rs.)	Quantity (units)	Sales Price (Rs.)
Product	800	10	1,000	12
Product B	1,200	6	1,400	5

Find out variances.

**Solution:**

**(i) Sales Value Variance** = Actual Value of Sales – Standard Value of Sales

Actual Value of Sales:

Product A	1,000 x 12 =	12,000
Product B	1,400 x 5 =	7,000
Total		<u>Rs. 19,000</u>

Standard Value of Sales:

Product A       $800 \times 10 = 8,000$

Product B       $1,200 \times 6 = 7,200$

Total      Rs. 15,200

Sales Value Variance =  $19,000 - 15,200 = \text{Rs. 3,800 Favourable.}$

**(ii) Sales Price Variance** = Actual Quantity Sold (Actual Price – Standard Price)

$$\begin{aligned} \text{Product A} &= 1,000 (12 - 10) \\ &= 1,000 (2) \\ &= \text{Rs. 2,000 Favourable} \end{aligned}$$

$$\begin{aligned} \text{Product B} &= 1,400 (5 - 6) \\ &= 1,400 (-1) \\ &= \text{Rs. 1400 Unfavourable} \end{aligned}$$

Sales Price Variance = Rs. 600 Favourable

**(iii) Sales Volume Variance** = Standard Price (Actual Units Sold – Standard Units)

$$\begin{aligned} \text{Product A} &= 10 (1,000 - 800) \\ &= 10(200) \\ &= \text{Rs. 2,000 Favourable} \end{aligned}$$

$$\begin{aligned} \text{Product B} &= 6 (1,400 - 1,200) \\ &= 6 (200) \\ &= \text{Rs. 1200 Favourable} \end{aligned}$$

Sales Volume Variance = Rs. 3,200 Favourable.

**(iv) Sales Mix Variance:** There is a difference between standard quantity and actual quantity, so the standard will be revised in proportion to actual quantity of sales.

*Revised Standard:*

Product A =  $800/2000 \times 2,400 = 960$  Units.

$$\text{Product B} = 1200/2000 \times 2,400 = 1,440 \text{ Units}$$

Sales Mix Variance = Standard Value of Actual Mix – Standard Value of Revised Standard Mix

Standard Value of Actual Mix:	Rs.
Product A = 10 x 1,000	= 10,000
Product B = 6 x 1,400	= 8,400
Total	<u>= 18,400</u>

Standard Value of Revised Standard Mix:

Product A = 10 x 960	= Rs. 9,600
Product B = 6 x 1,440	= Rs. 8,640
Total	<u>= Rs. 18,240</u>

$$\text{Sales Mix Variance} = 18,400 - 18,240 = \text{Rs. 160 Favourable.}$$

#### **Verification:**

$$\text{Sales Value Variance} = \text{Sales Price Variance} + \text{Sales Volume Variance}$$

$$\text{Rs. 3,800 (Fav.)} = \text{Rs. 600 (Fav.)} + \text{Rs. 3,200 (Fav.)}$$

$$\text{Rs. 3,800 (Fav.)} = \text{Rs. 3,00 (Fav.)}$$

#### **7.9.4.1 PROFIT AND TURNOVER METHODS OF CALCULATING SALES VARIANCES**

A businessman may be interested more in knowing variations in profits and sales. The profit and turnover methods of calculating sales variances will be useful for this purpose. The variances are analysed as follows:

**(a) Total Sales Margin Variance:** Actual Profit – Budgeted Profit.

Actual Profit = Actual quantity sold x Actual profit per unit.

Budgeted Profit = Budgeted quantity of Sales x Budgeted profit per unit.

**(b) Sales Margin Variance due to Selling Price.** This variance arises due to the difference between actual selling price and standard selling price. This variance is calculated as :

Actual Quantity (Actual Price – Standard Price)

**(c) Sales Margin Variance due to Volume.** This Variance arises due to the

difference between actual quantity of sales and budgeted quantity of sales. It is calculated as: Standard Profit per Unit (Actual Quantity of Sales – Standard Quantity of Sales).

- (d) **Sale Value Variance**= Budgeted sales value-Actual sales value.
- (e) **Sales Volume Variance**= Standard selling price per Unit (Actual Quantity of Sales – Standard Quantity of Sales).
- (f) **Selling Price Variance**= Actual Quantity (Budgeted selling Price – Actual Selling Price).
- (g) **Sales Quantity Variance**= Budgeted sale value-Revised standard sales value.  
Budgeted sale value=Budgeted quantity x budgeted selling price per Unit  
Standard sales value= Actual Quantity x budgeted selling price per Unit  
Actual sales value= Actual Quantity x Actual selling price per Unit  
Revised Standard sales value= Total Standard sales value x budgeted proportion.
- (h) **Sales Mix Variance**= Revised Standard sales value -Standard sales value

**Example 7.12:** S. M. Ltd., has given the following budgeted and actual sales figures:

	Budgeted			Actual		
	Quantity	Sale Price	Value	Quantity	Sales Price	Value
Product A	500	60	30,000	600	65	39,000
Product B	700	40	28,000	650	38	24,700

The cost per unit of product A and B was Rs. 55 and Rs. 32 respectively. Compute variances to explain difference between budgeted and actual profit.

**Solution:**

- (i) **Total Sales Margin Variance**= Actual Profit– Budgeted Profit  
or Actual Quantity x Actual Profit per Unit – Budgeted Quantity x Budgeted Profit per Unit

#### **Actual Profit per Unit**

Actual Sales Price – Actual Cost

Product A = 65 – 55 = Rs. 10

Product B = 38 – 32 = Rs. 6

Budgeted Profit per Unit = Budgeted Sale Price – Actual Cost

$$\text{Product A} = 60 - 55 = \text{Rs. 5}$$

$$\text{Product B} = 40 - 32 = \text{Rs. 8}$$

Actual Profit

Product A = 600 x 10	= Rs. 6,000
Product B = 650 x 6	= Rs. 3,900
	<u>Rs. 9,900</u>

Budgeted Profit

$$\text{Product A: } 500 \times 5 = \text{Rs. 2,500}$$

$$\text{Product B : } 700 \times 8 = \text{Rs. 5,600}$$

Rs. 8,100

Sales Margin Variance = 9,900 – 8,100 = Rs. 1,800 Favourable

**(ii) Sales Margin Variance due to Selling Price:**

Actual Quantity (Actual Price – Standard Price)

$$\text{Product A} = 600 (65-60) = \text{Rs. 3,000 Favourable}$$

$$\text{Product B} = 650 (38-40) = \text{Rs. 1,300 Unfavourable}$$

Sales Margin Variance due to Selling Price = Rs. 1,700 Favourable

**(iii) Sales Margin Variance due to Volume:**

Standard Profit per unit (Actual Quantity – Standard Quantity)

$$\text{Product A: } 5(600-500) = \text{Rs. 500 Favourable}$$

$$\text{Product B: } 8(650-700) = \text{Rs. 400 Unfavourable}$$

Sales Margin Variance due to Volume

= Rs. 100 Favourable

**(iv) Sale Value Variance** = Budgeted sales value – Actual sales value.

$$=(500 \times 60 + 700 \times 40) - (600 \times 65 + 650 \times 38) = 5700 \text{ (F)}$$

**(v) Sales Volume Variance** = Standard selling price per Unit (Actual Quantity of Sales – Standard Quantity of Sales).

	Budgeted	Actual	Diff.	Budgeted	Variance
	Qty.	Qty.		Price (Rs.)	Rs.
Product A	500	600	100 (F)	60	6000 (F)
Product B	700	650	50 (A)	40	2000 (A)
					<u>4000 (A)</u>

**(vi) Selling Price Variance** = Actual Quantity (Budgeted selling Price – Actual Selling Price).

	B. P (Rs.)	A. P. (Rs.)	Diff.	AQ	Variance
Product A	60	65	05 (F)	600	3000 (F)
Product B	40	38	02 (A)	650	1300 (A)
					<u>1700 (F)</u>

**(vii) Sales Quantity Variance**= Budgeted sale value-Revised standard sales value.

	BSV(Rs.)	AQ	B. P (Rs.)	SSV OF AQ	Revised SSV OF AQ	Var.
Product A	30000	600	60	36000	$62000 \times 30000/58000$ = (32069)	2069(F)
Product B	28000	650	40	26000	$62000 \times 28000/58000$ = (29931)	<u>1931 (F)</u> 4000 (F)

**(viii) Sales Mix Variance**= Revised Standard sales value -Standard sales value

	AQ	B. P (Rs.)	SSV OF AQ	Revised SSV OF AQ	Var.
Product A	600	60	36000	$62000 \times 30000/58000$ = (32069)	3991 (F)
Product B	650	40	26000	$62000 \times 28000/58000$ = (29931)	<u>3991 (A)</u> Nil

## 7.10 ACCOUNTING TREATMENT OF VARIANCES

When the financial statements are prepared they contain actual cost figures there is no variances. But, at the time of implementation of standard costing system, the accounting records contain both standard costs and actual costs, by which we calculate variances. Then the next question arises that how to deal with the variances at the end of the accounting period? Which method should be followed for treating them? The accountants suggest a number of methods for this purpose. Some of them are discussed, which may be adopted for the accounting treatment of variances:

**1. Transfer to Profit and Loss Account.** Under this method all variances are transferred to profit and loss account. In this method, the stock of finished goods, work-in-progress and cost of sales are shown at standard cost. It is considered that variances arise due to insufficiency or waste, so these should not become a part of normal cost of production.

**2. Allocation of Variances to Finished Stock.** In this method, variances are

apportioned to finished goods, work-in-progress and cost of sales either on the basis of value of closing balances or on the basis of units. This method has the effect of recording actual costs in the financial statements. The adjustment of variances is made only in the general ledger and not in subsidiary books. The distribution of variances is not made to products. The variances not being actual losses should not be taken to profit and loss account.

**3. Transfer of Variances to the Reserve Account.** In this method cost variances are taken to next accounting period as deferred items. The variances whether favourable or adverse are transferred to a reserve account and are offset against future fluctuations. If the variances are favourable then they are taken to the liability side of the balance sheet and they are set off against adverse variances in future. On the other hand, if variances are adverse then these are taken to the balance sheet as a deferred charge and are written off against future favourable variances. This method is not in common use but it may be useful in cases where seasonal fluctuations occur so that favourable and adverse variances may be written off in the course of a business cycle concerning more than one accounting period.

## **7.11 SUMMARY**

Firms use the standard costing technique, in combination with an appropriate product costing method, for managing costs. Engineering driven standards for usage of resources are set, which are converted into rupee value by using budgeted process. Therefore, while standard quantities are not revised unless warranted by changes in product specification, design or process of manufacturing, standard prices are revised on yearly basis. A firm may set standards at an ideal level or at the attainable level or at the basic level depending on the objective it desires to achieve through the standard costing system. The key to a standard costing system is variance reporting. Variances

between actual and standards are reported for investigation and corrective actions are taken to remove the causes of adverse variances. Favourable variances must also be investigated and standards are reviewed and revised, if necessary. Sales variances are presented either in term of variances in margin or in terms of variances in turnover. Usually, a comprehensive report, which, reconciles the actual profit and the budgeted profit, is presented showing sales and cost variances. Many firms maintain cost ledger within a standard costing system. The three important methods of accounting are: partial plan or output plan, single plan or input plan and dual plan. These methods treat variances differently while basic principles of book-keeping are the same in all three methods,

## **7.12 SELF-TEST QUESTIONS**

1. What is meant by Standard Costing? Distinguish between Standard Cost and Estimated Cost?
2. What are the advantages of Standard Costing? Also discuss the limitations of standard costing.
3. Distinguish between Standard Costing and Budgetary Control.
4. Discuss the preliminary steps for establishing a system of standard costing.
5. Write short notes on the following:
  - (a) Current Standard
  - (b) Basic Standard
  - (c) Normal Standard.
6. Describe the managerial uses of variance analysis.
7. Explain in brief the various types of variances used in standard costing.
8. The standard material required for production is 10,500 kgs. A price of Rs. 2 per kg has been fixed for the materials. The actual quantity of materials used for the product is 11,000 kgs. A sum of Rs. 24,750 has been paid for the materials.  
Calculate: (i) Material Cost Variance, (ii) Material Rate Variance, and (iii) Material Usage Variance. [Ans. (i) Rs. 3,750 Adv., (ii) Rs. 2,750 Adv.; (iii) Rs. 1,000 Adv.]
9. The standard cost of a chemical mixture is :  
40% Material A at Rs. 20 per kg.

60% Material B at Rs. 30 per kg.

A standard loss of 10% is expected in production. During a period, there is used: 90 kgs Material A at a cost of Rs. 18 per kg. 110 kgs material B at a cost of Rs. 34 per kg. The weight produced is 182 kgs. of good product. Calculate (a) Material price variance, (b) Material mix variance, (c) Material yield variance, and (d) Material cost variance. [Ans. (a) Rs. 260 Adv. ; (b) Rs. 100 Fav. ; (c) Rs. 52 Fav. ; (d) Rs. 108 Adv.]

10. The standard material cost to produce a tonne of chemical S is :

200 kg of material A @ Rs. 10 per kg.

300 kg of material B @ Rs. 5 per kg.

400 kg of material C @ Rs. 7 per kg.

During the period, 100 tonnes of mixture S were produced from the usage of: 30 tonnes of material A at a cost of Rs. 9,000 per tonne

40 tonnes of material B at a cost of Rs. 6,000 per tonne

50 tonnes of material C at a cost of Rs. 7,000 per tonne.

Calculate: (a) Material Cost Variance, (b) Material Price Variance, and (c) Material Usage Variance. [Ans. (a) Rs. 2,30,000 Adv.; (b) Rs. 10,000 Adv. (c) Rs. 2,20,000 Adv.]

11. In a factory 100 workers are engaged and the average rate of wage is 50 paise per hour. Standard working hours per week are 40 and the standard performance is 10 units per gang hour. During a week in March, wages paid for 50 workers were at the rate of 50.paise per hour, 10 workers at 70 paise per hour and 40 workers at 40 paise per hour. Actual output was 380 units. The factory did not work for five hours due to breakdown of machinery. Calculate appropriate labour variances. [Ans.(a) LCV = Rs. 20 Adv.; (b) LRV = Rs. 80 Fav. ; (c) LEV = Rs. 150 Fav.. ; (d) Idle Time Variance = 250 Adv. (e) LYV = Rs. 150 Fav.] .

12. From the following information compute: (i) Fixed Overheads Variance, (ii) Expenditure Variance, (iii) Volume Variance, (iv) Capacity Variance, and (v) Efficiency Variance.

	Budget	Actual
Fixed Overheads for November	Rs. 20,000	20,400
Units of Production in November	10,000	10,400
Standard time for 1 Unit	= 2 hours	
Actual Hours Worked	= 20, 100 hours	

(Ans. (i) Rs. 300 Un favourable, (ii) Rs. 400 Unfavourable, (iii) Rs. 100 Favourable, (iv) Rs. 800 Favourable, and (v) Rs. 700 Unfavourable.

13. The standard cost of a product was fixed as follows:

Standard Price of Material Rs. 5 per kg.

Standard Quantity of Material 6 kg. per unit

Standard Direct labour Cost Rs. 100 per unit.

Factory Overheads (Standard) Rs. 2,40,000 p.a.

Normal operating time for the year was estimated at 2400 hours and standard time for production per unit was fixed at 9 machine hours. 15 identical machines were employed by the company in the manufacture of this product. The production during 1995 was 3500 units. All machines were working throughout the year without any breakdown and were fully employed in the manufacturing operations. 20,000 kg. of material was consumed at a total cost of Rs. 1,20,000. The wage bill amounted to Rs. 4,00,000. There had been no increase in wage rates as compared to the rates prevailed at the time standards were fixed. The actual overhead for the year 1995 was Rs. 2,60,000. Compute the standard and actual cost per unit of the product and the following variances:

(i) Material Price Variance, (ii) Material Usage Variance,  
(iii) Labour Efficiency Variance, (iv) Overhead Expenditure Variance, and  
(v) Overhead Volume Variance.

**Ans:** (i) Rs. 20,000 (Adverse), (ii) 5000 (Favourable), (iii) Rs. 50,000 (Adverse), (iv) Rs. 20,000 (Adverse), and (v) Rs. 30,000 (Adverse).

### **7.13 SUGGESTED READINGS**

6. Ashish K. Bhattacharya, Principles and Practices of Cost Accounting (3<sup>rd</sup>.), New Delhi: Prentice Hall of India Private Limited, 2004.
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## **COURSE: MANAGEMENT ACCOUNTING**

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Course code: **MC-105**

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Lesson: **8**

### **BUDGETARY CONTROL**

**Objective:** After going through this lesson, you should be able to understand meaning, objectives, scope organisation and types of budgets and budgetary control.

#### **Structure**

- 8.1. Definition of Budget
- 8.2. Objectives of Budgetary Control
- 8.3. Scope and Techniques of Budgetary Control
- 8.4. Requisites for Effective Budgetary Control
- 8.5. Organization for Budgetary Control
- 8.6. Advantages and Limitations of Budgetary Control
- 8.7. Types of Budgets
- 8.8. Summary
- 8.9. Self-Assessment Questions
- 8.10. Suggested Readings

#### **8.1. Definition of Budget**

The Chartered Institute of Management Accountants, England, defines a 'budget' as under:

"A financial and/or quantitative statement, prepared and approved prior to define period of time, of the policy to be perused during that period for the purpose of attaining a given objective."

According to Brown and Howard of Management Accountant "a budget is a predetermined statement of managerial policy during the given period which provides a standard for comparison with the results actually achieved."

An analysis of the above said definitions reveal the following essentials of a budget:

1. It is prepared for a definite future period.
2. It is a statement prepared prior to a defined period of time.
3. The budget is monetary and/or quantitative statement of policy.

4. The budget is a predetermined statement and its purpose is to attain a given objective.

A budget, therefore, be taken as a document which is closely related to both the managerial as well as accounting functions of an organization.

## Forecast Vs Budget

Forecast is mainly concerned with an assessment of probable future events. Budget is a planned result that an enterprise aims to attain. Forecasting precedes preparation of a budget as it is an important part of the budgeting process. It is said that the budgetary process is more a test of forecasting skill than anything else. A budget is both a mechanism for profit planning and technique of operating cost control. In order to establish a budget it is essential to forecast various important variables like sales, selling prices, availability of materials, prices of materials, wage rates etc. both budgets and forecasts refer to the anticipated actions and events. But still there are wide differences between budgets and forecasts as given below:

Forecasts	Budgets
<ol style="list-style-type: none"> <li>1. Forecasts is mainly concerned with anticipated or probable events</li> <li>2. Forecasts may cover for longer period or years</li> <li>3. Forecast is only a tentative estimate</li> <li>4. Forecast results in planning</li> <li>5. The function of forecast ends with the forecast of likely events</li> <li>6. Forecast usually covers a specific business function</li> <li>7. Forecasting does not act as a tool of controlling measurement.</li> </ol>	<ol style="list-style-type: none"> <li>1. Budget is related to planned events</li> <li>2. Budget is planned or prepared for a shorter period</li> <li>3. Budget is a target fixed for a period</li> <li>4. Result of planning is budgeting</li> <li>5. The process of budget starts where forecast ends and converts it into a budget</li> <li>6. Budget is prepared for the business as a whole</li> <li>7. Purpose of budget is not merely a planning device but also a controlling tool.</li> </ol>

## Budgetary control

Budgetary control is the process of establishment of budgets relating to various activities and comparing the budgeted figures with the actual performance for arriving at deviations, if any. Accordingly, there cannot be budgetary control without budgets. Budgetary control is a system which uses budgets as a means of planning and controlling.

According to I.C.M.A. England Budgetary control is defined by Terminology as “the establishment of budgets relating to the responsibilities of executives to the requirements of a

policy and the continuous comparison of actual with the budgeted results, either to secure by individual actions the objectives of that policy or to provide a basis for its revision”.

Brown and Howard defines budgetary control is “a system of controlling costs which includes the preparation of budgets, co-ordinating the department and establishing responsibilities, comparing actual performance with the budgeted and acting upon results to achieve maximum profitability.”

The above definitions reveal the following essentials of budgetary control:

1. Establishment of objectives for each function and section of the organization.
2. Comparison of actual performance with budget.
3. Ascertainment of the causes for such deviations of actual from the budgeted performance.
4. Taking suitable corrective action from different available alternatives to achieve the desired objectives.

## **8.2. Objectives of Budgetary Control**

Budgetary control is planning to assist the management for policy formulation, planning, controlling and co-ordinating the general objectives of budgetary control and can be stated in the following ways:

1. Planning: A budget is a plan of action. Budgeting ensures a detailed plan of action for a business over a period of time.
2. Co-ordination: Budgetary control co-ordinates the various activities of the entity or organization and secure co-operation of all concerned towards the common goal.
3. Control: Control is necessary to ensure that plans and objectives are being achieved. Control follows planning and co-ordination. No control performance is possible without predetermined standards. Thus, budgetary control makes control possible by continuous measures against predetermined targets. If there is any variation between the budgeted performance and the actual performance the same is subject to analysis and corrective action.

## **8.3. Scope and Techniques of Budgetary Control**

*Scope:*

1. Budgets are prepared for different functions of business such as production, sales etc. Actual results are compared with the budgets and control is exercised.
2. Budgets have a wide range of coverage of the entire organization. Each operation or process is divided into number of elements and standards are set for each such element.
3. Budgetary control is concerned with origin of expenditure at functional levels.
4. Budget is a projection of financial accounts whereas standard costing projects the cost accounts.

*Technique:*

1. Budgetary control is exercised by putting budgets and actual side by side. Variances are not normally revealed in the accounts.
2. Budgetary control system can be operated in parts. For example, advertisement budgets, research and development budgets, etc.
3. Budgetary control of expenses is broad in nature.

## **8.4. Requisites for Effective Budgetary Control**

The following are the requisites for effective budgetary control:

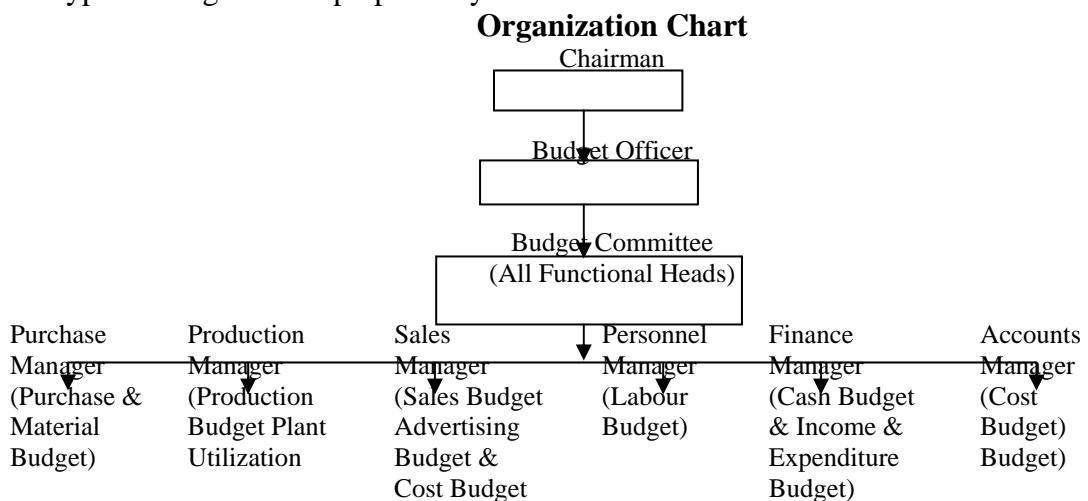
1. Clear cut objectives and goals should be well defined.
2. The ultimate objective of realising maximum benefits should always be kept uppermost.

3. There should be a budget manual which contains all details regarding plan and procedures for its execution. It should also specify the time table for budget preparation for approval, details about responsibility, cost centers etc.
4. Budget committee should be set up for budget preparation and efficient of the plan.
5. A budget should always be related to a specified time period.
6. Support of top management is necessary in order to get the full support and co-operation of the system of budgetary control.
7. To make budgetary control successful, there should be a proper delegation of authority and responsibility.
8. Adequate accounting system is essential to make the budgeting successful.
9. The employees should be properly educated about the benefits of budgeting system.
10. The budgeting system should not cost more to operate than it is worth.
11. Key factor or limiting factor, if any, should consider before preparation of budget.
12. For budgetary control to be effective, proper periodic reporting system should be introduced.

### 8.5. Organization for Budgetary Control

In order to introduce budgetary control system, the following are essential to be considered for a sound and efficient organization. The important aspects to be considered are explained as follows:

1. *Organisation chart*: For the purpose of effective budgetary control, it is imperative on the part of each entity to have definite ‘plan of organization’. This plan of organization is embodied in the organization chart. The organization chart explaining clearly the position of each executive’s authority and responsibility of the firm. All the functional heads are entrusted with the responsibility of ensuring proper implementation of their respective departmental budgets. An organization chart for budgetary control is given showing clearly the type of budgets to be prepared by the functional heads.



From the above chart we can observe that the chairman of the company is the overall in charge of the functions of the Budgeted Committee. A Budget Officer is the convener of the budget committee, who helps in co-ordination. The Purchase Manager, Production Manager, Sales Manager, Personnel Manager, Finance Manager and Account Manager are made responsible to prepare their budgets.

2. *Budget Center*: A budget center is defined by the terminology as ‘a section of the organization of an undertaking defined for the purpose of budgetary control’. For effective budgetary control budget centre or departments should be established for each of which budget will be set with the help of the head of the department concerned.

3. *Budget officer*: Budget officer is usually some senior member of the accounting staff who controls the budgetary process. He does not prepare the budget himself, but facilitates and co-

ordinates the budgeting activity. He assists the individual departmental heads and the budget committee, and ensures that their decisions are communicated to the appropriate people.

**4. Budget committee:** Budget committee comprising of the Managing Director, the Production Manager, Sales Manager and Accountant. The main objective of this committee is to agree on all departmental budgets, normal standard hours and allocations. In small concerns, the Budget Officer may co-ordinate the work for preparation and implementation of budgets. In large-scale concern a budget committee is setup for preparation of budgets and execution of budgetary control.

**5. Budget manual:** A budget manual has been defined as ‘a document which set out the responsibilities of persons engaged in the routine of and the forms and records required for budgetary control’. It contains all details regarding the plan and procedures for its execution. It also specifies the time table for budget preparation to approval, details about responsibility, cost centres, constitution and organisation of budget committee, duties and responsibilities of budget officer.

**6. Budget period:** A budget is always related to specified time period. The budget period is the length of time for which a budget is prepared and employed. The period may depend upon the type of budget. There is no specific period as such. However, for the sake of convenience, the budget period may be fixed depending upon the following factors:

- (a) Types of business
- (b) Types of budget
- (c) Nature of the demand of the product
- (d) Length of trade cycle
- (e) Economic factors
- (f) Availability of accounting period
- (g) Availability of finance
- (h) Control operation

## Key Factor

Key Factor is also called as ‘Limiting Factor’ or Governing Factor. While preparing the budget, it is necessary to consider key factor for successful budgetary control. The influence of the Key Factor which dominates the business operations in order to ensure that the functional budgets are reasonably capable of fulfilment. The key factors include- raw materials may be in short supply, non-availability of skilled labours, Government restrictions, limited sales due to insufficient sales promotion, shortage of power, underutilization of plant capacity, shortage of efficient executives, management policies regarding lack of capital, and insufficient research into new product developments.

### 8.6. Advantages and Limitations of Budgetary Control

The advantages of budgetary control may be summarized as follows:

1. It facilitates reduction of cost.
2. Budgetary control guides the management in planning and formulation of policies.
3. Budgetary control facilitates effective co-ordination of activities of the various departments and functions by setting their limits and goals.
4. It ensures maximization of profits through cost control and optimum utilization of resources.
5. It evaluates for the continuous review of performance of different budget centres.
6. It helps to the management efficient and economic production control.
7. It facilitates corrective actions, whenever there are inefficiencies and weaknesses comparing actual performance with budget.
8. It guides management in research and development.

From the above it is clear that the budgetary control is an effective tool for management control. However, it has certain important limitations which are identified below:

1. The budget plan is based on estimates and forecasting. Forecasting cannot be considered to be an exact science. If the budget plans are made on the basis of inaccurate forecasts then the budget programme may not be accurate and ineffective.
2. For reason of uncertainty about future, and changing circumstances which may develop later on, budget may prove short or excess of actual requirements.
3. Effective implementation of budgetary control depends upon willingness, co-operation and understanding among people reasonable for execution. Lack of co-operation leads to inefficient performance.
4. The system does not substitute for management. It is like a management tool.
5. Budgeting may be cumbersome and time consuming process.

### **8.7. Types of Budgets**

As budgets serve different purposes, different types of budgets have been developed. The following are the different classification of budgets developed on the basis of time, functions, and flexibility or capacity.

(A) *Classification on the basis of Time:*

1. Long-term budgets
2. Short-term budgets
3. Current budgets

(B) *Classification according to functions:*

1. Functional or subsidiary budgets
2. Master budgets

(C) *Classification on the basis of capacity:*

1. Fixed budgets.
2. Flexible budgets

### **(A) Classification on the basis of time**

1. *Long-term budgets:* Long-term budgets are prepared for a longer period varies between five to ten years. It is usually developed by the top level management. These budgets summarise the general plan of operations and its expected consequences. Long-term budgets are prepared for important activities like composition of its capital expenditure, new product development and research, long-term finance etc.
2. *Short-term budgets:* These budgets are usually prepared for a period of one year. Sometimes they may be prepared for shorter period as for quarterly or half yearly. The scope of budgeting activity may vary considerably among different organization.
3. *Current budgets:* Current budgets are prepared for the current operations of the business. The planning period of a budget generally in months or weeks. As per ICMA London, “Current budget is a budget which is established for use over a short period of time and related to current conditions.”

### **(b) Classification on the basis of function**

1. *Functional budget:* The functional budget is one which relates to any of the functions of an organization. The number of functional budgets depends upon the size and nature of business. The following are the commonly used:
  - (i) Sales budget
  - (ii) Purchase budget
  - (iii) Production budget
  - (iv) Selling and distribution cost budget

- (v) Labour cost budget
- (vi) Cash budget
- (vii) Capital expenditure budget

2. *Master budget:* The master budget is a summary budget. This budget encompasses all the functional activities into one harmonious unit. The ICMA England defines a Master Budget as the summary budget incorporating its functional budgets, which is finally approved, adopted and employed.

### **(C) Classification on the basis of capacity**

1. *Fixed budget:* A fixed budget is designed to remain unchanged irrespective of the level of activity actually attained.
2. *Flexible budget:* A flexible budget is a budget which is designed to change in accordance with the various level of activity actually attained. The flexible budget also called as Variable Budget or Sliding Scale Budget, takes both fixed, variable and semi fixed manufacturing costs into account.

#### **8.7.1. Control Ratios**

Ratios are used by the management to determine whether performance of its activities is going on as per estimates or not. If the ratio is 100% or more, the performance is considered as unsatisfactory. The following are the ratios generally calculated for performance evaluation.

1. *Capacity ratio:* This ratio indicates the extent to which budgeted hours of activity is actually utilised.

$$\text{Capacity Ratio} = \frac{\text{Actual hours worked production}}{\text{Budget hours}} \times 100$$

2. *Activity ratio:* This ratio is used to measure the level of activity attained during the budget period.

$$\text{Activity ratio} = \frac{\text{Standard hours for actual production}}{\text{Budgeted hours}} \times 100$$

3. *Efficiency ratio:* This ratio shows the level of efficiency attained during the budget period

$$\text{Efficiency ratio} = \frac{\text{Standard hours for actual production}}{\text{Actual hours worked}} \times 100$$

4. *Calendar ratio:* This ratio is used to measure the proportion of actual working days to budgeted working days in a budget period.

$$\text{Calendar ratio} = \frac{\text{Number of actual working days in a period}}{\text{Budgeted working days for the period}} \times 100$$

**Illustration 1.** A company produces two articles A and B. Each unit takes 4 hours for A and 10 hours for B as production time respectively. The budgeted production for April, 2005 is 400 units of A and 800 units for B. The actual production at the end of the month was 320 units of A and 850 units of B. Actual hours spent on this production were 200. Find out the capacity, activity and efficiency ratios for April 2003. Also find out the Calendar ratio if the actual working days during the month be 28 corresponding to 26 days in the budget.

#### **Solution.**

Standard budgeted hours:

$$A - 400 \div 4 = 100 \text{ hours}$$

$$B - 800 \div 10 = 80 \text{ hours}$$

$$180 \text{ hours}$$

Standard hours for actual production:

$$A - 320 \div 4 = 80 \text{ hours}$$

$$B - 850 \div 10 = 85 \text{ hours}$$

$$165 \text{ hours}$$

$$(1) \text{ Capacity ratio} = \frac{\text{Actual hours worked}}{\text{Budgeted hours}} \times 100$$

$$= \frac{200}{180} \times 100$$

$$= 111.1\%$$

$$(2) \text{ Activity ratio} = \frac{\text{Standard hours for actual production}}{\text{Budgeted hours}} \times 100$$

$$= \frac{165}{180} \times 100$$

$$= 91.66\%$$

$$(3) \text{ Efficiency ratio} = \frac{\text{Standard hours for actual production}}{\text{Actual hours worked}} \times 100$$

$$= \frac{165}{200} \times 100$$

$$= 82.5\%$$

$$(4) \text{ Calendar ratio} = \frac{\text{Number of actual working days in a period}}{\text{Number of working days in a budget period}} \times 100$$

$$= \frac{28}{26} \times 100$$

$$= 107.69\%$$

**Illustration 2.** Product A takes 4 hours to make and B requires 8 hours. In a month 27 effective days of 8 hours a day. 500 units of A and 300 units, of Y were produced. The company employ 25 workers in the production department. The budgeted hours are 60,000 for the year. Calculate capacity ratio, activity ratio and effective ratio.

**Solution.**

Standard hours for actual production:

$$\text{Product A: } 500 \times 4 = 2000 \text{ hours}$$

$$\text{Product B: } 300 \times 8 = 2400 \text{ hours}$$

$$4400 \text{ hours}$$

$$\text{Budgeted hours for the month} = \frac{60000}{12}$$

$$= 5000 \text{ hours}$$

$$\text{Actual hours worked} = 25 \times 27 \times 8 = 5400 \text{ hours}$$

$$(1) \text{ Capacity ratio} = \frac{\text{Actual hours worked}}{\text{Budgeted hours}} \times 100$$

$$= \frac{5400}{5000} \times 100$$

$$= 108\%$$

$$(2) \text{ Activity ratio} = \frac{\text{Standard hours for actual production}}{\text{Budgeted hours}} \times 100$$

$$= \frac{4400}{5000} \times 100$$

$$= 91.66\%$$

$$(3) \text{ Efficiency ratio} = \frac{\text{Standard hours for actual production}}{\text{Actual hours worked}} \times 100$$

$$\begin{aligned}
 &= \frac{4400}{5400} \times 100 \\
 &= 81.48\%
 \end{aligned}$$

## 8.7.2. Sales Budget

Sales budget is one of the important functional budgets. Sales estimate is the commencement of budgeting may be made in quantitative terms. Sales budget is primarily concerned with forecasting of what products will be sold in what quantities and at what prices during the budget period. Sales budget is prepared by the sales executives taking into account number of relevant and influencing factors such as: Analysis of past sales, key factors, market conditions, production capacity, government restrictions, competitor's strength and weakness, advertisement, publicity and sales promotion, pricing policy, consumer behaviour, nature of business, types of product, company objectives, salesmen's report, marketing research's reports, and product life cycle.

**Illustration 3.** Ashish Engineering Co. Ltd. manufacturers two articles X and Y. Its sales department has three divisions: West, South and East. Preliminary sales budgets for the year ending 31<sup>st</sup> December 2003, based on the assessments of the divisional executives:

Product X: West 40,000 units: South 1,00,000 units and East 20,000 units

Product Y: West 60,000 units: South 8,00,000 units and East Nil

Sales price X Rs. 2 and Y Rs. 3 in all areas.

Arrangements are made for the extensive advertising of product X and Y and it is estimated that West division sales will increase by 20,000 units. Arrangements are also made to advertise and distribute product Y in the Eastern area in the second half of 2003 when sales are expected to be 1,00,000 units.

Since the estimated sales of the South division represented an unsatisfactory target, it is agreed to increase both the estimates by 10%. Prepare a sales budget for the year to 31<sup>st</sup> December 2003.

**Solution:**

**Sales budget for the year 2003**

Division	Product X			Product Y			Total Rs.
	Qty.	Price Rs.	Value Rs.	Qty. Rs.	Price Rs.	Value Rs.	
West	60,000	2	1,20,000	80,000	3	2,40,000	3,60,000
South	1,10,000	2	2,20,000	88,000	3	2,64,000	4,84,000
East	20,000	2	40,000	1,00,000	3	3,00,000	3,40,000
<b>Total</b>	<b>1,90,000</b>		<b>3,80,000</b>	<b>2,68,000</b>		<b>8,04,000</b>	<b>11,84,000</b>

**Illustration 4.** Natarajan Ltd. has four sales territories A, B, C, D. Each salesman is expected to sell the following number of units during the First Quarter of 2003. Assume the average selling price to be Rs. 10:

Month	A Units	B Units	C Units	D Units
	Units	Units	Units	Units
April	500	750	1,250	1,750
May	1,000	900	1,400	2,000
June	1,250	1,000	1,500	2,250

**Solution:**

### Sales budget, First Quarter 2003

Territory	April			May			June			Quter		
	Qty.	Price	Value	Qty.	Price	Value	Qty.	Price	Value	Qty.	Value	
	Unit	Rs.	Rs.	Unit	Rs.	Rs.	Unit	Rs.	Rs.	Unit	Rs.	
A	500	10	5,000	1,000	10	10,000	1,250	10	12,500	2,750	27,500	
B	750	10	7,500	900	10	9,000	1,000	10	10,000	2,650	26,500	
C	1,250	10	12,500	1,400	10	14,000	1,500	10	15,000	4,150	41,500	
D	1,750	10	17,500	2,000	10	20,000	2,250	10	22,500	6,000	60,000	
Total	4,250		42,500	5,300		53,000	6,000		60,000	15,550	155,500	

### 8.7.3. Production Budget

Production budget is usually prepared on the basis of sales budget. But it also takes into account the stock levels desired to be maintained. The estimated output of business firm during a budget period will be forecast in production budget. The production budget determines the level of activity of the produce business and facilities planning of production so as to maximum efficiency. The production budget is prepared by the chief executives of the production department. While preparing the production budget, the factors like estimated sales, availability of raw materials, plant capacity, availability of labour, budgeted stock requirements etc. are carefully considered.

### 8.7.4. Cost of Production Budget

After preparation of production budget, this budget is prepared. Production cost budgets show the cost of the production determined in the production budget. Cost of production budget is grouped in to material cost budget, labour cost budget and overhead cost budget. Because it break up the cost of each product into three main elements material, labour and overheads. Overheads may be further subdivided in to fixed, variable and semi-fixed overheads.

Therefore separate budgets required for each item.

**Illustration 5.** From the following particular, you are required to prepare production budget of Mittal Ltd. a manufacturing organization that has three products X, Y and Z.

Product	Estimated stock at the beginning of the budget period	Estimated stock at the end of the budget period	Estimated sales as per sales budget
X	5,000 units	6,400 units	21,600 units
Y	4,000 units	3,850 units	19,200 units
Z	6,000 units	7,800 units	23,100 units

#### **Solution.**

Particulars	X (Units)	Y (Units)	Z (Units)
Expected sales during the period	21,600	19,200	23,100
Add: Closing stock at the end of budget period	6,400	3,850	7,800
	28,000	23,050	30,900
Less: Opening stock at the beginning of the budget period	5,000	4,000	6,000
Budgeted production	23,000	19,050	24,900

**Illustration 6.** Production cost of a factory for a year is as follows:

Direct wages Rs. 40,000

Direct materials Rs. 60,000

Production overhead fixed Rs. 20,000

Production overhead variable Rs. 30,000

During the forthcoming year, it is expected that

(a) The average rate for direct labour remuneration will be far from Rs. 3 per hour to Rs. 2 per hour

(b) Production efficiency will remain unchanged

(c) Direct labour hours will increase by  $33\frac{1}{3}\%$

The purchase price per unit of direct materials and of the other materials and services which comprise overheads will remain unchanged.

Draw up a budget and a factory overhead rate, the overhead being absorbed on a direct wage basis.

