LOVELY PROFESSIONAL UNIVERSITY

COST AND MANAGEMENT ACCOUNTING

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SYLLABUS

Cost and Management Accounting

Objectives: To familiarise the students with the various cost concepts, elements of cost, methods and techniques of cost control and also to expose the students to the tools and techniques used in financial statement analysis.

S. No.	Description
1.	***Introduction to Cost Accounting:*** Meaning & Definition, Scope and use of cost accounting, Relationship between Financial Accounting and Cost Accounting , Role of Cost accounting in Decision-Making, Cost concepts, Element of cost, classification of costs, Preparation of cost sheet and unit or output costing.
2.	***Accounting for Material:*** Material Control, Pricing of material issues, Labour: labour turnover, methods of wage payment and incentive plans, Overhead: classification; absorption of Overhead; under and over absorption of Overhead.
3.	***Marginal costing & Absorption Costing:*** CVP Analysis; P/V ratio, break even point, margin of safety
4.	***Variance Analysis:*** Meaning & importance, Kinds of variance
5.	***Budgetary control:*** Meaning, objectives, Types of budgets
6.	***Introduction to Management Accounting:*** Meaning, nature, scope and limitations, Relationship of financial, cost and management accounting
7.	***Analysis of financial statements:*** Tools, Comparative statements, common size statements and trend analysis.
8.	***Ratio Analysis:*** liquidity ratios, activity ratios, solvency ratios and profitability ratios
9.	***Fund Flow Analysis:*** meaning, preparation of statement of changes in working capital & Fund Flow statement, Cash Flow analysis (as per AS-3): Cash from operating, investing & financing activities, preparation of cash flow statement.
10.	***Introduction to recent development in cost management:*** Human Resource Accounting, Activity Based Costing, Social Accounting.

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Unit 1: Introduction to Cost Accounting

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Objectives

After studying this unit, you will be able to:

- Explain the meaning and definition of cost accounting
- Discuss the scope and uses of cost accounting
- Describe the relationship between financial accounting and cost accounting
- State the role of cost accounting in decision making
- List the elements of cost
- Make classification of cost
- Describe costing system

Introduction

Cost accounting is a branch of accounting and has been developed due to limitations of financial accounting. The financial accounting is primarily concerned with record keeping directed towards the preparation of gross profit account, profit and loss account and balance sheet. It provides information regarding the gross profit, profit and loss that the business or enterprise

Notes

is making and also its financial position on a particular period. The information concerning the business or enterprise is helpful to the management to control on business.

The management of every business enterprise is interested to know much more than the usual information supplied to outsiders. In order to carry out its functions of planning, decision-making and control, it requires additional cost data. The financial accounts fail, to some extent, to provide required cost data to management and hence a new system of accounting which could provide internal report to management was conceived of.

1.1 Meaning and Definition of Cost Accounting

Cost accounting, which is a branch of accounting, has been developed due to limitations of financial accounts. "Cost accounting is an analytical system of accounting that discloses the cost per unit of different articles manufactured or jobs done and also the cost at various stages of completion".

Caution The cost accounting system is not independent of the financial accounts. It merely represents an elaboration of the basic financial accounting system.

Cost accounting is concerned with the classification, accumulation, control and assignment of costs. Cost accountant classifies, costs according to patterns of behaviour, activities or processes to which they relate products to which they attach and other categories, dependent on the types of measurement desired costs may be accumulated by accounts, jobs processes products or other business segments. The cost accounting system is directly concerned with control of inventories, plant assets and funds expanded on functional activities.