**Solution:**

#### Cost of production budget

Particulars	Rs.	Amount Rs.
Direct Materials		60,000
Direct wages $\left[ \text{Rs. } 40,000 \times \frac{2}{3} \times \frac{4}{3} \right]$		35,556
Prime cost		95,556
Add: Production overhead:		
Fixed	Rs. 20,000	
Variable	Rs. 30,000	50,000
Factor cost (or) cost of production		1,45,556

#### 8.7.5. Material Purchase Budget

The different levels of material stock are based on planned out. Once the production budget is prepared, it is necessary to consider the requirement of materials to carryout the production activities. Material purchase budget is concerned with purchase and requirement of direct materials to be made during the budget period. While preparing the materials purchase budget, the following factors to be considered carefully:

1. Estimated sales and production.
2. Requirement of materials during budget period.
3. Expected changes in the prices of raw materials.
4. Different stock levels, EOQ etc.
5. Availability of raw materials, i.e., seasonal or otherwise.
6. Availability of financial resources.
7. Price trend in the market.
8. Company's stock policy etc.

**Illustration 7.** Draw up a material purchase budget from the following information:

Estimated sales of a product are 30,000 units. Two kinds of raw materials A and B are required for manufacturing the product. Each unit of the product requires 3 units of A and 4 units of B. The estimated opening balance in the beginning of the next year: finished goods 5,000 units; A, 6,000 units; B, 10,000 units. The desirable closing balance at the end of the next year: finished product, 8,000 units; A, 10,000 units, B 12,000 units.

**Solution:**

$$\begin{aligned}
 \text{Estimated production} &= \text{Expected sales} + \text{desired closing stock of finished goods} - \\
 &\quad \text{Estimated opening stock of finished goods} \\
 &= 30,000 + 8,000 - 5,000 \\
 &= 33,000 \text{ units}
 \end{aligned}$$

### Material purchase budget for the year

Particulars	Material A (Units)	Material B (Units)
Material required to meet production Target		
Material A – $33,000 \times 3$	99,000	1,32,000
Material B – $33,000 \times 4$		
Add: Desired closing stock at the end of next year	10,000	12,000
	1,09,000	1,44,000
Less: Expected stock at the commencement of next year (opening balance)	6,000	10,000
Quantity of materials to be purchased	1,03,000	1,34,000

### 8.7.6. Cash Budget

This budget represents the anticipated receipts and payment of cash during the budget period. The cash budget also called as Functional Budget. Cash budget is the most important of the entire functional budget because, cash is required for the purpose to meeting its current cash obligations. If at any time, a concern fails to meet its obligations, it will be technically insolvent. Therefore, this budget is prepared on the basis of detailed cash receipts and cash payments. The estimated cash receipts include: cash sales, credit sales, collection from sundry debtors, bills receivable, interest received, income from sale of investment, commission received, dividend received and income from non-trading operations etc.

The estimated cash payments include the following:

1. Cash purchase
2. Payment to creditors
3. Payment of wages
4. Payments relate to production expenses
5. Payments relate to office and administrative expenses
6. Payments relate to selling and distribution expenses
7. Any other payments relate to revenue and capital expenditure
8. Income tax payable, dividend payable etc.

**Illustration 8.** Prasad and Co. wishes to prepare cash budget from January. Prepare a cash budget for the first six months from the following estimated revenue and expenses:

Month	Total sales (Rs.)	Materials (Rs.)	Wages (Rs.)	Production overheads (Rs.)	Selling and distribution overheads (Rs.)
January	10,000	10,000	2,00	1,600	400
February	11,000	7,000	2,200	1,650	450
March	14,000	7,000	2,300	1,700	450
April	18,000	11,000	2,300	1,750	500

May	15,000	10,000	2,000	1,600	450
June	20,000	12,500	2,500	1,800	600

### Additional information

1. Cash balance on 1<sup>st</sup> January was Rs. 5,000. New machinery is to be installed at Rs. 10,000 on credit, to be repaid by two equal instalments in March and April.
2. Sales commission @ 5% on total sales is to be paid within a month of following actual sales.
3. Rs. 5,000 being the amount of 2<sup>nd</sup> call may be received in March. Share Premium amounting to Rs. 1,000 is also obtainable with the 2<sup>nd</sup> call.
4. Period of credit allowed by suppliers- 2 months.
5. Period of credit allowed to customers- 1 month.
6. Delay in payment of overheads- 1 month.
7. Delay in payment of wages- ½ month.
8. Assume cash sales to be 50% of total sales.

### Solution.

#### Cash Budget from January to June

Particulars	January (Rs.)	February (Rs.)	March (Rs.)	April (Rs.)	May (Rs.)	June (Rs.)
Opening balance	5,000	9,000	14,900	13,500	12,350	16,550
<b>Estimated cash receipts:</b>						
Cash sales	5,000	5,500	7,000	9,000	7,500	10,000
Credit sales	-	5,000	5,500	7,000	9,000	7,500
Second call	-	-	5,000	-	-	-
Share premium	-	-	1,000	-	-	-
Total cash Receipts (A)	10,000	19,500	33,400	29,500	28,850	34,050
<b>Estimated cash payments:</b>						
Materials	-	-	10,000	7,000	7,000	11,000
Wages	1,000	2,100	2,250	2,300	2,150	2,250
Production Overheads	-	1,600	1,650	1,700	1,750	1,600
Selling & Distribution overheads	-	400	450	450	500	450
Sales commission	-	500	550	700	900	750
Purchase of machinery	-	-	5,000	5,000	-	-
Total cash Payment (B)	1,000	4,600	19,900	17,150	12,300	16,050
Closing balance (A – B)	9,000	14,900	13,500	12,350	16,550	18,000

**Illustration 9.** From the following data, forecast the cash position at the end of April, May and June 2005.

Month	Sales (Rs.)	Purchase (Rs.)	Wages (Rs.)	Miscellaneous (Rs.)
February	60,000	42,000	5,000	3,500
March	65,000	50,000	6,000	4,000
April	40,000	52,000	4,000	3,000
May	58,000	53,000	5,000	6,000
June	44,000	40,000	4,000	3,000

### Additional information:

1. Sales: 10% realized in the month of sales; balance realised equally in two subsequent months.
2. Purchases: These are paid in the month following the month of supply.
3. Wages: 10% paid in arrears following month.
4. Miscellaneous expenses: Paid a month in arrears.
5. Rent: Rs. 500 per month paid quarterly in advance due in April.
6. Income tax: First instalment of advance tax Rs. 15,000 due on or before 15<sup>th</sup> June.
7. Income from investment: Rs. 3,000 received quarterly in April, July etc.
8. Cash in hand: Rs. 3,000 on 1<sup>st</sup> April 2005.

**Solution.**

**Cash budget for the month of April, May and June**

Particulars	April (Rs.)	May (Rs.)	June (Rs.)
Opening balance of cash	3,000	7,550	700
Add: Cash receipts:			
Cash sales	4,000	5,800	4,400
Receipts from debtors (Credit Sales)			
Collection in 1 <sup>st</sup> month	29,250	18,000	19,800
Collection in 2 <sup>nd</sup> month	27,000	29,250	18,000
Income from investment	3,000	-	-
Total cash receipts (1)	66,250	60,600	42,900
Less: Cash payments:			
Creditors for purchases	50,000	52,000	53,000
Wages: Current (90%)	3,600	4,500	3,600
Arrears (10%)	600	400	500
Rent	500	-	-
Miscellaneous expenses	4,000	3,000	6,000
Income tax	-	-	15,000
Total payments (2)	58,700	59,900	78,100
Closing balance of cash (1-2)	7,550	700	(-) 35,200

**Working notes:**

1. Out of total sales, 10% are cash sales. Balance 90% is credit sales. In any given month 50% of credit sale of the previous two months are collected (See W.N.).
2. In any given month, 90% of the wages of the same month and 10% of previous month's wages are paid.

**3. Working notes for collection of cash from debtors and sales**

Particulars	February (Rs.)	March (Rs.)	April (Rs.)	May (Rs.)	June (Rs.)
Total sales	60,000	65,000	40,000	58,000	44,000
Less: Cash sales (10%)	6,000	6,500	4,000	5,800	4,400
Credit sales	54,000	58,500	36,000	52,200	39,600
Collection in 1 <sup>st</sup> month after credit sales	-	27,000	29,250	18,000	19,800
Collection in 2 <sup>nd</sup> month after credit sales	-	-	27,000	29,250	18,000

Total credit	-	-	56,250	47,250	37,800
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## 8.7.8. Master Budget

When the functional budgets have been completed, the budget committee will prepare a master budget for the target of the concern. Accordingly a budget which is prepared incorporating the summaries of all functional budgets. It comprises of budgeted profit and loss account, budgeted balance sheet, budgeted production, sales and costs. The ICMA England defines a Master Budget as 'the summary budget incorporating its functional budgets, which is finally approved, adopted and employed'. The master budget represents the activities of a business during a profit plan. This budget is also helpful in coordinating activities of various functional departments.

**Illustration 10.** Pushpack and Co., a glass manufacturing company requires you to calculate and present the budget for the next year from the following information:

Toughened glass	Rs. 2,00,000
Bent toughened glass	Rs. 3,00,000
Direct material cost	60% of sales
Direct wages	10 workers @ Rs. 100 per month

### Factory overheads

Indirect labour:

Work manager	Rs. 300 per month
Foreman	Rs. 200 per month
Stores and spares	2% on sales
Depreciation on machinery	Rs. 6,000
Light and power	Rs. 2,000
Repairs and maintenance	Rs. 4,000
Other sundries	10% on direct wages

Administration, selling and distribution expenses Rs. 7,000 per year.

### Solution.

#### Master budget for the year ending .....

Particulars	Amount	Amount
Sales (as per sales budget):		
Toughened glass	2,00,000	
Bent toughened glass	3,00,000	
		5,00,000
Less: Cost of production:		
(as per cost of production budget)		
Direct materials	3,00,000	
Direct wages	12,000	
Prime cost		3,12,000
Add: Factory overhead:		
Variable:		
Stores and spares	Rs. 10,000	
Light and power	Rs. 2,000	
Repairs and maintenance	Rs. 4,000	16,000
Fixed:		
Work Manager's salary	Rs. 3,600	
Foreman salary	Rs. 2,400	

Depreciation	Rs. 6,000		
Sundries	Rs. 1,200	13,200	3,41,200
Work's cost		3,41,200	
Gross profit			1,58,800
Less: Administration, selling & distribution overheads			7,000
Net profit			1,51,800

## 8.7.9. Fixed Budget

A budget is drawn from a particular level of activity is called fixed budget. According to ICWA London 'Fixed budget is a budget which is designed to remain unchanged irrespective of the level of activity actually attained.' Fixed budget is usually prepared before the beginning of the financial year. This type of budget is not going to highlight the cost variance due to the difference in the levels of activity. Fixed budgets are suitable under static conditions.

## 8.7.10. Flexible Budget

Flexible budget is also called variable or sliding scale budget, 'takes both the fixed and manufacturing costs into account. Flexible budget is the opposite of static budget showing the expected cost at a single level of activity. According to ICMA, England defined Flexible Budget is a budget which is designed to change in accordance with the level of activity actually attained.'

According to the principles that guide the preparation of the flexible budget a series of fixed budgets are drawn for different levels of activity. A flexible budget often shows the budgeted expenses against each item of cost corresponding to the different levels of activity. This budget has come into use for solving the problems caused by the application of the fixed budget.

### Advantages of flexible budget

#### 1. Advantages of flexible budget

1. In flexible budget, all possible volume of output or level of activity can be covered.
2. Overhead costs are analysed into fixed variable and semi-variable costs.
3. Expenditure can be forecasted at different levels of activity.
4. It facilitates at all times related factor can be compared, which essential for intelligent decision are making.
5. A flexible budget can be prepared with standard costing or without standard costing depending upon what the company opts for.
6. A flexible budget facilitates ascertainment of costs at different levels of activity, price fixation, placing tenders and quotations.
7. It helps in assessing the performance of all departmental heads as the same can be judged by terms of the level of activity attained by the business.

#### Distinction between fixed budget and flexible budget

Fixed budget	Flexible budget
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<ol style="list-style-type: none"> <li>1. It does not change with the volume of activity</li> <li>2. All costs are related to one level of activity only.</li> <li>3. If budget and actual activity levels vary, cost ascertainment does not provide a correct picture.</li> <li>4. Ascertainment of costs is not possible in fixed cost.</li> <li>5. It has a limited application for cost control.</li> <li>6. It is rigid budget and drawn on the assumption that conditions would remain constant.</li> <li>7. Comparison of actual and budgeted performance cannot be done correctly because the volume of production differs.</li> <li>8. Costs are not classified according to their variability, i.e., fixed, variable and semi-variable.</li> </ol>	<ol style="list-style-type: none"> <li>1. It can be recast on the basis of volume of cost.</li> <li>2. Costs are analysed by behaviour and variable costs are allowed as per activity attained.</li> <li>3. Flexible budgeting helps in fixation of selling price at different levels of activity.</li> <li>4. Costs can be easily ascertained at different levels of activity.</li> <li>5. It has more application and can be used as a tool for effective cost control.</li> <li>6. It is designed to change according to changed conditions.</li> <li>7. Comparisons are realistic according to the change in the level of activity.</li> <li>8. Costs are classified according to the nature of their variability.</li> </ol>
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## **Method of preparing flexible budget**

The following methods are used in preparing a flexible budget:

1. Multi-activity method
2. Ratio method
3. Charting method.

1. *Multi-Activity method:* This method involves preparing a budget in response to different level of activity. The different level of activity or capacity levels are shown in Horizontal columns, and the budgeted figures against such levels are placed in the Vertical Columns. The expenses involved in production as per budget are grouped as fixed, variable and semi variable.
2. *Ratio method:* According to this method, the budget is prepared first showing the expected normal level of activity and the estimated variable cost per unit at the side expected level of activity in addition to the fixed cost as estimated. Therefore, the expenses as per budget, allowed for a particular level of activity attained, will be

calculated on the basis of the following formula: Budgeted fixed cost + (Variable cost per unit of activity  $\times$  Actual unit of activity).

3. *Charting method:* Under this method total expenses required for any level of activity, are estimated having classified into three categories, viz., variable, semi variable and fixed. These figures are plotted on a graph. The expenses are plotted on the Y-axis and the level of activity is plotted on X-axis. The graphs will thus, help in ascertaining the quantum of budgeted expenses corresponding to the level of activity attained with the help of this chart.

### **8.7.11. Zero Base Budgeting (ZBB)**

Zero base budgeting is a new technique of budgeting. It is designed to meet the needs of the management in order to ensure the operational efficiency and effective utilization of the allocated resources of a concern. This technique was originally developed by Peter A. Phythrr, Manager of Texas Instrument during 1969. This concept is widely used in USA for controlling their state expenditure when Mr. Jimmy Carter was the president of the USA. At present the technique has for its global recognition for many countries have implemented in real terms.

According to Peter A. Phythrr ZBB is defined as an “Operative planning and budgeting process which requires each manager to justify his entire budget in detail from Scratch (hence zero base) and shifts the burden of proof to each manager to justify why we should spend any money at all”.

In zero-base budgeting, a manager at all levels, have to justify the importance of activity and to allocate the resources on priority basis.

#### **Important aspect of ZBB**

Zero-based budgeting involves the following important aspects:

1. It emphasises on all requisites of budgets.
2. Evaluation on the basis of decision packages and systematic analysis, i.e., in view of cost benefit analysis.
3. Planning the activities, promotes operational efficiency and monitors the performance to achieve the objectives.

#### **Steps involved in ZBB**

The following are the steps involved in zero base budgeting:

1. No previous year performance of inefficiencies is to be taken as adjustments in subsequent year.
2. Identification of activities in decision packages.
3. Determination of budgeting objectives to be attained.
4. Extent to which zero base budgeting is to be applied.
5. Evaluation of current and proposed expenditure and placing them in order of priority.
6. Assignment of task and allotment of sources on the basis of cost benefit comparison.
7. Review process of each activity examined afresh.
8. Weightage should be given for alternative course of actions.

#### **Advantages of ZBB**

1. Utilization of resources at a maximum level.
2. It serves as a tool of management in formulating production planning.

3. It facilitates effective cost control.
4. It helps to identify the uneconomical activities.
5. It ensures the proper allocation of scarce resources on priority basis.
6. It helps to measure the operational inefficiencies and to take the corrective actions.
7. It ensures the principles of management by objectives.
8. It facilitates co-operation and co-ordination among all levels of management.
9. It ensures each activity is thoroughly examined on the basis of cost benefit analysis.

### **8.7.12. Performance Budgeting**

Performance budget has been defined as a ‘budget based on functions, activities and projects.’

Performance budgeting may be described as ‘the budgeting system in which input costs are related to the performance, i.e., end results.’

According to National Institute of Bank Management, Performance budgeting is, “the process of analyzing, identifying, simplifying and crystallizing specific performance objectives of a job to be achieved over a period, in the framework of the organizational objectives, the purpose and objectives of the job.”

From the above definitions, it is clear that budgetary performance involves the following:

1. Establishment of well defined centres of responsibilities:
2. Establishment for each responsibility centre- a programme of target performance is in physical units.
3. Forecasting the amount of expenditure required to meet the physical plan laid down.
4. Comparison of the actual performance with the budgets, i.e., evaluation of performance.
5. Undertaking periodic review of the programme with a view to make modifications as required.

**Illustration 11.** Prepare a flexible budget for overheads on the basis of the following data. Ascertain the overhead rates at 50%, 60% and 70% capacity.

	<b>At 50% capacity (Rs.)</b>
Variable overheads:	
Indirect material	3,000
Indirect labour	9,000
Semi-variable overheads:	
Electricity (40% fixed 60% variable)	15,000
Repairs (80% fixed 20% variable)	1,500
Fixed overheads:	
Depreciation	8,250
Insurance	2,250
Salaries	7,500
Total overheads	46,500
Estimated direct labour hours	93,000

**Solution.**

Particulars	Flexible budget		
	50% capacity	60% capacity	70% capacity
<b>Variable overheads:</b>			
Indirect material	2,500	3,000	3,500
Indirect labour	7,500	9,000	10,500
<b>Semi-variable overheads:</b>			
Electricity	13,500	15,000	16,500
Repairs and maintenance	1,450	1,500	1,550
<b>Fixed overheads:</b>			
Depreciation	8,250	8,250	8,250
Insurance	2,250	2,250	2,250
Sales	7,500	7,500	7,500
Total overheads	42,950	46,500	50,050
Estimated direct labour hours	77,500	93,000	1,08,500
Overhead rate	Re. 0.55	Re. 0.50	Re. 0.46

**Working notes:**

1. *Electricity:* Rs. 15,000 is the cost of electricity at 60% capacity, of which 40% are fixed overheads, i.e., Rs. 6,000 and variable is Rs. 9,000:

$$\text{For 60% capacity variable overheads} = \text{Rs. 9,000}$$

$$\text{For 50% capacity variable overheads} = \frac{9000}{60} \times 50 = \text{Rs. 7,500}$$

$$\text{Therefore electricity cost at 50% capacity} = 6,000 + 7,500 = \text{Rs. 13,500}$$

$$\text{For 70% capacity, variable overheads} = \frac{9000}{60} \times 70 = \text{Rs. 10,500}$$

$$\begin{aligned} \text{Therefore electricity cost at 70\%} &= \text{Rs. 10,500} + \text{Rs. 6,000} \\ &= \text{Rs. 16,500} \end{aligned}$$

2. *Repairs and maintenance:* Rs. 1500 is the cost of repairs and maintenance at 60% capacity, of which 80% is fixed overhead, i.e., Rs. 1,200 and variable is Rs. 300:

$$\text{For 60% capacity variable overhead} = \text{Rs. 300}$$

$$\text{For 50% capacity variable overhead} = \frac{300}{60} \times 50 = \text{Rs. 250}$$

$$\text{Therefore the total cost of repairs and maintenance at 50\%}$$

$$= \text{Rs. 1,200} + \text{Rs. 250} = \text{Rs. 1,450}$$

$$\text{For 70% capacity, variable overhead} = \frac{300}{60} \times 70 = \text{Rs. 350}$$

$$\text{Therefore the total cost of repairs and maintenance}$$

$$= \text{Rs. 1,200} + \text{Rs. 350} = \text{Rs. 1,550}$$

**Illustration 12.** With the following data for a 60% activity prepare a budget for production at 80% and 100% capacity

Production at 60% capacity 300 units

Materials Rs. 100 per unit

Labour Rs. 40 per unit

Expenses Rs. 10 per unit

Factory expenses Rs. 40,000 (40% fixed)  
 Administrative expenses Rs. 30,000 (60% fixed)

**Solution.**

**Flexible Budget**

Particulars	60% capacity	80% capacity	100% capacity
	300 units	400 units	500 units
<b>Direct cost:</b>			
Material Rs. 100 per unit	30,000	40,000	50,000
Labour Rs. 40 per unit	12,000	16,000	20,000
Expenses Rs. 10 per unit	3,000	4,000	5,000
Total direct costs	45,000	60,000	75,000
Add: variable factory expenses (Rs. 40 per unit)	12,000	16,000	20,000
Variable administrative expenses (Rs. 20 per unit)	6,000	8,000	10,000
Fixed factory expenses (40% of Rs. 40,000)	16,000	16,000	16,000
Fixed administrative expen. (60% of Rs. 30,000)	18,000	18,000	18,000
Total	97,000	1,18,000	1,39,000

**8.8. Summary**

Budgeting has come to be accepted as an efficient method of short-term planning and control. It is employed, no doubt, in large business houses, but even the small businesses are using it at least in some informal manner. Though the budgets, a business wants to know clearly as to what it proposes to do during an accounting period or a part thereof. The technique of budgeting is an important application of management accounting. Probably, the greatest aid to good management that has ever been devised is the use of budgets and budgetary control. It is a versatile tool and has helped managers cope with many problems including inflation.

**8.9. Self-Assessment Questions**

1. What do you mean by a budget? List out its essentials.
2. What are the differences between budgets and forecasts?
3. What do you understand by budgetary control? Explain briefly the characteristics of a good budget.
4. What are the objectives of budgetary control?
5. Describe essential requisites for effective budgetary control.
6. What do you understand by organization for budgetary control?
7. What are the advantages and limitations of budgetary control?
8. What is sales budget? What are the factors considered in developing the sales budget?
9. Write short notes on: (a) Production budget, (b) cost of production budget, and (c) materials budget.
10. What do you understand by cash budget? Discuss the procedure for preparing the cost budget.
11. What do you understand by master budget?
12. What do you understand by fixed budget and flexible budget? What are the advantages of flexible budget?
13. Describe the different methods of preparing flexible budget.
14. A manufacturing company submits the following figures:  
 Budgeted production 44 units; Actual production 40 units;  
 Standard hours per unit 8; Actual work hours 500.

You are required to calculate (a) capacity ratio, (b) activity ratio, and (c) efficiency ratio.

15. Two articles A and B are manufactured in a department. Sales for the year 2003 were planned as follows:

Product	1 <sup>st</sup> quarter	2 <sup>nd</sup> quarter	3 <sup>rd</sup> quarter	4 <sup>th</sup> quarter
	Units	Units	Units	Units
A	5,000	6,000	6,500	7,500
B	2,500	2,250	2,000	1,900

Selling price were Rs. 10 per unit for A and Rs. 20 per unit for B respectively.

Average less return are 10% of sales and the discounts and bad debts amount to 2% of the total sales.

16. A company is expecting to have Rs. 25,000 cash in hand on 1<sup>st</sup> April 2003 and it requires you to prepare an estimate of cash position in respect of three months from April to June 2003, from the information given below:

	Sales (Rs.)	Purchase (Rs.)	Wages (Rs.)	Expenses (Rs.)
February	70,000	40,000	8,000	6,000
March	80,000	50,000	8,000	7,000
April	92,000	52,000	9,000	7,000
May	1,00,000	60,000	10,000	8,000
June	1,20,000	55,000	12,000	9,000

**Additional information:**

- (a) Period of credit allowed by suppliers- two months.
- (b) 25% of sale is for cash and the period of credit allowed to customer for credit sale one month.
- (c) Delay in payment of wages and expenses one month.
- (d) Income tax Rs. 25,000 is to be paid in June 2003.

17. PQR company Ltd. has given the following particulars, you are required to prepare a cash budget for the three months ending 1<sup>st</sup> December, 2003.

Months	Sales	Materials	Wages	Overheads
August	20,000	10,200	3,800	1,900
September	21,000	10,000	3,800	210
October	23,000	9,800	4,000	2,300
November	25,000	10,000	4,200	2,400
December	30,000	10,800	4,500	2,500

Credit terms are:

Sales/Debtors- 10% sales are on cash basis: 50% of the credit sales are collected next month and the balance in the following month:

Creditors	Materials 2 months Wages 1/5 month Overheads 1/2 month
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18. A factory is currently to 50% capacity and produces 10,000 units estimate the profits of the company when it works at 60% and 80% capacity and offer your critical comments.

At 60% working raw materials cost increases by 2% and selling price falls by 2% at the 80% working, raw material cost increases by 5% and selling price falls by 5%.

At 50% capacity working the product costs Rs. 180 per unit and is sold at Rs. 200 per unit. The unit cost of Rs. 180 is made up as follows:

Materials	Rs. 100
Labour	Rs. 30
Factory overhead	Rs. 30 (40% fixed)
Administrative overhead	Rs. 20 (50% fixed)

[Ans. Rs. 2,00,000; Rs. 2,12,000; Rs. 2,12,000]

### **8.10. Suggested Readings**

1. Jain and Khan: Management Accounting, TMH, Delhi.
2. Pandey, I.M.: Financial Management, Vikas Publishing House, Delhi.
3. Periasamy, P.: Financial, Cost and Management Accounting, HPH, Delhi.
4. Maheshwari, S.N.: Accounting for Management and Control, Sultan Chand and Sons, Delhi.
5. Van Horne: Financial Management and Analysis, Pearson Publication, Delhi.

## **COURSE: MANAGEMENT ACCOUNTING**

**COURSE CODE: MC-105**

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**LESSON: 09**

**VETTER: Dr. N. S. Malik**

**Objective:** The objectives of the present lesson are to understand the various elements and steps required for installation of MIS at different management levels. Further, the chapter also intends to discuss the concepts of management reporting system and its principles.

## **LESSON STRUCTURE**

- 9.1 Introduction
- 9.2 Elements of MIS
- 9.3 Meaning and Definition of Report
- 9.4 Objectives of Report Preparation
- 9.5 Management Reporting
- 9.6 Methods of Reporting
- 9.7 Requisites of A Good Report
- 9.8 Kinds of Reports
- 9.9 Level of Management And Reporting
- 9.10 Reporting System
- 9.11 Principles of A Good Reporting System
- 9.12 Process of Report Writing
- 9.13 Summary
- 9.14 Self-Test Questions
- 9.15 Suggested Readings

## 9.1 INTRODUCTION

Today, the business operates under an environment, which is more competitive and complex as compared to earlier times. The rapid growth or size of business has necessitated the delegation of authority at various levels of management. There are problems of control, co-ordination and communication. The decision-making has become a difficult task. The decisions have wider ramifications for business and a wrong decision may than lead to its closure. Management needs full information before taking any decisions. Because, good decisions can minimise cost and optimise return. Thus, Management Information System (MIS) can be helpful to the management in undertaking managerial function smoothly and effectively. It is an approach of providing timely, adequate and information to the right person in the organization, which helps him in taking right decisions. So, management information system is a planned and organized approach to the transferring of intelligence within an organization for the organization of management. The information is furnished into useful quantum of knowledge in the form of reports.

## 9.2 ELEMENTS OF MIS

**An effective system of MIS collects data from all possible sources. The information is properly processed and stored for use in future. Basically, the elements of MIS are:**

- (i) **To determine the need, type and sources of information.**
- (ii) **To process and store the collected information.**
- (iii) **To determine the time and quantum of information needed.**
- (iv) **To send the desired information to different managerial levels within specified time.**
- (v) **To involve the process of measuring the adequacy of served. Otherwise, the information should be enlarged or modified.**

### 9.2.1 TYPES OF MIS

Management Information System has the following types:

**(A) Management Operating System:** This system is meant for meeting for information needs of lower and middle level management. The information supplied generally relates to operations of the business. The figures about finance, raw materials, labour, production, sales, etc; are supplied to concerned persons. The operational information is required to see the pace of work and make necessary changes, if needed. The supply of information is quick and regular. The use of electronic devices is made for processing and analysing data.

**(B) Management Reporting System:** This system is designed to supply the information to top-level management for decision taking. The information is presented in a way, which enables the management to take quick decisions. Sometimes, comparative information is to present before management the real position of the enterprise. The supply to this information is slow because information from various sources is compiled firstly. Decision-making requires full information about all-important areas of the enterprise.

### **9.2.2 INSTALLATION OF MIS**

The installation of management information system requires the following steps:

**(i) Preliminaries:** The introduction of MIS requires a proper study of the business objectives, plans, policies, etc. It enables in deciding the type of data required, its sources and the levels at which it is required. The organization structure should be able to supply the required information. The organizational levels, authorities, responsibilities, etc. should be studied for this purpose. The success of MIS will depend upon the support of top-level management. The management also should be able to supply the requisite finances.

- (ii) **Planning:** The information needs of top; middle and lower levels of management should be studied so that the system is planned accordingly. The functions of each level of management should also be studied. The points like what data are needed? When is it needed? Who needs it and; in what form is it needed? Should be studied for making the system effective.
- (iii) **Implementation:** MIS can effectively be applied only when every person in the organisation is involved in it. The person should also be given training for implementing this system. Information system manuals should be prepared to devise the procedure for it. The manual and mechanical devices necessary for processing data should also be selected. Standard proformas, etc, should also be decided for collecting information. The main emphasis should be on the involvement in the organisation.
- (iv) **Review.** The review of the system is very essential. The problems and difficulties in the system and additional requirements should be pointed out. The review of MIS will enable us to mark the loopholes and a corrective action will make the system more effective. It should be determined whether the information supplied was sufficient or not? Was the information relevant and critical? Was the frequency of reporting justified? The answers to these questions will help in making changes in the system. Without a proper review, the system will cease to be effective and useful after some time. It should constantly be reviewed with the change in the situation in the business.

### 9.3 MEANING AND DEFINITION OF REPORT

The word ‘Report’ is derived from the Latin word ‘*portage*’ that means ‘to carry’. So ‘report’ is a document, which carries the information. The word report consists of two parts, viz, RE+PORT. The meaning of the word RE is ‘again’ or ‘back’ and PORT

means ‘to carry’. Combining these two words it means to carry the information again. It must be clear that reports are always written for any event, which has already occurred. So report is a written document, which carries the information again. Dictionary meaning of the word report is ‘to convey’ or to transmit as having been said.’ In fact, a report is a communication from someone who has the information to some one who wants to use that information. Report is always planned for use. According to G.R. terry, report is “a written statement based on a collection of facts, event and opinion and usually expresses a summarized and interpretative value of this information. It may deal with past accomplishments, present conditions or future developments”. Terry talks about report as a written communication prepared on the basis of collected information related to present, past or future. In the word of Johnson and Savage, “A good business report is a communication that contains factual information, organised and presented in clear, correct and coherent language”. Simply, report can be defined as “a form of statement which presents and examines facts relating to an event, problem, progress of action, state of business affairs etc, and for the purpose of conveying information, reporting findings, putting forward ideas and making recommendations as the basis of action”. So report is an impartial presentation of facts. These facts may arise out of available factual data or through enquiry, investigation, survey, interview, experiments or research. A mere expression of opinion without supporting factual data is not a report.

#### **9.4 OBJECTIVES OF REPORTING**

The reports are prepared and written to serve the following purpose

- (i) **Communication:** Reports are means of upward commutation. It is a communication from someone who has the information to someone who needs that information for carrying out functions of management. Report provides

information to executives, government agencies, shareholders, creditors, customers or general public.

- (ii) **Record:** Report provides valuable records for future reference. Reports record facts and results of investigation. The facts can be of great importance in future.
- (iii) **Legal requirements:** Reports are also written and submitted to fulfill legal requirements. For instance, annual report of company's accounts is necessarily to be furnished to shareholders under companies act, 1956. Similarly, audit report of accounts must accompany the income-tax return Income Tax Act, 1961.
- (iv) **Public relations:** Reports of general progress of business and utilisation of national resources to public helps in increasing the goodwill and developing public relations.
- (v) **Measuring performance tool:** Routine reports about the work performance of employees help the management to measure performance in view of the objects. The reports on performance shall become the basis for promotions and incentives.
- (vi) **Control:** Report is the basis of control process. It is on the basis of report, actions are initiated and instructions are given to improve the performance.

## 9.5 MANAGEMENT REPORTING

The process of providing information to the management is known as 'Management Reporting'. The reports are regularly sent to various levels of management so as to enable in judging the effectiveness of their responsibility centers. These reports also become a base for taking corrective measures, if necessary. According to Anthony and Reece, "Reports on what has happened in a business, are useful for two general

purposes: information and control, respectively". Information reports are useful to tell management what is going on. On the other hand, control reports are useful in assessing personal performance and economic performance. Reporting is not equivalent to communication. Communication is both downward and upward i.e. decisions are communicated to lower levels and reactions of lower levels are communicated to top-level management. Reporting is only upward. The reports are prepared by the management accountant and sent for the review of top-level management. The communication of reports may be oral, written or graphic. The reports may be sent weekly, monthly, quarterly or yearly. The timing of reports is linked with their nature. The sales and production reports may be weekly, whereas profitability reports may be annually.

## **9.6 METHODS OF REPORTING**

Reports may be presented in a number of ways. The method of reporting may depend upon the nature of information to be conveyed, the volume of data or information to be the media available for communications. Following methods of reporting may be used:

### **9.6.1 Written Reporting**

A number of written reports may be sent to different levels of management. These reports may be:

- (i) **Formal financial statements:** Such statements may deal with actual figures against the budgeted ones or comparative accounting statement giving information at different period of time.
- (ii) **Tabulated information:** The tabulated statistics, which include analysis according to products, time, territories etc. A particular type of information,

for examples sales, may be tabulated as per different periods, products, areas etc.

(iii) **Accounting Ratios:** Accounting ratios may be presented as a part of formal financial statements. The ratios are useful in appropriate analysis of financial statements. The ratios may be current ratios, efficiency ratios, long-term solvency ratios, profitability ratios, etc.

#### **9.6.2 Graphic Reporting**

The reports may be presented in the form of charts, diagrams and pictures. These reports have the advantage of quick grasp of trends of information presented. A look at the chart or diagram may enable the reader to have an idea about the information.

#### **9.6.3 Oral Reporting**

<u>Oral reporting may be of: a)</u>	<u>Group meetings, b)</u>	<u>Conversation with individuals.</u>
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Oral reporting is helpful only to a limited extent. It cannot form a part of important managerial decision making. For that purpose the reports must be in writing so that these may be referred in future discussions too. A combination of written, graphic and oral reporting may be useful for the concern.

### **9.7 REQUISITES OF A GOOD REPORT**

A report is a vehicle carrying information to those who need it. A report is prepared by putting in labour by the executives. The usefulness of the report will depend upon its quality and the way in which it has been communicated. A report should be prepared in a way it serves the purpose and presented at a time when it is needed. Good reporting is thus essential for effective communication. A good report should have the following requisites:

- 1. Good form and content:** The following points must be taken into account while preparing a report:

- (i) The report should be given a proper title, headings, sub headings and paragraph divisions. The title will explain the purpose for which the report has been prepared the title also enables to point out the persons who need the report. A production report may be titled as 'Production Report for the Month of April 1992'. The title explains the purpose and period of preparing the report.
- (ii) If statistical figures are to be given in the report then only significant figures and totals should be made a part of it and other detailed figures should be given in appendix.
- (iii) The reports should contain facts and not opinions. The opinion may come, if essential, as a sequel to certain facts and not otherwise.
- (iv) The report must contain the date of its preparation and date of submission.
- (v) If the report is prepared in response to a request or letter then it should bear reference number of such request or letter.
- (vi) The contents of a report must serve the purpose for which it has been prepared. Separate reports should be prepared for different subjects. Various aspects of the subject should be properly conveyed.
- (vii) The contents of the report should be in a logical sequence.

2. **Simplicity:** The report should be presented in a simple, unambiguous and clear language. The language should be non-technical. If the report is loaded with technical terminology, it will reduce its utility because the reader may be unfamiliar with that language. The reader should be able to understand report without any difficulty. The report should also be readable. The figures should be rounded so as to make them easily understandable. If possible, chart, diagrams or graphs should be used for presenting information.

**3. Promptness:** Promptness in submitting a report is an essential element of a good report. The reports should be sent at the earliest. These are required for studying the progress and performance of various departments. A considerable delay in the occurrence of an event and reporting of the same will defeat the purpose of reporting. Information declared is information denied. The quick supply of reports will enable the management to take corrective measures at the earliest. The reports are to be based on information; the promptness in reporting will depend on quick collections of facts and figures. Following steps may help in quick reporting.

- (i) A proper record-keeping system should be introduced in the organisation to meet various information needs.
- (ii) To avoid clerical errors, mechanized accounting should be used.
- (iii) The accounting work should be centralized to avoid bottlenecks in collecting information.

**4. Relevancy:** The reports should be presented only to the persons who need them. They should be marked to relevant officials. Sometimes reports are sent to various departments in a routine way, then it will involve unnecessary expenditure and the reports will not remain secret. The persons or departments to whom the report is to be sent must be clear to the sender. People do not give much attention to reports coming in a routine way. So, this type of practice involves unavoidable expenditure and reduces the importance of reports.

**5. Consistency:** There should be a consistency in the preparation of reports. The comparability of reports will be possible only if they are consistent. For consistency, the reports should be prepared from the same type of information and statistical data. This will be possible if same accounting principles and concepts are used for

collecting, classifying, tabulating and presenting of information. Consistency in reporting enhances their utility.

**6. Accuracy:** The reports should be reasonably accurate. Statistical reports may sometimes be approximated to make them easily understandable. The production of figures accurate upto paise may be difficult to be remembered, their reasonable approximation may make them readable and understandable. The degree of accuracy depends upon the nature of information and the purpose of its collection. The approximation should not be done upto the level where information loses its form and utility. So accuracy should be used to enhance the use of reports.

**7. Controllability:** The reports should be addressed to appropriate persons in respective responsibility centres. The reports should give details of variances, which are related to that centre. This will help in taking corrective measures at appropriate levels. The variances which are not controllable at a particular responsibility centre may also be mentioned separately in the report.

**8. Cost Consideration:** The cost of preparing and presenting the report should also be considered. This cost should not be more than the benefits expected from such reports. The cost should be reasonable so that all types of concerns may use reporting. The cost-benefit analysis will help in deciding about the adopting of reporting system.

**9. Comparability:** The reporting system is meant to help management in taking correct decision and improving the operational efficiency of the organisation. This objective will better be achieved if reports give comparative information. The comparative information can be in relation to previous period, current standards, or budgets. This information helps in finding out deviations or variances. Where performance is below standards or expectations, such variances can be highlighted in the reports. The 'management by exception' is possible when exceptional information

will be supplied to the management. The comparative reporting will, at once, help the reader to reach at conclusions about his performance of the responsibility o centre mentioned in the report.

**10. Frequency of Report:** Along with promptness, the frequency of reporting is also significant. The reports should be sent regularly when they are required. The timing of reporting will depend upon the nature of information and its purpose. Some reports may be sent daily, some weekly, some monthly and so on. Frequency of reports means that these should be sent when required. The reports are prepared at appropriate times and sent to appropriate persons as per their requirements.

## **9.8 KINDS OF REPORTS**

The reports may be classified into the following categories:

### **9.8.1 ACCORDING TO OBJECT AND PURPOSE**

**Reporting based on objectives and purpose has been further been grouped into the following:**

(A) **External Reports:** The reports meant for persons outside the business are known as external reports. Outsiders interested in company reports may be shareholders, creditors or bankers. Though the company may not be answerable to outsiders but still some reports are meant for outside public. The company publishes income Statement and Balance Sheet at eh end of every financial year and these statements are filed with the Registrar of Companies and stock Exchanges. Final statements of accounts are expected to conform to certain basic details. In India, Companies Act has made it compulsory to disclose some minimum information in final accounts.

(B) **Internal Reports.** Internal reports refer to those reports, which are meant for different levels of management. Internal reports are not public documents and they are not expected to conform to any standards. These reports are prepared

by keeping in view the needs of disposal for scanning them. These reports may be meant for top level, middle level and lower level of management. The frequency of these reports vary in accordance with the purpose they serve. Some of the internal reports that are commonly used are: period report about profit or loss and financial position, statement of cash flow and changes in, working capital, report about cost of production, production trends and utilisation of capacity, labour turnover reports, material utilisation reports, periodic reports on sales, credit collection period and selling and distribution expenses, report on stock position, etc.

#### **9.8.2 ACCORDING TO NATURE**

According to nature, reports are divided into three categories:

- (A) **Enterprise Reports:** These reports are prepared for the concern as a whole. These reports serve as a channel of communication with outsiders. Enterprise reports may concern all activities of the enterprise or may be related to different activities. Enterprise reports may include balance sheet, income statement, income tax returns, employment reports, chairman's report, etc. These reports contain standardised information and are beneficial to outsiders. The interpretation of financial statements can also be undertaken from these reports. The reports are important from financial analysis point of view.
- (B) **Control Reports.** Control reports deal with two aspects. One aspect relates to the personal performance and the second aspect deals with the economic performance. The first type of reports is reported to judge the performance of managers and heads of responsibility centres with that performance should have been under the prevailing circumstances. The reasons for deviations in performance are also identified. The second type of reports shows how well

the responsibility centre has fared as an economic entity. Such analysis is made periodically. This type of analysis requires the use of full cost accounting rather than responsibility accounting. Control reports should consider the following:

- (i) Control reports should be related to personal responsibility.
- (ii) They should compare actual performance with the standards.
- (iii) They should highlight significant information.
- (iv) These reports should be sent at a proper time as to enable taking corrective measures.

(C) **Investigative Reports:** These reports are linked with control reports. In case some serious problem arises then the causes of this situation are studied and analysed. Investigative reports are based on the outcome of special solution studies. These reports are intermittent and are prepared only when a situation arises. They are prepared according to the nature of every situation. They are helpful to the management in analysing the cause of some problems.

### **9.8.3 ACCORDING TO PERIOD**

According to period the reports may be:

(A) **Routine Reports:** These reports are prepared about day-to-day working of the concern. They are periodically sent to various levels of management. These reports may differ according to the nature of information and details to be reported. So far as the timing is concerned they may be sent daily, weekly monthly, or quarterly. Routine reports may relate to sales information, production figures, capital expenditure, purchases of raw materials, market trends, labour situations, etc. There is a tendency to ignore routine reports by all recipients because of their routine nature. Important information in the

report should be highlighted or presented in a different way or may be written in a different ink.

(B) **Special Reports.** The management may confront some difficulties and routine reports may not give sufficient information to tackle these situations. Under such circumstances, special reports are required for special purposes only, which are known as 'Special reports'. These reports are prepared according to the need of the situation. Available accounting information may not be sufficient, so data may have to be especially collected. There may be a need to put extra staff for compiling these reports. It may also involve co-ordination of different departments and different levels of management. According to J. Batty, special reports should be divided into sections, each covering the main purposes: reasons for the report; investigation made; finding a conclusion and recommendations.

Special reports may deal with the following topics.

- a. Information about market analysis and methods of distribution of competitors.
- b. Technological change in the industry.
- c. Problems about him purchase of raw materials, etc.
- d. Reports about the change in methods of production and their implications.
- e. Trade association matters.
- f. Report by the secretary on company matters.
- g. Political development at home and abroad having impact on business.

#### **9.8.4 ACCORDING TO FUNCTIONS**

According to function, the reports may be divided into two categories:

**(A) Operating Reports:** These reports provided information about operations of the concern. The operating reports may consist of the following:

- (i) Control Reports.** These reports are used for managerial control. They are intended to spot deviations from budgeted performance without loss of time so that corrective action can be taken. Control reports are also used to assess the performance of individuals.
- (ii) Information Reports.** These reports are prepared to provide useful information, which will enable planning and policy formation for future. Information reports can take the form of trend reports and analytical reports. Trend reports provide information in comparative form over a period of time. Graphic representations can be effectively used in trend reports. As opposed to trend reports, analytical reports provide information in a classified manner about composition of certain results so that one can identify specific factors in the overall total.

**(B) Financial Reports:** These reports provide information about the financial position of the concern on specific dates or movement of finances during a specific period. The balance sheet provides information movement of cash during a particular period. These reports can be either static or dynamic. Balance sheet and other subsidiary reports are examples of static reports: cash flow, fund flow statements and other reports showing financials position as compared to the budgeted are examples of dynamic reports.

## **9.9 LEVEL OF MANAGEMENT AND REPORTING**

There are generally, three levels of management and their informational needs are different. Some type of information and in the same form and content may not be needed at all the managerial levels. The three levels of management are:

- (A) Top level management
- (B) Middle Level Management
- (C) Lower level Management or First line management

The information to be presented and the method of reporting should meet the specific requirements of various levels of management. The guiding **principles for reporting** to different levels of management are as follows:

- (i) The lower the level of management the more detailed will be the reports and higher the level of management the shorter or summarized will be the reports. The lower level management consisting of foremen, section in-charges, supervisors, etc. need more detailed reports because they are concerned with actual execution of work. On the other hand, top management (i.e. Board of Directors) has limited time and needs summarized reports. Sometimes only exceptional matters are reported to this level.
- (ii) The frequency of reports is also connected with the level of management the lower the level of management the higher will be the frequency of reporting. The middle and lower levels of management need the reports more frequently because they deal with day-to-day operations of the business. The top-level management will ask for the reports when some decision is to be taken or some policy has to be decided.
- (iii) The number of reports to be sent is also concerned with the levels of management. The top level management will get maximum number of reports and lower levels will get lesser number of reports. The top management is to

get reports about every activity in the business while lower level management is concerned with a particular department or section so it will get information about this area only. The Board of Directors will receive a large number of reports because it controls every function in the organisation.

**9.9.1 REPORTS FOR TOP LEVEL MANAGEMENT:** Top level management consists of Board of Directors. Top level management is concerned with policy planning and coordinating activities. The goals are set for the organization and policies are devised to achieve these goals. The work of executing policies is left to the top level management.

- (i) Periodic report about profit and loss account and balance sheet.
- (ii) Statements of funds flow and cash flow at regular intervals.
- (iii) Reports on production trends and utilisation of capacity.
- (iv) Reports about cost of production.
- (v) Periodic reports on sales, credit collection period and selling and distribution expenses
- (vi) A statement on development and research expenditure.

**9.9.2 REPORTS FOR MIDDLE LEVEL MANAGEMENT**

The Middle level management is assigned the work for executing various policies. Top management sets the objects or goals. The requisite authority is delegated to middle level management so that organisation goals may be achieved. The reports submitted to middle level management are detailed so that a corrective view of performance of different departments is undertaken. Middle management also undertakes the work of co-ordinating activites of different departments. The report submitted to middle management could be classified as follows:

**(A) Production Manager**

1. Actual production figures along with budgeted production figures for that period. These reports are generally daily, weekly or fortnightly;
2. The figures about the availability and utilisation of workers. Figures about normal and abnormal idle time are also reported;
3. Capacity utilisation Reports;
4. Material Usage Reports;
5. Machine and labour utilisation Reports;
6. Absenteeism and labour Turnover Reports;
7. Scrap Report;
8. Machine Hours Lost Report;
9. Stock Position Report;
10. Analysis of Budgeted cost of Production and Actual Cost of Production, etc.

**(B) Sales Manager**

1. Reports on actual and budgeted sales. These reports are submitted area-wise and product wise;
2. Weekly reports on orders booked, orders executed and orders still to be executed;
3. Reports on credit collection and bad debts, etc;
4. Reports on stock position;
5. Analysis of selling and distribution Expenses, product as well as area wise;
6. Market Survey Reports;
7. Reports on customer's complaints;
8. Reports on effectiveness of sales promotion campaigns, etc.

**(C) Purchase Manager**

1. Raw materials purchases, actual materials received and orders pending;
2. Use of raw materials for production;

3. Raw materials balance and information when minimum level or maximum level reaches;
4. Analysis of purchase expenses;
5. Budgeted cost of Purchases and actual cost of purchases, etc.

**(C) Finance Manager**

1. Cash and Bank position reports;
2. Periodic fund flow and cash flow statements;
3. Debtors collection period reports;
4. Average payment period;
5. Analysis of working capital;
6. Report on budgeted profit and actual profit;
7. Statement of financial position;
8. Capital expenditure reports, etc.

**9.9.3 REPORTS FOR LOWER LEVEL MANAGEMENT**

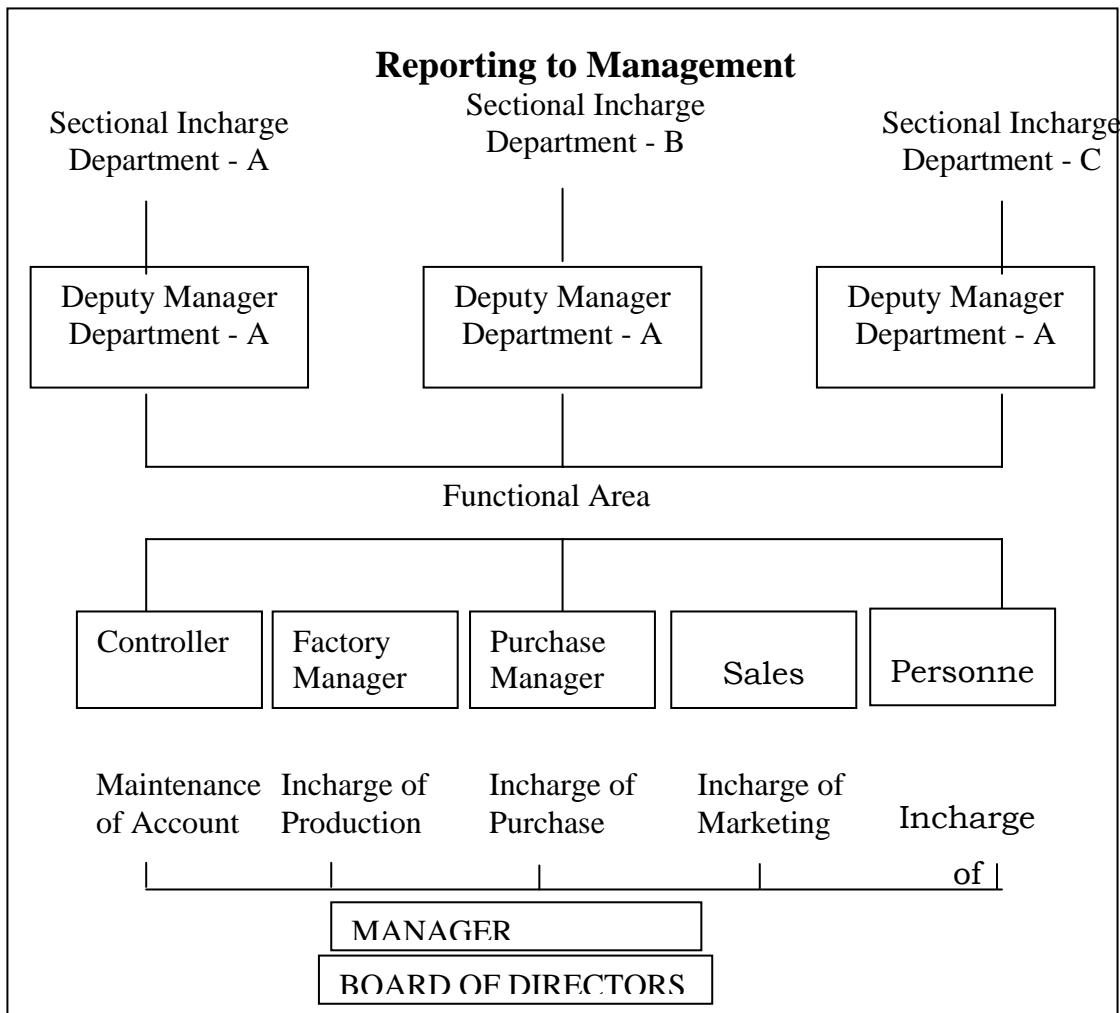
Lower level management consists of foremen or sectional in charges. They are responsible for the actual execution of policies. They are in touch with the day-to-day performance of their sections. They get daily reports from their junior. Junior level management prepares and sends regular reports to middle level management. Reports for foremen may include:

1. Labour utilisation report and causes of lost time;
2. Worker's efficiency reports;
3. Scrap report;
4. Actual shop expenses against budgeted expenses;
5. Maintenance cost reports, etc.

**9.10 REPORTING SYSTEM**

The reporting system involves at all levels of management. The reports originate from junior levels of management and go upto top level management, consisting of board of directors. The reporting system of a large-scale organisation is shown in the Graphics 9.1, given below:

Graphics: 9.1



The sectional incharge of every section regularly reports the progress of his section to his superior. In this diagram, functional have deputy managers who control department sections. The combined reports of different sections reach the department manger, called functional manager. Different functional managers submit the progress of their departments to the managing director. The brief summaries of departmental reports are submitted to the board of directors for reviewing polices and making strategy for the future. An effective reporting system will enable the top management to remain in constant touch with the progress of different departments.

The sectional incharge of every section regularly reports the progress of his section to his superior. In this graphics, Functional Managers have Deputy Managers who control departmental sections. The combined reports of different sections reach the departmental manager, called functional manager. Different functional managers submit the progress of their departments to the Managing Director. The brief summaries of departmental reports are submitted to the Board of Directors for reviewing policies and making strategy for the future. An effective reporting system will enable the top management to remain in constant touch with the progress of different departments.

## 9.11 PRINCIPLES OF A GOOD REPORTING SYSTEM

A good reporting system is helpful to the management in planning and controlling. Every level of management needs information relating to its activities so that effective planning may be undertaken and current activities may be controlled and necessary corrective measures may also be taken in time, if needed. Some general principles are followed for making the reporting system effective. These principles are discussed as follows:

1. **Proper flow of information:** A good reporting system should have a proper flow of information. The information should flow from the proper place to the right levels of management. The information should be sent in the right form and at a proper time so that it helps in planning and co-ordination. The frequency of reports will depend upon the nature of report, the types of data required for preparing the information and cost involved in preparing such reports. The flow of reports should be such that it does not cause delay in taking decisions. The reports should flow at regular intervals so that information needs of different managerial levels are met at a proper time. Flow of information is a continuous activity and affects all levels of the organisation. Information may flow upward, downwards or sideways within and organisation. Orders, instructions, plans etc may flow from top to bottom. Reports grievances, suggestions etc. may flow from bottom to top, Notifications, letters, settlements, complaints may flow from outside. Information also flows sideways from one manager to another at the same level through meetings discussions etc.
2. **Proper timing:** Since reports are used a controlling device so they should be presented at the earliest or immediately after the happenings of an event. The time required for preparation of reports should be reduced to the minimum; for

routine reports the period should be known and strictly adhered to. It will be a waste of time and effort to prepare information, which is too late to be of any use. The absence of information when needed will either mean wrong decisions or deferment of decisions on matters, which may be urgent in nature.

3. **Accurate information:** The information should be as accurate as possible. If the information supplied is inaccurate it may result in making wrong decisions. However, the degree of accuracy may differ in different reports. Sometimes, fractional information may be supplied as a guide for future policy making, so the degree of accuracy may be less. The supply of exact figures may involve a problem of understanding. Approximate figures are more understandable than accurate figures given upto paise. Accuracy should also not involve excessive cost of preparation nor should it be achieved at the sacrifice of promptness of presentation. It will be better to have approximate figure at a proper time than delayed information prepared accurately.
4. **Basis of comparison:** The information supplied through reports will be more useful when it is supplied in comparison with past figures, standards set or objectives lay down. The comparison of information with past or budgeted figures enables the reader to find out trends of variations. The decision taking authority will be able to make use of comparative figures while taking a decision. Corrective measures can also be initiated to improve upon the past performance. The management accountant can make the reports more useful by giving his own interpretations to the information.
5. **Reports should be clear and simple:** The purpose of preparing reports is to help management in planning, co-ordinating and controlling. This purpose can be achieved only when the readers easily understand the reports. The

information should be presented in a clear manner by avoiding extraneous data. Only relevant important information should become the part of a report. If supporting information cannot be avoided then it should either be given in appendix or separate chart should be attached for it. The method of presenting information should be such that it attracts the eye, and enables the reader to form an opinion about the information. The graphic presentation of information will enable the reader to find out the trends and also to determine deviations more quickly than in other methods. The arrangement of presentation should be brief, clear and complete. Simplicity is a good guide for reports preparation.

6. **Cost:** The benefit derived from reporting system must be commensurate with the cost involved in it. Though, it is not possible to assess the benefit of this system in monetary terms, there should be an endeavour to make the system as economical as possible.
7. **Evaluation of Responsibility:** The reporting system should enable the evaluation of managerial responsibility. The targets are fixed for various functional departmental heads. The record of actual performance is monitored along with the standards so as to enable management to assess the performance of different individuals. So, management reporting should be devised in a way that it helps in evaluating the work assigned to various persons.

## **9.12 PROCESS OF REPORT WRITING**

The process of designing and writing a report consists of three stages. These stages are as follows:

### **9.12.1 DECIDING THE NATURE AND PURPOSE OF THE REPORT**

The first stage is to know the type of the report. Whether the report is statutory or non-statutory. Its type shall determine the nature and shape of the report. It is also very essential to know the purpose or object of the report. The purpose shall determine the other two stages.

### **9.12.2 PLANNING STRUCTURE OF THE REPORT**

**There is no one-way to design the structure of the report. But following parts are common in any report.**

- (i) **Heading:** A short, clear, meaningful and attractive heading or title is necessary for a report. Title or heading should indicate the subject matter of the report.
- (ii) **Address:** Every report is written for some one. So it is essential to write the name of reader or readers. Report must be addressed to some person or body of persons.
- (iii) **Contents:** It is a list of chapters of the report. The contents of the report are listed in serial order along with page numbers on which such contents are to be found. Contents should be arranged logically.
- (iv) **Terms of reference or introduction:** It gives the reasons for writing a report. Brief description of the problem is stated. The object and scope of investigation are also given in this part.
- (v) **Body of the report:** This part is most important and lengthy. The writer presents here the facts and data collected by him. Use of tables, graphs, and diagrams can be made here or in appendices. The analysis of data is shown in this part.
- (vi) **Recommendations:** This part is the summary of the report and consists of conclusions and recommendations. The conclusions are made on the basis of

#### **STRUCTURE OF THE REPORT**

- (i) Heading
- (ii) Address

the facts and collected data. Recommendations or suggestions are given on the basis of conclusions.

- (vii) **Reference and appendices:** It is customary to mention, list of references and bibliography indicating the sources from where the writer has taken material for writing the report. Appendices contain diagrams, statistical tables, specimen forms etc.
- (viii) **Signature.** The person responsible for its preparation should sign every report. The chairman should sign any report submitted by a committee. It is advisable to mention date on the report.

### **9.12.3 DRAFTING OF REPORT**

Drafting of a report is an important stage in report writing. This stage includes following considerations.

- (i) **Collection of data and its analysis.** First step in drafting is collecting information, facts and data necessary for the purpose of the report. Data can be collected from secondary or primary sources. Data is collected by investigations, observations, and interviews or by survey etc. Collected data has to be classified tabulated, edited and analysed. The collected data has to be arranged logically and conclusions are drawn.

(ii) **Format of a report.** The format of a report, which has already been explained. It is concerned with the layout of the report and arrangement of the data. It can be standardised for the purpose. Following is a specimen of a report form. If report is in a letter form then it has salutation and a complimentary close. If report is in memorandum form, both salutation and complimentary close may be dispensed with.

Address (s)	Date
Dear Sir (s)	
Title	
1. Terms of Reference	
2. Finding of Investigation.	
3. Conclusions	
4. Suggestions	
Prepared by (Signature)	

(iii) **Writing of report:** Report writing is an art, which can be developed by practicing report writing and by studying the reports of other writers. Reports are written for others so the needs and style preferred by the reader should be kept in mind while writing a report. The general principles of a good reporting system, which have been explained earlier, will help in writing the report.

(iv) **Presentation of report.** General layout of a report should be pleasing to the eye. Report may be typewritten, printed or handwritten depending on the number of copies required. Sufficient space and margin should be kept on the left hand side. Reports should be written on one side of the paper with double spacing. Pages, paras and sections should be numbered. Use of diagrams, illustrations, charts, and tables may be made and these should be numbered. If report is voluminous or is liable to constant handling it should be in bound form.

## 9.13 SUMMARY

To know the present situation of the business and to formulate the policies for future in business, reports are very crucial item. The problems of control, co-ordination, communication and decision-making may be handled properly with reports, which are delivered by the subordinates to the superiors. The decisions have wider implication for business as a wrong decision may lead to its closure. Management needs detailed information before taking any decision. The good decisions can minimise cost and have a long-term positive bearing on the results. In all, it is the management reporting that furnishes useful quantum of knowledge in the form of reports.

#### **9.14 SELF-TEST QUESTIONS**

1. Explain MIS and Management Reporting.
2. What do you understand by report and its types? Why the reporting is compulsory in the business world?
3. What are the basic principles of report writing?
4. Explain the various steps for installing the reporting system at the various levels of management. Discuss them in detail.
5. What are the requisites for a good reporting system?

#### **9.15 SUGGESTED READINGS**

11. Ashish K. Bhattacharya, Principles and Practices of Cost Accounting (3<sup>rd</sup>.), New Delhi: Prentice Hall of India Private Limited, 2004.
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***Lesson: 10***

**ROLE OF COMPUTER IN ACCOUNTING**

**Objective:** The foremost objective of this lesson is to generate some awareness among the students with regard to the role of computer in accounting.

**Lesson Structure**

- 10.1 Introduction
- 10.2 The History of Computer
- 10.3 Old Methods and Machines Used in Accounting
- 10.4 Role of Computers in Accounting
- 10.5 Advantages and Limitations
- 10.6 Merging Accounting and Computer Applications
- 10.7 Self Assessment Exercise
- 10.8 Suggested Readings.

**10.1 INTRODUCTION**

The most common method of keeping the financial records of a company was manual. A bookkeeper kept the journals, the accounts receivable, the accounts payable and the ledgers in his best possible penmanship. In later years, an accounting machine, which was capable of performing normal bookkeeping functions, such as tabulating in vertical columns, performing arithmetic

functions, and typing horizontal rows was used. The billing machine, which was designed to typewrite names, addresses, and descriptions, to multiply and extend, to compute discounts, and to add net total, posting the requisite data to the proper accounts, and so to prepare a customer's bill automatically once the operator has entered the necessary information, was used. Early accounting machines were marvels of mechanical complexity, often combining a typewriter and various kinds of calculator elements. The refinements in speed and capacity made possible by advances in electronics and operating complexity of these machines. Many of the newer "generations" of accounting machines are operated by a computer to which they are permanently connected.

Computers are rapidly changing the nature of the work for most accountants and auditors. With the aid of special software packages, accountants summarize transactions in standard formats for financial records and organize data in special formats for financial analysis. These accounting packages greatly reduce the amount of tedious manual work associated with data management and recordkeeping. Computers enable accountants and auditors to be more mobile and to use their clients' computer systems to extract information from databases and the Internet. As a result, a growing number of accountants and auditors with extensive computer skills specialize in correcting problems with software or in developing software to meet unique data management and analytical needs. Accountants also are beginning to perform more technical duties, such as implementing, controlling, and auditing systems and networks, and developing technology plans and budgets.

Increasingly, accountants also are assuming the role of a personal financial advisor. They not only provide clients with accounting and tax help, but also help them develop personal budgets, manage assets and investments, plan for retirement, and recognize and reduce exposure to risks. This role is a response to client demands for a single trustworthy individual or firm to meet all of their financial needs. However, accountants are restricted from providing these services to clients whose financial statements they also prepare.

Persons planning a career in accounting should have an aptitude for mathematics and be able to analyze, compare, and interpret facts and figures quickly. They must be able to clearly communicate the results of their work to clients and managers. Accountants and auditors must be good at working with people, as well as with business systems and computers. At a minimum, accountants should be familiar with basic accounting software packages. Because financial decisions are made based on their statements and services, accountants and auditors should have high standards of integrity.

Increased awareness of financial crimes such as embezzlement, bribery, and securities fraud will also increase the demand for forensic accountants to detect illegal financial activity by individuals, companies, and organized crime rings. Computer technology has made these crimes easier to commit, and it is on the rise. But, development of new computer software and electronic surveillance technology has also made tracking down financial criminals easier, thus increasing the ease and likelihood that forensic accountants will discover their crimes. As success rates of investigations grow, demand will also grow for forensic accountants.

Proficiency in accounting and auditing computer software, or expertise in specialized areas such as international business, specific industries, or current legislation, may be helpful in landing certain accounting and auditing jobs. In addition, employers increasingly seek applicants with strong interpersonal and communication skills. Because many accountants work on teams with others from different backgrounds, they must be able to communicate accounting and financial information clearly and concisely. Regardless of one's qualifications, however, competition will remain keen for the most prestigious jobs in major accounting and business firms.

## **10.2 THE HISTORY OF COMPUTER**

The logical first step in becoming computer literate is to appreciate the origins of computers. Computers are the result of a long history of mathematical

exploration and innovations. They have their earliest roots in primitive systems of counting that relied on fingers and toes or stones to enumerate objects. Historically, the most important early computing instrument is the abacus, which has been known and widely used for more than 2,000 years. It is simply a wooden rack holding parallel wires on which beads are strung. When these beads are manipulated (moved along the wire) according to “programming” rules that the user must memorize, all ordinary arithmetic operations can be performed. Another computing instrument, the astrolabe, was also in use about 2,000 years ago for navigation.

Blaise Pascal is widely credited with building the first “digital calculating machine” in 1642. It performed only the addition of numbers entered by means of dials and was intended to help Pascal’s father, who was a tax collector. In 1671, Gottfried Wilhelm von Leibniz invented a computer that was built in 1694. It could add, and by successive adding and shifting, multiply. Leibniz invented a special “stepped gear” mechanism for introducing the addend digits, and this mechanism is still used. The machine of Leibniz was in a sense a forerunner of the mechanical desk calculator invented by Charles X. de Comar in 1820.

The first real computer didn’t change the world. It was never built. It existed, in fantastic detail, in the mind of a grumpy English mathematics teacher named Charles Babbage around the time of our civil war. He loved problems and puzzles, as do computer people today. He taught himself arithmetic, and when he went to college, he knew more algebra than his teacher. He invented speedometers and a machine for playing tic-tac-toe. Later he built an adding machine that could solve a particular kind of problem. Then, he began to design an “analytical engine” that could solve any kind of arithmetic problem. Babbage put together the idea of instructions sorted in punched cards with the idea of a calculating machine. To set up the machine to solve a new problem—weave a new arithmetic pattern—he would just change cards. The two ideas added up to a sum vastly greater than its parts. Inside Babbage’s head was the

first true computer. His design was practical, but it required cogwheels and gears and other parts that the machinists of his time could not make, and so the analytical engine had to wait a hundred years to be translated from a brilliant idea to working machine. The next influential invention was the census machine of Herman Hollerith. In the late nineteenth century, census taking had become a major task; tabulation of such a vast amount of data was slow and problematical. In an effort to find a faster way to compile raw statistical data, the Census Bureau sponsored a contest. Herman Hollerith's device was chosen the most effective and practical.

Hollerith had designed a device that read data from punched cards and kept track of the count. The keypunch system of data processing was popular for many years, although recently it has succumbed to faster and less cumbersome methods. Hollerith was so successful that he left the census Bureau in 1896 to form the International Business Machine Corporation -IBM, a recognized leader in the field of data-processing technology even today.

This concept led to systems using electromechanical devices, in which electric power provided mechanical motion—such as for turning the wheels of an adding machine. Such systems soon included features to feed in automatically a specified number of cards from a “read-in” station; and feed out cards punched with results. By modern standards the punch-card was slow, typically processing from 50 to 250 cards per minute, with each card holding up to 80 decimal numbers. At the time, however, punched cards were an enormous step forward.

Vannevar Bush, a professor at MIT, built and demonstrated a differential analyzer in 1930. It was large, and had many gears, but it used electric motors. It worked, and could be programmed to perform many different types of calculating work. Bush's machine was also the first to use titles. His machine could store numbers or quantities of electricity in one part of the system. This ability led some to name Bush the Father of the Electronic Computer. The day

of the gear driven computer was almost over. Konrad Zuse, a German engineer, and Howard Aiken, a Harvard math professor, both built hybrid (part mechanical, part electronic) machines in the period between 1930 and 1950. Both used binary arithmetic and both used electric relays to perform math operations.

Professor Aiken worked in conjunction with IBM and had discovered Babbage's work. The ideas were so close to Aiken's that he thought he had received a personal message from the past. Professor Aiken was building a computer named Mark I. Instead of punched cards, Professor Aiken used rolls of punched paper to tell the machine what to do. Electricity turned the counter wheels, and eight hundred thousand switches, buttons, and other electrical parts filled a room three times as big as an ordinary living room.

In 1942, two men and their associates were at work at the Moore School of the University of Pennsylvania on a machine which, while embodying enormous advances in automatic computing, was less famed than the Mark I. It was not operational until two months after the Japanese surrender and therefore did not get credit for helping to win World War II. The co-inventors of ENIAC (Electronic Numerical Integrator and Calculator) which was actually the world's first electric computer were Dr. J. Prosper Eckert, an electrical engineer, and Dr. John Mauchly, a physicist. It would have been easily possible for them to build ENIAC twelve to fifteen years earlier, as it would have been possible to build the Mark I—all of the components and the theory required were in existence except for the fact that nobody put up the money or had the incentive to do so. The patron of ENIAC was the United States government, more specifically, the Army.

The most significant feature of ENIAC was that it introduced vacuum tube technology, and no longer were calculations and operations performed by moving mechanical parts. This feature allowed for greatly increased speed of performance. The next computer was developed by Mauchly, Eckert, and

others and was called the Electronic Discrete Variable Automatic Computer (EDVAC). It was smaller and more powerful than its predecessors. It also had two other important features: it used binary numbering systems, and it could internally sort instructions in numerical form. Today, all data and programs are stored in binary form. This method of storing instructions inside the computer is far more efficient than paper tape storage used in earlier devices.

Another member of the first generation of computers was the Electronic Delayed Storage Automatic Computer (EDSAC) built at Cambridge University in England. This computer introduced the concept of stored programs. Before this, computers often had to be rewired to be used for various operations. Their memories were incapable of storing more than one program at a time. EDSAC helped eliminate time consuming and costly rewiring procedures.

In 1946, Mauchly and Eckert formed a corporation to build computers for commercial use; the UNIVAC (1951) was the first electronic computer used by large business firms. This launched the major growth of computers into the business field. The first generation of computers, which thrived from 1951 until 1964, was characterized by vacuum tube technology. Although they were amazing devices in their time, they were large, took up valuable space, were expensive to operate, and required almost constant maintenance to function properly. The next generation of computers attempted to resolve some of these problems.

The second generation of computers extended from 1959 until 1964 and was characterized by transistor technology. The transistor was developed by John Bardeen and others at the Bell Laboratories in New Jersey. Bardeen studied substances that permitted a limited amount of electricity through them—semiconductors. Transistors using semiconductor material could perform the work of vacuum tubes and took up less space.

Because transistors were smaller, the distance between operating parts was reduced and speed of performance was increased significantly. Transistors were also much cooler than vacuum tubes, reducing the need for expensive air conditioning in areas where computers were housed. Transistors did present several problems, though. They were relatively expensive because each transistor and its related parts had to be individually inserted into holes in a plastic board. Also, wires had to be fastened by floating boards in a pool of molten solder. Even though the distance between individual parts was reduced, it was still great enough to limit speed of computer operations. The next generation of computers helped to alleviate some of these problems.

The development of integrated circuits in 1963 spawned the third generation of computers, lasting from 1964 to 1975. Integrated circuits developed from a need to mass produce transistors in a few simple production steps. The production process begins when tubes of silicon are sliced into wafer thin disks that are chemically pure and cannot hold electrical charge. Then a preconceived design is etched onto the surface of the wafer with the use of light rays.

The integrated circuit continued the trend toward miniaturization that has resulted in the popularity of the microcomputer and the personal computer system. Integrated circuit technology spawned a generation of computers that had greater storage capacity and technically increased speeds of performance. Many accessory devices were developed and marketed, such as magnetic tape drives and disc drives. Popular programming languages were developed and refined, many of which are still in use today.

Third generation computers are not aimed at specific applications such as business or scientific use. Rather, they were designed as general purpose computers. They represented a giant leap forward in the data processing field. Not only were speed and reliability enhanced, but power consumption was decreased markedly. Computers became smaller and less expensive, putting

computer power into the hands of a greater number of users than ever before. Computer Technology began to snowball.

Engineers were not satisfied with the degree of miniaturization that resulted from the integrated circuit. Also, the integrated circuits of the third generation were designed primarily with chips having the only function. As engineers learned how to manufacture chips more easily, they conceived the idea of grouping an assortment of functions on a single chip, creating a microelectronic “system” capable of performing various tasks required for a single job. This technology became known as Large Scale Integration (LSI). Thus, the fourth generation of computers was born in the mid-1970.

LSI technology has also been responsible for the recent popularity of the microcomputer. These “Little giants” fit easily on a desk top and put computer power in the hands of an increased number of people. Declining prices of powerful computer systems have also encouraged development of the electronics field in general. LSI turned computer technology into big business, and this trend will certainly continue in the foreseeable future.

A hint of tomorrow’s computer capability can be found in the IBM 3081, introduced in 1980. This computer is twice as powerful as its immediate predecessor. It was designed with Very Large Scale Integrated (VLSI) circuitry further increases the speed at which computers are able to function. Multiprocessing—the simultaneous running of several programs by one computer is likely to develop further in the fifth generation of computers. Computers will continue to get smaller as well as prices becoming lower.

### **10.3 OLD METHODS AND MACHINES USED IN ACCOUNTING**

The most common method of keeping the financial records of a company was manually. A bookkeeper kept the journals, the accounts receivable, the accounts payable and the ledgers in his best possible penmanship. In later

years, an accounting machine, which was capable of performing normal bookkeeping functions, such as tabulating in vertical columns, performing arithmetic functions, and typing horizontal rows was used. The billing machine, which was designed to typewrite names, addresses, and descriptions, to multiply and extend, to compute discounts, and to add net total, posting the requisite data to the proper accounts, and so to prepare a customer's bill automatically once the operator has entered the necessary information, was used. Early accounting machines were marvels of mechanical complexity, often combining a typewriter and various kinds of calculator elements. The refinements in speed and capacity made possible by advances in electronics and operating complexity of these machines. Many of the newer "generations" of accounting machines are operated by a computer to which they are permanently connected.

## **10.4 ROLE OF COMPUTER IN ACCOUNTING**

Because of the minute by minute change in finances, accurate record keeping is critical. Computerizing a business's general ledger, payroll, and other accounting tasks increases office efficiency. With a computer, you can request and receive an in house balance sheet, an income statement, or other accounting reports at a moment's notice. While keeping your checkbook on a computer may not be practical, computers are great for handling complex home financial records. You can get statements on net worth and year's tax deductible expenses within minutes.

### **A. Spreadsheets**

Electronic spreadsheets allow you to do anything that you would normally do with a calculator, pencil and columnar scratch pad. Spreadsheets were primarily designed for managers who in the process of planning must do "what if" calculations. Due to their flexibility, electronic spreadsheets have found their way into small businesses and, to a lesser extent to homes. A typical integrated double entry accounting system will contain some or all of the

following components: accounts receivable, accounts payable, general ledger, inventory, order entry, payroll, time, and billing.

It takes its name from the accountant's spreadsheet—a sheet of paper with rules for rows and columns—on which such work was usually done. Spreadsheet programs are much faster, more accurate, and easier to use than traditional accounting techniques. The programs are widely used on personal computers for keeping sales, expense and inventory records, and for budgeting and forecasting future sales and expenses. As a result of these and many other applications, computer spreadsheets have become the most important of all software tools for modern businesses.

Early programs such as VisiCalc provided 254 rows and 63 columns for entering data and formulas for calculations. Some modern programs for computers with large memories provide thousands of rows and hundreds of columns. VisiCalc was introduced by Robert Frankston, a young computer programmer, and Dan Bricklin, a Harvard Business School student who was looking for a way to use the power of a computer to simplify complex time-consuming financial analyses. VisiCalc proved so useful in such applications that it provided an entry for personal computers into the business world. In 1980, the Sorcim Corporation introduced SuperCalc, a similar spreadsheet program for personal computers using the CPM operating system.

A new generation of computer software for business began with integrated spreadsheet programs, which can be used to prepare spreadsheets, create graphs, and manage data. In such programs, for example, it is easy to display spreadsheet data in the form of a graph or to transfer data from a data base to a spreadsheet. One of the first such programs was Lotus 1-2-3, an immediate success following its introduction in 1983.

In the third generation of integrated business software, spreadsheet, graphics, and data management capabilities were supplemented by word processing and

communications capabilities. With such comprehensive programs, it became possible to create multiple windows on the computer display. Each window could contain a different application—a graph in one, a spreadsheet in another, and word processing in a third. The window capabilities of integrated programs such as Symphony and Framework make it easy, for example, to transfer a spreadsheet or a data-base report to word processing for styling and formatting before printing.

### **B. General Ledger**

General Ledger is a labor saving device for the preparation of financial statements and for establishing multiple income and cost entries.

### **C. Accounts Receivables**

Accounts receivable, when computerized, can get your bills out the same day you've performed a service. An accounts receivable module prepares invoices and customer accounts, adds credit charges where appropriate, handles incoming payments, flags your attention to customers that are delinquent, and produces dunning notices. It allows you to have daily cash control. You get out the bills on time, yet you avoid errors such as billing a customer twice for the same item. The further advantage is that debits and credits are posted automatically to the general ledger, order entry, and in some instances inventory, once they are entered in accounts receivable.

### **D. Accounts Payables**

Accounts payable, when computerized, will provide for purchase order control, invoice processing, payment selection and handling, check writing and control, cash-requirements, forecasting, and format preparation. It will also double-check the accuracy of the vendor's invoice, and some software systems will cross-check it against the purchase order and the inventory module.

### **E. Inventory Control**

Inventory Control module has multiple functions, including tracking inventory for both costing and tax purposes, controlling purchasing (and the overall level

of expenditure) and minimizing the investment in inventory (and subsequent loss of cash flow). The payroll module prepares and prints payroll checks, including all itemized deductions. It is integrated with the general ledger so you automatically set aside the correct amount for FICA and withholding.

#### **F. Point of Sale**

Point of sale module captures all sales information at (or in place of) the cash register, including salesperson, date, customer, credit information, items, and quantity sold. It can produce sales slips or sales invoices, plus it reports on items, customer, and salesperson activity.

#### **G. Purchasing and Receiving**

Purchasing and receiving module can represent an invaluable addition. It can generate purchase orders and track their fulfillment. You can find out which vendors are delivering on time and saving you the expense of having to follow up on partial and incomplete orders.

#### **H. Time and Billing Module**

Time and billing module reduces manual and clerical work, simplifies the billing process, prompts you and your partners to bill on time, reduces unbilled work-in progress, minimizes unreported time, reduces unbilled time, measures and analyzes non-chargeable time and provides criteria to analyze staff performance. Because a computerized accounting system is basically a computerized data management system, the disposition of labor is almost the same. One staff member must serve as a data-base manager and be in charge of setting up the chart of accounts, establishing the interrelationships among the files and establishing and maintaining an audit trail.

### **10.5 ADVANTAGES AND LIMITATIONS OF COMPUTER USE**

The most important advantage of using the computer is the speed with which we can get accounting done. In addition, we find that it is very easy to do accounting functions. Posting to the ledger, a tedious task of double entry, when done directly from the general ledger module, can be largely automated

when done through special purpose modules like accounts payable or accounts receivable. With an accounts receivable module, you just need to enter the actual cash totals of items purchased and the software distributes these amounts to the general ledger so they become credits to corresponding revenue accounts. At the same time, an offsetting entry is made automatically to the accounts receivable account.

With a computer, one can receive a balance sheet, income statement or other accounting reports at a moment's notice. We also find that some day to day data entry can be turned over to relatively unskilled workers.

When you use a computer, it is possible that data can be lost because of hardware or software damage. Since the computer has no judgement of its own, it does not pick up on errors as a human being does. There can be loss of data due to accidents like fire etc... There can be loss of data or change of data due to fraud or embezzlement. There can be loss or unavailability of data due to loss of staff. Inaccurate data may be due to clerical error or mistakes in programming. Total security is economically unachievable and some failures must be expected. The right level of expenditure on security measures will minimize the sum of the cost of the measures and the expected loss. There will always be some risks that are best shared through insurance, rather than prevented or avoided.