Note

Cost Accounting vs. Management Accounting

S.No.	Point of Difference	Cost Accounting	Management Accounting
1.	Objectives	Its main purpose is to ascertain the cost and control	Its major objective is to take decisions through supplement presentation of accounting information
2.	Scope	It deals only with the cost and related aspects	It not only deals with the cost but also revenue. It is wider than the cost accounting
3.	Utilization of Data	It uses only quantitative information pertaining to the transactions	It uses both qualitative and quantitative information for decision making
4.	Utility	It ends only at the presentation of information	But it starts from where the cost accounting ends; means that the cost information are major inputs for decision making
5.	Nature	It deals with the past and present data	But it deals with future policies and course of actions

The following are the important definitions of cost accounting:

"Cost accounting is the provision of such analysis and classifications of expenditure as will enable the total cost of any particular unit of production to be ascertained with reasonable degree of accuracy and at the same time to disclose exactly how such total cost is constituted".

—Walter W. Bigg

Notes

"Costing is the proper allocation of expenditure whereby reliable cost may be ascertained and suitably presented to affford guidance to the producers in control of their business".

—Harold James

"Costing is the classifying, recording and appropriate allocation of expenditure for the determination of the cost of products or services, and for the presentation of suitably arranged data for purposes of control and guidance of the management. It includes the ascertainment of the cost of every order, job, contract, process, service, or unit at as may be appropriate. It deals with the costs of production, selling and distribution".

—Harold J. Wheldon

"Cost accounting means the application of principles of accounting in such a manner that the management is always assured of a detailed recording and analysis of expenditures incurred in connection with the operation of any business so that it is able to measure performance and control activities".

—Jeremiah Lock Wood

Self Assessment

State whether the following statements are true or false:

1. Financial accounting is concerned with the classification, accumulation, control and assignment of costs.
2. The cost accounting system is directly concerned with control of inventories, plant assets and funds expanded on functional activities.
3. The cost accounting system is independent of the financial accounts.

1.2 Scope and Use of Cost Accounting

The scope of any subject refers to the various areas of study included in that subject. As regards, the scope of cost accounting is very wide and includes the following:

1. ***Technique and Process of Costing:*** The technique of costing involves two distinct steps, namely, (a) classification of costs according to various elements, and (b) allocation and apportionment of the expenses which cannot be directly charged to production. As a process, costing is concerned with the routine ascertainment of cost with a formal and selected procedure.
2. ***Cost Control:*** Cost control is the guidance and regulation by executive action of the costs of operating and undertaking. This guidance and regulation is done by the executive who is responsible for causing the deviation. This process will become clear by enumerating the steps involved in any technique of cost control. Cost control is exercised through a variety of techniques such as inventory control, product control, quality control, budgetary control, standard costing, etc.
3. ***Ascertainment of Cost:*** It deals with the collection and analysis of expenses, the measurement of production at different stages and linking up of production with the expenses. To achieve the first step, costing has developed different systems such as Historical or Actual Cost, Estimated Cost and Standard Cost. For achieving the second step, costing has developed different methods such as single or output costing, job costing, contract costing, etc. Finally, for achieving the last step costing has developed important techniques such as, Marginal Costing, Standard Costing, Budgetary Control, Total Absorption Costing and Uniform Costing.

Notes

4. ***Cost Audit:*** The terminology of ICMA, London, defines cost audit, as "the verification of the correctness of cost accounts and of the adherence to the cost accounting plan". Cost audit has a much wider role to play in an industry or organisation than people could imagine. The aim of cost audit is to highlight the shortcomings inherent in the cost accounting system.

5. ***Budgetary Control:*** According to Heiser, budgetary control can be defined as "an overall blue print of a comprehensive plan of operations and actions expressed in financial terms". According to him, budgeting process involves the preparation of a budget, comparison of budgeted and actual expenditure and income, planning and coordinating for control, etc.

Self Assessment

Fill in the blanks:

4. ..... is the guidance and regulation by executive action of the costs of operating and undertaking.

5. The aim of ..... is to highlight the shortcomings inherent in the cost accounting system.

6. ..... process involves the preparation of a budget, comparison of budgeted and actual expenditure and income, planning and coordinating for control, etc.