**Much computer-related crime is opportunist:** People who were not seeking any advantage had temptation thrust under their noses. Copies of computer printouts get mis-directed, or thrown in a waste paper basket in a public place. Magnetic tapes from bankrupt companies have been sold with data still on them. Often a programming error reveals a system flaw: someone who by chance reads a magnetic tape file that he should have been writing discovers interesting data on it.

Sabotage, vandalism, malicious damage, and arson tend to be even more destructive than the Acts of God they emulate. Political and industrial action, riots and civil commotions, may not be aimed specifically at the computer but they can be very effective in preventing its operation.

Fraud and embezzlement are usually achieved on a computer system by altering data or programs. There are numerous techniques, varying from additions and deletions to input data, through changing the standing information files, modifying the behavior of programs, to duplicating or suppressing output. Although most frauds that have been reported had gone on for some time, it could be that 'one shot' frauds have been more frequent but more often escape detection.

Eavesdropping and stealing information by tapping telecommunications lines requires the sort of technical skill which is very widely available (to the surprise of those without technical education). It is possible to emulate a legitimate user of a system, or discover his password through trickery or as the result of carelessness, and thus have access to the information he would have, such access can be very important for setting up more profitable operations, such as taking money out of little used bank accounts, or concealing changes made in files. There are other ways of trespassing, without using wire tapping. For example, the magnetically encoded cards often used as keys to systems can be copied and altered, giving the villain access to credit, cash or other valuable assets.

Wherever a computer is used to handle an organization's accounts, it can be used as a means of attacking the funds it controls. In most computerized bookkeeping systems, it is the computer which effectively causes credit transfer; so by establishing false accounts, or diverting some of the contents of the real ones, credit can reach a false beneficiary. The system can also be used to conceal a change in the cost, or the illegitimate acquisition or the destruction of tangible goods and services.

**Duplication which is designed to minimize losses** in the event of deliberate or accidental threat can be used. Duplication is designed to ensure that the system survives damage to any individual part. Duplication is also the fundamental method of detecting errors in processing. Defense in depth is designed to make the attacker overcome a series of barriers before he can damage any vital part of the system. In addition, most companies have computer auditors who ensure the integrity and accuracy of the organizations records, protect and conserve the organization's assets and prevent fraud, theft and error. These auditors also ensure that systems will survive the hazards to which they are exposed.

## **10.6 MERGING ACCOUNTING AND COMPUTER APPLICATIONS**

There has been increasing concern recently that accounting, the "language of business," is not expressive enough to match the potential created by the phenomenal growth of technology. While management accountants have taken a lead role in developing frameworks for performance evaluation that encompass financial and nonfinancial measures, the methods by which antiquated accounting systems are designed prevent them from taking full advantage of advances in information technology. If management accountants were to get more involved in the process of software design, particularly through models such as the resources, events, and agents (REA) model, they could become more involved in supporting firm-wide strategic management and control.

Management accountants have a greater opportunity to support corporate strategy when they are involved in developing IT databases using a conceptual design tool in concert with the balanced scorecard (BSC). We try to establish a logical link between the design potential of the REA model and the performance measurement framework of the BSC. This link provides the basis for an integrated conceptual database design framework that will enable management accountants to assist in the development of meaningful

accounting information systems and establish their role as partners in the development and evaluation of corporate strategy and planning.

Peter Drucker spoke of the turbulence in accounting that is becoming evident as the CFO's role in organizational strategy undergoes a transformation. Now that structured tasks are computerized, which has resulted in reengineering and some outsourcing of traditional accounting tasks, management accountants who use only the traditional skills required for such tasks do so at their and the profession's peril. The work of management accountants has become analytical and decision oriented, but these financial professionals are unable to fully realize the changes in their role unless they become partners in the design and development of the information systems in their organizations. To become partners, management accountants need to develop and identify tools that give them greater insight into database development processes.

It is important to describe two developments in accounting: the resources, events, and agents (REA) model and the balanced scorecard (BSC) model. The two, operating together, can close the loop among the performance measurement, strategic decision-making, and systems design functions of a company.

The REA model, a conceptual model for database design, has the potential to enable management accountants to play an intrinsic role in the design of information systems. The balanced scorecard provides a framework for an "integrated view" of the organization that extends beyond the traditional financial view. It also provides a wealth of information about the firm that can enable management accountants to define and describe entities in the database more accurately.

Are there developments in accounting aimed to meet these challenges? The traditional "accounting view" of the organization is insufficient to satisfy many "information customers." Accounting systems, which are driven by

transaction-based financial accounting requirements, capture limited characteristics of transactions. As a result, different functional areas maintain parallel information systems to cater to their individual needs, causing inefficiencies in data storage and making it difficult to integrate information across functional areas.

The key problem is antiquated design and development of accounting systems. The only planning in traditional accounting is the "chart of accounts," the first step in the accounting cycle that focuses on financial transactions and culminates in summarized, uniform financial statements. The accounting system still depends largely on the debit-credit model that has a 700-year history dating back to *Lucas Pacioli*. This model had validity in manual systems and gave shape to accounting activities in traditional accounting. But with changes in the nature and size of firms and the advent of databases and online computing, this antiquated system has become a handicap to designing information systems required for executive decision making.

This situation has largely left information systems development activities to people in management information systems (MIS). MIS has developed the sequence of activities called "systems development life cycle" (SDLC), which includes systems planning, analysis, design, and implementation. Depicting the information systems in terms of Michael Porter's value chain concepts helps us gain insights into the issues that impact the development of corporate information systems

The design phase of the SDLC adds value to the information system because it helps determine the adequacy and relevance of information for decision making. It is in this phase that the information for strategic and other decisions is framed and determined. Currently, information systems personnel from MIS departments, who are trained in technical aspects of information systems, play the key role in systems design and implementation activities. Management accountants, however, are in the position to be most knowledgeable about the

information value chain and the means through which it can add value. Accordingly, as Michael Porter puts it, "No other business information system has the ability to combine the performance of all functions of a business into one set of measures, which has led accounting to be known as the 'language of business.'" Peter Drucker, as quoted earlier, also predicted that the challenges to information systems would not be technical but rather would be the ability to translate data into information that is useful for decision making. Therefore, the key benefit of the information value chain would be to collect and present relevant information that would add value to control and decision-making processes. But traditional accounting systems give only a limited view of the organizational processes, which means management accountants are handicapped from playing a major role in the overall systems design. What is needed is an "integrated" and encompassing view of the organization. It can be provided by the REA model and the balanced scorecard, with management accountants deeply involved in both.

The REA model provides management accountants with a tool for designing database systems. The balanced scorecard, a downstream activity in the information value chain, provides a framework of performance measures that can be used for communicating and measuring strategy and providing a framework for systems design. The two tools converge in the design phase of information systems development, and here management accountants have an opportunity to create a new role for themselves in the information systems area.

Kaplan and Norton see "functional silos" as handicaps in the development and implementation of strategy. They point out that, "Organizations are traditionally designed around functional specialties such as finance, manufacturing, marketing, sales, engineering, and purchasing. Each function has its own body of knowledge, language, and culture. Functional silos arise and become a major barrier to strategy implementation as most organizations have great difficulty communicating and coordinating across these specialty

functions." Management accountants can play a key role in harnessing the potential of a measurement system that encompasses the specialty functions.

Research has also helped in highlighting that systems design in the information systems value chain can have an important impact on the effectiveness of measurements. This confirms--and research supports--those management accountants should be more involved in systems design and implementation. It is at the design stage that these measures are fully integrated into the system. The relationship between meanings attached to different measures and the data that is collected must be consistent across functional areas and reflect business activities. Research confirms that measures commonly used across business units are more useful for decisions. This highlights the need for greater uniformity and comparability of measures. In addition, the need to coordinate and communicate strategy throughout the organization also confirms the need for measures to cascade to different levels in the organization without changes in meaning. For example, Kaplan and Norton have indicated a link between the BSC implementation process and information systems when they point out that "a newly formed team develops an implementation plan for the scorecard, including linking the measures to databases and information systems, communicating the balanced scorecard throughout the organization, and encouraging and facilitating the development of second-level metrics for decentralized units. As a result of this process, an entirely new executive information system that links top-level business unit metrics down through shop floor and site-specific operational measures could be developed" (emphasis added). The design of information systems, therefore, is an important component of implementing a BSC that conforms to corporate strategy.

## **10.7 SELF ASSESSMENT EXERCISE**

1. What do you think can be the major role of computer in accounting particular in management accounting? Briefly explain any two roles with examples.

2. The basic objective of computer applications in accounting is to make it easily understandable to common users. Discuss a detailed and planned reaction for the purpose
3. Assuming you are appointed the manager of a business organization with an authority to put latest technology in place? Put up a detailed plan for the purpose
4. Discuss and illustrate with suitable examples the effective role of computer in accounting required in modern times.

## 10.8 SUGGESTED READINGS

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<b>Course</b>	<b>:</b>	<b>Management Accounting</b>	<b>Writer</b>	<b>:</b>	<b>Dr. M.C. Garg</b>
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<b>LESSON-11</b>					

## INFLATION ACCOUNTING

**Objective:** On completion of this lesson, you should be able to (a) Explain the impact of increase in price level on financial statements (b) to make adjustments in (conventional) financial statements for increase in general price level resulting in decrease in purchasing power of money and (c) to prepare financial statements on the basis of current cost instead of historical cost.

### LESSON STRUCTURE

- 11.1 Introduction
- 11.2 Reasons for Inflation Accounting
- 11.3 Limitations of Historical Accounting
- 11.4 Methods of Inflation Accounting
- 11.5 Advantages of Inflation Accounting
- 11.6 Disadvantages of Inflation Accounting
- 11.7 Summary
- 11.8 Self Assessment Questions
- 11.9 Suggested Readings

#### **11.1 introduction to inflation accounting**

Inflation is a state to inflation accounting in which purchasing power of money goes down or conversely there is more money in circulation than is justified by goods and services. The effect of inflation is that prices of assets go up and the accounts prepared on the basis of conventional accounting system present much distorted figures to the users of accounts.

Accountants prepare Profit and Loss Account and Balance sheet at historical costs. Profit is the difference between revenue and costs. Revenue reflects the current value whereas costs represent current as well as historical costs. Thus the profit is overstated measured in terms of money and the value of money is fluctuating due to inflation, any measurement with fluctuating scale is unreliable and would distort the true financial position of the organization.

In such cases to make the measurement perfect, the scale should be kept steady. If this is not possible, an alternative should be evolved to adjust the effects of fluctuating changes in money value and make the financial statements reflect current values in real terms. Management Accountant has responsibility towards shareholders and internal management of the organisation to appraise the true financial position of the organisation.

Inflation Accounting devised to show the effect of changing cost and prices on affairs of a company during the course of relative accounting periods. It is also known as 'Accounting for price level changes'.

#### **11.2 Reasons for Inflation Accounting**

Financial accounts are the basis on which the success of the business is measured and on which investors can find out whether or not their investment is safe and will produce a reasonable return for them. Financial accounts, therefore, have a significant effect on the business, and shareholders are particularly interested in them from the

point of view of not only obtaining a good return on their investment but also of maintaining the value of that investment.

But if this value is expressed in terms of historical costs, without allowing for the inspect of inflation, it could be illusory. Hence, the need for inflation accounting. The purpose of inflation adjusted accounting is to restore the principle of matching current revenues with current costs or current purchasing power to the Profit and Loss Account, thus removing the inflationary element from historic cost profit and/or allowing the concept of physical capital maintenance to be adopted.

Inflation accounting is a system of accounting which regularly records all items in financial statements at their current values. The system recognizes the fact that the purchasing power of money is decreasing day-by-day during inflation and finds out profit or loss or states the financial position of the business on the basis of the current prices prevailing in the economy.

### **11.3 Limitations of Historical Accounting**

Now there is a near unanimity among the accountants that historical cost accounts suffer from many serious limitations during the period of rapidly changing prices. The following are the main limitations of historical accounts :

1. **Utility of accounting records seriously impaired :** Financial statements or reports based on historical cost fail to reflect the effect of such changes in purchasing power on the financial position and profitability of the firm. Financial statements may be incorrectly interpreted unless adjustments are made to place the data on the current price level. In this way, the utility of the accounting records not taking care of price level changes is seriously impaired and makes a demand on the accounts for adjusting financial accounting for inflation to know the real financial position and profitability of a concern.
2. **Unrealistic profits :** Under the historical accounting system, depreciation calculated on the basis of historical cost of old assets is usually lower than that of those calculated at current value or replacement value. This results in more profits on paper which, if distributed in full, will lead to various consequence of over statement of profits as more taxes, more bonus to the employees, more dividend to shareholders etc. Thus there will be reduction of capital and ultimately the company may go into liquidation.
3. **Insufficient provision of depreciation :** Under the historical accounting system, depreciation is calculated on the original cost of fixed assets with the result that only an amount equivalent to the original cost of the fixed assets is available for its replacement when its life is over. But the replacement cost of the asset will be more than the original cost on account of inflation so that the replacement provision made by way of depreciation charge on the original cost will be insufficient for the purpose.  
According to the Economic Survey, “there is now considerable evidence that the steep increase in cost of machinery and equipment in recent years is affecting not only new investment but also modernization and replacement of existing equipment. In a period of rapidly rising prices depreciation formulae based on historical cost cease to provide adequate resources for the replacement of the existing worn out equipment. Moreover, in industries under price control, so long as the calculations of permissible rates of return continue to be based on historic cost of fixed capital in use, there is a built in disincentive to new investment.” Most of the industrial sickness in India is due to the insufficient funds available for replacement and renovation on account of charging depreciation on historical cost.

4. **Fixed assets values are unrealistic :** In times of rising prices, the conventional system of accounts based on historical cost does not give a true and fair view of the business enterprise as is required under the Companies Act, 1956 as fixed assets are shown at their historical cost and not at current values.
5. **Different basis :** In conventional system of accounting, fixed assets are shown at the historical costs whereas operating expenses and incomes are taken at current prices. Thus different bases adopted are not desirable for having correct and reliable information about the business.
6. **Return on capital employed misleading :** Under historical cost accounting system the profits are overstated and fixed assets are understated specially when there is increase in the price of the old fixed assets. Return on capital employed which is very useful for the valuation of the business by its owners, creditors and management will not be correct and may lead to misleading decisions. This will be clearer from the following example.

	Rs.
Fixed Assets at cost	20,00,000
Less : Accumulated Depreciation	
12,00,000	
	-----
	8,00,000
Add : Current Assets	10,00,000
	-----
Total Assets	18,00,000
Less : Current Liabilities	4,00,000
	-----
Capital Employed	14,00,000

Net profit after tax @ 50% and 10% depreciation on original cost is Rs. 2,80,000. Replacement cost of the fixed assets is Rs. 40,00,000.

In the above example, under the historical accounting system return on capital employed (after taxes) is 20%, i.e.

$$\frac{\text{Net Profit}}{\text{Capital Employed}} \times 100 = \frac{\text{Rs. } 2,80,000}{\text{Rs. } 14,00,000} \times 100$$

But if we calculate depreciation on replacement cost of the fixed assets, return on capital employed will not be 20% as is shown below :

(Rs.)

Net Profit as given  
2,80,000

Add : 10 % depreciation on Rs. 20,00,000 fixed assets  
2,00,000

written back

Add : Tax written back (50% of profit before tax, i.e., 50% of  
2,80,000  
Rs. 5,60,000) -----

-----

Profit before depreciation and tax  
7,60,000

Less : 10% Depreciation on replacement cost of Rs.40,00,000  
4,00,000 -----

----- 3,60,000

Less : 50% Tax 1,80,000 -----

-----  
Profit on the basis of price level accounting  
1,80,000 -----

-----  
Capital employed on the basis of replacement cost :  
(Rs.)

Fixed assets at replacement cost  
40,00,000

Less : Accumulated depreciation (60% as in historical accounting  
24,00,000  
system) -----

----- 16,00,000

Add : Current assets  
10,00,000 -----

----- 26,00,000

Less : Current liabilities  
4,00,000 -----

-----  
Capital Employed  
22,00,000 -----

$$\text{Return on capital employed} = \frac{\text{Rs.}1,80,000}{\text{Rs.}22,00,000} \times 100 = 8.2\%$$

7. **Matching Principle Violated :** Financial accounting based on historical cost shows closing stock at cost or market price, whichever is lower. Sales are shown at current purchasing power of the rupee while stocks are shown at cost or market price, whichever is lower. Thus, profit disclosed by financial accounting based on historical cost during inflation does not represent increase in wealth of the business in terms of current purchasing power because closing stocks are not shown at their current value.
8. **Incorrect ascertainment of operating capacity :** In historical cost accounting, cost of goods sold is understated because replacement cost of inventory consumed or used is not matched against revenue giving rise to higher figure of profit. It thus does not give true and fair view of the operating capability of the enterprise.
9. **Difficulty in comparison of profitability of two plants :** In case of price level changes, comparison of profitability of two plants set up at different dates becomes difficult. Suppose a plant costing Rs. 10,00,000 was set up by one firm 9 years ago and the plant of the same capacity costing Rs. 20,00,000 (price increased due to inflation) is set up by another firm in 2003. It is the practice of the firm to charge 10% depreciation on plant. The old firm will charge Rs. 1,00,000 as depreciation (i.e., 10% on Rs. 10,00,000) and the new firm will charge Rs. 2,00,000 as depreciation (i.e., 10% on Rs. 20,00,000). Consequently, profit of the old firm will be overstated by Rs. 1,00,000 because of less depreciation as compared to the new firm even though the efficiency of the both the plants may be the same. Hence comparison of the two plants set up at different dates is not possible.
10. **Violation of the law of additivity :** During inflation accounting data may not be additive. It is argued that date may be added or subtracted if the purchasing power of the currency remains the same. Since the value of the rupee does not remain the same on account of price level changes, the addition and subtraction of accounting data does not give meaningful results and violates the law of additivity.
11. **Misleading interperiod and interfirrm comparison :** For the purpose of interperiod and interfirrm comparison, ratios are to be calculated. Financial ratios calculated based on historical costs will not give correct view. No meaningful information will be available for correct decisions.  
From the above discussion, it is clear that conventional accounting based on historical cost has outlived its utility when prices are changing frequently. To overcome the drawbacks of conventional accounting, the adoption of accounting for changing prices is advocated.

#### 11.4 METHODS OF Inflation ACCOUNTING

Many alternatives have been proposed in accounting to minimize the limitations of historical cost-based financial statements and to recognize the effects of inflation on financial statements. Though no consensus has yet been reached on a specific solution, the professional bodies in various countries have issued a number of statements suggesting the use of different methods of accounting for changing prices. It would indeed be a major development in the building up of a coherent and logical structure of accounting, if an objective and useful method of accounting for changing prices gains universal acceptance. Of the many proposals that have been put forward for inflation accounting, the following two methods need specific consideration.

- (1) Current Purchasing Power Method (CPP). Also known as Constant Purchasing Power Accounting, General Price-Level Accounting.
- (2) Current Cost Accounting Method (CCA).

### 11.4.1 Current Purchasing Power (CPP) Method

Under this method of adjusting accounts to price changes, all items in the financial statements are restated in terms of a constant unit of money i.e. in terms of general purchasing power by using an appropriate multiplier. A general price index is used for this purpose since it is the best indicator of the changes in the purchasing power of money as a whole. This method takes into account the changes in the general purchasing power of money and ignores the actual rise or fall in the price of the given item. The values of historical costs are to be converted into value of purchasing power as at the end of the period. Two index numbers are required one showing the general price level at the end of the period and the other reflecting the same at the date of the transaction.

Profit under this method, is increased in the value of the net assets over a period. All valuations are being made in terms of current purchasing power. For the purpose of CPP method of accounting it is necessary to distinguish between two classes of items monetary and non-monetary items.

**(a) Monetary items :** Monetary items may be defined as those fixed by contract or by their nature and are expressed in rupees regardless of changes in the price level. They include monetary assets such as cash, debtors and loans, and exist as money or as claims to specified sums of money. Holders of monetary assets suffer a loss in the general purchasing power of their assets during period of inflation.

Thus, if one holds money in the form of a bank deposit and the yearly rate of inflation is 25 per cent the loss in the purchasing power of that money by the end of the period will be 25 per cent. Monetary items include monetary liabilities such as creditors, bank overdrafts and long-term loans. As the value of money falls during a period of inflation, it follows that the value of such liabilities in current rupees will fall similarly, and this fall represents a purchasing power gain to the debtor.

Consequently, those who incur monetary liabilities gain at the expense of creditors during periods of inflation, since they will settle these liabilities with rupees possessing less purchasing power than those they have previously received directly or indirectly at the time the liabilities were incurred.

**(b) Non-monetary items :** Non-monetary items are assets and liabilities such as fixed assets, shareholders' equity, which are assumed neither to lose nor to gain in value by reason of inflation or deflation. This is because price changes for these items will tend to compensate for changes in the value of money. For example, if stock on hand at the beginning of the year remain unsold at the end of the year, then there will be no purchasing power loss since one assumes the sale price when they are sold would be adjusted upwards to take account of the fall in the value of money.

**Illustration-11.1 :** ABC Ltd. was formed on 1<sup>st</sup> January, 2004, with a share capital of Rs. 75,000 which was fully subscribed in cash on the date. On the same day, equipment was purchased for Rs. 45,000, of which Rs. 20,000 was paid immediately, the balance of Rs. 25,000 being payable in 2 years from date of purchase. The price level index was 100 on 1<sup>st</sup> January, 2004.

Goods were purchased in two installments prior to commencing business as follows :

1<sup>st</sup> purchase of Rs. 44,000, when the price level index was 110.

2<sup>nd</sup> purchase of Rs. 45,000, when the price level index was 120. All sales were made when the price level index was 130, and expenses of Rs. 16,000 were also incurred at the same index level. Stocks were valued on the FIFO methods and the closing stock was valued at Rs. 29,000. The price level index at 31<sup>st</sup> December, 2004 was 130.

The Profit and Loss Account and Balance Sheet in respect of year 2004, prepared on a historical cost basis, are as follows :

**Balance Sheet as at 31<sup>st</sup> December, 2004**

	Rs.
Fixed Assets	45,000
Less : Accumulated Depreciation	4,500
	40,500
Current Assets	
Stock	29,000
Debtors	19,000
Bank Balance	39,500
	87,500
Less: Current Liabilities	33,500
Net Current Assets	54,000
	94,500
Share Capital	75,000
Profit and Loss Account	19,500
	94,500

**Profit and Loss Account for the year ended 31<sup>st</sup> December, 2004**

Sales	1,00,000
Cost of goods sold	60,000
Gross operating income	40,000
Expenses	16,000
Depreciation	(10% of Rs. 45,000) 4,500
Net Operating Profit	20,500
	19,500

Required :

- Calculating the purchasing power gain or loss on the monetary items.
- Prepare an inflation adjusted Profit and Loss Account for the year ended 31<sup>st</sup> December, 2004.
- Prepare an inflation adjusted Balance Sheet as at 31<sup>st</sup> December, 2004 when the price level index was 130.

**(a) Calculation of purchasing power gain or loss on monetary items during the year ended 31<sup>st</sup> December, 2004**

Particulars	Unadjusted monetary items (Rs.)	Conversion Factor	Adjusted monetary items (Rs.)
Net Current Monetary items on 1 <sup>st</sup> January, 2004 (cash invested)	75,000	130/100	97,500

Sales		1,00,000	130/130	1,00,000
	(a)	1,75,000		1,97,500
Less :				
Purchases of Equipment		20,000	130/100	26,000
Purchase of Goods				
(i) Index at 110		44,000	130/110	52,000
(ii) Index at 120		45,000	130/120	48,750
Expenses		16,000	130/130	16,000
	(b)	1,25,000		1,42,750
Net current monetary items on 31-12-2004		50,000		54,750
(a-b)				
Unadjusted net current monetary items on 31-12-2004		-		50,000
Purchasing power loss for the year ended 31-12-2004				4,750

**(b) Preparation of inflation adjusted income statement for the year ended 31<sup>st</sup> December, 2004**

Particulars	Unadjusted (Rs.)	Conversion Factor	Adjusted (Rs.)
Sales	1,00,000	130/130	1,00,000
Cost of goods sold			
At index 110	44,000	130/110	52,000
At index 120	16,000	130/120	17,333
Expenses	16,000	130/130	16,000
Depreciation	4,500	130/100	5,850
	80,500		91,183
Net Profit	(a-b)	19,500	8,817

**(c) Preparation of inflation adjusted Balance sheet as at 31<sup>st</sup> December, 2004**

Particulars	Unadjusted (Rs.)	Conversion Factor	Adjusted (Rs.)
Fixed Assets	45,000	130/100	58,500
Less : Accumulated Depreciation	4,500	130/100	5,850
	40,500	130/110	52,650
Current Assets			
Stock	29,000	130/120	31,417
Debtors	19,000	130/130	19,000
Bank Balance	39,500	130/130	39,500
	87,500		89,917
Less : Current Liabilities	33,500	130/130	33,500
Net Current Assets	(b)	54,000	56,417

Total Assets	(a) + (b)	94,500		1,09,067
Share Capital		75,000	130/100	97,500
Profit and Loss Account		19,500		8,817
Accumulated purchasing power gain				2,750
		94,500		1,09,067

### Calculation of accumulated purchasing power gain

Gain on unpaid balance of purchase price of equipment		
Adjusted balance	(Rs. 25,000 x 130/100)	32,500
Unadjusted balance		25,000
		7,500
Less : Loss as computed on monetary items		4,750
Net accumulated purchasing power gain		2,750

### Arguments in favour of CPP

A number of arguments have been advanced in favour of CPP which are as follows :

(i) Inflation is concerned with changes in the general level of prices, therefore, only CPP can be regarded as a true form of inflation accounting. Those who consider inflation as an increase in general price-levels and a decline in the purchasing power of the money, favour CPP as the best approach to inflation accounting.

(ii) As CPP uses uniform purchasing power as the measuring unit, it possesses the qualities of objectivity and comparability. It has the further advantage of being based on historical costs used in conventional accounting system presently in use. Therefore, it retains all the characteristics of historical cost accounting except for the change in unit of measurement. Also it does not involve the sometimes subjective measurements required by the current value and current cost methods.

(iii) Several authors, e.g., Mathews, Ijiri, Agrawal and Hallbaur, have demonstrated that the adoption of CPP helps maintain the capital of the entity in terms of its general purchasing powers. The accompanying retention of additional resources is accomplished by expensive the inflation-adjusted costs of non-monetary assets and recognizing a loss on holding net monetary assets in the computation of distributable income.

(iv) CPP provides useful information about the comparable impact of inflation across firms. Inflation affects firms differently, depending on the age and composition of their assets and equities. Highly capital intensive firms are likely to report significantly larger depreciation expense under CPP method than nominal depreciation expense. Highly leveraged firms will report a larger purchasing power

gain during periods of increasing prices than firms that use relatively little debt. CPP reports these differing effects of inflation across firms.

(v) CPP improves the relevance and measurement of net income as it provides a better matching of revenues and expenses because of a constant and common measuring unit. On the contrary, conventional historical accounting does not measure income properly as a result of the matching of rupees of different size (purchasing power) on the income statement. Also, a gain or loss under CPP is explicitly recognized for the changes in the general purchasing power of monetary assets and liabilities held. Income before the purchasing power gain or loss must exceed any loss of purchasing power of monetary assets and equities if the purchasing power of the monetary or financial, capital of the firm is to be maintained.

(vi) CPP provides relevant information for management evaluation and use. Purchasing power gain and loss resulting from holding monetary items reflect management's response to inflation. The restated non-monetary items indicate the approximate purchasing power needed to replace the assets.

(vii) CPP presents to users, in general, the impact of general inflation on profit and provides more realistic return on investment. Financial data adjusted for price-level changes provide a basis for a more intelligent, better informed allocation of resources, whether those resources are in the hands of individuals, business entities or government.

### **Limitation of CPP**

Financial statements prepared under CPP method are criticized for the following reasons :

- i) In the long term, CPP method does not remedy the deficiencies of historic cost accounting and so it does not provide the best long term solution to the problems of accounting for inflation.
- ii) The Retail Price Index is an index of prices of wide range goods and services purchased by domestic consumers. In many cases, such an index will give a misleading indication of effects of inflation on individual companies.
- iii) The method leads to a new set of problems by expressing company accounts in a new writ of measurement viz., quantity of current purchasing power instead of monetary units. The unit of current purchasing power is likely to be conceptually difficult for most users of accounts to understand.

### **11.4.2 Current Cost Accounting (CCA) Method**

In order to rectify the defects and meet the problems of historic cost accounting and the Current Purchasing Power method, an accounting system to be known as 'Current Cost Accounting' is devised. The CCA method matches current revenues with the current cost of the resources which are consumed in earning them.

In this method, historical values of items are not taken account; rather current values of individual items are taken as the basis for preparing profit and Loss Account and Balance Sheet.

## Important Characteristics of Current Cost Accounting

**1. Fixed assets are shown in the Balance Sheet at their current values and not at their depreciated original costs.**

2. Stocks are shown in the Balance Sheet at their value to the business, i.e., at the value prevailing on the date of the Balance Sheet. These are not shown at cost or market price whichever is lower as is done in case of historical accounting.
3. To find out profit for the year, depreciation is calculated on the current values of the relevant fixed assets.
4. The difference between the current values and the depreciated original costs of fixed assets is transferred to Revaluation Reserve Account and is written on the liabilities side of the Balance Sheet. The revaluation reserve is not available for distribution as dividend but is utilized for increased replacement cost of fixed assets and under provision of depreciation in the past years.
5. The cost of stock consumed during the year is taken at current value of the stock at the date of consumption and not the purchase price of the stock consumed.
6. Monetary assets and liabilities are not adjusted under this method because they are always recorded at their value to the business. The values of these items do not change with changes in price level because we are not going to receive more or pay less on account of these items.
7. Under current cost accounting approach of inflation accounting, accounting profit is divided into three parts : (i) current operating profit, (ii) realized holding gain, and (iii) unrealized holding gain. The above classification is made to show separately the effect of holding non-monetary assets (i.e., holding activities) during inflation. It will also help to assess properly the result of operating activities. Now, we may give below the meaning of these types of profits.

**Realised Holding Gain :** It is the excess of the replacement cost of a non-monetary asset sold on the date of its sale over its historical cost.

**Unrealised Holding Gain :** It is the excess of the replacement cost of a non-monetary asset on the closing date over its historical cost. Such a gain is shown separately in the Balance Sheet as revaluation reserve and is not available for distribution as dividend but is utilized for increased replacement cost of the non-monetary asset.

**Current Operating Profit :** It is the excess of the sale proceeds of goods and services sold during a particular accounting period over the replacement cost of the goods or services sold on the dates the sales were effected.

## Objective of CCA

Current Cost Accounting (CCA) aims to maintain capital of a business enterprise in terms of its operating capability. Operating capability is denoted by the net operating assets of the enterprise in terms of shareholders funds. As an equation,

$$\text{Net Operating assets} = \text{Total tangible assets} + \text{Net monetary working capital}$$

(current assets – current liabilities)

A change in the input prices of goods and services used and financed by the business will affect the amount of funds required to maintain the operating capability of the business enterprise. Therefore, maintaining the operating capability is the objective which is attempted to be achieved under CCA while preparing Profit and Loss Account and Balance Sheet. CCA is based on UK

accounting standard, SSAP 16 Current Cost Accounting, issued in 1980. CCA aims to prepare the following :

- (A) Current Cost Profit and Loss Account (to determine Current Cost Operating Profit)
- (B) Current Cost Balance Sheet

## Current Cost Profit and Loss Account

In CCA, the profit and loss account is prepared to determine the current cost operating profit (CCOP). CCOP is determined after allowing for the impact of price changes, on the funds needed to continue the existing business and maintain its operating capability whether financed by share capital or borrowing. CCOP is calculated before interest on net borrowings and taxation. After determining CCOP, interest and taxes are considered in current cost profit and loss account to finally ascertain net income under CCA. Net income under CCA can be defined as the surplus amount which can be distributed to proprietor or shareholders after keeping the operating capability of an enterprise intact. CCOP is determined after making the following three adjustments to historical cost profit before interest and taxes :

- (1) Cost of Sales Adjustment (CCSA)
- (2) Depreciation Adjustment
- (3) Monetary Working Capital Adjustment (MWCA)
- (4) Gearing Adjustment

**1. Cost of Sales Adjustment (COSA) :** The 'Cost of Sales Adjustment' refers to the difference between the current cost of stocks at the date of sale and the amount charged as the cost of goods sold in computing the historical cost profit. Business enterprises use standard costing systems for the purpose of obtaining timely information about the cost of stocks.

These standard costing systems are designed to identify and to reflect, *inter alia*, changes in the current cost of purchased stocks. Where a standard costing system is in use, it is possible to derive an analysis of the variances which are differences between historical and standard costs, and to use this analysis to identify the extent, to which current costs differ from standard costs. This information may be used to adjust the standard cost of goods sold to their current costs.

Where standard costing systems are not used, it is possible to average out the changes in the cost of sales. This method involves valuing the opening and closing stocks at the average cost for the year. The cost of sales is established as the purchases of the year, which are already stated at their average price for the year, adjusted by the revised values of the opening and closing stocks.

The important principle to be remembered is that current costs must be matched with current revenues. As far as sales are concerned, it is a current revenue and, therefore, requires no adjustment. With reference to costs all operating expenses are current and pose no problem.

But in the case of sales certain adjustment is needed if there are stocks. This adjustment is known as Cost of Sales Adjustment (COSA). If there are no stocks then cost of sales will comprise only current purchases and cost of sales adjustment is not necessary.

**Illustration-11.2** Historical Cost Data :

(Rs. in

‘000)

Opening stock	350
---------------	-----

Add : Purchases	2,300
Less : Closing stock	2,650
Cost of sales at historical cost	540
	2,110

Index for the cost of stock

At the beginning of the year	100
At the end of the year	120
Average for the year	110

**(a) Revised opening and closing stocks to average cost for the year**

Opening stock	(350x110/100)	385
Closing stock	(540x110/120)	495

**(b) Computation of current cost of sales using revised amounts for Opening and Closing stocks.**

Opening stock	385
Add : Purchases	2,300
	2685
Less : Closing stock	495
Cost of sales on current cost basis	2,190

**(c) Computation of Cost of Sales Adjustment**

Cost of sales on current cost basis	2,190
Less : Cost of sales on historical cost basis	2,110
Cost of Sales Adjustment	80

Cost of Sales Adjustment can be ascertained with the help of the following formula :

$$\text{COSA} = \frac{C}{I_a} - \frac{O}{I_o}$$

where,

O	=	Historical cost of opening stock
C	=	Historical cost of closing stock
Ia	=	Average index number for the period
Io	=	Index number appropriate to opening stock

Ic	=	Index number appropriate to closing stock
----	---	---

$I_o$  and  $I_c$  may be index numbers at a point of time or may be average index numbers periods during which the opening stock and closing stocks are built up depending on the information given in the problem.

**2. Depreciation Adjustment :** The Depreciation Adjustment reflects the difference between the depreciation calculated on the current cost of fixed assets and the depreciation charged in computing the historical cost profit. The accounting policy adopted for the purpose of calculating the historical cost profit should be followed when calculating the depreciation on the current cost of fixed assets.

Once an enterprise has established the current cost of an asset, the determination of the depreciation adjustment is a simple matter. The current cost depreciation charge may be computed by revising the depreciation charge in accordance with the change in the appropriate index level between the year of the purchase of the asset and the current year. This calculation is illustrated below :

### **Illustration-11.3 :**

Asset X	Historical Rs.	Index factor	Current cost Rs.
Cost in year 1	1,200	200/150	1,600
Depreciation (10% p.a.)	720	200/150	960
	480		640

Index for Asset X

Mid of the year	150
End of the year	200

Calculate Depreciation Adjustment.

### **Calculation of Depreciation Adjustment**

(Rs.)

Current Cost Depreciation	(10% p.a. of Rs. 1,600)	160
Historical Cost Depreciation	(10% p.a. of Rs. 1,200)	120
Depreciation Adjustment		40

In general, the accepted accounting practices for depreciation in historical cost accounting apply equally in CCA. The charge for depreciation for a period should represent the estimated consumption of service potential during the period evaluated at current costs. The current cost depreciation charge depends not only on the estimated current replacement cost of the assets but also on the estimate of the proportion of the total service potential which has been consumed. Therefore, for the purpose of CCA, useful life of the asset must be estimated at regular intervals.

**3. Monetary Working Capital Adjustment (MWCA)** – Besides showing the adjustments to cost of sales and depreciation, it is also required to show the financing adjustment. Financing adjustments have in common a several recognition of the interaction between changing prices and the financing of an enterprise, but there are differences of opinion about the form such financing adjustment should take.

Current cost method require a financing adjustment reflecting the effects of charging prices on net monetary assets or to a gain from holding net monetary liabilities when prices are rising and vice versa. Monetary working capital adjustment can be worked out with the help of following formula :

$$MWCA = \frac{W_c - W_o}{I_a} - \frac{W_o}{I_o}$$

where,

$W_o$	=	Opening balance of monetary working capital
$W_c$	=	Closing balance of monetary working capital
$I_a$	=	Average index number for the period
$I_o$	=	Index number appropriate to opening MWC
$I_c$	=	Index number appropriate to closing MWC

The purpose of this adjustment is to apply the concept of current value to monetary assets, to achieve the same effect as do the depreciation and the cost of sales adjustments in respect of fixed assets and stocks. The MWCA represents the amount of additional finance needed for monetary working capital as a result of changes in input prices of goods and services.

Monetary working capital may be defined as the aggregate of :

- (i) Trade debtors, prepayments and trade bills receivable, plus
- (ii) Certain special categories of stocks not subject to COSA, less
- (iii) Trade creditors, accruals and trade bills payable.

Any fluctuation in bank balances or overdrafts due to change in volume of stock and other items mentioned above should also be included in computation of 'Monetary Working Capital'. The bank balance or overdraft balance, to the extent it does not fluctuate, should be taken into consideration for computation of 'Gearing Adjustment'.

The objective of the 'Monetary Working Capital Adjustment' and 'Cost of Sales Adjustment' is to take account of the effects of changing prices on the financing requirements necessary to maintain the working capital applied to the day-to-day operations of the business.

The method used to compute the monetary working capital adjustment should be compatible with that used to compute the Cost of Sales Adjustment. For example, the sales of finished goods give rise to trade debtors. Hence, all things being equal, changes in the amount of finance required to support the increased level of trade debtors associated with price inflation will tend to be proportional to changes in the cost of goods finished.

Consequently, the change in the index of finished goods prices is used to calculate that part of the monetary working capital, which relates to

supporting trade debtors. Equally, since the purchase of raw materials in the case of a manufacturing company gives rise to trade creditors, the change in the index of raw material prices is used to calculate that part of the monetary working capital which relates to trade creditors.

### Illustration-11.4

(Rs.)

Particulars	Beginning of the year	End of the year
Historical Cost balance		
Trade Debtors	60,000	80,000
Trade Creditors	50,000	65,000

Index Numbers	Finished goods	Raw materials
Beginning of the year	110	105
Average of the year	110	
114		
End of the year	118	120

### Calculate Monetary Working Capital Adjustment

Particulars	(Rs.)
<b>TRADE DEBTORS ADJUSTMENT</b>	
Increase in Trade debtors	(80,000-60,000) 20,000
Less : Index adjustment	$[(80,000 \times 110 / 118) - (60,000 \times 110 / 100)]$ 8,576
	(a) 11,424
<b>TRADE CREDITORS ADJUSTMENT</b>	
Increase in Trade creditors	(65,000-50,000) 15,000
Less : Index adjustment	$[(65,000 \times 114 / 120) - (50,000 \times 114 / 105)]$ 7,464
	(b) 7,536
Monetary Working Capital Adjustment	(a)- 3,888

It should be noted that most of the problems associated with the calculation of the monetary working capital adjustment arise from the needs to identify monetary assets and liabilities associated with the net borrowing requirement. This net borrowing requirement affects the gearing adjustment which has to be made under CCA.

4. **Gearing Adjustment :** The capital structure of a company has important implications for financial management purposes. In particular, the gearing is important, since it expresses the relationship between fixed interest (loan) capital and fixed dividend (preference) shares on the one hand and ordinary shares on the other. A company that has a large proportion of fixed interest and fixed dividend bearing capital to ordinary capital is said to be highly geared.

The purpose of the Gearing Adjustment is to allocate equitably the current cost adjustments in order that the full burden should not fall on ordinary shareholders; where they themselves have not financed the entire assets in respect of which the adjustments are made. This adjustment, subject to interest on borrowing, indicates the benefit or cost to shareholders which is realized in the period, measured by the extent to which a proportion of the net operating assets are financed by borrowing.

The current cost profit attributable to shareholders is the surplus after making allowance for the impact of price changes on the shareholders' interest in the net operating assets, after provision for the maintenance of lenders' capital in accordance with their repayment rights.

A Gearing Adjustment to be made where a proportion of the assets of the business are financed by borrowing. Net borrowing is defined as the amount by which liabilities (defined in (i) below) exceed assets (defined in (ii) below).

- (i) The aggregate of all liabilities and provisions (including convertible debentures and deferred tax but excluding dividends) other than those included within monetary working capital.
- (ii) The aggregate of all current assets other than those subject to a cost of sales adjustment and those included within monetary working capital.

The Gearing Adjustment itself results from the application of the gearing ratio to the net adjustments made in converting the historical cost profit to current cost profit. The gearing ratio is found in the relationship between net borrowing (L) and the average ordinary shareholder's interest obtained from the opening and closing balance sheet(S), as follows :

$$\text{Gearing Ratio} = \frac{L}{L + S}$$

### Illustration-11.5

(Rs.)

Particulars	Opening Balance sheet	Closing Balance sheet	Average
Shareholders' Interest			
Share capital	100	100	100
Reserves (including the current cost reserve)	50	60	55
	150	160	155
Net borrowing	100	110	105
	250	270	260

### Current Cost Adjustment

(Rs.)

Cost of sales	20
Add : Monetary working capital	10
	30
Add : Depreciation	15
Current Cost Adjustment	45

## **Gearing Adjustment**

$$\begin{array}{lclcl} \text{Gearing Ratio} & = & 105/(105+155) & = & 40.38\% \\ \\ \text{Gearing Adjustment} & = & 45 \times 40.38/100 & = & 18\% \end{array}$$

## **Current Cost Reserve**

Current cost accounting suggests the creation of a reserve account, known as current cost reserve account. The current cost reserve includes (i) current cost adjustments, i.e., depreciation backlog adjustment, cost of sales adjustment and monetary working capital adjustment, (ii) gearing adjustment, (iii) unrealized revaluations surpluses on fixed assets, closing stock and investment. The gearing adjustment amount is credited to profit and loss account and debited to Current Cost Reserve Account

**Illustration-11.6 :** Assume a company has a capital mix of 40 per cent debt and 60 per cent equity. The following amounts of adjustments have been found using CCA method :

Cost of sales adjustment	Rs. 10,000
Depreciation adjustment	Rs. 20,000
Monetary working capital adjustment	Rs. 25,000
Total	Rs. 55,000

In the above case debt constitutes 40 per cent of the total capital. Therefore, the amount of gearing adjustment will be Rs. 22,000 (Rs. 55,000 x 40%). It means only Rs. 33,000 which represents shareholders' share will be charged to Profit and Loss Account. The Current Cost Reserve Account will be credited with the amount of Rs. 33,000 on account of three adjustments. Alternatively, more preferably, Rs. 55,000 is charged to Profit and Loss account. Since the amount of gearing adjustment is credited to Profit and Loss

account, the net effect is that only Rs. 33,000 stands charged to Profit and Loss account. Also, gearing adjustment is debited to Current Cost Reserve account.

## Preparation of Current Cost Balance Sheet

Under current cost accounting current cost balance sheet is prepared. Balance sheet items are treated in the following manner :

**(1) Fixed Assets** – The fixed assets should be shown in the balance sheet at their value to the business. The value of the business of an asset is the amount which the business would lose if it were deprived of the asset. Determining the value to the business, i.e. generally the current cost of fixed assets, involves great difficulty, because usually the assets now in use were acquired long ago than is typically the case with inventory, and the assets in use, if replaced currently, would be replaced by different assets.

Thus, if a used asset of like age and condition to the asset in use can be priced, that will set the current cost. If a new asset has to be used as the basis for pricing the old asset, adjustments have to be made for the differences in life expectancy, productive capacity, quality of service, and operating costs between the new and the old asset. The concepts of gross and net current replacement cost are important in this context. The gross current replacement cost of an existing asset is the cost that would have to be incurred at the date of the valuation to obtain and install a substantial identical asset in new conditions. For example, if a plant purchased on January 1, 2001 for Rs. 80,000 can be purchased on December 31, 2003, for Rs. 1,00,000, its gross current replacement cost on December 31, 2003, will be Rs. 1,00,000. The net current replacement cost of an existing asset refers to the part of the gross current replacement cost which represents its unexpired service potential. For example, suppose the plant in the above example is estimated to have an economic life of five years.

Since it has been used for three years, its net current replacement cost would be Rs. 40,000 (assuming that the equipment will have a zero scrap value at the end of its economic life).

In circumstances, where the asset in use would not be replaced, if for any reason it were taken out of service, its value to the business is not its current cost but a lower recoverable amount. This recoverable amount is its value if sold or its value if used, whichever is higher. Its value if sold is its realizable value, net of selling costs. Its value in use is the net present value of future cash flows (including the ultimate proceeds of disposal) expected to be derived from the use of the asset by the enterprise.

**(2) Land and Buildings** – The land and buildings occupied by the owner himself, should be shown in the balance sheet at their value to the business which will normally be the open market value for their existing uses, plus estimated acquisition costs. However, in case where an open market valuation of the land and buildings as a whole cannot be made, the net replacement cost of the buildings and the open market value of land for its existing use plus the estimated acquisition costs should be taken as their value to the business. The valuation should be made by professionally qualified valuers at periodic intervals.

**(3) Inventories** – In the balance sheet, inventories should normally be shown at the lower of the current replacement cost as on the date of balance sheet and the net realizable value.

### **Revaluation Surplus Transferred to Current Cost Reserve**

#### **Account**

Increase in the value of fixed assets like plant and machinery, land and building, closing stock, investment is credited to current cost reserve account. The increase in value of fixed asset is arrived at by

deducting the net historical cost of the asset from its net current cost at the end of the year, both sums being calculated before taking depreciation into account.

To take an example, assume a plant was purchased for Rs.1,20,000 having a useful life of ten years. Its replacement cost now is Rs.1,80,000. In the fifth year, the amount to be transferred to current cost reserve account will be Rs.36,000, calculated as follows :-

	Net book value after 5 years (Rs.)	+	Depreciation for 5 <sup>th</sup> year	=	Net book value before depreciation (Rs.)
Current cost	Rs.90,000	+	Rs.18,000	=	Rs.1,08,000
Historical cost	Rs.60,000	+	Rs.12,000	=	Rs.72,000
Net credit to current cost reserve a/c					Rs.36,000

The profit and loss account, balance sheet and current cost reserve account under current cost accounting will appear as follows :-

### **Current Cost Accounting (CCA) Profit and Loss Account**

(Rs.)

Historical profit before interest and tax

--

Less : Current cost operating adjustments :

- (i) Depreciation adjustment --
- (ii) Cost of sales adjustment (COSA) --
- (iii) Monetary working capital adjustment (MWCA) --

--

-----

Current cost operating profit

--

Less : Interest on borrowings including  
debentures and dividend on preference shares

--

-----  
-----  
Current cost profit after interest

--

Add : Gearing adjustment\*

--

-----  
-----  
Current cost profit before tax

--

Less : Provision for tax

--

-----  
-----  
Current cost profit after tax (attributable to shareholders)

--

Less Dividends proposed

--

-----  
-----  
Current cost profit retained

--

**Note** - Amount of gearing adjustment is generally deducted from interest.

#### \*Notes :

1. Alternatively, gearing adjustment amount could be deducted from the total of current cost operating adjustments (dep. adjustment, COSA and MWCA). The result will be the same if gearing adjustment is deducted from current cost adjustments, or if not deducted from current cost operating adjustment and subsequently added to current cost profit.

2. Gearing adjustment is calculated only when a firm is financed partly by borrowing. No gearing adjustment arises when a company is wholly financed by shareholders' capital. To find out the net borrowings, cash balance is deducted from total borrowings. Or if cash balance is more than the borrowings, there will be no gearing adjustment.

The above profit and loss account (prepared in a statement format) can be shown in a 'T' format, as below.

## Profit and Loss Account

To Depreciation adjustment	--	--	By historical profit before	--
To current cost reserve :			interest and taxes	
COSA	--	--	By current cost reserve	--
MWCA*	--	--	(gearing adjustment)	
To Interest		--		
To Profit before tax			--	
Total			Total	

\* MWCA will be shown on credit side of profit and loss account in case of negative adjustment. In this case entry will be :

## Current Cost Reserve A/c Dr.

## To Profit and Loss A/c

Entry for revaluation of assets is as follows :

Plant and Machinery A/c Dr.

### To Current Cost Reserve A/c

## **Balance Sheet under CCA**

Profit and Loss A/c	--	Plant and Machinery
Current Cost Reserve (balance)	--	(or similar assets) (Revalued amount)

### Current Cost Reserve A/c

To P. & L. A/c (gearing adjustment)	--	By Fixed Assets (revalued surplus amount)	--
To depreciation (backlog)		By P & L A/c (COSA)	
To balance c/d	--	By P & L A/c (MWCA)	--

**Illustration-11.6 :** The summarized current balance sheet of Naveen Ltd. and its 60% owned subsidiary Pracheen Ltd. are as follows :

(Rs.'000)

Particulars	Naveen Ltd.		Pracheen Ltd.	
	31-12-2004	31-12-2003	31-12-2004	31-12-2003
Fixed Assets	5,950	5,600	3,825	3,700
Investment in Pracheen Ltd.	600	600	-	-
Stock	3,450	1,500	1,155	1,040
Debtors less Creditors	1,725	1,200	750	510
Taxation	(550)	(430)	(450)	(220)
Proposed Dividend	(350)	(250)	-	-
Total	10,825	8,220	5,280	5,030
Share Capital	3,000	3,000	1,000	1,000
Reserves	3,490	2,165	2,250	21,300
	6,490	5,165	2,250	1,300
Loan less Cash	4,335	3,055	2,030	2,730
Total	10,825	8,220	5,280	5,030

The historical cost Profit and Loss Account for the year ended 31-12-2004 is as follows :

(Rs.'000)

Particulars	Naveen Ltd.	Pracheen Ltd.

Turnover	15,500	12,100
Operating Profit	1,700	1,300
Interest payable	400	340
Profit before tax	1,300	960
Tax	550	450
Profit after tax	750	510
Proposed dividend	350	-
Retained profit	400	510

Notes :

(i) The following current cost adjustment has been calculated :

Particulars	(Rs.'000)	
	Naveen Ltd.	Pracheen Ltd.
Cost of sales	275	150
Monetary Working Capital	205	90
Depreciation	350	375

(ii) The following are the movements of the current cost reserves :

Surplus on revaluation

Fixed Assets	1200
800	
Stocks	350
165	

Monetary working capital adjustments (as above)

You are required to prepare :

- (i) The consolidated current cost Profit and Loss Account for the year ending 31-12-2004 for the Naveen group.
- (ii) A statement of the movements on the group current cost reserve for the year ending 31-12-2004.

### Solution :

#### Group Current Cost Profit and Loss Account for the year ending 31-12-2004

(Rs.'000)

Turnover	(15,500+12,100)	27,600
Profit before interest and tax on historical cost basis	(1,700+1,300)	3,000
Less : Current Cost Operating Adjustment (Note 1)		1,445
		1,555
Gearing Adjustment (Note 2)	656	
Interest payable	(400+340)	740
Current cost profit before tax		1,471
Tax	(550+450)	1,000
Current cost profit after tax		471
Less : Attributable to outside shareholders (Note 4)		80
Current cost profit attributable to shareholders to Naveen Ltd.		391
Proposed dividend		350
Retained current cost profit for the year		41

#### Statement of Retained profits/reserve

(Rs.'000)

Retained current cost profit for the year	41
Movement on current cost reserve (Note 5)	1,854
	1,895
Retained profits/reserves at the beginning of the year	(2,165+60% of 1,300)
Retained profits/reserves at year end	(3,490+60% of 2,250)

#### Note 1 : Adjustments made in deriving Current Cost Operating Profit (Rs.'000)

Cost of sales	(275 + 150)	425
---------------	-------------	-----

Monetary working capital	(205 + 90)	295
Working Capital		720
Depreciation	(350 + 375)	725
Current Cost Operating Adjustment		1,445

### **Note 2 : Gearing Adjustment (Group)**

**(Rs. '000)**

Particulars	31-12-2004	31-12-2003
Net operating assets (Group)		
Fixed Assets	(5,950+3,825)	9,775
Stock	(3,450+1,155)	4,605
Monetary Working Capital	(1,725+750)	2,475
		16,855
Financed by Net borrowing (Group)		
Loan less Cash	(4,335+2,030)	6,365
Tax	(550+450)	1,000
		7,365

$$\text{Gearing proportion} = \frac{7,365 + 6,435}{16,855 + 13,550} \times 100 = 45\%$$

$$\text{Current Cost Operation Adjustment (Note 1)} = 1,445$$

$$\text{Gearing Adjustment} = 1,445 \times 45.4 / 100 = 656$$

### **Note 3 : Gearing Adjustment – Pracheen Ltd.**

**(Rs. '000)**

Particulars	31-12-2004	31-12-2003
Net Operating Assets		
Fixed Assets	3,825	3,700
Stock	1,155	1,040
Monetary Working Capital	750	510
	5,730	5,250
Financed by Net borrowing (Pracheen Ltd.)		
Loan less Cash	2,030	2,730
Tax	450	220
	2,480	2,950

$$\text{Gearing proportion} = \frac{2,480 + 2,950}{5,730 + 5,250} = \frac{5,430}{10,980} = 0.497 \approx 50\%$$

#### **Note 4 : Current Cost Profit/Loss attributable to outside shareholders**

(Rs.'000)

Current cost profit of Pracheen Ltd.		510
Less : Current Cost Operation Adjustment		
Cost of sales	150	
Monetary working capital	90	
Depreciation	375	615
		(105)
Add : Gearing Adjustment (Note 3)		304
		199
Minority Interest 40%		80

#### **Note 5 : Statement of movements on group Current cost Reserve for the year ending 31.12.2004.**

(Rs.'000)

Particulars	Total	Minority	Attributable to Group
Surplus on revaluation			
Fixed Assets (1,200 + 800)	2,000	320	1,680
Stock (350 + 165)	515	66	449
MWCA	295	36	259
	2,810	422	2,388
Gearing adjustment	(656)	(122)	(534)
Net movement for the year	2,154	300	1,854

#### **Advantage of CCA**

The following are the main advantages of this approach :

- (i) It maintains intact the operative capacity of the enterprise as this method seeks to closely approximate the impact of inflation on the enterprise.
- (ii) The theory underlying in this approach (i.e., earnings and assets of an enterprise should be measured by reference to the value to the business) is quite logical and useful for some group of users of financial statements.

(iii) The break up of the assets and liabilities under CCA approach is more accurate and real financial picture of an enterprise will be available as compared to historical cost accounting as CCA figures are with reference to the current price.

## Limitations of CCA

The following are the main limitations of this approach :

1. There is an element of subjectivity inherent in periodic valuations especially where reliable indices are not available. Under CCA accounts are not objective so as to provide information capable of independent verification. The valuation of assets is influenced by the discretion and subjective judgement.
2. Under CCA approach, figures of operative profit and capital employed in different years are not comparable as current cost accounts are prepared in monetary units having a different purchasing power in each year.
3. Under this approach, operating profits do not reflect the real earnings of the firm. Profits when distributed will be out of capital and will not help to maintain the operating capability of the firm.
4. External users will not be able to predict future cash flows (as CCA will not be applicable to cash flow statements) which is very necessary for investment decision making.
5. Under this approach, accounts of an enterprise shall have to be adjusted even if changes in specific prices occur without any changes in the purchasing power of money.
6. The valuation method under this approach is ill-defined. There is no integrated and comprehensive body of procedures which is followed for valuation in CCA.

**7. The various aspects of the CCA are not easily understood as it introduces into accounts notional concept of valuation amount in place of the existing historical cost of assets. Thus, the method is less intelligible.**

8. The ultimate aim of CCA is to replace gradually historical cost accounts but there may be legal problems in replacement as the income tax authorities may not recognize CCA.  
In view of the above limitations, CCA may not be generally acceptable to the enterprise and professional bodies in various countries.

### 11.5 Advantages of Inflation Accounting

The advantages of Inflation Accounting include the following :

1. Historical accounting tends to inflate profits because less depreciation based on historical costs of assets (which are usually lower) is charged. Inflated profits if distributed as dividend will lead to erosion of capital. Accounting adjusted to price level changes tends to correct this malady by charging depreciation on current values of assets. In this way, capital is kept intact which is essential in a limited liability business.
2. Inflation accounting helps to maintain the physical capital (i.e., fixed assets) intact because sufficient funds are made available for replacement of fixed assets when they are worn out by charging depreciation on their current values.
3. Balance Sheet exhibits a true and fair view of the financial position of a firm because assets are shown at their current values.
4. For managerial decisions, the anticipated and actual profit must be expressed in rupees of the same purchasing power. Inflation accounting does this by matching the cost and revenue at current values.
5. Financial ratios calculated on the basis of balance sheets and profit and loss account adjusted to current values would provide more meaningful information as compared to the ratios based on the historical costs.
6. A rate of return on capital employed adjusted to the current price index is more useful in the valuation of business by its owners, creditors and management.

**7. Employees, shareholders and public are not misled because inflation accounting shows current profit based on current prices. Historical accounting shows exaggerated profits by relying on historical values which may be very low. Exaggerated profit may induce employees and shareholders to make a claim for higher wages and dividends.**

### **11.6 Disadvantages of Inflation Accounting**

1. Charging depreciation on current values of fixed assets is not acceptable to income tax authorities, so no useful purpose will be served by following accounting for changing prices so far as income tax is concerned.
2. Charging depreciation is a process of distribution of original cost of a fixed asset over its effective life, so charging anything in excess over the effective life of an asset is against the concept of depreciation.

**3. Adjusting accounts to changing prices is a never ending process because prices go on changing every day.**

4. Price level accounting is not free from prejudice. Assets are recorded at current values which will be according to the whims of an individual or group of individuals. It would enable people to dress up their balance sheets according to their whims. On the other hand, actual cost recorded in historical accounting is an objective evidence and is free from prejudice.
5. The profit disclosed by system of price level accounting by taking items at current values is not a realistic profit and, therefore, to that extent, it should not be distributed as dividend. Distribution of unrealized profit as dividend amounts to erosion of capital which is not desirable.
6. In times of deflation, lower depreciation will be charged because assets will have lower current value. It will increase profit which will lead to payment of excessive dividend. It is not desirable because it amounts to payment of capital profit.

### **11.7 Summary**

Inflation accounting is a system of accounting which regularly records all items in financial statements at their current values. The system recognizes the fact that the purchasing power of money is decreasing day-by-day during inflation and finds out profit or loss or states the financial position of the business on the basis of current prices prevailing in the economy. At present there are two methods which help to take the inflationary effect while preparing financial statements. These methods are (a) current purchasing power method and (b) current cost accounting method. In current purchasing power method, the historical accounting data are adjusted on the basis of any established and approved general price index at a given date. This method takes care of changes in the value of money but it does not account for changes in the value of individual items. The value of an item may be increased on the basis of general price index whereas the actual value of that item might have decreased. To remove this drawback, in current cost accounting method, historical values of items are not taken into account, rather current values of individual items are taken as the basis for preparing profit and loss account and balance sheet.

### **11.8 Self Assessment Questions**

1. Discuss the shortcomings of conventional accounting based on historical cost during inflation.
2. Define inflation accounting. Give its advantages and disadvantages.
3. Discuss the methods which can be adopted to adjust price level changes, while determining income.
4. Explain under CCA method what is meant by -

- (a) Cost of Sales Adjustment
- (b) Monetary Working Capital Adjustment

5. Discuss the features of CPP method for accounting under condition of changing price levels. What are the limitations of this method ?

### **11.9 SUGGESTED READINGS**

1. D Solomons, Making Accounting Policy, Oxford University Press, New York
2. American Institute of Certified Public Accountants, Reporting the financial effects of price level changes, AICPA, New York
3. M O Alexnder, Effects of changing prices and values in John C Burton et.al. (Ed), Handbook of Accounting and Auditing, Gorham and Lanont, Warren
4. Report of the Inflation accounting Committee, HMSO, London
5. Shukla and Grewal, Advanced Accounting, S. Chand and Sons, New Delhi
6. Financial Reporting and Changing Prices, Financial Accounting Standards Board.

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<b>LESSON-12</b>					

## **HUMAN RESOURCE ACCOUNTING**

**Objective :** The objective of the present lesson is to discuss the concept, objectives assumptions and methods of Human Resource Accounting

### **LESSON STRUCTURE**

- 12.1 Introduction
- 12.2 Concept of Human Resource Accounting
- 12.3 Objectives of HRA
- 12.4 Need for HRA
- 12.5 Assumption of HRA
- 12.6 Benefits of Human Resource Accounting
- 12.7 Methods of Accounting for Human Resources
- 12.8 Requirements under the Companies Act
- 12.9 Recording and Disclosure in Finance Statements
- 12.10 Problems and Limitation of HRA
- 12.11 Summary
- 12.12 Self Assessment Questions
- 12.13 Suggested Readings

#### **12.1 introduction**

It is widely recognized that human resources are no lesser important than other productive resources. However the recognition of importance of people in organisations as productive resources by the accountants is a recent origin. In conventional accounting practices, human work force, a core element, did not find its place. The expenses incurred in respect of acquisition, selection, layoff, training, promotion and development etc. of employee are treated as revenue expenditure which yield benefits to an enterprise in the form of service rendered by the manpower and such expenditure should be quantified as well as capitalised and shown in the Balance Sheet. But the managers failed to recognize and treat them as an asset in the financial statements.

It was in 1960's, the behavioural scientists attacked the conventional accounting practice for its failure to value the human resources of the organisation along with other productive resources and pointed out that this was a serious handicap for effective management. As a consequence, valuation of human resources has received widespread recognition. In the course of time a number of accounting models have been developed to value and report human resources of an organisation. In the management terminology this is called "Human Resource Accounting" (HRA).

Human resources have certain distinct characteristics from other physical assets, like personality, self control, devotion, quality, skill, talents, loyalty and initiativeness. An organisation's basic need of present time is to improve productivity, that can be improved by the human force. Hence to encourage, it is necessary to take progressive decisions for them. Advocates of HRA stresses on the importance of the human

element in organisations and the failure of conventional accounting in dealing with it as an asset. In its simplest form HRA involves the identification of the costs of recruitment, training, and maintenance of an entity's human assets.

The basic premise underlying the theory of HRA are:

- ❖ People are valuable resources of an enterprise.
- ❖ The usefulness of manpower as an organizational resources is determined by the way in which it is managed.
- ❖ Information on investment and value of human resources is useful for decision-making in the enterprise.

Just like financial capital structure, which consists of various types of capital, the human capital structure consists of various types of employees employed in an organisation. The type of employees may be executives, supervisory, artisans, clerical and skilled staff or semi-skilled staff. The composition and proportion of various types of employees play an important role in development of an organisation. The human capital structure is highly related with HRA and the techniques to value human resource.

## 12.2 Concept of Human Resource Accounting

Human resource accounting is the process of measuring and reporting the human resources of an organisation. It is the process of providing information about individuals and groups of individuals, within an organisation to decision-makers both inside and outside the organisation. The American Accounting Association's Committee on Human Resource Accounting (1973) defines HRA as "the process of identifying and measuring data about human resources and communicating this information to interested parties". According to Flamholtz. "Human resource accounting may be defined as the measurement and reporting of the cost and value of people as organizational resources. It involves accounting for investments in people and their replacement cost. It also involves accounting for the economic value of people to an organisation."

According Davidson and Weil "it is the process of measuring and reporting the human dynamics of an organisation. It is the assessment of the condition of human resources within an organisation and the measurement of the change in the condition through time."

According to the above definitions, the requirements of HRA are as follows :

- Valuation of human resources.
- Recording of human resources as per accounting principles.
- Disclosure of human resource information in the financial statements.

HRA is the measurement of cost value of people for organisation. HRA is the systematic recording of the transactions relating the value of human resource. The importance of people in the organisation as productive resource was ignored by the management, but now a days it has received increasing attention and widespread interest in developing the system of HRA.

The productivity of a company's investment is known for the rate of return, which is calculated on the basis of physical assets investment only. There is need to find out productivity of investment on human beings in any organisation. It is an effective tool for decision making.

Human resources have certain distinct characteristics from the physical assets like personality, self control, devotion, quality, skill, talent, loyalty, initiativeness etc. It is a basic need of present time to improve productivity, that can be improved by the human force. Hence to encourage, it is necessary to account them and to take progressive decisions for them.

### **12.3 Objectives of HRA**

HRA is basically adopted to treat human resources as assets, to generate human data about human resources, to assign value to human resources and to present human assets in the balance sheet. The following are the main objectives of an HRA system :

1. To furnish cost value information for making management decisions about acquiring, allocating, developing and maintaining human resources in order to attain cost effective organisation objectives.
2. To allow management personnel to monitor effectively the use of human resources.
3. To provide a determination of asset control i.e., whether human assets are conserved, depleted or appreciated.
4. To aid in the development of management principles by classifying the financial consequences of various practices.
5. To recognize the nature of all resources used or cultivated by a firm and improvement of the management of human resources so that the quality and quantity of goods and services are increased.
6. To facilitate the effective and efficient management of human resources.
7. To evaluate the return on investment in human resources.

### **12.4 Need for HRA**

HRA is required to be implemented in the organisation for the following reasons : 1.

The Balance Sheet and Profit and Loss Account of a firm cannot show true and fair view of its affairs unless all resources and assets including human resources are properly shown.

- 2 The expenditure on hiring, training and acquiring experience and efficiency on the human element is huge amount in these days. Firms spend large amount on the training and development of the skilled workers, the technical personnel, the accountants and the managers. It is essential that the true position regarding the nature of this expenditure and its role is prominently highlighted for the benefit of all concerned.
3. Management is required to take important decisions regarding the appointment, promotion, training, internal transfers, work distribution, merit rating, job evaluation, layoff, discharge etc. in respect of its personnel. In the absence of proper accounting data, sometimes the decisions are faulty and the organisation suffers on this account.
4. Employee also is well informed about the investment made by the employer on him and his true value to the organisation, so that he adopts an enlightened attitude when faced with certain important decisions regarding himself and react properly.

5. Strikes, lockouts, go slow, work to rule, absenteeism, high labour turnover rate etc. which plague industry are natural in a system where the human resource are not properly valued and prominently shown in the books. Wastage of human resource and time due to the above would be checked to a large extent if its cost to the different parties is calculated. Such information could also form the basis of wage agreements.
6. Comprehensive manpower inventory is also essential for manpower planning projections regarding the future requirements of manpower and their development within the organisation or hiring from outside will be possible only if proper records are maintained.
7. In the context of the country as a whole, while there is no scarcity of unskilled workers and the inter-firm mobility is also low, there is relative scarcity of skilled and technical manpower like the technicians and engineers, the accountants, the managers etc. Precise estimates of the value of these scarce human resources is essential for their systematic development.

### **12.5 Assumptions of HRA**

The following assumptions which underly HRA :

1. Human resources provide benefits to an organisation in a fashion similar to the manner in which financial and physical resources provide benefits.
2. The benefits associated with both conventional assets and human resources have value to the organisation because these benefits contribute in some way to the accomplishment of the organizational goals.
3. The acquisition of human resources typically involved an economic cost and the benefits associated with such resources can personally be expected to contribute to the economic effectiveness. It follows, therefore, that these benefits are essentially economic in nature and are subject to measurement in financial terms.
4. Since the usual accounting definition of an asset involves the right to receive economic benefits in future, human assets are appropriately classified as accounting assets.
5. It is theoretically possible to identify and measure human resource costs and benefits within an organisation.
6. Information with respect to human resource costs and benefits should be useful in the process of planning, controlling, evaluating and predicting organizational performance.

### **12.6 BENEFITS OF HUMAN RESOURCE ACCOUNTING**

The concept of human resource accounting covers the people who constitute a valuable resource of an enterprise and information on the investment and value of such resources is useful for internal and

external decision-making. Such accounting is of paramount importance to the nation and also to individual organisations. The following are the main benefits of Human Resource Accounting :

1. **Helpful in proper interpretation of Return on Capital Employed :** The human resource accounting will disclose the value of human resources. This will help in proper interpretation of return on capital employed. Such information will give long-term perspective of the business performance which could be more reliable than the return on capital employed based on net profit only.
2. **Improves managerial decision-making :** The maintenance of detailed records relating to internal human resources (i.e. employees), will improve managerial decision-making specially in situations like direct recruitment versus promotion, transfer versus retention, retrenchment or relieving versus retention, utility of cost reduction programme in view of its possible impact on human relations and impact of budgetary control on human relations and organizational behaviour and decision on relocating plants, closing down existing units, developing overseas subsidiaries etc. Thus, the use of HRA will definitely improve the quality of management.
3. **Serves social purpose :** It will serve social purpose by identification of human resource as a valuable asset which will help in prevention of misuse and under use due to thoughtless or rather reckless transfers, demotions, lay offs and day to day maltreatment by supervisors and other superiors in the administrative hierarchy; efficient allocation of resources in the economy; effecting economy and efficiency in the use of human resources and proper understanding of the evil effects of avoidable labour unrest/disputes on the quality of the internal human resources.
4. **Increase productivity :** It will have the way for increasing productivity of the human resources because, the fact that a monetary value is attached to human resources, and that human talent,

devotion and skill considered as valuable assets and allotted a place in the financial statements of the organisation, would boost the morale, loyalty and initiative of the employees, creating in their mind a sense of belonging towards the organisation and would act as a great incentive, giving rise to increased productivity.

5. **Invaluable contribution to humanity.** HRA will be an invaluable contribution for accounting to humanity and it will lead to improve human efficiency while preserving human dignity and honour. For this, a basic change in individual behaviour, attitude and thinking is required. HRA will help in realizing the value of human resources and, thus, will influence the individual behaviour, attitude and thinking in the desired direction.
6. **Essential where the human element is the prime factor.** HRA is absolutely essential in such organisations where human element is the prime factor, e.g., a professional accounting firm, a drama company, a solicitor and attorney firm, an educational institution.
7. **Completes MIS.** Human resource data would create a more complete management information system as it can provide information of vital importance for both short-term and long-term decision-making as well as performance measurement. It will provide adequate basis for decision on allocation of resources e.g., budgeting, capital expenditure decisions and better measurement of resources of an organisation. Performance measurement helps in assessing the strengths and shortcomings of an organisation and helps in making better promotion policies.
8. **For successful operation of an organisation.** The success of an organisation very much depends on the build up of quality work force at all levels. The success stories of BHEL, ITC, Hindustan Lever, Larsen & Toubro and several other enterprises are largely due to the emphasis on human resource development. If this vital asset is not

shown in the balance sheet, to that extent the public and investors are handicapped.

### **12.7 methods of accounting for human resources**

Traditional accounting system treats human resources as current cost and charge such cost as of revenue nature. On the basis of contractual obligation, the organisation, pays only salaries, wages and related fringe benefits for human resources, i.e. what the organisation pays in under normal methods of accounting chargeable to revenue only and no human resource is carried over as asset in the Balance Sheet. The latest thinking on HRA considers such resources as capital items and involving human resources. The following are relevant :

- They render future service that have economic value,
- The value would depend upon how the resources are utilized.

Various management actions such as training, development and technological advances have the effect of conserving, enhancing and depleting the value of human resources. Like the accounting for any other assets, HRA involves :

- Capitalising the human resources and recording them as investments.
- Recording the routine expiration of the resources on the basis of amortisation.
- Record the loss of resources due to obsolescence and labour turnover.
- Valuation of the human resources after adjustments.

From time to time many methods have been suggested for the valuation of human resources. These methods can broadly be classified into Cost Methods and Present Value Methods.

#### **12.7.1 Cost methods**

The HRA methods based upon cost involve computation of cost of human resources to the organisation. The HRA models based upon cost are described as under :

1. Historical Cost Model
2. Replacement Cost Model
3. Opportunity Cost Model
4. Standard Cost Model

**1. Historical or Acquisition Cost Model :** This model is also known as 'Acquisition Cost Model'. This model of accounting of human resources was first initiated by Rensis Likert at R.G. Bary Corporation in Ohio Columbia (USA) in 1967. This model involves capitalization of the actual cost incurred on developing the human resources of the organisation. This historical cost consists of recruitment, selection, hiring training and development etc.

Again historical cost may be categorized into two namely Acquisition cost and Learning costs. Recruitment cost, selection cost, hiring cost and placement costs are the examples of acquisition cost. Training and development costs are examples of learning costs. The sum of such costs for all the employees of the organisation represents the value of the human resources of the organisation.

This value is amortised over the expected length of service of individual employees. The unexpired cost is considered to be the investment in human resources. If an employee leaves the organisation due to resignation, death, dismissal etc., whole of the amount not written off is charged to the current revenue.

Under this method, the actual cost of recruiting, selection, training, developing of an employee are capitalized and written off over the his length of service. If an employee expires or leaves the organisation within his tenure of service the remaining value is charged off against revenue.

**Advantages :** Historical costs based HRA have several advantages. Because they use primarily accounting techniques which have been in common use for many years, this method is relatively easy to develop and apply. In addition management would have little difficulty in understanding the meaning of the information supplied by cost-based systems since the underlying concepts are consistent with those of the conventional (historical) accounting data which management often rely upon. Another important advantage is that the accumulation of the cost of human resources investments in individuals is a much simpler process than attempts to measure the value of these individuals. Thus, historical cost-based approaches avoid some of the behavioural problems which are found in HRA.

Historical cost based HRA would be useful to business managers interested in personnel control, evaluation, and lower labour turnover. The availability of human resource costs bring home to managers the sums of money invested in personnel of the relevant department, and the likely costs of replacing staff by persons of similar competence. This approach can be used in personnel cost control where departments are required to operate under a budgetary system.

**Disadvantages :** Historical cost based HRA has the following disadvantages :

- (i) The principal shortcoming of historical cost approaches relates to the limitations inherent in any accounting system based on historical costs, viz., past costs are not particularly relevant to decisions about the present and the future. Historically cost-based accounting for human resources has serious limitations for decision-making purposes just as it does for financial or physical resources. It can be argued that a balance sheet should reflect the economic value of an organisation's assets and claims thereon, and income measurement should assess the changes in these economic values for specific time periods.
- (ii) The measurement problems in historical cost approaches to HRA can be summarized as follows. *First*, it is necessary to define and identify those items which are, in fact, human resource costs. A *second* measurement problem involves distinguishing between those costs which are to be capitalized and those costs which are to be treated as expenses of the period in which they are incurred. An *additional* measurement difficulty relates to the selection of reasonable procedures for the amortisation of capitalized human resource costs. Although the significance of the measurement problems associated with cost-based systems should not be underestimated, these problems appear to be solvable at least for practical purposes.
- (iii) Historical cost data must always be interpreted carefully keeping in mind the scope and function of the measurement system which has generated the data.

2. **Replacement Cost Model :** This method of valuation of human resources was developed by Eric G. Flamholty on the basis of concept of replacement cost suggested by Rensis Likert. Replacement cost refers to the sacrifice that would have to be incurred to replace resources presently owned or employed. It is the measure of the cost to replace a firm's existing human assets. These costs consist the cost of selecting, recruiting, hiring, training, placing and developing new employees to reach the level of competence of the existing employees.

It has the advantage of adjusting the employee value to the current market value. This approach is regarded as, "a good surrogate for the economic value of the asset in the sense that, market considerations are essential in reaching a final figure. Such a final figure is also generally intended to be conceptually equivalent to a notion of a person's economic value."

This method is based on current value or replacement cost. Under this system, an organisation values an employee at the estimated cost of replacement with a new

employee of equivalent ability. The application of such a method, however, is made difficult by the problems of defining and measuring replacement costs.

In the context of human resources, it refers to the cost that would have to be incurred to replace human resources presently employed. Flamholty has referred to two different concepts of replacement cost viz, Individual replacement cost and Positional replacement cost.

(a) **Individual Replacement Cost :** The replacement cost of individuals in an organisation as conceptualised by Flamholty comprises of :

(i) The present estimated cost of hiring, training and developing individuals upto the normal level of productivity of the existing individuals, i.e. it includes the basic cost elements like :

- Recruiting outlay cost
- Acquisition cost
- Formal training and orientation cost
- Informal training cost
- Efficiency recovery cost
- Extra supervision cost
- Familiarisation cost
- Cost of lost productivity during training
- Investment building experience cost
- Development cost
- Others

(ii) Costs associated with moving the existing position holders either out of the organisation or to new positions within the organisation, i.e.

- The cost of carrying a vacancy until a suitable replacement can fill it i.e. likely cost of contribution during the period when vacancies remain unfilled.
- Cost of moving and displacement.
- Loss of productivity of the employees and their co-workers prior to their separation.

**The effect of a vacant position on other employees.**

(b) **Positional Replacement Cost :** Besides the assessment of replacement cost of individuals, such a cost item may be estimated with reference to different positions in an organisation rather than specific individuals to be referred to as positional replacement cost. It may be difficult to identify a suitable replacement of an individual employee in an organisation. One good design engineer may be produced from a batch of thirty graduate trainee engineers after twenty years. Recognising this fact, Flamholtz has introduced the concept of marginal value of replacement cost and full replacement cost.

The marginal value replacement cost has been defined as the summation of :

- (i) The cost to recruit one person at the entry level.
- (ii) The cost to select one person at the entry level.
- (iii) The cost to develop one person at each intermediate level.
- (iv) The separation cost for one person at the critical level.

The full replacement cost refers to the summation of all such cost elements not for only one person but for number of persons as needed so as to make available the replacement for one individual.

**Limitations :** The following are the limitations of Replacement Cost Models :

- This model claims to incorporate the current value of company's human resources in its annual accounts at the year end. However its utility in actual practice is limited as

it is very difficult to find exact replacements for individuals as no two human beings are alike in terms of abilities.

- The estimation of the replacement cost of individuals or the rebuilding cost of human organisation would be based on the best judgment of the managers rather than facts and figures, thus being subjective in nature, may not be acceptable to the traditional accountants.
- The replacement cost of individuals may affect their behaviour significantly and might feel themselves indispensable, leading to subsequent increase in the cost of retaining them.
- Decrease in the rebuilding cost of human organisation may also be cause of concern for the employees.
- Market imperfections may make the replacement of an individual having specific skill more costly. Moreover, costs are escalated due to inflationary conditions and other influencing factors like union agreements, government legislations and external labour market situations.
- An increase in the capitalized value due to increase in replacement/rebuilding cost may reflect spurious organizational profit primarily attributable to the operational inefficiency, the effects of inflation, external factors and constraints whereas a decrease in the cost reflect apparent loss due to operational efficiency and better management of the human resource.

3. **Opportunity Cost Model** : This model of HRA seeks to measure the value of human resources on the basis of economic concept of opportunity cost. This model was proposed by Hekimian and Jones to overcome the limitations of replacement cost model. This model is also known as 'Competitive Bidding Model'.

It attempts to estimate the value of human resources by establishing an internal labour market in an organisation through the process of competitive bidding. Under this model, all managers of profit centres are encouraged to bid for any scarce employee they want. This is largely artificial method involving the concept of the competitive bidding process. In competitive bidding process, the opportunity cost of an employee or group of employees in one department is calculated on the basis of the bids (offers) by other departments for those employees. Thus the value of human resource is determined on the basis of the value of an individual employee in alternative use.

Under this system, profit center managers are encouraged to bid for scarce employees, the successful bid being included in the organisation's human investment calculations.

Employee abilities are related to profit generation, and may lead to a more efficient allocation of human resources. The employee is allotted to the highest bidder among the divisional managers and the bid price is included in that division's investment base. The maximum bid price may go to the extent of the capitalized value of extra profits likely to be generated by the ability and competence of the executives.

**Example I :** XYZ Ltd. has a capital base of Rs.10,00,000 and it earned profits of Rs.1,00,000. The return on investment of the same group of firms is 12%. If the services of a particular Engineer are required, it is expected that the profits will raise by Rs.30,000 over and above the target profit.

$$\text{Capitalised value of Rs.30,000 at 12% rate of return} = 30,000 \times \frac{100}{12} = \text{Rs.2,50,000}$$

Limit upto which the company may bid for an Engineer	=
Rs.2,50,000	
New Capital base	$= 10,00,000 + 2,50,000 =$
Rs.12,50,000	
Required rate of return on new capital base	$= 12,50,000 \times 12/100 =$
Rs.1,50,000	
Profit generated at old capital base	$= \text{Rs.}$
1,00,000	
Additional profit generated by the Engineer	$= 1,50,000 - 1,00,000 = \text{Rs.50,000}$

Therefore, the maximum bid can go upto the capitalized value of additional profit of Rs. 4,16,667 (i.e.  $50,000 \times 100/12$ ).