1.3 Relationship between Financial Accounting and Cost Accounting

In a modern system of industrial accounting, there is no independent cost ledger or financial ledger, but the complete accounting system is amalgamated into one set of double-entry accounts. In other cases, the figures posted to the cost ledger are reconciled at regular intervals, probably monthly, with the figures shown in the revenue accounts of the financial ledger.

Whichever system is adopted, the expenditure accounts and the cost accounts are interdependent. The application of financial and cost accounting to the service of management should be planned as one coordinated service, and for this purpose should be under common control. Integration does not, therefore, imply only the amalgamation of two systems or accounts, but it also entails the amalgamation of the accounting sections, including the cost office, into one unified department. It is, furthermore, desirable in the interests of the efficiency of the financial division that clerks shall be given the opportunity of obtaining experience in both financial accounting and cost accounting; in other words, in records of total expense heading and of breakdowns or analyses.

Differences between Cost Accounts and Financial Accounts

1. Financial accounts deal with all the items of expenses, losses, income and gains in total but the cost accounts deal with items of cost alone.

2. In financial accounts, items of cost that are dealt with are expressed in totals. Therefore, such accounts cannot disclose the cost per unit whereas in cost accounts all expenses are analyzed very carefully and apportioned accordingly. Hence, cost per unit can be very easily determined.

3. Financial accounts deal with facts alone whereas cost accounts deal with estimates as well as facts. Therefore, the result of cost accounts does not always tally with financial accounts.

4. Financial accounts cover a long period usually a year, but cost accounts cover comparatively a short period say a week, fortnight or a month.

5. Cost accounts do not form part of the ordinary process of double entry systems. Whereas the financial account must be invariably maintained according to double entry system.

Notes

6. Financial accounts display results in total profits whereas cost accounts give the results of each operation.

7. All expenses such as interest on capital, depreciation, etc., are normally charged in financial accounts, which reveals the true and fair affairs of business in general and cost of production in particular. In case of cost accounting, where certain expenses are eliminated or deleted the cost per unit will be generally unfair.

8. Financial accounting will generally present a better picture to the public who can not understand the intricacies of the maintenance of accounting. Cost accounting, in particular, is always beneficial from the point of management, rather than from the public undertaking.

Note

Differences between Financial Accounting and Cost Accounting

Basis of Differences	Financial Accounting	Cost Accounting
Purpose and Objective	The purpose and objective of financial accounting is external reporting mainly to owners, creditors, tax authorities, government and investors.	The purpose and objective of cost accounting is internal reporting to management.
Maintenance of Accounts	This is to be maintained compulsorily by forms of business organisations. The preparation of accounts must be in accordance with the statutory provisions of Companies Act and Income Tax Act.	Cost accounting is maintained voluntarily. In some cases government has directed some companies to maintain cost accounts to improve efficiency of business or industry.
Profit Analysis	Financial accounting discloses profit for the entire business as a whole.	Cost accounting shows the profit for each product, process or operation.
Recording	It classifies, records and analyses the transactions in a subjective manner, i.e., according to the nature of expenses.	Cost accounting records the expenditure in an objective manner, i.e., according to purpose for which costs are incurred.
Use of Control Techniques	It does not make use of any type of control techniques.	It makes use of some important control techniques such a Marginal Costing, Historical Costing, Budgetary Control, Standard Costing, etc., in order to control cost.
Stock Valuation	Stock is valued at cost or market price whichever is less.	Stock is always valued of cost price.
Pricing Policy	It fails to guide the formulation of pricing policy.	It provides adequate data for formulating of pricing policy.
Facts and Figures	Financial accounting deals mainly with actual facts and figures.	Cost accounting deals partly with facts and figures and partly with estimates.
Duration of Information Reporting	Generally, financial accounting provides financial information once a year.	Cost accounting furnishes cost data at frequent intervals i.e., reports are daily, weekly and monthly.
Evaluation of Efficiency	The information provided by financial accounting is not sufficient to evaluate the efficiency of the business activities.	The cost data helps in evaluating the efficiency of the business activities.

Notes

Self Assessment

State whether the following statements are true or false:

7. Financial accounts deal with all the items of expenses, losses, income and gains in total but the cost accounts deal with items of cost alone.
8. Financial accounts cover a short period usually a week.
9. Cost accounting will generally present a better picture to the public who can not understand the intricacies of the maintenance of accounting.

1.4 Role of Cost Accounting in Decision Making

The cost accounting plays an important role in the following decisions making:

1. ***Determination and Analysis of Cost:*** The main object of cost accountant is to determine cost per unit or per job or per contract. Thereby the constituents such as prime cost and overheads that may be fixed, variable, semi-variable can be disclosed, which in turn evaluate the operating efficiency of each departments.
2. ***Cost Control and Cost Reduction:*** Cost control and cost reduction is an important factor to be considered to know the best result obtained by each department. For this purpose, the standards are fixed and in case the efficiency of each department is more than the anticipated standard, the result will be considered as favourable and vice-versa.
3. ***Planning and Decision-making:*** This is possible when policies that are framed are properly implemented. The technique of cost accounting which produces the best result depends upon the best tools which are in operation by the management, stock holders, consumers and government.
4. ***A good system of costing will be of varied benefits to the management:***
   (a) Profitable and unprofitable activities can be disclosed by taking necessary steps periodically.
   (b) Costing enables a concern to measure the efficiency maintained and prove it.
   (c) Costing provides such information upon which estimates and tenders are based.
   (d) Costing guides future production policies.
   (e) An efficient check is provided on stores and materials.
   (f) An efficient check on labour and machines is also possible by providing incentives to workers.
   (g) It helps increase profits.
   (h) It enables a periodical determination of profits or losses without resort to stock taking.
   (i) It furnishes reliable data for comparing costs in different periods for different volumes of output.
   (j) The fixation of price cannot be properly done unless proper figures of costs are available.
   (k) The exact cause of increase or decrease in profit or loss can be detected.

Self Assessment

Notes

Fill in the blanks:

10. Cost control and ..... is an important factor to be considered to know the best result obtained by each department.

11. The technique of ..... which produces the best result depends upon the best tools which are in operation by the management, stock holders, consumers and government.

1.5 Cost Concepts

There are some important cost concepts that we must be aware of:

1.5.1 Cost Unit

Cost unit is defined by the ICMA as "a quantitative unit of product or service in relation to which costs are ascertained". A cost unit is a device used for the purpose of splitting total cost into smaller sub-divisions attributable to products or service. A cost unit simply stated is a unit of finished product, service of these in relation to which cost is ascertained and expressed. The following are some of the examples of cost units selected from different industries or organisation:

Table 1.1: Cost Units selected from Different Industries

Name of the Industry or Organisation	Product	Cost Unit
Brick Industry	Bricks	Per 1,000 bricks
Power Industry	Electricity	Per kilo-watt hour
Cement Industry	Cement	Per tonne
Pharmaceutical Industry	Tablets	Per 1,000 tablets
Sugar Industry	Sugar	Per tonne
Furniture Industry	Table	Per table
Hardware Industry	Bolts and nuts	Per 1,000 pieces
Cotton Textile Industry	Yarn	Per Kg
Construction Company	House	Per contract
Transport Companies	Service	Per passenger mile
Hospital	Service	Per bed-day
Canteen	Service	Per meal

1.5.2 Cost Centre

A cost centre refers to a part of a factory for which costs are accumulated separately. In order to facilitate charging of costs to cost units, it is necessary to divide the factory or industry into various parts which can be used to accumulate costs for subsequent distribution. Each such part of a factory or industry is known as cost centre.

Did u know? **What is responsibility centre?**

Cost centre facilitates fixation of responsibility for every officer-in-charge of part of department or section. Hence cost centre is also known as responsibility centre.