**Advantages :** The advocates of this approach claim that this bidding process is helpful in :

- More optimal allocation of human resources, and
- Planning, developing and evaluating human resources of a business as it provides a quantitative base for decision making.

**Limitations :** The following are the limitations of Opportunity Cost Model :

- It excludes the value of employees who can be readily hired. In other words, it does not consider those employees as an asset who are not scarce.
- A person specialized in one type of work and having no alternative work may get zero valuation.
- It would mislead the information collected on the basis of whole organisation.

4. **Standard Cost Method :** This approach was given by David Watson. In this method the standard cost of recruiting, hiring, training and development is accumulated every year for each grade of employees. However, this method is found to be suitable for control purposes and variance analysis, it has also the disadvantage of amortisation etc.

### 12.7.2 Present Value Models

The present value models use capital budgeting techniques to assess human resources, the argument being that the value of firm's employees is their discounted future earnings. Present Value methods try to measure economic value rather than simply record investment in human resources at historic or replacement cost.

Present value models seek to measure the value of human resources on the basis of present value of the services to be generated by the employees of an organisation in future. The following two approaches have been suggested for this purpose :

- By discounting the future salaries and employee related capital costs (such as cost incurred on recruiting, training and developing employees) by a certain rate of discount, and
- By discounting the future earning of an organisation at a certain date by a suitable rate and allocating a part of such present value to human resources.

Based upon these premises the following HRA models have been developed :

1. Lev and Schwartz Model
2. Hermanson's Models
3. Stochastic Rewards Valuation Model
4. Jaagi and Lau Model
5. Morse Model
6. Chakraborty Model
7. Dasgupta Model

**I. Lev and Schwartz Model.** This model has been developed by Brauch Lev and Aba Schwartz in 1971. They are of the opinion that determination of the total value of a firm's labour force is a straight forward extension of the measurement procedure of an individual value to the organisation. This model is also known as 'Present Value of Future Earning Model'. The model is a salary based model. It is based on certain assumption. One of the most important assumption is that the employee will not leave the organisation till retirement. The aggregate present value of different groups represents the capitalized future earnings of the firm as a whole. They have advocated the use of cost of capital rate for the purpose of capitalizing the present value of the future earning of the employees. According to them, the value of human capital represented by a person of age 'X' is the present value of his remaining future earnings from his employment. They have given the following formula for calculating the value of an individual :

$$V_r = \sum \frac{I(t)}{1+R^r}$$

Where

$V_r$	=	the value of an individual $r$ years old
$I(t)$	=	the individual's annual earnings upto the retirement
$t$	=	retirement age
$R$	=	discount rate

However, the model suffers from the following limitations :

**(i) A person's value to an organisation is not determined entirely by the person's inherent qualities, traits and skills but also by the organizational role in which the individual is placed. Moreover, the individual's skill and knowledge are not valuable to an organisation in an abstract form. They are valuable only when such qualities serve as a means to achieve the organizational goals.**

- (ii) The model ignores the possibility and probability of an individual leaving the organisation for reasons other than death or retirement. People may leave the organisations for a variety of reasons.
- (iii) It fails to correctly evaluate the team work involved. Team work is something more than the sum of the values of individuals. The valuation does not reflect the contribution of the team as a whole.

(iv) This model ignores security, bargaining capacity, skill and experience etc. which may affect the payment of higher or lower salaries. Again salaries paid to the employees may not reflect the real worth of the employees to the organisation.

2. **Hermanson's Models** : Roger H. Hermanson has suggested two models for the measurement of human resources : (i) Unpurchased Goodwill Model, and (ii) Adjusted Discounted Future Wages Model.

### **(i) Unpurchased Goodwill Model**

Under the model, it is argued that super normal profits in a firm are the indicators of presence of human resources. The model requires computation of the ratio of net income after taxes (EAT) to total assets (excluding human assets) of each firm. This in turn is compared with the ratio for the industry as a whole. The value of human resources of a firm is then measured with the help of differential rates.

In this the value of human assets of an organisation may be calculated by capitalising earnings in excess of normal earnings for the industry or the group of companies of which the firm is a part. It has been assumed that the excess profit earned by the concern is due to the extra ability of employees.

**Example 2 :** The investment made in ABC Ltd. is Rs.5,00,000. The normal earnings are 10%. The company is earning at the rate of 15%.

Company's actual earnings	(5,00,000 x 15/100)	Rs. 75,000
Less : Normal earnings	(5,00,000 x 10/100)	Rs. 50,000
Excess earnings		
Capitalised value of excess earnings (25,000 x 100/15)		Rs. 25,000
		Rs. 1,66,667

Therefore, the capitalized value of excess earnings i.e. Rs.1,66,667 is the value of human assets under this model.

### **(ii) Adjusted Discounted Future Wages Model**

This model uses compensation as a surrogate measure of a person's value to the firm. Compensation means the present value of future stream of wages and salaries to employees of the firm. The discounted future wages stream is adjusted by an 'efficiency ratio' which is weighted average of the ratio of the return on investment of the given firm to all the firms in the economy for a specified period, usually the current year and the preceding four years. The weights are assigned in the reverse order i.e., 5 to the current year and 1 to the proceeding fourth year. The following formula is used :

$$\begin{array}{ccccccc}
 & & \text{RF(0)} & \text{RF(1)} & \text{RF(2)} & \text{RF(3)} & \\
 \text{RF(4)} & & & & & & \\
 \text{Efficiency Ratio} & = & 5 & \text{-----} & + 4 & \text{-----} & + 3 & \text{-----} & + 2 & \text{-----} \\
 + & & & & & & & & & \\
 & & \text{RE(0)} & \text{RE(1)} & \text{RE(2)} & \text{RE(3)} & \\
 & & \text{RE(4)} & & & & \\
 \end{array}$$

Where,

RF(0) = Rate of accounting income on owned assets of the firm for the current year.

RE(0) = Rate of accounting income on owned assets of all the firms in the economy for the current year.

RF(4) = Rate of accounting income on owned assets of the firm for the fourth previous year.

RE(4) = Rate of accounting income on owned assets of all the firms in the economy for the fourth previous year.

The efficiency ratio measures the rate of effectiveness of the human resources operating in the given entity over a five year period. A ratio greater than one implies that the rate of return of the firm is above the average rate of return for all firms in the economy. The efficiency ratio has been criticized by certain authors as subjective because of arbitrary weighting scheme and restricting the valuation period to five years only.

The main drawback of the approach is the subjectivity in the method of calculation of efficiency ratio. While calculating the efficiency ratio, Hermanson assumed that the performance of the firm was entirely due to the efforts of employees and not due to any other extraneous cause.

**Stochastic Rewards Valuation Model :** This model has been suggested by Flamholtz. It identifies the major variables that determine an individual's value to an organisation, i.e., his expected realizable value. The expected realizable value of an individual is the present worth of future services expected to be provided during the period he is expected to remain in the organisation. The model is based on the presumption that a person's value to an organisation depends upon the positions to be

occupied by him in the organisation. The movement of people from one organizational role to another is stochastic process with rewards. As people move and occupy different organizational roles, they render services (i.e., rewards) to the organisation. However, the roles they will occupy in future will have to be determined probabilistically for each individual. The model suggests a five steps approach for assessing the value of an individual to the organisation :

1. Forecasting the period a person will remain the organisation i.e., his expected service life.
2. Identifying the services states, i.e., the roles that he might occupy including, of course, the time at which he will leave organisation.
3. Estimating the value derived by the organisation when a person occupies a particular position for a specified time period.
4. Estimation of the probability of occupying each possible mutually exclusive service state at specified future times.
5. Discounting the value at a predetermined rate to get the present value of human resources.

**4. Jaggi and Lau Model :** The model suggested by Jaggi and Lau is based on valuation of groups rather than individuals. A group implies homogeneous employees who may or may not belong to the same department or division. It might be difficult to predict an individual's expected service tenure in the organisation or at a particular level or position, but on a group basis it is easier to ascertain the percentage of

people in a particular group likely either to leave the firm during each of the forthcoming period, or to be promoted to higher levels.

In order to consider the role movements of employees within the organisation a Markov Chain representation can be used. The model required the determination of Rank Transitional Matrix and the expected quantities of services for each rank of service. The matrix can be prepared from the historical personnel records of the employees available in the organisation. For the purpose of measurement of quantities of services, a certain service or performance criteria is used.

The value of the services an organisation's current employee render in a future period is computed by multiplying the estimated number of current employees that will be in each service state in that period, by the value of the services an employee in each state (i.e. rank) renders to the organisation.

The equation for the computation of value of human resources of an organisation using Jaggi and Lau model is given below :-

$$TV = (N) r n (T) n (V)$$

Where,

TV = Column vector indicating the current value of all current employees in each rank.

(N) = Column vector indicating the number of employees currently in each rank.

n = Time period

r = Discount rate

(T) = Rank transitional matrix indicating the probability that an employee will be in each rank within the organisation or terminated in the next period given his current rank.

(V) = Column vector indicating the economic value of an employee of rank 1 during each period.

The model given by Jaggi and Lau tries to simplify the calculations of the value of human resources by taking groups of employees as valuation base. However this method is also difficult to apply in practice because of difficulty in obtaining reliable data.

This model suggests valuation of human assets on a group basis rather than on an individual basis. In this model 'group' means a homogeneous group of employees who may not necessarily be working in the same department. It is difficult to estimate the future period of stay and chances of promotion on an individual basis.

**5. Morse Model :** Under it the value of human resources is equivalent to the present value of the net benefits derived by the enterprise from the service of its employees. The following steps are involved under this approach :

- a) The gross value of the services to be rendered in future by the employees in their individual and collective capacity.
- b) The value of direct and indirect future payments to the employees is determined.
- c) The excess of the value of future human resources (as per (a) above) over the value of future payments (as per (b) above) is ascertained. This represents the net benefit to the enterprise because of human resources.
- d) By applying a predetermined discount rate (usually the cost of capital) to the net benefit, the present value is determined. This amount represents the value of human resources to the enterprise.

**6. Chakraborty Model :** This model also known as Aggregate Payment Model has been suggested by Prof. S.K. Chakraborty, the first Indian to suggest a model on human resources of an enterprise. In his model, he has valued the human resources in aggregate and not on an individual basis. However, managerial and non-managerial manpower can be evaluated separately. The value of human resources on a group basis can be found out by multiplying the average salary of the group with the average tenure of employment in that group. The average annual salary payments for next few years could be found out by salary structure and promotion schemes of the organisation.

He has further suggested that the recruitment, hiring, selection, development and training cost of each employee can be recorded separately. These could be treated as deferred revenue expenditure to be written off over the expected average stay of the employee in the organisation. The deferred portion should be shown in the position statement of the organisation. If there is a permanent exist on account of death, retrenchment etc. then the balance on deferred revenue expenditure for that year attributable to that person should be written off against the income in the year of exist itself.

The discount rate for the purpose of ascertaining the present value of estimated payments in the future should be taken as the expected average after tax return on capital employed over the average tenure period. He suggested the adoption of such a long-term rate to avoid fluctuations in human asset valuation from year to year simply due to changing rates of return.

**7. Dasgupta Model :** Prof N. Dasgupta (1978) suggested this approach. The various approaches (discussed in the previous pages) take into account only those persons who are employed and ignore those who are unemployed. According to him both employed and unemployed persons should be brought in its purview for determination of the value of human resources of the nation. Thus, for the preparation of the balance sheet of the nation, the system should be such so that it fits and shows the human resources not only a firm but also of the whole nation.

According to him, the total cost incurred by the individual up to that position in the organisation should be taken as the value of a person which is further adjusted by his intelligence level. It will include not only all expenses incurred by the individual for his education and training but also by the organisation on recruitment, training, familiarizing and development human beings employed in the organisation. The valuation can be done groupwise, if the number of employees is large. The value thus, determined should be further adjusted at the end of each year by

organisation on the basis of his age, seniority, status, performance, experience, leadership, managerial capabilities etc. The psychologists and other concerned experts will be helpful for such measurement. The revised value would be the value of the employee at the end of the year.

Theoretically this model may be sound but its practical application may be difficult as it will involve a number of factors which may not be capable of being expressed precisely and objectively in monetary terms.

Human resources valued according to this model should be shown both on the assets and liabilities sides of the balance sheet. On the assets side it should be shown after the fixed assets as Human Assets classified into two parts : (i) value of individual (ii) value of firm's investment. On the liabilities side, it should be shown after the capital as Human Assets by the amount at which it has been shown on the assets side against the value of individuals. This will be more clear from the following example.

**Example 3 :** A firm has started its business with a capital of Rs. 5,00,000. It has purchased fixed assets worth Rs. 2,50,000 in cash. It has kept Rs. 1,30,000 as working capital and incurred Rs. 1,20,000 on recruitment, training and developing the engineers and a few workers. The value of engineers and workers is assessed as Rs. 4,00,000. Show these items in the Balance Sheet.

**BALANCE SHEET**  
(including Human Resources)

Liabilities	Rs.	Assets	Rs.
Capital	5,00,000	Fixed Assets	2,50,000
Human Assets	4,00,000	Human Assets : (i) Individual Value (ii) Value of Firm's Investment	4,00,000 1,20,000
		Current Assets	

		Less : Current Liabilities	1,30,000
	9,00,000		9,00,000

### 12.8 Requirements under the Companies Act

At present, companies in India are expected to furnish information relating to their employees such as name, age, qualification, designation and nature of duties, remuneration, date of commencement of employment, experience as per Section 217(2A) of the Indian Companies Act, 1956, read with the Companies (Particulars of Employees) Amendment Rules, 1988 forming part of the Director's Report.

The particulars provided by companies relating to their employees are only specific in nature. In other words, details of remuneration drawn by the managerial employees alone are shown in the annual reports and the details of remuneration of non-managerial personnel are not shown.

The provisions includes only those employees whose remuneration falls within certain specified limits. Moreover, only those companies who have their employees drawing remuneration in excess of the specified limits had to give an account of such details as required under section 217(2A) of the Companies Act, 1956.

### 12.9 Recording and Disclosure in Financial Statements

The various models dealing with the mode of valuation of human resources as an asset have been explained. In India Human Resource Accounting has not been included so far as a system. India Companies Act, 1956 does not provide any scope for furnishing any significant information about human resources in financial statements. Beyond it, there is no rigid instruction on behalf of the Companies Act, 1956 to attach information about the value of human resources and the results of their performance during the accounting year in notes and schedules. In India, a growing trend towards the measurement and reporting of human assets, particularly in the public sector, is noticeable during the past few years. There are about twelve companies in India which have adopted the concept of human resource accounting so far. The data of only four companies is compatible for comparison. The companies are :

- (i) **Bharat Heavy Electrical Limited (BHEL)**, which is the first Indian company to publish human resource accounts from 1974-75 onwards and is one of the FORTUNE 500 companies listed outside U.S.A.

- (ii) **Steel Authority of India Ltd. (SAIL)**, which is a holding company consisting of five integrated steel plants and two alloy steel units in the public sector.
- (iii) **Minerals and Metals Trading Corporation (MMTC)**, which is the biggest trading organisation in India.
- (iv) **Southern Petrochemical Industries Corporation Ltd. (SPIC)**, which is one of the biggest diversified organisations in the Joint Sector, producing fertilizers, chemical, electronic etc.

Most of the Indian enterprises observed Lev and Schwartz model in the sense that they have computed the present value of future direct and indirect payment to their employees as the basic frame work of human resource valuation.

## **12.10 PROBLEMS AND LIMITATIONS OF HRA**

No doubt HRA can provide valuable information both for management and outsiders, yet its development and application in different industries and organisations has not been very encouraging. This accounting concept is not popular like social accounting because it may not result in providing immediate and tangible benefits and on account of the fact of lack of consensus among accountants and other concerned about the basis of measurement of the value of human resources. The reluctance on the part of the organisation to introduce the HRA system can be attributed to the following :

1. There are no specific and clear-cut guidelines for finding cost and value of human resources of an organisation. The existing valuation system suffers from many drawbacks.
2. The life of human resources is uncertain and therefore, valuing them under uncertainty seems unrealistic.
3. There is a possibility that HRA may lead to dehumanizing and manipulations in employees. For example, a person having a low value may feel discouraged and thus, in itself, may affect his competency in work.
4. The much needed empirical evidence is yet to be found to support the hypothesis that HRA, as a managerial tool, facilitates better and effective management of human resources.

5. Human resources, unlike physical assets, are not capable of being owned, retained and utilized at the pleasure of the organization. Hence, treating them as 'asset' in the strict sense of the term, could not be appropriate.
6. There is a constant fear of opposition from the trade unions. Placing the value on employees would prompt them to seek rewards and compensation based on such valuation.
7. Tax laws do not recognize human beings as assets. So human resource accounting has been reduced to a merely theoretical concept.

### **12.11 summary**

Human resource accounting (HRA) is the art of valuing recording and presenting systematically the work of human resources in the books of accounts of an organization. The objectives of HRA is to inform the general public about human capital measures taken by the enterprises and their effect on the human resources. HRA is helpful in proper interpretation of return on capital employed, improves managerial decision making increase productivity, serves social purpose, helps in investment decisions, creates a complete management information system and leads to improve human efficiency several methods for valuation of human resources have been developed and can be broadly classified into cost models and Present Value Models. HRA models based upon cost methods involve computation of cost of human resources to the organization while present value methods use capital budgeting techniques to assess human resources. Sourer companies in India have adopted these models after modifications to suit Indian conditions. The absence of general acceptance of the measurement criteria for valuation of human resources would prove to be an impediment towards its wider adoption. However, as more experience is gathered in the use of various models, it is expected that in the year to come corporate reporting practices will ascribe greater importance to this emerging diversion of accounting.

### **12.12 Self Assessment Questions**

<ol style="list-style-type: none"> <li>1. What do you mean by Human Resource Accounting ? Give the objectives of this system.</li> </ol>
<ol style="list-style-type: none"> <li>2. Discuss the different methods of Human Resource Accounting. Which one of them will you recommend for adoption in India under the prevailing circumstances ? Give reasons.</li> <li>3. In what way HRA information would be useful to management ?</li> <li>4. Give the main problems and limitations of Human Resource Accounting.</li> <li>5. Compare Lev and Schwartz model with Flamholtz model of measuring human resources. Discuss their short comings.</li> </ol>

### **12.13 SUGGESTED READINGS**

1. American Accounting Association's Committee on Human resource Accounting, The accounting Review Supplement
2. Bikki Jaggi and H S Lau, Towards a model for Human Resource Valuation, Accounting Review
3. E G Flamholtz, The impact of Haryana Resource Valuation on Management decisions, Accounting, Organizations and Society.
4. E C Flamholtz, Human Resource accounting, Dickenson Publishing Co., Clifornia
5. American Accounting Association, report of the committee on accounting for Human resources, The Accounting review Supplement.
6. Roger H Hermanson, Accounting for Human Assets, Michigan State University, Michigan

<b>Course</b>	<b>:</b>	<b>Management Accounting</b>	<b>Writer</b>	<b>:</b>	<b>Dr. M.C. Garg</b>
<b>Course Code</b>	<b>:</b>	<b>MC-105</b>	<b>Vetter</b>	<b>:</b>	<b>Dr. B S Bodla</b>
<b>LESSON-13</b>					

## **SOCIAL ACCOUNTING**

**Objective :** The objective of the present lesson is to discuss the concept, objectives, scope approaches, benefits and limitations of Social Accounting.

### **LESSON STRUCTURE**

- 13.1 Introduction
- 13.2 Meaning of Social Accounting
- 13.3 Objectives of Social Accounting
- 13.4 Need for Social Accounting
- 13.5 Uses of Social Responsibility Accounting
- 13.6 Scope of Social Accounting
- 13.7 Social Benefits and Social Costs
- 13.8 Measurement of Social Costs and Benefits
- 13.9 Approaches in Social Accounting
- 13.10 Benefits of Social Reporting
- 13.11 Limitations of Social Reporting
- 13.12 Social Disclosure Practices in India
- 13.13 Summary
- 13.14 Self Assessment Questions
- 13.15 Suggested Readings

#### **13.1 introduction**

Conventional financial accounting primarily focuses on the measurement and reporting of business transactions between two or more business firms. Financial statements prepared under financial accounting are basically meant to serve the needs of shareholders and potential investors in making sound economic decisions. Exchanges between a firm and its social environment are practically ignored. The conventional financial reporting system is designed to gather, process and report financial results and operating statistics with no regard to social performance information of business enterprises. This nature of financial accounting has led to, in recent years, a serious debate that business activity should conform to socially, desirable ends, e.g., that products should not be harmful to users, the pursuit of profit should be constrained by social considerations; the environment should be protected from industrial malpractices in the form of pollution of every kind; and employees should have a right to security of employment. As business enterprises respond to pressures of new dimension—social, human and environmental—they may not necessarily change their basic (business) goals, but they will alter them to reflect the new constraints to be satisfied.

American Accounting Association Committee on Measurement of Social Costs has emphasized on operational objectives for the corporate enterprises such as increase in annual profit by 8 per cent, an increase in sales by 20 per cent, a reduction in pollution levels by 30 per cent and an employee mix that reflects the mix of minorities in communities where plants are located. Recently a study conducted by Spicer concludes that the most profitable, larger companies, in general, were judged by

investors to be less risky in terms of both total and systematic risk. In addition, these companies were awarded generally higher price-earnings ratios than those with poorer pollution-control records. Social accounting is based on the following hypothesis : “The technology of an economic system imposes a structure on its society which not only determines its economic activities but also influences its social relationships and well-being. Therefore, a measure limited to economic consequences is inadequate as an appraisal of the cause-effect relationships of the total system; it neglects the social effects.”

### **13.2 MEANING OF SOCIAL ACCOUNTING**

The term ‘social accounting’ is of recent origin and many other terms like, ‘social audit’ ‘socio-economic accounting’, ‘social cost benefit analysis’, ‘report on corporate social policies’, ‘social information system’, ‘social accounting’, ‘social responsibility accounting’ etc. are often interchangeably used for this. Now –a –days it is being realized that commercial evaluation of business units is not sufficient to justify commitment of funds to a business unit. Rather evaluation will be complete only if it takes into consideration social cost and benefits associated with them.

In order to gain understanding of the term social accounting, various points of view given by some eminent accounting authorities are reproduced below:

Ralph Eates defines the term as “The measurement and reporting, internal and external, of information concerning the impact of an entity and its activities on society”.

Elliot uses the term social responsibility accounting which, according to him, “is a systematic assessment of and reporting on those parts of a company’s activities that have a social impact. Social responsibility accounting, therefore; describes the impact of corporate decisions on environment pollution, the consumption of non-renewable resources, and ecological factors; on the rights of individuals and groups; on the maintenance of public services; on public safety; on health and education and many other such social concerns.”

According to G.C. Maheshwari, social accounting is “identification, measurement, recording and reporting of corporate activities which may permit informed decision-making with respect to social activities of the firm having direct or indirect effect on the very fabric of the society at large, while ‘social audit’ would mean enquiry into the corporate social accounting records by an outside agency that can opine with a view to attestation and authentication of such records and reports.”

It can be said that social accounting is rational assessment of and reporting on some meaningful, definable domain of a business enterprise’s activities that have social impact.

### **13.3 Objectives of Social Accounting**

The objective of social accounting is to inform the general public about social welfare measures taken by the enterprise, and their effects on the society. How far the enterprise is successful in fulfilling the social obligations, also comes to light through social accounting. The eminent objectives of social accounting are as follows :

- To know the contribution of individual firms towards the society.
- Through social accounting, firms strategies and practices that directly affect relative resources can be determined.
- Relevant information on firm’s goals and policies is made available to general public.

- Social accounting aims at development of models of quantification and proper presentation of social costs and benefits of an enterprise.

#### **13.4 Need for Social Accounting**

The practice of social accounting is followed only by a handful of enterprises in public sector. There is a greater need for social accounting in a developing economy is needed for the following reasons :

- The management fulfils its social obligations and informs its members, the government and the general public.
- The management responds through social accounting to the criticisms leveled by hostile media and voluntary social organisations.
- There are certain legal obligations that have to be fulfilled by the business, such as social security obligations and welfare measures etc. The management informs the public and government about its efforts in this regard through social accounting.
- The management gets feedback on its efforts and policies aimed at the welfare of the society.
- Social accounting is necessary from the view point of public interest groups, social organisations and government bodies.
- Through social accounting the company proves itself that it is not a society unethical in view of moral cultures and environment degradation.

#### **13.5 Uses of Social Responsibility accounting**

Social responsibility information about business enterprises is mainly useful to internal users (management), external users (shareholders and other investors), and in influencing the share prices of a company.

#### **Internal Users**

Within a company, the greatest need and the greatest demand for social responsibility information comes from top management, or board of directors. Top management, especially the chief executive officer, needs social performance information to respond to a critical press, to answer shareholders' questions, and to ensure that company policies are followed. Corporate directors, especially because of their

growing legal liability, need to know in some detail what sort of social programmes the company is having, and what result it is getting. Directors also need complete information about the effects of the company on society; it is probably more important that they be fully informed as to negative effects, since this is where the criticism will be directed and this is where the directors may have to defend themselves. Labour unions can also be expected to seek social performance information about their companies.

### **External Users**

The external users' demand for social accounting information is even more diverse. Social accounting and reporting are needed by present and potential investors, by large institutions and individuals. Some studies conducted in this area show the impact of social disclosure on investment decisions. In a survey of institutional investors, Longstreth and Rosenbloom found that 57 per cent of the respondents indicated that they considered social factors in addition to economic factors when making investment decision.

### **Impact on Share Prices**

The disclosure of social information helps investors in studying the negative effects of social awareness expenditures on earnings per share alongwith any compensating positive effects that reduce risk or create greater interest from a particular investment. Between firms competing in the capital markets those perceived to have the highest expected future earnings in combination with the lowest expected risk from environmental and other factors will be most successful at attracting long term funds. Others believe that 'ethical investors' form a clientele that responds to demonstrations of corporate social concern. Investors of this type would like to avoid particular investments entirely for ethical reasons and would prefer to favour socially responsible companies in their investment decisions.

### **13.6 Scope of Social Accounting**

Brummet has identified five possible areas in which corporate social objectives may be found :

1. Net income contribution
2. Human resource contribution
3. Public contribution
4. Environmental contribution
5. Product or service contribution

#### **1. Net Income Contribution**

The term 'contribution' includes both benefits and costs associated with an organization's activities. Implicit in this definition of the scope of corporate social responsibility are a variety of users having different purposes in using accounting information.

The growing attention which other social objectives are receiving does not reduce the importance of the income objective. A business organisation can not survive without an adequate financial surplus. The recognition of the importance of other social objectives does not diminish the importance of the income objectives. On the contrary, it adds meaning to the significance of corporate net income by drawing attention to the circumstances under which it has been produced. In this sense, there is a clear correlation between income and other objectives. The failure to recognize a social responsibility may well affect the organization's income performance either in the short term or the long term. Thus, excessive hours of work under bad working conditions may damage the ability of workers to maintain the level of

output. Failure to pay adequate attention to the quality of the products and customer's reactions to poor product quality may ultimately affect sales and income. For this reasons, many would argue that the income objective is the complete test of business efficiency, both as regards financial and social goals.

## **2. Human resource contribution**

This contribution reflects the impact of organizational activities on the people who constitute the human resources of the organisation. These activities include; recruiting practices; training programmes; experience building; job rotation; job enrichment; wage and salary levels; fringe benefit plans; management-union relations; employee skills; employee knowledge; employee attitudes; employee self-actualization; congruence of employee and organizational goals; mutual trust and confidence; job security, stability of work force, lay-off and recall practices; transfer and promotion policies; occupational health; freedom from undue stress; on-the-job physical environment, and on-the-job safety.

## **3. Public contribution**

This area considers the impact of organizational activities on individuals generally outside the organisation. For example, general philanthropy—contributions to educational, cultural, or charitable organisations; financial or manpower support for public transportation; health services, urban housing, day-care centres, minority business, community problem solving, minority group programmes and general volunteer community activities; equal opportunity employment practices; training and employment of handicapped persons; and taxes paid.

The contribution which corporate enterprise may make towards the public good are generally overlooked in the debate on social accounting. It should be noted, for example, that the creation of jobs

and the provision of employment are important public contributions, as well as the development of local services which often accompanies corporate expansion into a community. The training and employment of the handicapped is an important corporate social contribution.

#### **4. Environmental contribution**

This area involves the environmental aspects of production, covering the use of resources, the production process and the product itself, including recycling and other positive environmental activities. Attention has been drawn in recent years to the negative aspects of organizational activities such as the pollution of air and water, noise, and spoiling of the environment. Moreover, industrial activities lead to a net use of irreplaceable resources and a net production of solid wastes.

Corporate social objectives are to be found in the abatement of these negative external social effects of industrial production, and in adopting more efficient technologies to minimize the use of irreplaceable resources and the production of waste.

#### **5. Product or service contribution**

This area concerns the qualitative aspects of the organization's product or service, for example, product utility, product life-durability, product safety, serviceability as well as the welfare role of the product or service. Moreover, it includes customer satisfaction, truthfulness in advertising, completeness and clarity of labeling and packaging. Many of these considerations are important already from a marketing point of view. It is clear, however, that the social responsibility aspect of the product contribution extends beyond what is advantageous from a marketing angle.

#### **13.7 Social Benefits and Social Costs**

Corporate social accounting and reporting focuses, primarily, on the measurement and reporting of social benefits and costs arising due to social responsibilities and activities of business enterprises. It is necessary to know what social benefits and costs are associated with such social responsibilities and activities.

#### **Social benefits**

Generally speaking, the term 'social benefits' includes the following benefits :

- 1. Products and services provided** – Business enterprises generally provide products and services; these are purchased by customers, which provides *prima facie* evidence of benefit to society. The starting point for valuing such benefits is the exchange prices usually arrived

at in response to demand and supply factors. In other words, an automobile that sells for Rs. 1,00,000, presumably, is expected to provide to the purchaser, one element of social benefit having a present value of at least Rs. 1,00,000. Included in this category of benefits are facilities, equipment, and space provided to other elements of society, for which rent is received.

Care must be exercised, however, to value only direct effects from the products and services provided. Suppose that the automobile referred to above provided the purchaser utility having an estimated present value of Rs. 1,20,000, and that in turn used the auto to provide free transportation to and from work for several neighbours, resulting in additional benefits to the neighbours (but not to the owner) estimated to Rs. 15,000. The amount to be reported by the selling firm, including Rs. 20,000 in consumer surplus, would be Rs. 1,20,000 not Rs. 1,00,000 or Rs. 1,35,000 (the automobile owner could report social benefits provided of Rs. 15,000). Significant indirect effects should be reported in footnotes, but not integrated into the model, since they are not actually provided by the reporting entity.

2. **Payments to other elements of society** – Companies render benefits to various elements of society as they pay for goods and services used. The value of employment provided should be separately disclosed; that is, payments to employees represent a social benefit in the amount of money transmitted to such employees and made available for their use. Since the value of human services used is separately reported as a social cost, compensation that is less than the value of services used results in a lower net social surplus (or greater social deficit). Other significant payments included in this section include loans, contributions, dividends, interests, taxes, and assessments. It should be noted that the benefit provided by a firm disbursing money is the money itself; what the recipient entity does with that money should be credited to that separate entity. In this case significant indirect effects might be reported in a footnote but should not be integrated into the model.
3. **Additional direct employee benefits** – The value of most fringe benefits should be reported in this category, e.g., the value of experience provided, training programmes, special opportunities provided, and rewarding work that provides utility to the employee over and above the monetary remuneration.
4. **Staff, equipment, and facility services donated** – When business firms make available their officers and employees to other organisations, benefits are provided separate from the compensation paid to the employees. These benefits might be estimated at the cost that would have been incurred by the outside organisation if it had hired persons with the qualifications required.

5. **Environmental Improvements** – When companies provide clean areas, plant trees, landscape eroded terrain, and clean polluted lakes, benefits accrue to society. The company is charged for the social costs of environmental damage done, hence it should receive credit for benefits provided through restoration of a previously damaged environment. Valuation is difficult for these benefits and is, probably, not accurately reflected by the amount of outlay. Community survey, shadow pricing, and economic studies might be used to develop suitable estimates.
6. **Other benefits** – Companies may provide to society benefits not falling within the above categories. These would include such programmes as free day-care centers, special assistance to minority enterprises, and sponsorship of public interest television programmes at a cost exceeding the advertising value.

## Social costs

‘Social costs’, generally, include the following costs :

1. **Goods and materials acquired** – Raw materials acquired by an entity represent a sacrifice to society to the extent of the value in alternative use.
2. **Building and equipment purchases** – When the reporting entity acquires a building or piece of equipment, the utility from that item is lost to the rest of society for as long as it is held by the entity. This cost to society should be approximated by the exchange price, adjusted downward for producers’ surplus. In fact, in this approach, there is no cost to society as the fixed assets are used by their owner. The full cost occurs at the moment of transfer from the rest of society to the reporting entity, and is measured by the discounted present value of the future stream of benefits that the seller would have received had they not been sacrificed in the exchange.
3. **Labour and services used** – The cost to society of human services used is the sacrifice in time and effort made by the employees (as elements of society); this can, probably, be approximated by the benefits that they could obtain in alternative employment and other activities. This raises difficult measurement problems. When the measurements involve excessive subjectivity, it may be reasonable to value employee services at the amount paid for them, with some adjustment for underutilization, nepotism, favouritism, producers’ surplus and the like.
4. **Discrimination** – Entities may engage in two forms of discrimination : external discrimination, or discrimination in hiring, and internal discrimination, or discrimination in placement, advancement, and training. External discrimination imposes direct cost on those women and minorities (or any other targets of discrimination, for that matter) that would otherwise have been hired by the company. Their social cost is the present value of income lost and the value of experience forgone. The social cost of internal discrimination is the present value of lifetime sacrificed income and experience caused by a delay in advancement of one year (continuing discrimination in succeeding years would be charged in the social reports of those years). Internal discrimination should be easier to value, since a limited number of specifically identifiable individuals are involved.
5. **Work-related injuries and illness** – Any injury and/or illness attributed to the entity and its activities should be reported as a social cost. The cost of an injury or illness might be estimated as the present value of lost income plus an increment for discomfort, frustration, and delayed experience. This cost can, of course, be reduced by installation of safety devices, elimination of unhealthy conditions, health monitoring and similar efforts.

6. **Public service and facilities used** – This category includes the reporting entity's share of police and fire protection, the legislative and judicial system, and government activities at all levels. Many of these services are so pervasive as to make estimation of one entity's share exceptionally difficult. The amount of taxes paid might be used as a starting point. In addition, industry studies might be undertaken to produce guidelines or adjustment factors for firms within the industry.
7. **Environmental damage** – The entity imposes damage on the environment most noticeably through the production and waste disposal processes, but damage is also done by delivery trucks, salesmen's automobiles, construction, and some advertising. The damage comes in several forms – air and water pollution, noise, plant-life destruction, terrain damage, trash and litter, and even visual pollution. In measuring environmental damage, the objective is to estimate the utility lost to society through the entity's activities or omissions. In the case of water pollution, estimates may be sought for lost recreational utility, value of fish and plant life destroyed, increased treatment cost down-stream, and impairment of living conditions proximate to the waterway. Air pollution may require estimates of lost utility due to pollution-related illness (medical costs, lost productivity, shortened life span, and discomfort), damage to exterior finishes, impairment of living conditions, and plant-life damaged or destroyed.
8. **Payments for other elements of society** – Customers, lenders, investors, and others make payments to the reporting entity; in so doing they are sacrificing the utility that such purchasing power could command. This sacrifice is a cost to society vis-à-vis the reporting entity. Payments from customers might be netted against the value of the products and services provided, but the proposed gross disclosure would be more informative especially when market imperfections result in a significant difference between the value of products or services and the amount paid.

### **13.8 Measurement of social costs and benefits**

The greatest problem in social accounting and reporting is an apparent lack of valid and reliable measurement technique. Social measurement often requires valuation of goods, services and effects that have not been exchanged in the market and consequently do not have recorded exchange or market prices. Exchange prices are considered to be the foundation of business accounting. However, exchange prices are often not available and are not very good indicators of social value. Therefore, some other measures of social benefits and costs need to be developed. Social measurement requires the estimation of benefits or utility provided by an entity, and the costs or sacrifices imposed on elements of society. Several approaches for social measurements can be used.

#### **1. Surrogate Valuation**

When a desired value can not be directly determined, a surrogate value needs to be estimated, that is, some item or phenomenon that is logically expected to involve approximately the same utility or sacrifice as the item in question. For example, assume that we want to estimate the value of building facilities loaned by a company to some community groups. In this case, a surrogate valuation can be obtained by determining the amount of rent such groups would have to pay if they rented commercial facilities having the same utility. Surrogate valuation has weaknesses; a wrong thing could be measured or a surrogate may be selected which is not sufficiently related in value to the item under consideration. In spite of this drawback, surrogate valuation is one of the most useful tools available in social accounting.

## 2. Survey Techniques

Survey techniques involve obtaining information from those affected – elements of society who make the sacrifice or who receive the utility – for measurement of social cost and benefits. In this, a simple approach is to ask individuals directly what something is worth to them. In this direct inquiry method, several criteria must be fulfilled :

- (a) The user of affected individual must have a clear appreciation of the impact on him of the item under consideration.
- (b) He must be able to relate this impact to monetary units, either directly or through the use of surrogates.
- (c) He must be willing to give a truthful answer or at least must have no discernible reason for lying.

## 3. Restoration or Avoidance Cost

Certain social costs may be valued by estimating the monetary outlay necessary to undo or prevent the damage. Some social effects can not be undone and, in such cases, the restoration cost estimate is supplemented with estimates of such additional damage. An example would be the damage to automobiles and vehicles from streets and roads during rainy season. This damage can be prevented if proper care is taken. Suppose the damage to a car amounted to Rs. 3,000 , but the cost of preventive measures would have been only Rs. 1,500. Therefore, Rs. 1,500 is the proper value to be assigned to this social cost.

## 4. Appraisals

Independent appraisals may be useful for valuing certain goods, buildings, and land. These will often reflect nothing more than an expert estimate of market value and are, thus, analogous to surrogate valuation performed by an outside expert. When appraisals are used, it is necessary that we understand the basis for them and interpret the results accordingly.

## 5. Analysis

Many times an economic and statistical analysis of available data produces a valid and reliable measure of value. Estimates of the increased earnings value of education have relied on present value analysis of comparative earnings rates and life expectancies.

The above measurement approaches generally provide an adequate set of choice for virtually any social measurement problem. They must be used, however, with care and proper understanding in full recognition of their respective weaknesses and especially with careful attention to the attributes that are ultimately intended to be measured. The Sachar Committee Report has suggested that company social report needs to be developed both in quantity and monetary terms.

### 13.9 Approaches in Social Accounting

Many different are used in corporate social accounting. However, no one approach is widely recognized as the most appropriate for social accounting. Some of these approaches in social accounting are as follows :-

- (i) Cost-Benefit Analysis approach

- (ii) Socio-Economic Operating Statement Approach
- (iii) Integral Welfare Theoretical Approach
- (iv) Descriptive or Narrative Approach
- (v) Goal Oriented Approach
- (vi) Value Added Approach
- (vii) Pictorial Approach
- (viii) Regulatory Requirements

### **(i) Cost-Benefit Analysis Approach**

This approach has been developed and used by Abt Associates in the United States. Under this approach presentation of social information in a quantitative form is made. It consists two parts viz., (i) Social Income Statement and (ii) Social Balance Sheet. The objective of this approach is to determine the full impact of corporate activities on different constituents.

The Social Income Statement part provides social benefits and social costs to staff, local community and general public. The Social Balance Sheet part depicts the social investment of capital nature on the assets side such as township, water supply, roads, buildings, hospital, ambulances, school, club etc. and shows organisation equity and social equity on the liabilities side.

The main objective of this approach is to determine the full impact of corporate activities on different social aspects. The format of Social Income Statement is given in Table 13.1. It explains (i) Social benefits and costs to staff, (ii) Social benefits and costs to community and (iii) Social benefits and costs to the general public.

Ultimately, it discloses net social income to staff, community and general public. The Social Income Statement provides monetary quantification for the firm's social benefits. These benefits are defined as resources generated by the company operations having a positive impact, or increasing the society's resources. The social costs are resources used in the company's operations at a 'cost sacrifice'. The net social income is social gain or loss to the society's resources due to the firms operations.