Cost centre has been defined by ICMA as "a location, person or item of equipment or group of these in respect of which costs may be ascertained and related to cost units".

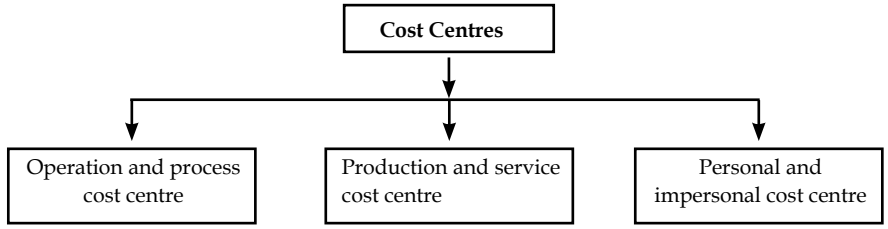
Notes

The main kinds of cost centre are given below:

- Operation and process cost centre,
- Production and service cost centre, and
- Personal and impersonal cost centre

These kinds of cost centre have been shown in the figure given as:

Figure 1.1: Cost Centres



1. ***Operation and Process Cost Centre:*** Operation cost centre consist of those machines which carry out the same operation.

   A process cost centre is a cost centre in which a specific process or a continuous process of operation is carried out.

2. ***Production and Service Cost Centre:*** A production cost centre is one where actual production process is carried out. The manufacturing and non-manufacturing costs are charged to production cost centre.

   A service cost centre is one which provides services to other cost centre. Only non-manufacturing costs are charged to service cost centre.

3. ***Personal and Impersonal Cost Centre:*** Personal cost centre consists of a person or group of persons. Personal cost centre follows the organisational structure of a factory or organisation. Under this type of cost centre, costs are analysed and accumulated according to; say, factory manager, sales manager, store keeper, etc. Impersonal cost centre consists of a location of equipment. A cost centre relating to location may represent an area of sales, warehouse. Cost centre relating to an item of equipment could be a machine or group of machines.

   Whatever may be the kinds of cost centre, it is determined by taking into consideration the following factors:

   - Responsibilities and accountabilities to be identified,
   - Volume of work to be performed,
   - Uses of cost centres, and
   - Cost control activities exercised.

Self Assessment

Fill in the blanks:

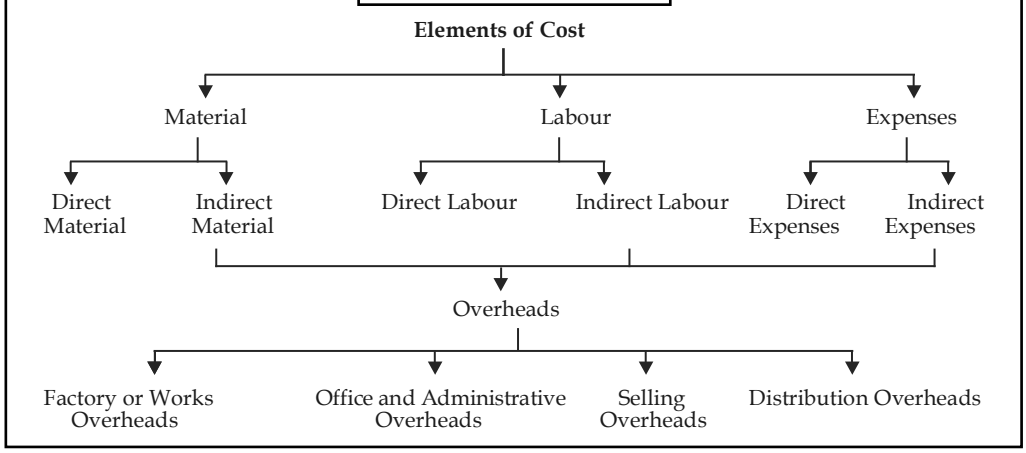
12. A ..... refers to a part of a factory for which costs are accumulated separately.
13. A ..... is a cost centre in which a specific process or a continuous process of operation is carried out.
14. The manufacturing and non-manufacturing costs are charged to ..... cost centre.

Notes

1.6 Elements of Cost

The correct of interpretation of the term 'cost' may also be understood by having knowledge about basic elements of cost. These elements have been shown in the following figure.

Figure 1.2: Elements of Cost



The following is the brief description of these elements of cost:

1. ***Direct Material:*** Direct material is material that can be directly identified with each unit of the product. Direct material can be conveniently measured and directly charged to the product.

   For example, raw cotton in textile manufactures, sugarcane in sugar industry and leather for shoe-making industry.

   The cost of direct material includes the following:

   (a) All type of raw materials issued from the store,

   (b) Raw materials specifically purchased for the specific job or project,

   (c) Raw materials transferred from one cost centre to another cost centre.

   (d) Primary packing material, like cartons, cardboard boxes, etc.

2. ***Indirect Material:*** They are those materials which do not normally form a part of the finished product. It has been defined as "materials which cannot be allocated but which can be apportioned to or absorbed by cost centres or cost units". These are:

   (a) Stores used in maintenance of machinery, buildings, etc., like lubricants, cotton waste, bricks and cements.

   (b) Stores used by the service departments, i.e., non-productive departments like Power house, Boiler house and Canteen, etc.

   (c) Materials which due to their cost being small, are not considered worth while to be treated as direct materials.

3. ***Direct Labour:*** Direct labour is labour that can be identified directly with a unit of finished product. All the labour charges expended in altering the construction, composition, confirmation or condition of the product is included in it. It includes the payment of direct wages made to the following groups of direct labour:

   (a) Direct labour engaged on the actual production of the product.

Notes

(b) Direct labour engaged in adding this manufacture by way of supervision, maintenance and tool setting, etc.

(c) Inspectors, analysts, etc. specially required for such production.

4. ***Indirect Labour:*** The wages of that labour which cannot be allocated but which can be apportioned to or absorbed by, cost centres or cost units is known as indirect labour. In other words, wages paid to labour which are employed other than or production constitute indirect labour costs. Examples of indirect labour are: charge hands and supervisors, maintenance workers, labour employed in service departments, material handling and internal transport, apprentices, trainees and instructors, factory clerical staff and labour employed in time and security office, etc.

5. ***Direct or Chargeable Expenses:*** They include all expenditures other than direct material and direct labour that are specifically incurred for a particular product or job. Such expenses are charged directly to the particular cost account concerned as part of the prime cost.

   Examples of direct expenses are: excise duty, royalty, surveyor's fees, cost of rectifying defective work, travelling expenses to the job, experimental expenses of projects, expenses of designing or drawings, repairs and maintenance of plant obtained on hire and hire of special equipment obtained for a contract.

6. ***Indirect Expenses:*** Indirect expenses are expenses which can not be allocated but which can be apportioned to or absorbed by cost centres or cost units as rent, insurance, municipal taxes, salary of manager, canteen and welfare expenses, power and fuel, cost of training for new employees, lighting and heating, telephone expenses, etc.

7. ***Overheads:*** Overheads may be defined as the cost of indirect materials, indirect labour and such other expenses including services as cannot conveniently be charged direct to specific cost units. Thus, overheads are all expenses other than direct expenses. Overheads may be divided into following categories:

   (a) Factory or works overheads cover all indirect expenditure incurred by the undertaking from the receipt of the order until its completion is ready for dispatch either to the customer or to the finished goods store. The overheads also include: depreciation on plant and machinery, buildings and equipments, insurance charges on fixed assets, repairs and maintenance of fixed assets, electricity charges, coal and other fuel charges, rent, rates and taxes of works, etc.