The format of Social Balance Sheet is given in Table 13.2. The balance sheet part of social accounting contains information on social assets and social liabilities. The utility of this approach lies in the presentation of information in quantitative information is provided. Any other additional information is provided in footnotes.

**Table 13.1**  
**Social Income Statement of XYZ Ltd. for the year ended 31<sup>st</sup> March, .....**

Particulars	Amount
<b>(I) Social Benefits and Costs to Staff</b>	
(a) Social Benefits to Staff	
1. Medical and Hospital facilities	x x x
2. Educational facilities	x x x
3. Canteen facilities	x

4. Recreation, Entertainment and Cultural activities	x x
5. Housing and Township facilities	x x x
(b) Social Cost to Staff	
1. Layoff and Voluntary termination	x x x
2. Extra hours worked by Executives but not paid	x x x
Net Social Benefits to Staff	x x x
<b>(II) Social Benefits and Costs to Community</b>	
(a) Social Benefits to Community	
1. Local Taxes paid to Panchayat/Municipality	x x x
2. Environmental Improvements	x x x
3. Generation of Job Potential	x x x
4. Generation of Business	x x x
(b) Social Costs to Community	x x x
1. Increase in cost of living in the vicinity on account of Company's plants	
Net Social Benefits to Community	x x x
<b>(III) Social Benefits and Costs to General Public</b>	
(a) Social Benefits to General Public	
1. Taxes and Duties paid to State Governments	x x x
2. Taxes and Duties paid to Central Governments	x x x
(b) Social Costs to General Public	
1. State Services consumed – Electricity service	x x x
2. Central Services consumed – Telephone, Telegrams, Postal services and Banking	x x x
Net Social Benefits to General Public	x x x
Net Social Income (I) + (II) + (III)	x x x

**Table 13.2**  
**Social Balance Sheet of XYZ Ltd. as on 31<sup>st</sup> March,.....**

Liabilities	Amount	Assets	Amount
<b>I. Organisation Equity</b>		I. Social Capital Investment	
<b>II. Social Equity Contribution</b>	x x x	Township Land	x x x

<b>by Staff</b>	<b>x x x</b>	Building (i) Township (Residential & Welfare Buildings) (ii) Canteen Buildings Township Water Supply & Sewerage Township Roads Township Electrification	x x x x x x x x x x x x x x x
		<b>II. OTHER SOCIAL ASSETS</b>	x x x
		Hospital Equipments	x x x
		Hospital Vehicles and Ambulances	x x x
		School Equipments	x x x
		Club Equipments	x x x
		Playground/Park	x x x
		School Buses	x x x
		Others	x x x
		<b>III. HUMAN ASSETS</b>	x x x
			---
			---
			x x x

## **(ii) Socio-Economic Operating Statement Approach**

This approach was suggested by David Linowes and Ralph W. Estes. Linowes proposes the development of a 'Socio-Economic Operating Statement' for social reporting which aims at focusing on 'what corporation has done for society' on one hand and 'what it has failed to do' on the other.

He suggested that a firm should prepare a social statement periodically along with the Corporate Balance Sheet and Income Statement. It would include a tabulation of the corporation's voluntary expenditures to benefit its employees, public or environment, offset against the cost of programmes which were not undertaken but which would have resulted in improvement.

Estes proposed a comprehensive model to report and permitting the disclosure of all direct benefits and costs of an entity in terms of its net contribution to society. The main assumption under this approach is that, a firm gives something to the society and

uses something of society and this interaction be presented in a statement format which is called the ‘Socio-Economic Operating Statement (SEOS)’. According to this approach, the firm presents the positive and negative aspects of its social activities. The positive aspects are termed as ‘social benefits’ and negative aspects as ‘social costs’.

The net social contribution of a firm is represented by the difference between social benefits and social costs. This approach suggests that a firm should prepare a social statement periodically showing the expenditure made for ‘improvement in social areas, offset the cost of programmes which were not undertaken but which would have resulted in improvements’.

Typical basic guidelines for the preparation of SEOS are :

- If a socially beneficial action is required by enforceable law or union regulations, it is not included in the SEOS.
- If a socially beneficial action is required by law but is ignored, the cost of such item is a ‘detriment’ for the year. The same treatment is given to an item if postponed, even with government approval.
- A prorated portion of salaries and related expenses of personnel who spend time in socially beneficial actions or with social organisations is included.
- Cash and product contributions to social institutions are included. The cost of setting up facilities for the general good of employees or the public, if done voluntarily without union or government mandate, is included.
- Expenditure made voluntarily for the installation of safety devices on the premises or in products and not required by law or other contract are included.
- The cost of voluntarily building a playground or nursery facility for employees and / or neighbours is included. Operating costs of the unit are also included for each succeeding year applicable.
- Extra costs of designing and building business facilities to upgrade health, beauty or safety standards are included.

The format of Social Economic Operating Statement is given in Table 13.3. Further Lee Seidler developed another approach for Social Accounting and reporting and suggested two Income Statement formats, one for a profit seeking organisation and another for a non-profit seeking organisation the result of which is a net social profit or loss reflecting the net contribution of the entity to the society.

### TABLE 13.3

#### Socio Economic Operating Statement of XYZ Ltd. for the year ended 31<sup>st</sup> March, 2004

<p><b>(I) Social actions – People related</b></p> <p>(a) Improvements</p> <p>Minority enterprise technical assistance programme</p>	<p>4,000</p>
---	--------------

Emergency flood relief	3,000
Training programme for handicapped workers	8,000
Executive time – hospital trusteeship	5,000
Minority hiring programme – extra training and turnover costs	6,000
Day-care center for children of employees setup and maintenance cost – voluntarily established	11,000
	-----
	37,000
(b) Less : Detriments	16,000
Postponed installation of hydraulic safety control system-cost of unit	-----
	16,000
	-----
	21,000
Net Improvements for the year	
 <b>(II) Social actions – Environment related</b>	
(a) Improvements	
Cost of installing water quality monitoring system to control pollution	22,000
Cost of clearing landscaping company-owned ravaged area and dump	41,000
Executive time-free consulting service to state environmental protection agency	4,000
	-----
	67,000
(b) Less : Detriments	60,000
Deferral of liquid waste treatment facility	19,000
Postponed installation of higher smoke stacks to reduce air pollution	-----
	79,000
	-----
	12,000
Net Deficit for the year	
 <b>(III) Social actions – Product related</b>	
(a) Improvements	
Voluntary discontinued product judged unsafe for home use- Projected annual net income.	23,000
Salary of safety engineer on loan to government product safety committee.	21,000
	-----
	44,000
	-----

(b) Less : Detriments	36,000
Cost of process redesign to reduce manufacturing hazard – recommended by Safety Council, but implementation deferred	----- 36,000 -----
Net Improvement for the year	<b>8,000</b>
Total Socio-economic improvements during the year 2003-04	17,000
Add : Net cumulative Socio-Economic Improvements as at 1.4.2003	1,76,000 ----- <b>1,93,000</b>
<b>Net Socio-Economic Improvements upto 31<sup>st</sup> March, 2004</b>	

### (iii) Integral Welfare Theoretical Approach

This approach deals with all activities which are expected to be undertaken by business enterprises. The conceptual approach of this school of thought is well summarized by Eichhorn (1974) in his book on 'Social Accounting'. It intends to develop an integral assessment of all activities on the part of business corporations from the view point of society.

This school of thought involves the preparation of a social report comprising social benefits and social costs. These social costs and social benefits are presented in Table 13.4, from which it is understood that corporate social accounting framework includes social costs such as labour, material, fixed assets and capital costs.

In the same manner social benefits are provided in the form of qualitative products, safety of products, rational prices and regular supply of products. It also prevents value of negative external effects and value of positive external effects on the part of business corporations.

**Table 13.4 : Social Statement**

Social Costs	Rs.	Social Benefits	Rs.
(I) Producers' Surplus for :			
1. Labour Performance	x x x	(I) CONSUMERS' SURPLUS FOR :	x x x
2. Fixed Assets	x x x	1. Product A	x x x
3. Materials	x x x	2. Product B	x x x
4. Capital	x x x	3. Product C	x x x
5. Entrepreneurial Performance	x x x	4. Product D	
6. Performance paid in advance	x x x		
	-----		-----
	-----		-----
<b>(II) Value of Negative external effects on :</b>		(II) CONSUMERS' SURPLUS FOR :	x x x
1. Employees	--	1. Employees	--
2. Population	--	2. Population	
3. Companies		3. Companies	
4. Public Entities	x x x	4. Public Entities	x x x

Net Social Benefits	<b>x x x</b> <b>x x x</b> <b>x x x</b> ----- -- <b>x x x</b> ----- -- <b>x x x</b>	Net Social Costs	<b>x x x</b> <b>x x x</b> <b>x x x</b> ----- -- <b>x x x</b> ----- -- <b>x x x</b>
---------------------	--	------------------	--

#### **(iv) Descriptive or Narrative Approach**

The American Accounting Association's Committee on 'Environmental Effects of Organisational Behaviour' has proposed this method to include certain environmental disclosures. The nature of such type of narrative disclosure is non-quantitative. These disclosures would be attached to the annual financial statements. Under this approach, a firm highlights the positive aspects of its social activities. The Committee recommended that the present reporting model be more fully utilized to :

- (a) Display environmental control expenses on a separate line in the Income Statement.
- (b) Disclose separately total environmental control expenditures in the Funds Statement.
- (c) Classify separately environmental control facilities in the Balance Sheet.
- (d) Use accrual accounting for Environmental Liabilities.

The Committee further recommended that the present reporting system should help to identify the environmental problems facing the organisation and the disclosure of material environmental effects on financial position, earnings and business activities of the corporations.

Under this method, the schedules representing employees benefit and services, social overheads, township maintenance, etc., are prepared and shown as part of annexure in the Annual Report. Social overhead

includes medical, education, canteen, transportation facilities etc. Schedules of township maintenance contains expenditure on building, water, sewerage etc. It consists of quantitative measurements on the social involvement of the firms. This is to be included as an additional footnote in the financial statement section of the annual report.

### **(v) Goal Oriented Approach**

It is based on the recognition of the fact that companies usually have elaborate goals and purposes describing the economic and social objectives which they have set for themselves. Therefore, it involves two aspects :

- (a) The selection of social goals, and
- (b) The reporting and assessment of company's performance according to these goals. Compared to the other social approaches, this concept has the advantage because indicators to be used to report on company's achievements are not arbitrarily selected but are derived from the specific goals and objectives under consideration. The detailed activities are measured and analysed in pursuit of these goals. It also has the advantage of integrating traditional financial reporting and social reporting.

### **(vi) Value Added Approach**

Under the Value added Accounting, the income accruing to the enterprise after external payments is taken into account. It represents the value added to goods and services, required by the enterprises as a result of the efforts of management and employees.

### **(vii) Pictorial Approach**

Under this approach, photographs of health care center, school and hospital etc. run by the firm are presented in annual reports.

### **(viii) Regulatory Requirements**

The reporting is done by other methods also which include mention of social activities by an enterprise in the Chairman's Report, Director's Report or Auditor's Report. This approach is followed by many public and private sector enterprises, because it is simple to present.

The Companies (Disclosure of Particulars in the Report of Board of Directors) Rules, 1988 require information regarding Conservation of energy, Technology absorption and Foreign earnings and outgo. Disclosures requirement under this rule has covered some aspects of social reporting.

Indian economy is based on the principle to democracy and socialism and as such the social audit has greater importance for our country. For this reason an order for social audit was issued by the Government of India by amending Section 227(4A) of the Companies Act, 1956 and by passing the Manufacturing and Other Companies (Audit Report) order, 1988.

#### **13.10 Benefits of Social Reporting**

Several benefits may be realized by an organisation by the publication of a social statement. These may include :

- Presentation of a complete picture to the society and the management to enable everybody to form correct opinions.
- Assist management in formulating appropriate policies and priorities.
- Avoidance of adverse publicity.
- Improved image leading to greater support from government and public.
- Help in marketing and greater customer support.
- Evidence of social commitment.
- Improved employee motivation.
- Better business relations with all concerned e.g. banks, insurance, government.
- Resolution of social problems can assist in long term growth of the organisation.
- Attracting and retaining high quality staff.
- Obtaining feedback from the public as to the changes required in the focus.
- Improve confidence of shareholders or members.
- Several companies are realizing that being a socially responsible organisation can be good for productivity, morale and loyalty amongst employees.

In addition to the benefits derived by the individual organisation, various other interested parties like government agencies, consumer council, shareholders associations, trade associations, news media etc. also benefit because of ready availability of the information.

### 13.11 Limitations of Social Reporting

Though the importance of social responsibility and reporting is being recognized by many companies in India, yet its progress and performance is hindered due to the following reasons :

- **Not Mandatory :** Disclosure of social responsibility information is not mandatory for private sector units. In the case of public sector units also 'order for social overheads schedule' does not at all fulfil the requirements of social audit.
- **No Standard format :** There are no well established concepts, conventions, postulates and axioms to guide the Social Accountant in drafting his accounts and reporting.
- **Lack of clear cut definition of social reporting :** Every enterprise adopts different methods for measuring, reporting and evaluating social responsibility as there is no clear cut definition and procedure for social reporting.

- **No cadre of social auditors :** There is no separate cadre of social auditors and it is not clear how and who will conduct such audit.
- **Auditing social cost and benefit is an intricate function :** It is highly doubtful if only accountancy scholars would be able to perform the stupendous task of identifying and documenting the many sided social effects of business behaviour and auditing social costs and benefits.

### 13.12 Social Disclosure Practices in India

In India, the Companies Act, 1956 deals with the preparation of balance sheet and profit and loss account. The Act requires the auditor to make a report under section 227 to members (shareholders) and express an opinion whether the company's balance sheet and profit and loss account exhibit 'true and fair' view of the company's state of affairs. Although, this Act has been amended from time to time, no specific provision has been made requiring companies to provide social responsibility disclosures in their annual reports. The Government of India appointed a Committee under the chairmanship of Justice Rajinder Sachar to consider and report on the changes that are necessary in the form and structure of the Act. The Committee recommended the inclusion of the following, *inter alia*, in the director's report :

**"Steps taken by the company in various spheres with a view to discharging its social responsibilities towards different segments of the society, quantifying where possible and in monetary terms. The Board should also report on the future plans of the company towards the discharge of its social responsibilities and duties."**

In 1981, The Institute of Chartered Accountants of India after making a survey found that 123 out of 202 companies provided some information in their directors reports about company contribution in social responsibility areas.

The TISCO performed the first social audit (the company has used the term audit) ever undertaken by any company public or private, in India. The purpose of the audit was to examine and report whether, and the extent to which the company had fulfilled objectives regarding its social and moral responsibilities to the consumers, employees, shareholders, society and the local community. In its 65 page report, the Audit committee has given the background of the idea (social audit) and explained the company's responses (action and inaction) towards Jamshedpur, pollution, employer-employee relations, consumers, shareholders, community development and social welfare programme, rural development programme, etc. The report about social audit performed by the company is very descriptive and not structured and accounting-oriented.

Some Indian Companies have made attempts to provide information on their social responsibility activities in published annual reports. Some such companies have been given social income statements and social balance sheet in their annual reports; some have preferred to give narrative disclosures on social responsibility actions. Also, social reporting policy of Indian Companies has not been consistent. Some Indian Companies, after giving social responsibility reports for a few years, have discontinued it without stating any reasons in this regard.

### Social Accounting in Oil India Ltd.

In today's corporate world, no organization can afford to ignore its responsibility to society. Corporate reporting can no longer confine itself to the conventional form of

reporting. Society expects and in some countries the law recognizes that corporate reporting should incorporate description of the employment policies (In Indian context its policy towards employment of SC/ST and handicapped personnel), action being taken for industrial health and safety of its personnel, policies towards environment and expenditure on pollution control, fulfilling community obligations, customer satisfaction and fulfilling national priorities. In the case of OIL, being a public sector undertaking, fulfillment of social obligations assumes greater significance.

OIL does not lag behind its commitment to fulfil its social obligations and responsibilities. It recognizes its responsibility towards community in and around its operational area and extends help towards community's requirements of education, medical, social, cultural, sports and other community welfare measures such as family planning, immunization against communicable diseases etc. OIL encourages indigenous industry by giving due attention to development of ancillary units making available its technical know-how to achieve better quality of indigenous production and giving price preference to indigenous supplies on global tenders.

OIL recognizes its basic responsibility to contribute towards National priority of self sufficiency in production of crude oil. Success achieved by OIL in its exploratory and development efforts towards discovery of hydrocarbon reserves is explained in the directors report on current year's performance.

Social accounting is termed as a process by which an organization's social performance is analyzed and interpreted to produce a set of social accounts. For a number of years OIL has been incorporating in its Annual Reports, Social Accounts considered for evaluating the impact of OIL's activities on society.

Social accounts have been prepared based on 'Abt Associates approach' with such modifications as to suit Indian conditions and made the statement meaningful in the context of OIL.

Some of the items incorporated in Social Accounts require special mention.

## **I. INCREMENTAL HYDRO-CARBON RESERVES**

Since, 1996 OIL has decided to incorporate in social accounts, effect of its efforts towards increase in hydrocarbon reserves. As a measure of abundant caution, OIL has decided to restrict its reporting to increase in reserves of proved and developed properties only. Cost of production has been based on actual cost incurred during the current year.

## **II. FLARING OF GAS**

In the past, flaring of gas has been reported by OIL as Social Cost to General Public. OIL has constantly been endeavouring to minimize the extent of gas flaring. Success achieved by OIL in its efforts is reflected hereunder :

Year	Percentage of gas
------	-------------------

Flare to total Production	
1995-96	18.76
1996-97	11.59
1997-98	11.09
1998-99	11.90
1999-2000	10.43

OIL experts consider that the extent of flaring has been brought down to a level which is now considered as unavoidable/inescapable. As there is no loss of natural resources, social accounts do not include flaring of gas as a social cost.

### III. PRICE DIFFERENCE

If OIL had sold its production in the International market then not only it would have earned foreign exchange but would also have increased its profitability to the extent of difference between International price and the current price received by OIL for sale of its products. Such price difference has been exhibited as a benefit to general public in social accounts.

### IV. PROFITS

Being a public sector undertaking, OIL has considered it appropriate that dividends paid and retained profits relating to Government share holdings, should be incorporated as Social Benefit.

### Social Income Statement as at 31<sup>st</sup> March, 2000

	Rs. In lakhs	
	1999-00	1998-99
Social Benefit & Cost to Staff		
I. A Social benefits to staff		
1. Housing & Township facilities (including Supply of Water, electricity & Gas)	2699	2779
2. Medical & Hospital Facilities	1477	1321
3. Transport	535	383
4. Holiday benefits	4071	2576
5. Educational facilities	306	296
6. Interest concession	364	599
7. Provident fund, Gratuity & Pension	2923	2367
8. Bonus & Ex-gratia payments.	660	688

9. Training to staff	385.33	713
10. Welfare activities including canteen facilities	781.63	477
11. Medical benefits to retired employees	52.81	61
12. Other benefits	58.84	89
<b>Total Social Benefits to Staff</b>	<b>14314</b>	<b>12347</b>
<b>B. Social Costs to Staff</b>		
1. Involuntary Termination	39	3
<b>Net Social Benefits to Staff (A-B)</b>	<b>14275</b>	<b>12344</b>
<b>II. Social Benefits &amp; Costs to Community</b>		
<b>A. Social Benefits to Community</b>		
1. Social Welfare to community	1045	1103
2. Environmental improvements	242	141
3. Generation of job potential	3959	18143
4. Generation of business	20545	14111
<b>Total Social Benefits to Community</b>	<b>25792</b>	<b>33498</b>
<b>B. Social Costs to Community</b>	<b>0</b>	<b>0</b>
<b>Net Social Benefits &amp; Costs to Society (A-B)</b>	<b>25792</b>	<b>33498</b>
<b>III. Social Benefits &amp; Costs to Society</b>		
<b>A. Social Benefits to General Public</b>		
1. Taxes & Duties paid to		
(a) Central Government	53379	44090
(b) State Government	30028	24854
2. Difference between International Price and Administered Price received by OIL for Crude Oil, Natural Gas & Liquefied Petroleum Gas	161339	62414
3. Price difference on Global tenders to Indigenous suppliers	35	33
4. Evaluation of Increase in Hydro-carbon Reserves (refer note 1 below)	402227	284075
5. Energy Conservation	730	437
6. Dividend paid to Central Government	10500	7700
7. Retained profits for the year relating to Government share holding	28019	20067
8. Other benefits to general public	405	26

Total Social Benefits to General Public	686663	443696
B. Social Costs to General Public		
1. Foreign exchange spent (refer note 2 below)	5842	7346
Total Social Cost to General Public	5842	7346
Net Social Benefits to Society (A-B)	680821	436350
Net Social Income to Staff, Community and General Public (I+II+III)	720887	482192

Note :

1. Increase in Hydro-carbon reserves is restricted to proved and development properties. Out of the value of such reserves at International price, deduction has been made for its cost of production estimated at current year's actual cost.
2. In addition to social benefits as above, OIL has further contributed towards saving in foreign exchange, to the extent of Rs. 3,29,637 lakhs (previous year Rs. 204, 493 Lakhs) by producing Crude Oil, Natural Gas and Liquefied Petroleum Gas.

Source : Oil India Ltd., Annual Report 1999-2000 Pp. 143-149

### **13.13 summary**

The conceptual thinking about corporate social accounting has grown at a rate faster than what has been done in practice. The social accounting information about business enterprises are not only important for external users, public interest groups, government, etc., but also for managements in planning and decision-making areas. In pursuance of their basic goals, all organisations have a social commitment. The debate on a suitable corporate social reporting model is continuing. At present, the primary objectives for business enterprises should be to provide disclosure about their society related activities. If a business enterprise decides to wait for a perfect model, completely reliable measures, generally accepted reporting standards, and qualitative characteristics applicable to social information, it would be failing in its responsibilities as a stable and forward looking employer and a good citizen. Business enterprises should be ready to accept growing challenges emerging in social accounting and reporting area.

### **13.14 self assessment questions**

1. What do you mean by Social Accounting ? Discuss the objectives and need for social accounting.
2. Explain the various methods of measurement of social costs and social benefits.
3. How should social accounting information be reported in published annual reports? Which method of disclosure, do you think, will be most appropriate ?
4. Discuss the effect of social disclosures on the share prices of a company. Explain the limitations of social reporting also.

### **13.15 SUGGESTED READINGS**

1. K V Ramanathan, Towards a theory of corporate social accounting, Accounting Review
2. Sachar Committee Report of the High-Powered Expert committee on companies and MRTP Acts, Minisrty of Law, Justice and Comapnt Affairs, New delhi
3. R L Gupta, Advanced Accounting, Sultan Chand and Sons, New delhi
4. A Belkaoui, Socio- Economic Accounting, Quorum Books, Westport.
5. Longstreth and Rosenbloom, Corporate social reporting and the institutional investor, Praeger, New York

<b>Course</b>	<b>:</b>	<b>Management Accounting</b>	<b>Writer</b>	<b>:</b>	<b>Dr. M.C. Garg</b>
<b>Course Code</b>	<b>:</b>	<b>MC-105</b>	<b>Vetter</b>	<b>:</b>	<b>Dr. B.S. Bodla</b>
<b>LESSON-14</b>					

## **ECONOMIC VALUE ADDED (EVA) STATEMENTS**

**Objective :** The objective of this lesson is to enable the readers to understand the concept of Economic Value Added and procedure for its computation. This would also familiarize about superiority of EVA over traditional measures, drawbacks of EVA and EVA disclosure practices in India.

### **LESSON STRUCTURE**

- 14.1 Introduction
- 14.2 Concept of EVA
- 14.3 Computation of EVA
- 14.4 Improving EVA
- 14.5 Superiority of EVA over Traditional Measures
- 14.6 Implementing EVA
- 14.7 EVA vs. Residual Income
- 14.8 Drawbacks of EVA
- 14.9 Market Value Added
- 14.10 EVA Disclosures in India
- 14.11 Summary
- 14.12 Self Assessment Questions
- 14.13 Suggested Readings

#### **14.1 introduction**

The goal of financial management is to maximize the shareholder's value. The shareholder's wealth is measured by the returns they receive on their investment. Returns are in two parts, first is in the form of dividends and the second in the form of capital appreciation reflected in market value of shares. The market value of share is influenced by number of factors, many of which may not be fully influenced by the management of firm. However, one factor, which has a significant influence on the market value, is the expectation of the shareholders regarding the return on their investment.

The share prices are influenced by the extent to which the management is able to meet the expectation of the shareholders. Various measures like Return on Capital Employed, Return on Equity, Earnings per Share, Net Profit margin, Operating Profit margin have been used to evaluate the performance of the business. The problem with these performance measures is that they lack a proper benchmark for comparison. The shareholders require at least a minimum rate of return on their investment depending on the risk in the investment. Sometimes, the industry average or the competitor's performance may be considered as a benchmark, which may not be acceptable to meet the shareholder's minimum expectations.

#### **14.2 concept of EVA**

The New York based financial advisory Stern Stewart and Co. postulated a concept of economic income in 1990 in the name of 'Economic Value Added' (EVA). EVA is a modified version of residual income concept. EVA has provided financial discipline in many U.S. companies and encouraged managers to act like owners and boosted shareholders' returns and the value of their companies.

The company creates shareholder value only if it generates returns in excess of its cost of capital. The excess of returns over cost of capital is simply termed as Economic Value Added (EVA). EVA measures whether the operating profit is sufficient enough to cover cost of capital.

Shareholders must earn sufficient returns for the risk they have taken in investing their money in company's capital. The return generated by the company for shareholders has to be more than the cost of capital to justify risk taken by the shareholders. If a company's EVA is negative, the firm is destroying shareholders wealth even though it may be reporting positive and growing EPS or Return on Capital employed.

EVA is just a way of measuring an operation's real profitability. EVA holds a company accountable for the cost of capital it uses to expand and operate its business and attempts to show whether a company is creating a real value for its shareholders. EVA is a better system, than ROI, to encourage growth in new products, new equipment and new manufacturing facilities. EVA measurement also requires a company to be more careful about resource mobilization, resource allocation and investment decisions. It effectively measures the productivity of all factors of production.

### **14.3 Computation of EVA**

Operationally defined, *EVA is the difference between the net operating profits after taxes (NOPAT) and capital charge i.e., cost of capital employed (COCE) or the product of capital employed with the difference between the Return on Capital Employed (ROCE) and the Cost of Capital Employed (COCE) i.e.,*

$$\text{EVA} = \text{Net operating profits after taxes (NOPAT)} - \text{Capital Charge} \\ (\text{WACC} \times \text{CE})$$

where            WACC = Weighted Average Cost of Capital

CE = Capital Employed

NOPAT = Profits after depreciation and taxes but before interest cost

OR

$$\text{EVA} = \text{Capital Employed (CE)} \times (\text{Return on Capital Employed} - \text{Cost of Capital} \\ \text{Employed})$$

1. NOPAT refers to quantum of net operating profit remained in the business after the payment of taxes but before interest. Addition and subtraction of non-operating income and expenses to the net profit figure and making certain other adjustments for turning accounting profits into economic profits is also advocated. To convert the Generally Accepted Accounting Principles (GAAP) earning into EVA, Stern Stewart has identified about 164 potential adjustments to GAAP. But due to diverse accounting disclosure practices adopted in India and abroad following are the adjustments being felt quite sufficient in Indian context to convert the accounting profit, also known as GAAP earnings, into economic profit or EVA.

- Accounting principles allows companies to write-off Research & Development expenses. But these expenses may not be truly revenue in nature. For successful R&D projects, EVA calculations writes back the R&D expenses and amortises them over a period during which benefits of the successful R&D projects will be reaped. The

NOPAT figure calculated from Profit and Loss account is adjusted by adding back the R&D expenses and capitalizing them in the balance sheet. Only those R&D expenses that have no future value are charged to the income statement.

- During periods of rising prices companies save taxes by adopting the LIFO system of inventory valuation. Under the LIFO method, costs of the recently acquired raw material are charged to the production while the costs of earlier purchases are accumulated in inventory thereby understating the inventory and the profits. For calculating EVA the LIFO system of valuation is changed to FIFO basis which is a better basis for estimating current replacement costs. NOPAT and Equity are adjusted for this change from LIFO to FIFO by adding the difference between the LIFO and FIFO inventory (or LIFO and FIFO cost of goods sold) to the equity and NOPAT. This way the tax benefits of LIFO are retained.
- Deferred taxes arise due to the difference in timing of recognition of revenues and expenses for financial reporting versus reporting for tax purposes. It is basically the accumulation of the difference between accounting provision of taxes and the tax amount actually paid under the head 'Reserve for Deferred Taxes'. NOPAT is adjusted for the tax actually paid instead of the accounting provisions. The reserves for deferred taxes are added to the equity.
- The depreciation charge if excessive needs adjustments.
- Certain marketing expenses like advertising or sales promotion for a new brand launch are capitalized and amortised over the period during which benefits will be reaped.
- Goodwill of an acquired business, if written off, is capitalized and adjusted in NOPAT and equity.
- Expenses incurred on employee training again will provide benefits over a period so these expenses are also capitalized.
- Operating leases are to be capitalized. The net present value of the lease payments is capitalized.
- Restructuring expenses and such other expenses which will benefit the firm in the long run are capitalized and written-off over a period.
- Other adjustments like adding back the provision for warranty claims, provisions for bad and doubtful debts are also made. They are accounted for on the cash basis.

Similarly other non-cash book-keeping entries are adjusted and accounted for on cash basis.

- Provision for gratuity and pension should be recognized and provided for properly.

2. WACC is the weighted average of the cost of debt (ki), cost of equity (ke) and cost of preference capital (kp), if any, with weights equivalent to the proportion of each in the total capital, i.e.,

$$WACC = \frac{ke \times \frac{s}{v} + ki \times \frac{b}{v} + kp \times \frac{p}{v}}{v}$$

where,

ke	=	Cost of equity
ki	=	Effective cost of debt i.e., kd (1-t),
kp	=	Cost of preference capital,
v	=	Total value of business,
s	=	Value of equity capital,
b	=	Value of debts,
p	=	Value of preference capital.

Ki refers to the average rate of interest the company pays for its debt obligation i.e., a company's effective debt cost is taken by measuring interest paid against total borrowings and then adjusting it for taxes.

Kp is the discount rate that equates the present value of after tax interest payment cash outflows to current market value of the Preference Share Capital. Ke, Cost of equity can be calculated opting for a number of theories e.g.,

- Capital Asset Pricing Model (CAPM)
- Bond yield plus risk premium approach.
- Earnings price (E/P) Approach.
- Realised yield Approach.
- Dividend Capitalisation Approach.

Under CAPM cost of equity capital is expressed as :-

$Ke = R_f + \beta (R_m - R_f)$ .  $R_f$  represents the most secure return that can be achieved and in Indian context, it represents current yields available in long-term government bonds.

$\beta$  refers to the sensitivity of the security returns to changes in the market returns.

The suitability of a particular approach to calculation of cost of equity capital differs from country to country depending on their distinct disclosure and reporting practices and other environmental conditions.

3. Capital Employed (CE) is the next element required for calculating EVA and can be calculated through the assets side or the liabilities side of a balance sheet.

From the assets side of the balance sheet :-

$CE = \text{Current Assets} - \text{Non interest bearing current liabilities (i.e., Net Working Capital} + \text{Net Fixed Assets})$

From the liability side of the balance sheet :-

CE = Interest bearing debt (short term as well as long term) + Net worth less any non-operating assets.

The mechanism of EVA is very simple. Applying the above mentioned methodology if the result is positive, the firm in question has created value over the period and if the EVA is negative, it will be termed as a value destroyer. A company having consistently high EVA implies that it has been successful in creating value for the business. It has effectively utilized the resources in the most profitable use. On the other hand, a company having oscillating EVA or consistently negative EVA indicates that there is something wrong with the Company.

The procedure of computing EVA is further explained herein with the help of a hypothetical company's income statement and balance sheet :-

*Income Statement*

	(Rs.)
Net Sales	26,000
Cost of goods sold	14,000
Selling & distribution expenses	4,000
Depreciation	1,500
Other operating expenses	1,000
Operating Income	20,500
Interest expenses	5,500
Income Before Tax	-2,000
Income tax (35%)	3,500
Net Profit After Tax	-1,225
	2,275

*Balance Sheet*

Liabilities	Amount (Rs.)		Assets	Amount (Rs.)
Total Equity Capital :				
Share Capital	3,000		Land & Building	6,500
Retained Earnings	4,300		Equipment	4,100
Profit & Loss A/c	2,100	9,400	Other long-term assets	4,900
Long -term Debt		7,600	Inventory	2,500
Account Payable (A/P)		1,000	Accounts Receivable (A/R)	4,000
Accrued Expenses (A/E)		2,500	Cash	1,500
Short Term Debt		3,000		
		23,500		23,500

**Step I : Calculate Net Operating Profit After Tax (NOPAT)**

	(Rs.)
Operating Income	5,500
- Tax (35%)	1,925
NOPAT	3,575
OR	

Net Profit	2,275
+ Interest expense (1-Tax Rate)	1,300
NOPAT	3,575

## Step II : Identify Company's Capital

	(Rs.)
Total Liabilities	23,500
Less :	Rs.
Account Payable (A/P)	1,000
Accrued Expenses (A/E)	2,500
Capital (C)*	3,500
	20,000

\*Company's Capital = Total Liabilities – Non-interest bearing liabilities

## Step III : Determine Capital Cost Rate (CCR)

Here, CCR = 10%

The reason is that owners expect 13% return for using their money because less than that is not attractive to them; this is about the return that investors can get by investing long-term with equal risk (stock, mutual funds of other companies). The company has  $9400/23500 = 40\%$  (or 0.4) of equity with a cost of 13%. It has also 60% debt and assumes that it has to pay 8% interest for it. So the average capital costs would be

$$\begin{aligned}
 \text{CCR} &= \text{Average equity proportion} \times \text{Equity Cost} + \text{Average Debt Proportion} \times \text{Debt Cost} \\
 &= (40\% \times 13\%) + (60\% \times 8\%) \\
 &= 0.4 \times 13\% + 0.6 \times 8\% \\
 &= 5.2\% + 4.8\% \\
 &= 10\%
 \end{aligned}$$

## Step IV : Calculate Company's EVA :

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$$\begin{aligned}
 \text{EVA} &= \text{NOPAT} - \text{C} \times \text{CCR} \\
 &= \text{Rs. 3,575} - \text{Rs. } 20,000 \times 10\% \\
 &= \text{Rs. 3,575} - \text{Rs. 2,000} \\
 &= \text{Rs. 1,575}
 \end{aligned}$$


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Thus, it is clear that the company has created in EVA of Rs. 1,575.

### 14.4 Improving EVA

EVA can be improved in any of the following ways :

- Increasing NOPAT with the same amount of capital.
- Reducing the capital employed without affecting the earnings i.e. discarding the unproductive assets.
- Investing in those projects that earn a return greater than the cost of capital.

- By reducing the cost of capital, which means employing more debt, as debt is cheaper than equity or preference capital.

#### 14.5 Superiority of EVA over Traditional Measures

Performance measurement systems that were successful in the past are becoming obsolete and in some cases are dysfunctional and obstructive to improvements. A dynamic and more competitive environment requires dynamic benchmarks to get a clear picture of :-

- What is really happening to the performance of a business firm?
- Whether the firm is a value generator or a value destroyer?

Ultimately, the value-based performance measures e.g., Cash Flow Return On Investment (CFROI), Cash Value Added (CVA), Shareholder Value Added (SVA) and Economic Value Added (EVA) have appeared on the scene. Out of these new ‘trendier’ performance measures the popularity graph of EVA is touching new heights day-by-day and when compared with the traditional measures it occupies a place of pride on the following grounds :

(i) EVA is a performance measure most directly linked to the definitive and reliable measure of wealth creation which is Market Value Added (MVA), the difference between the market value of an enterprise and the capital contributed by shareholder and lenders. MVA is in fact the cumulative amount by which a company has enhanced or diminished shareholder wealth.

(ii) ROCE, RONW, ROI etc. consider only one side of the performance i.e., *they consider the borrowing cost but ignore the cost of equity*. This leads the decision makers and financial analyst toward a failure to highlight whether the return is commensurate with the risk of underlying assets. In turn, it ultimately results into biased and inappropriate decisions regarding rejection of economically profitable project or acceptance of unviable projects. For instance, a company’s current ROCE 20% and its overall cost of capital is 16%. It receives a new investment opportunity with an estimated ROCE of 18%, cost of capital remains the same (i.e., at 16%). To maximize ROCE one will reject the said opportunity. But actually, if accepted, it would have added two per cent economic surplus to the shareholders’ wealth. In another case, the present ROCE of a company is 12% and cost of capital is 16%. It receives a new investment opportunity with an estimated ROCE of 14% with no change in cost of capital. Again, to maximize ROCE the said opportunity will be accepted by the company. But this will destroy shareholder’s wealth as shareholders want to maximize the absolute return above the cost of capital and not to maximize percentages.

On the contrary, EVA mechanism gives due recognition to the cost of equity in all managerial decisions from board room to the shop floor and thus provides a comprehensive and reliable yardstick to measure the shareholders’ value creation (or destruction) by an individual business entity focusing towards maximization of absolute return above the cost of capital.

(iii) The EVA financial management system eliminates all the inconsistencies among various parameters resulting from the use of different criteria/financial measures for different corporate functions under the typical traditional financial management system, by incorporating all business issues, for instance, reviewing a capital budgeting process, valuing an acquisition,

considering strategic plan alternatives, assessing performance, communicating or rewarding management into an integrated criteria of creating value. This would unite all employees in the pursuit of the single goal of creating value. Managers will certainly have to consider margins, turnover ratios, unit costs and a host of other variables, but the anxiety is always in the context of their impact on EVA. EVA system, thus, covers the full range of managerial decisions against a typical traditional system with inconsistent standards, goals and terminology.

- (iv) Further, it links the management compensation to the shareholder value in a much refined manner. With EVA the bonus targets are set every year as a percentage gain in EVA and there is no cap on the maximum amount of bonus payment. A part of the bonus earned is banked and paid in later years. EVA results that are below target will shrink the banked bonus and vice-versa. Thus, EVA-based compensation system ties management's interest with those of shareholders and the value creation motion will permeate the whole organisation.
- (v) EVA captures the performance status of corporate system over a broader canvas i.e., to arrive at true profits, cost of borrowed capital as well as cost of equity should be deducted from net operating profits. Further to maximize earnings is not sufficient, at the same time consumption of capital should be minimum/optimum under an EVA based system.
- (vi) The utility of EVA simply does not end by indicating the degree of wealth creation. It goes beyond that to pinpoint the lacunae in the business performance. A regular monitoring of EVA throws light on the problem areas of a company and thus helps managers to take corrective actions.
- (vii) EVA does have an extremely important role in strategy formulation. It is used to assess the likely impact of competing strategies on shareholder wealth and thus helps the management to select the one that will best serve shareholders. It can be particularly effective in this regard when it is augmented by new tools such as Real Option Analysis, Balanced Score Card, Activity-Based Costing and Activity-Based Management.
- (viii) It also fits well with the concepts of corporate governance and thus is considered to be the best corporate governance system. EVA bonus system does this by giving employees an ownership stake in improvements in the EVA of their divisions or operations. This causes employees to behave like owners and reduces or eliminates the need for outside interference in decision making.
- (ix) The issue of capital charge compels operating managers to use assets more diligently by focusing directly on the costs associated with inventories, receivables and capital equipment. It enables managers to routinely and automatically consider the cost of capital in every decision and accurately assess the tradeoff between operating costs and capital costs. Combining operating costs and capital costs in a single profit measure that is expressed in rupee rather than a rate of return gives EVA another unique quality. Hence managers could use EVA to guide their future resource allocation decisions and economic income of the firm by any of the following strategies or a combination of these.
- (x) EVA is also an ideal technique for companies operating in new-age sectors. The typical knowledge industry is not capital intensive, and the companies operating in these industries are not faced with too many decisions involving huge amounts of

capital. Moreover in such industries returns on the capital invested are immediate. As a result, EVA is almost a made-to-order performance metric for the knowledge industries.

#### 14.6 **Implementing EVA**

Measuring EVA is not enough-rather one needs to adopt it and implement it.

Implementing EVA is a 4-step process, also called as 'the 4-M process' and these 4-Ms are :-

1. Measurement,
2. Management System,
3. Motivation,
4. Mindset.

(1) **Measurement** – Any company that wishes to implement EVA should institutionalize the process of measuring the metric regularly. This measurement should be done after carrying out the prescribed accounting adjustments, using the formula :--

$$EVA = (ROCE - COC) \times \text{Capital Employed}$$

$$EVA = NOPAT - (WACC \times \text{Capital Employed})$$

(2) **Management System** – Further, the company should be willing to align its management system to the EVA process. The EVA based management system is the basis on which the company should take decisions related to the choice of strategy, capital allocation, merger & acquisitions, divesting business and goal setting. In effect, each one of a company's activities should be aligned to, and derived from the company' EVA process.

(3) **Motivation** – Companies should decide to implement EVA only if they are prepared to implement the incentive plan that goes with it. This plan ensures that the only way in which managers can earn a higher bonus is by creating more value for shareholders. Sales-based incentives reward managers for incremental sales without considering the costs involved, and profits based reward systems can be the source of resentment, at least among those managers who believe that their rewards are based on variables beyond their control. An EVA based incentive system, however, encourages managers to operate in such a way as to maximize the EVA, not just of the operations they oversee but of the company as whole.

(4) **Mindset** - Like other transformation techniques, the effective implementation of EVA necessitates a change in the culture and mindset of the company. All constituents of the organisation need to be taught to focus on one objective maximizing EVA. This singular focus leaves no room for ambiguity and also it is not difficult for employees to know just what actions of their will create EVA, and what will destroy it.

Other major issues related to the implementation of EVA are the geographical or cultural context, the relative simplicity or complexity in adopting it as a measure of corporate performance in some countries, the characteristics of a company, identifying the particular stage in the organizational life style when it works best and its suitability to one particular industry. A lot of attempts have been made to investigate and solve these issues. It has been found that there is no particular geographical or cultural context and no particular stage in a firm's lifecycle where and when EVA can be best implemented. The ideal company to implement it is one in which the board of directors and the senior management want to improve the efficiency of a firm, take advantage of opportunities quickly and align the interests of the management and shareholders. As far as the industry is concerned, the nature of industry is far less important than the attitude of management. The management must surely wish to have the benefits of EVA. This is the key driver of its success.

#### **14.7 EVA vs. Residual Income**

It is strange but a fact that EVA has gained so much of popularity in recent years even though the concept of residual income has been in existence even before EVA. EVA is just a refinement of residual income. Residual income is defined as the difference between profit and the cost of capital. It differs from EVA in the fact that profits and capital employed are book figures i.e. the same as appearing in the financial statements. No adjustments to profit and capital employed figures as reported in Profit & Loss account and Balance sheet are made unlike EVA.

In fact in most of the articles in Indian newspapers and magazines the EVA figures calculated for Indian companies are actually residual income and not EVA. The information relating to most of the adjustments that need to be made to the NOPAT and capital employed figures does not appear with the financial statements and is available only to internal management, so an outsider can only calculate the residual income.

#### **14.8 Drawbacks of EVA**

The following are the drawbacks of EVA :

One important drawback of EVA is that it ignores inflation. So it is biased against new assets. Whenever a new investment is made capital charges is on the full cost initially, so EVA figure is low. But as the depreciation is written off the capital charge decreases and hence EVA goes up. This problem existed with measures like ROI also.

Second problem is that since EVA is measured in rupee terms it is biased in favour of large, low return businesses. Large business that has returns only slightly above the cost of capital can have higher EVA than smaller business that earn returns much higher than the costs. This makes EVA a poor metric for comparing businesses.

Thirdly, in the short term EVA can be improved by reducing assets faster than the earnings and if this is pursued for long it can lead to problems in the longer run when new improvements to the asset base are made. This new investment can have a high negative effect on EVA because the asset base would have been reduced to a large extent and improvements will involve huge investments.

#### **14.9 Market Value Added (MVA)**

A term closely related to EVA is MVA. MVA is the market value of the capital employed in the firm less the book value of capital employed. MVA is calculated by summing up the paid value of equity and preference share capital, retained earnings, earnings, long term and short term debt and subtracting this sum from the market value of equity and debt.

MVA is a cumulative measure of corporate performance. It measures how much a company's stock has added to or taken out of investors' pocket book over its life and compares it with the capital those same investors put into the firm. EVA drives the MVA. Continuous improvements in EVA year after year will lead to increase in MVA.

#### **14.10 EVA DISCLOSURES IN INDIA**

The number of companies that have turned to economic value added (EVA) over the past few years as a new and modified way to gauge corporate financial performance is going up. Highly rated companies like Coca Cola, AT&T, Quaker Oats, Briggs and Stratton have set up separate EVA measurement systems in their organization. India corporate world is also recognizing the importance of EVA. Particularly, after the liberalization on foreign holdings in Indian Companies, the concept of shareholder value is gaining grounds. Some companies e.g., Hindustan Lever, NIIT, Infosys

Technologies, Hyderabad based Dr. Reddy Laboratories have already made EVA a part of their published Annual Reports and others e.g., Ranbaxy Laboratories, Samtel India Ltd. have started calculating EVA as an internal report. EVA has become a part of doing business at NIIT. EVA has enabled the management to link key decisions to shareholder value. Several hundred front line management have already undergone orientation and training in implementing EVA in their business activities.

ITC began consciously examining its shareholder value creating capabilities in 1996. According to the CEO of ITC, the concept of EVA has been followed as it enables the company to clearly identify value drivers from the perspective of the capital market, and once they are identified, it becomes possible for the company to focus their internal processes on them and take every strategic decision in a manner that contributes to the enhancement of shareholder value.

#### **Economic Value Added (EVA) Statement in Infosys Ltd.**

Year ended March 31	2003	2002	2001	2000	1999
1. Average capital employed (Rs. in crore)	2470.48	1734.97	1111.47	703.87	245.42
2. Average debt/total capital (%)	-	-	-	-	-
3. Beta variant	1.57	1.41	1.54	1.48	1.48
4. Risk-Free debt cost (%)	6.00	7.30	10.30	10.45	12.00
5. Market premium	7.00	7.00	7.00	8.00	9.00
6. Cost of equity (%)	16.99	17.17	21.08	22.29	25.32
7. Cost of debt (post tax) (%)	N.A	N.A.	N.A.	N.A.	N.A.
8. Weighted average cost of capital (WACC) (%)	16.99	17.17	21.08	22.29	25.32
9. PAT as a percentage of average capital employed (%)	38.78	46.57	56.08	40.63	54.16
10. Economic Value Added (EVA)	(In Rs. Crore)				
Operating profit					
(PBT excluding extraordinary income)	1158.93	943.39	696.03	325.65	155.86
Less : Tax	201.00	135.43	72.21	39.70	22.94
Less : cost of capital	419.73	297.90	234.30	156.89	62.14
Economic value added	538.20	510.06	389.02	129.06	70.78
11. Enterprise value	(In Rs. Crore)				
Market value of equity	26847.33	24654.33	26926.35	59338.17	9672.80
Less : cash and cash equivalents	1638.52	1026.96	577.74	508.37	416.66
Add : debt	-	-	-	-	-

Enterprise value	25208.82	23627.37	26348.61	58829.80	9256.14
12. Ratios					
EVA as a percentage of average capital employed(%)	21.79	29.40	35.00	18.34	28.84
Enterprise value/average capital employed	10.20	13.62	23.71	83.58	37.72

Note :

1. The cost of equity is calculated by using the following formula :  
return on risk-free investment + expected risk premium on equity investment adjusted for beta variant for Infosys in India.
2. Till last year, we had used the average beta variant for software stocks in the US in the above calculation.
3. The figures above are based on Indian GAAP financial statements.

#### **14.11 summary**

The basic objective of the EVA technique is to identify whether the organisation's Net Operating Profit After Tax generated during a given period is capable of covering the cost of capital for the same period, thus generating value for its owners. Though the technique is very simple to understand, it is tricky to implement. Companies trying to implement EVA are asked to incorporate up to 164 changes to their financial accounts. However, despite the computational difficulties, it emphasizes the intrinsic truth that the equity capital of an organisation is expensive and risky and an organisation capable of monitoring the net profit position with the cost of capital would generate value for its owners in the long-run. Thus any system will bear fruits only when it is well implemented and has the support of all the parties concerned and EVA is no exception to this rule. Moreover, as with any other system EVA too has limitations but it still stands as an improvement over measures like ROI and ROE and if implemented well, by taking the limitations into account, will yield better results.

#### **14.12 Self Assessment Questions**

1. What is EVA concept ? State the conceptual issues involved in calculating EVA.
2. Discuss the ways in which EVA can be improved.
3. Discuss the considerations to be kept in mind for implementing EVA.
4. How is EVA superior to traditional performance measures.

#### **14.13 SUGGESTED READINGS**

1. E.C. Wood, "Added Value : They Key to Prosperity", Business Books.
2. E.S. Hendriksen, Accounting Theory, Irwin.
3. Ahindra Chakrabarti, "Economic Value Added (EVA) Performance Metric to Sustain Competitiveness", Global Business Review.
4. K.P. Singh & M.C. Garg "EVA in Indian Corporates" Deep & Deep Publication

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## **LESSON-15**

# **BRAND VALUATION AND ACCOUNTING**

**Objective :** After reading this lesson, you should be able to describe the meaning of brand, objectives of corporate branding, objectives of brand accounting etc.

## **LESSON STRUCTURE**

- 15.1 Introduction
- 15.2 Meaning of Brand
- 15.3 Identification of Brands as an Asset
- 15.4 Objectives of Corporate Branding
- 15.5 Meaning of Brand Accounting
- 15.6 Objectives of Brand Accounting
- 15.7 Difficulties in Brand Accounting
- 15.8 Valuation of Brands
- 15.9 Whole Organization as a Brand
- 15.10 Co-Branding
- 15.11 Brand Accounting Practices
- 15.12 Summary
- 15.13 Self Assessment Questions
- 15.14 Suggested Readings

### **15.1 introduction**

The asset structure of corporate entities consists of both tangible and intangible assets. Traditionally, accountants regarded tangible assets like land, building, plant and machinery, cash and bank balances etc. as the only productive or earning generating assets and gave undue importance in their maintenance and accounting. Accounting principles and standards also laid stress on accounting for these tangibles.

In modern competitive environment, the corporate value and earning power are decided and generated by both the classes of assets, often more by intangibles than tangibles. In a turbulent marketing environment, brand gives tremendous competitive advantage to corporate. It can be said that rather than product selling itself, it is brand that sells the product. Vast sums are being spent by corporate to propagate and perpetuate the brand identity among product or service users. Brands are strategic assets. The key to survival of companies is their brands in the modern world of complex and competitive business environment.

### **15.2 meaning of Brand**

According to American Marketing Association “the word ‘brand’ means a name, term, sign, symbol or design or a combination of these intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of competitors.”

Corporate branding can be taken to mean the strategic exercise, by managerial decision making of creating, developing, maintaining and monitoring the identity, image and ownership of a product/corporate entity. Among various intangibles such as goodwill, patents, copyrights, brands etc., brands comprise an important item in that they greatly determine the corporate market value of a firm.

Brand achieves a significant value in commercial operation through the tangible and intangible elements. Brands may be that which is acquired from outside source while acquiring business or may also be nurtured internally by a company, which are known as "Home-grown brands". By assigning a brand name to the product, the manufacturer distinguishes it from rival products and helps the customers to identify it while going in for it. The necessity of branding of products has increased enormously due to the influence of various factors like growth of competition, increasing importance of advertising etc.

Power brands make such a lasting impact on the consumers that it is almost impossible to change his preferences even if cheaper and alternative products are available in the market. Brands have major influence on takeover decisions as the premium paid on takeover is almost always in respect of the strong brand portfolio of the acquired company and of its long-term effect on the profits of the acquiring company in the post –acquisition period.

### **15.3 Identification of brands as an asset**

There are various definitions of the term 'asset'. Asset as a concept, is generally characterized by the following features :

- For an asset there must exist some specific right to future benefits or service potentials.
- Rights over asset must accrue to a specific individual or firm.
- There must be a legally enforceable claim to the right or services over the asset.
- The asset must be the result of a past transaction or event.

The companies with valuable brands register those names and are legally entitled to sole ownership and use of them. Brands are created through marketing efforts over time, they are the result of several past transactions and events.

### **15.4 Objectives of Corporate Branding**

Corporate managers have to continuously monitor the brand strengths in terms of various brand attributes. Brand identification, market share, competitive strength, international acceptance, brand availability, market stability etc. are some of the attributes which build the brand strengths.

The cost incurred to propagate and popularize the brand does not automatically guarantee the brand value. A proper linkage should always be envisaged between cost and attributes. A cost in the form of advertisement etc. which strengthens the brand attributes should add to the brand value and brand equity. The important objectives of corporate branding are as follows :

1. **Corporate Identity** : Brands help companies in creating and maintaining an identity for them in the market place. This is facilitated by brand popularity and the eventual customer loyalty attached to the brands.

2. **Total Quality Management (TQM)** : By building brand image, it is possible for a body corporate to adopt and practice Total Quality Management (TQM). Brands help in building a lasting relationship between the brand owner and the brand user.
3. **Customer Preference** : The need for branding a product or service arises on account of the perceived choice and preferences which are built up psychologically by the customers. In fact, branding gives them the advantage of status fulfillment.
4. **Market Segmentation** : Segmenting a market requires classification of markets into more strategic areas on a homogeneous pattern for efficient operations to enable firms to effectively target consumers and to meet the competition. This segmenting of a market is facilitated through the built-up strong brand values.
5. **Strong Market** : By building strong brands, firms can enlarge and strengthen their market base. This would also facilitate programmes, designed to achieve maximum market share.

#### **15.5 meaning of Brand Accounting**

The term brand accounting refers to “the practice of valuation and reporting of the value of brand of a product or service in the financial statements of a corporate entity, the value of a brand being ascertained either as a result of revaluation in the case of home-grown brands or as a result of acquisition/merger in the case of newly acquired brands”.

Accounting is basically a measurement and communication system. Corporate brand accounting can be defined as a process of identification, measurement and communication of brand value and brand equity to permit informed judgment and decisions by the users of the information.

#### **15.6 Objective of Brand Accounting**

The accounting for brands is motivated by the following reasons :

1. **Real Economic Value** : By showing brand value in the Balance Sheet of a firm, an objective and realistic assessment of the company's real economic value could be made possible. This would facilitate the ascertainment of correct Net Asset Value (NAV) which would be useful in times of business acquisitions and mergers.
2. **Future Profitability** : A brand generated or purchased, could be very useful for ascertaining the future income making ability of companies. In fact, enormous sums of money spent on promoting and supporting brands would go to appreciate the value of the firm. Companies which enjoy brand equity will have the market value of their share enhanced. Brand equity refers to the value added to the equity of a firm by the brand popularity and loyalty.

3. **Preventing Predation :** By building and explicitly disclosing brands in financial statements, companies could put up a powerful defense against potential predators and thereby ward off possible acquisition and take-over bids.
4. **Leverage Benefits :** By enhancing the NAVs through brand disclosure separately in the Balance sheet, it is possible for companies to resort to easy debt borrowing as this causes an increase in NAV. In fact, the borrowing limits a firm enhances with the increase in NAV. This ultimately paves the way for sound capital structure and an improved gearing ratio.
5. **Quality Decisions :** Inclusion of brand values not only enhances NAV, but also ensures fair valuation of the firm. This promotes quality managerial decision making. Brand valuation may help managers in placing importance on brand promotion and strategic brand positioning which hold the key for corporate marketing success.
6. **Quality Accounting :** Brand value inclusion enhances the quality of accounting practice since the value added by corporate brands are considered significant in financial statements. This could ultimately improve the financial accounting system and management control.
7. **Social Obligation :** Brand valuation and its disclosure would help managers and shareholders alike appreciate the significant role of brands in maintaining and enhancing the market value of firms. This could help especially the shareholders in making an objective evaluation of companies (rating) before investing their money. This exercise, in a way, helps firm fulfill their social obligations.
8. **Other Benefits :** Brand accounting provides a strong basis for self-evaluation of its value by corporate. This could help firms in making a perfect estimate of the ability to take on the competitors. It not only helps in tackling competitors locally, but could be of much greater advantage to the foreign joint ventures and collaborations.

### **15.7 Difficulties in Brand Accounting**

Intangibles are not easily measurable and it poses severe challenges in valuation of brands also. Some of the difficulties faced by the accountants in brand valuation are as follows :

1. **Distinctiveness :** Brands need to be valued distinctively as different from other intangibles such as goodwill. For instance, any attempt to commonly treat brand as a part of goodwill as is done at present may create serious distortions in accounting position. Besides, this would create handicaps in brand accounting. This is because, a brand cannot be treated like any other item such as patents and copyrights. In fact,

brand needs to be separately disclosed in the balance sheet, because of its significant contribution to corporate image and identity.

- 2 **Disclosure :** There is always a problem of making disclosure of brand values in financial statements. This is because, there is no standard accounting practice requiring statement and disclosure of brand values in a particular way.
- 3 **Uncertainty :** The problem that is associated with the brand, as an item of intangibles, is that its possible returns are uncertain, immeasurable and non-current in nature. Any expected on such intangibles are usually either written off or treated as deferred revenue expenditure.
- 4 **The Dilemma :** Another area of challenge posing brand accounting is whether to amortize or capitalize the value of brand. There is no question of amortizing brand values as either the economic life of the brand cannot be determined in advance or its value depreciates over time. In fact, it is to be noted that a brand can be purchased or generated and maintained, thus enhancing the corporate future income earnings capacity. The challenge could, however, be overcome by categorizing the brand expenditure into maintenance and investment. Whereas the maintenance expenditure could be charged to Profit and Loss Account and the capital expenditures be shown in the Balance Sheet and where the brand value is shown separately and explicitly in the Balance Sheet, the leverage position of the company can be shown enhanced.
- 5 **No Market :** The prevailing practice is that the intangibles are not required to be revalued according to some accounting standards on account of the non-existence of an active secondary market for them. In fact, the need for brand accounting arises mainly on account of conditions warranted by acquisition and merger.
- 6 **New Brands :** A related problem in accounting for such intangibles as brands is that it is often difficult to determine whether a new one is being gradually substituted for an existing brand. This raises the issue as to how to account for it in subsequent years. In such case, the relevant question is : Should the original cost of brand be written-down as it erodes? It may be difficult to determine whether a brand remains the same asset over time as it is subtly reshaped to meet new market opportunities.
- 7 **Joint Costs :** The contribution to the value of a brand is made not simply by investing a desirable product with a customer seductive name, but by building market share by the skilful exploitation of the product in a whole host of ways of general efficiency with which a business is conducted by expending money on a joint cost basis. It is very difficult to segregate and account for joint costs that are incurred and the cost of brand developed as a result of general operations of the business.

## 15.8 Valuation of brands

The methods of brand valuation would depend on one or more of the following variables :

- Exclusive earning power of brand.
- Product as a brand and hence, product life cycle.
- Separating a brand from other less important value drivers
- Cost of acquisition of brand.
- Expenses incurred on nurturing a home grown brand.
- Impact of other brands as new entrants to the market.
- Intrinsic strength of the people and process handling the brand.
- Accuracy in projecting the super or extra earnings offered by a brand and rate of discounting such cash flows.
- The cost of withdrawing or replacing the brand.
- Internationalization of a brand and therefore, local earning power of a brand in various countries or markets.

Several approaches have been evolved over a period of time for determining the value of brands. These models lay emphasis on ascertaining the 'Brand Strength' of a product or service of a corporate entity, which is defined as the sum total of all benefits flowing from different dimensions of a brand such as quality of market leadership (ML) of the brand, relative stability of market (SM) enjoyed by the brand, the extent of market share (MS) of the brand, the levels of international acceptance (IA) of the brand, ability of the brand to meet the changing modern marketing trends (MT), the extent of strategic support (SS) provided by the brand to the corporate's survival and growth, competitive strength (CS) offered by the brand and above all the legal and social brand protection (BP). Thus, the brand value/strength can be stated as follows :

$$\text{Brand value} = (\text{ML} + \text{MS} + \text{SM} + \text{IA} + \text{MT} + \text{SS} + \text{CS} + \text{BP})$$

Here, ML = Market Leadership

MS = Extent of Market Share

SM = Stability of Market

IA = Levels of international acceptance

MT = Ability to meet the changing modern marketing trends

SS = Extent of Strategic support

CS = Competitive strength

BP = Social Brand protection

The valuation of brands is discussed from the angle of (i) Acquired brands, and (ii) Self generated brands.

## Valuation of Acquired Brands

A purchased brand is one, which is acquired from other existing concerns. The acquiring company may acquire only the brand name(s). The value of acquired brands would be the price paid for acquisition of that brand.

On the other hand, a company may acquire an existing business concern along with its brands. There are the cases of business mergers and amalgamations. The sum involved in these transactions provides an indication of the financial value of the brands. At the maximum this value is equal to the difference between the price and the value of the net assets indicated on the acquired company's balance sheet.

Brand value = Purchase consideration - Net assets taken over

However, it is questionable to say that the excess price paid always represents the brand value. The excess is only an amount of purchased goodwill and the acquiring company may have paid the excess price for varied factors also, location of the factory, long term contracts with suppliers, better employee morale, better manufacturing technology etc. besides for brands.

It would be difficult to say what part of the excess price paid is attributable to brands. Besides, the price payable is always decided by forces of demand and supply conditions of mergers and amalgamations market. Competitive force may make the acquirer to increase the bid price thereby increasing the amount of purchased goodwill. This inseparability of brand from other intangible assets makes it difficult to value the brands.

## Valuation of Self-generated Brands

Several approaches have been evolved over a period of time for determining the brand values. The important methods in valuation of self-generated brands are discussed below :

1. **Historical Cost Model :** According to this approach, the valuation of a brand is determined by taking into account the actual expenses incurred in the creation, maintenance and growth of corporate brands. The value of the brand is computed as follows:

Brand value = Brand Development Cost + Brand Marketing and Distribution Cost  
+ Brand Promotion Costs including advertising and other costs.

The historical cost method is specifically applicable to home-grown brands for which various costs like development costs, marketing costs, advertising and general communication costs. are incurred. The sum total of all these costs would represent the value of brands. However, the entire advertisement costs cannot be regarded as incurred for brand. Further, several heavily advertised brands today show hardly any value of presence.

The chief advantage of this model is that the various types of costs that are actually incurred are considered. This facilitates easy computation of brand values. However, it does not explain the impact of brand value on the profitability of a firm.

2. **Replacement Cost Model :** Under this model, the brands are valued at the costs, which would be required to recreate the existing brands. The method is based on the assumption that the existing brands can be recreated exactly by new brands. It is the opportunity cost of investments made for the replacement of the brand.

Brand value = Replacement Brand Cost

The main disadvantage with this model is that this model gives an estimation of brand value but it is near impossible to replace the existing brands by new brands. Further, such values are only subjective ones.

3. **Market Price Model :** The probable value that a company would get for sale of its brands is taken as the value of the brands under this model. Therefore, the brand value is net realizable value from sale of a brand.

However, this value is only an assumed value because there exists no ready-made market for many brands. Further, brands are created or bought by corporate not for sale or resale. Value payable by the purchaser depends upon the benefits expected from the purchase of brand. But the method determines the value from the seller's point of view.

4. **Current Cost Model :** According to this approach, the current corporate brands are valued at the current value (current costs) to the group, which is reviewed annually and is not subject to amortization. This basis of valuation ignores any possible alternative use of brand, any possible extension to the range of products currently marketed under a brand, any element of hope value and any possible increase in value of a brand due to either a special investment or a financial transaction (e.g. licensing) which would leave the group with different interest from the one being valued.

$$\text{Brand value} = \text{Current use value}$$

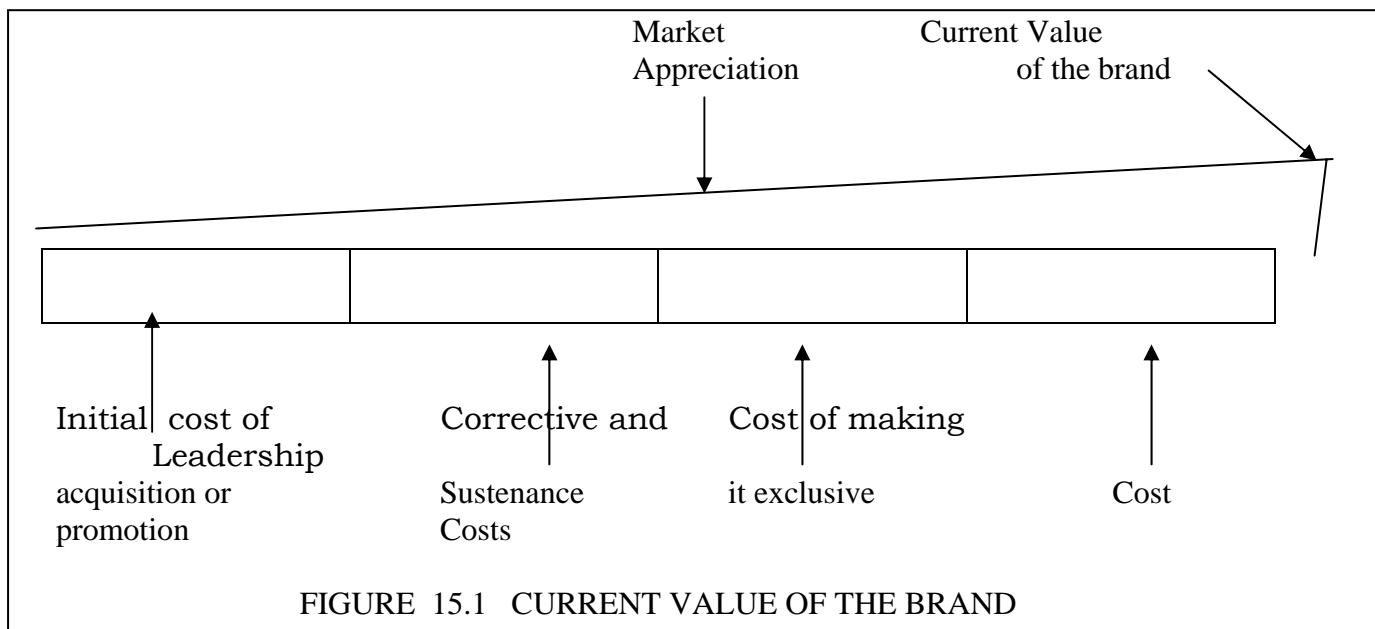


FIGURE 15.1 CURRENT VALUE OF THE BRAND

5. **Potential Earning Model :** The Potential Earnings (PE) model is based on the estimated potential earnings that would be generated by a brand and their capitalization by using appropriate discount rate. The volume of revenues raised by a brand in the market determines its value. Accordingly, the value of a brand at any one point of time is given by :

$$\text{Total Market value of brand} = \text{Net Brand Revenue/Capitalisation Rate}$$

Where,

$$\text{Net Brand Revenues} = (\text{Brand units} \times \text{Unit brand price}) - (\text{Brand units} \times \text{Unit brand cost}) - (\text{Marketing cost} + \text{R cost} + \text{Tax costs})$$

Though the model sounds objective, problem lies in ascertaining the actual marketing cost incurred for a particular brand of a product. Moreover, it is difficult to select an appropriate capitalization rate.

6. **Present Value Model** - According to present value model, the value of a brand is the sum total of present value of future estimated flow of brand revenues for the entire economic life of the brand plus the residual values attached to the brand. This model is also called Discounted Cash Flow model which has been wisely used by considering the year wise revenue attributable to the brand over period 5,8 or 10 years. The discounting rate is the weighted average capital cost, this being increased where necessary to account the risks arising out of a weak brand. The residual value is estimated on the basis of a perpetual income, assuming that such revenue is constant or increased at a constant rate.

$$\text{Brand value} = \frac{R_t}{1+r_g} + \frac{\text{Residual value}}{1+r_g}$$

Where,

$R_t$  = Anticipated revenue in year  $t$ , attributable to the brand

$t$  = Discounting rate

Residual value beyond year  $N$

Brands supported by strong customer loyalty, may be visualized as a kind of an annuity, since, mathematically, an annuity is a series of equal payments made at equal intervals of time. Brands backed up by the loyalty of hard-core customers offer strong probability of having steady long -term incomes. Great care must be taken to estimate as much correctly as possible, the future cash flow likely to emanate from a strongly positioned specific brand. A realistic present value of a particular brand having strong loyalty of customers can thus be obtained from summation of discounted values of the expected future incomes from it.

The DCF model for evaluating brand values has got three sources of failure : (i) Anticipation of cash flow, (ii) Choice of period, and (iii) Discounting rate.

7. **Sensitivity Model** : According to this approach, the brand revenues are determined as a functional inflow of such market factors as level of awareness of brand (AB), level of customer influence (BI) and level of brand autonomy (BA) in the market, all these factors in the first place predominating the sales revenues and then the brand revenues or the brand value. In other words, sensitivity of each of the above forces determines the brand value.

$$\text{Brand value} = (\text{Brand units sold} \times \text{Unit Brand price}) \times AB \times BI \times BA - (BDC + BMDC + BPC)$$

Where,

AB, BI and BA are sensitivity index of brand values.

BDC = Brand Development Cost

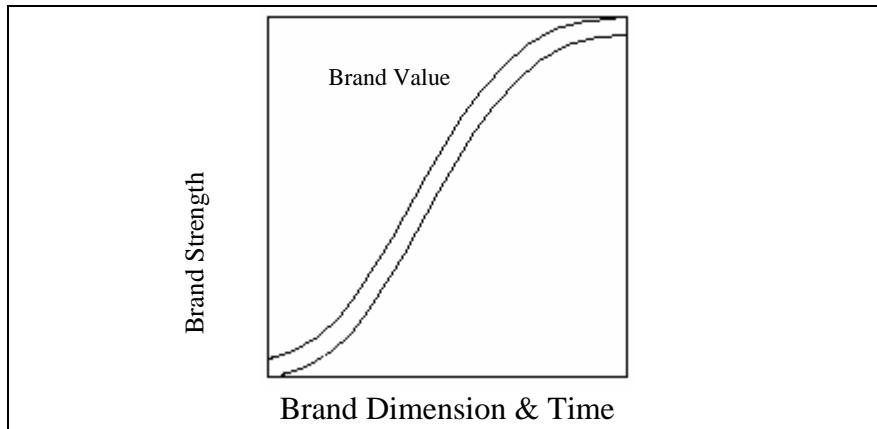
BMDC = Brand Marketing and Distribution Cost

BPC = Brand Promotion Cost

The demerit of this model is that it gives more importance to subjective variables in the estimation of brand value and this renders the whole exercise less reliable.

8. **Life Cycle Model** : Under this approach, the brand value is indicated by means of relating the brand dimensions to the brand strength. This model is applicable to home grown brands, where the brands are generated, nurtured and developed throughout their life which resembles a product life cycle, The model is so called because the

various brand dimensions behave in a way over a period of time thus forming the brand value, to its life. This results in the formation of S-curve. The model merely gives a diagrammatic representation of formation and behaviour of brand strength. The various dimensions assumed in this approach are difficult to be quantified. Figure 15.2 depicts the life cycle model of corporate brand strength.



**FIGURE 15.2 : LIFE CYCLE MODEL**

**9. Incremental Model :** Under this approach, the value of a brand is measured in terms of incremental benefits accruing to a firm on account of additions made to the brand value as a result of acquisition or revaluation of brands. The brand value is computed as follows:

Brand value = Total expected benefits after acquiring or revaluing brands – Total benefits of brands owned

**10. Super Profits Model :** This is the most commonly used method for brand valuation. The simple formula of valuation under this method is as follows :

Brand value = Discounting Factor  $\times$  (Total profit of an enterprise in 'n' years  $\times$  Profit of an enterprise without the brand in 'n' years)

The disadvantages in this method are as follows:

- How many years ('n') profits to be considered ?
- What should be the discounting rate ?
- How do we decide the profit of an enterprise without the brand ?

**11. Market Oriented Approach :** This method is much outward looking and emphasizes on the market forces and competition, to arrive at a brand's value. The method requires very good understanding of the market, new entrants, exit of old competitors, market expansion and shrinkage and impact of other macro-level variables on the market. The valuation process demands due amount of conservatism in projecting the market size and company's market share.

Brand value = Discounting Factor  $\times$  Company's profitability ratio  $\times$  (Cumulative market's size in next ten years – Cumulative total of market share enjoyed by other branded and non-branded products in next 10 years)

The advantage of this method is, it looks at macro aspects governing the brand's growth or shrinkage. It also takes the cognizance of non-branded products and their threat to the company's brand. Company's profitability ratio and the accounting factor are a matter of strategic benchmarking.

### 15.9 Whole Organisation as a brand

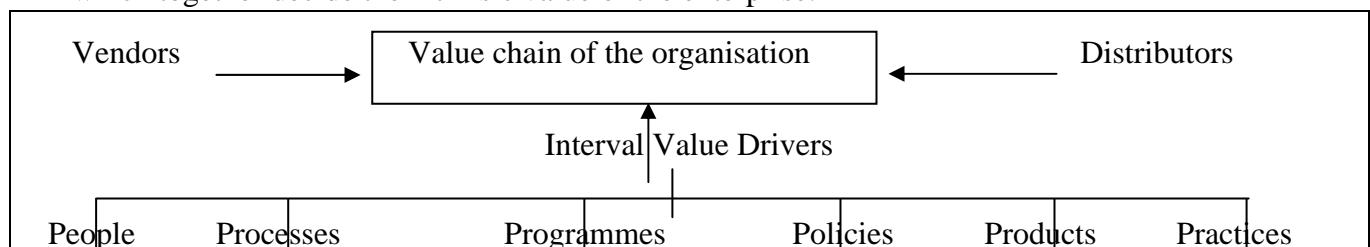
Normally one cannot identify a product or process or programme as an exclusive brand, the premium enjoyed by such enterprise becomes the value of the brand.

$$\text{Brand value} = \text{Intrinsic value of an enterprise} - \text{Net asset value of the assets of an enterprise}$$

This method is useful under the following circumstances :

- The buyer acquires the whole of the enterprise.
- A going concern values itself and exhibits such premium enjoyed by it, in its Balance Sheet.
- One company becomes the brand equity or brand name for whole of the group.
- Valuation of an enterprise as a brand is to be used as a base for computing the brand value of each value driver in the value chain of the enterprise.

This method is a very accurate choice of performance indicators and their weight ages which together decide the intrinsic value of the enterprise.



**FIGURE 15.3 : ORGANISATION AS A BRAND**

### 15.10 Co-Branding

From an organizational perspective, co-branding represents an opportunity for a win-win scenario. As we move from the era of transaction brand marketing to relationship brand marketing, co-branding is becoming more important strategy for co-producing an enhanced value.

Co-branding brings in royalty income, boosts sales, brings new markets, brings additional consumer benefits, minimizes investments, avoids barriers to entry, reduces risks, brings quicker returns, get price premiums, brings customer reassurance, provides access to leading edge technologies, communicates high product/service quality, contributes to market priming, reinforces advertising manager, builds brand's exposure, creates consumer interest and above all offers enhancement for the core brand value.

Co-branding is also called as Partnership Branding, brings in better retailer collaboration and clearly it is a powerful tool, offering major strategic and financial advantages.

### 15.11 Brand Accounting Practices

According to the GAAP (Generally Accepted Accounting Principles) of ASB (Accounting Standards Board), UK, there is a growing intensity among companies wanting to include in their list of intangible assets, for the purpose of disclosure in financial statements such items as brands for the purposes of acquisitions and mergers etc. The board has laid down the following conditions in this regard :

- a. Knowledge of historical costs of brand creation.
- b. Ready ascertainability of brand costs.
- c. Clear separability of brand from the characteristics of Goodwill.
- d. Independent measurement of cost as different from Goodwill.

There has been, in fact, a raging debate as to whether to include brand and other items under the broad head "Intangible fixed assets" which could be used for computing NAV necessary at the time of acquisitions.

There has not been noticed any practice of accounting formally framed, regulated and followed in any part of the world relating to brands. However, it is interesting to note that (though the ASB has not allowed) some companies in UK make disclosure of brand values and state the relevant accounting policy in their financial statements. For instance, some companies have the practice of including brand values in the computation of fair value of business acquired and of interest taken in associated undertakings. This is recognized where the brand has a value which is substantial and long-term. Acquired brands are only recognized where title is clear, brand earnings are separately identifiable, the brand could be sold separately from the rest of the business and where the brand achieves earnings in excess of those achieved by unbranded products.

Similarly, amortization is not provided except where the end of the useful economic life of the acquired brand can be foreseen. The useful economic lives of brands and their carrying value are subject to annual review and any amortization or provision for permanent impairment would be charged against the profit for the period in which they arose. Moreover, the cost of the brands is calculated at acquisition, as part of the fair value accounting for businesses acquired, on the basis of after tax multiples of pre-acquisition earnings after deducting attributable capital employed.

According to the accounting practice of some companies, intangibles represent significant owned brands acquired and valued at historical cost. No amortization is charged as the annual results reflect significant expenditure in support of these brands and the values are reviewed annually with a view to writing down if a permanent diminution arises.

For some other companies, intangible fixed assets comprise certain acquired separable corporate brand names. These are shown at a valuation of the incremental earnings expected to arise from the ownership of brands. The valuations are based on the present value of notional royalty savings arising from ownership of those brands and on estimates of profits attributable to brand loyalty. The valuations are subject to annual review. No depreciation is provided where, in the opinion of the directors, brands do not have a finite useful economic life. Corporate brand names represent the directors' valuation of the brand names. These assets have been valued in accordance with the Group's accounting policy for intangible fixed assets.

It is pertinent to note that the ASB, UK, holds the view that the inclusion of brands and other similar intangible assets in the Balance Sheet are undesirable developments unless the conditions laid down under GAAP are fulfilled.

The ICAI (Institute of Chartered Accountants of India) makes a small mention as to how the Goodwill must be disclosed as part of fixed asset in the Balance Sheet. The Institute is yet to evolve a method for valuation, accounting and disclosure of corporate brands. According to AS-6 of ICAI : Goodwill should be recorded in the books only when some consideration in money or money's work has been paid for it. Whenever a business is acquired for a price (payable in cash or in shares or otherwise) which is in excess of the value of net assets of the business taken over, the excess should be termed as Goodwill.

## 15.12 Summary

Any item of financial transaction/asset which requires valuation (if any), and disclosure in the accounting statements need a regulatory framework. The development of brand valuation method and accounting framework are very important in this regard. Not much headway, however, has been made in the sphere of accounting for brands. Enervated by the benefits of brand value, many firms in the West saw the sage of mega-mergers and acquisitions in the late eighties. This was

attributed to enhanced NAVs made possible by brands' disclosure in the Balance Sheet. However, there is a biggest handicap of reliable and independent assessment of the brand value. This is the single most important reason for the brands not allowed to be placed on the Balance Sheet by the Authorities concerned. Though, value is assigned to externally acquired brands, there is no effective way for assessment of home-grown brands. Nevertheless, it is gratifying to note that the Institute of Chartered Accountants of England and Wales (ICAE & W), has given due recognition to the internally generated brand values and allow disclosure in the Balance Sheet which necessitates periodic revaluation.

The brands are to be explicitly recognized, as part of purchased Goodwill, by the ICAI of India, which would make possible the recognition of brand values. Rules and methodologies necessary for the valuation accounting and disclosure of brands may be framed in this regard. This would go a long way in governing the brand accounting practice and contribute to healthy business combinations in India, especially where the brand values are given serious consideration in the emerging strategic alliances, mergers and acquisitions fueled by the entry of MNCs. This assumes special significance in the environment of globalization, liberalization and privatization of Indian economy.

It emerges from the above discussions that Goodwill, brand valuation and accounting are definite to take the world of accounting by storm in the near future which would mark the beginning of a new era of accounting practice. Thus, there exists a strong and a clear case for brand accounting, especially in view of the imminent benefits of brand accounting to the corporate bodies and the investors alike.

### **15.13 Self Assessment Questions**

1. Define Brand. Discuss the objectives of corporate branding ?
2. What is the necessity of brand accounting in the competitive business environment?
3. Discuss the difficulties in accounting the brands.
4. Explain various models available for valuation of home-grown brands.
5. How would you value the acquired brands ?

### **15.15 SUGGESTED READINGS**

1. Kotler Philip, Armstrong Gary, Principles of Marketing, Printice-Hall of India (Pvt.) Ltd.
2. ASB, Goodwill and Intangible Asset, U.K.
3. Pyne Radhanath, Valuing brands, The Accounting Debate, The Chartered Accountant.
4. Datta Manipadma, Brand Equity : A paradigm shift in firm valuation, Chartered Secretary.