   (b) Office and administrative overhead consists of all expenses incurred in the direction, control and administration of a factory. Examples are the expenses in running the general office e.g., office rent, light, heat, salaries, salary to secretaries and accountants, general managers, directors, executives, investigations and experiments and miscellaneous fixed charges.

   (c) Selling overheads comprise the cost of products or distributors of soliciting and recurring orders for the articles of commodities dealt in and of efforts to find and retain customers.

   It includes sales office expenses, salesmen's salaries and commission, showroom expenses, advertisement charges, fancy packing, samples and free gifts, after sales service expenses and demonstration and technical advice to potential customers.

   (d) Distribution overheads comprise all expenditure incurred from the time the product is completed in the work until it reaches its destination. It includes warehouse rent, warehouse staff salaries, insurance, expenses on delivery vans and trucks, expenses on special packing for bulk transport, losses in warehouse stocks and finished goods damaged in transit and cost of repairing, etc.

Self Assessment

Notes

State whether the following statements are true or false:

15. The wages of that labour which cannot be allocated but which can be apportioned to or absorbed by, cost centres or cost units is known as direct labour.

16. Overheads may be defined as the cost of indirect materials, indirect labour and such other expenses including services as cannot conveniently be charged direct to specific cost units.

1.7 Classification of Costs

Costs can be classified according to

1. General classification

2. Technical classification

1.7.1 General Classification

Generally, the costs are classified as follows:

Product vs. Period Costs

Product costs include all the costs that are involved in acquiring or making product. For a manufacturer, they would be the direct materials, direct labor, and manufacturing overhead used in making its products. Product costs are viewed as "attaching" to units of product as the goods are purchased or manufactured and they remain attached as the goods go into inventory awaiting sale. So initially, product costs are assigned to an inventory account on the balance sheet. When the goods are sold, the costs are released from inventory as expense (typically called Cost of Goods Sold) and matched against sales revenue.

Caution The product costs of direct materials, direct labor, and manufacturing overhead are also "inventoriable" costs, since these are the necessary costs of manufacturing the products.

The purpose is to emphasize that product costs are not necessarily treated as expense in the period in which they are incurred. Rather, as explained above, they are treated as expenses in the period in which the related products are sold. This means that a product cost such as direct materials or direct labor might be incurred during one period but not treated as an expense until a following period when the completed product is sold.

Note Manufacturing overhead is also referred to as factory overhead, indirect manufacturing costs, and burden.

Period costs are not included as part of the cost of either purchased or manufactured goods and are usually associated with the selling function of the business or its general administration. As a result, period costs cannot be assigned to the products or to the cost of inventory. These costs are expensed on the income statement in the period in which they are incurred, using the usual rules of accrual accounting that we learn in financial accounting.

Notes

Example: 1. Sales commissions and office rent.

2. Selling and administrative expenses.

The period costs are reported as expenses in the accounting period in which they:

1. best match with revenues,
2. when they expire, or
3. in the current accounting period.

In addition to the selling and general administrative expenses, most interest expense is a period expense.

Direct vs. Indirect Costs

Direct costs are those costs that can be traced to specific segments of operations.

Direct cost of the product can be classified into the following categories.

1. ***Direct Material:*** Direct material which is especially used as a major ingredient for the production of a product.

Example: (a) The wood is a basic raw material for the wooden furniture. The cost of the wood procured for the furniture is known direct material cost.

(b) The cotton is a basic raw material for the production of yarn. The cost of procuring the cotton is known as direct material for the manufacturing of yarn.

2. ***Direct Labour:*** Direct labour is the cost of the labour which is directly involved in the production of either a product or service.

Example: The cost of an employee who is mainly working for the production of a product/service at the centre, known as direct labour cost.

3. ***Direct Expenses:*** Direct expenses which are incurred by the firm with the production of either a product or service. The excise duty and octroi duty are known as direct expenses in connection with the production of articles and so on.

Indirect costs are those costs that can not be identified with particular segments.

4. ***Indirect Material:*** The material which is spent cannot be measured for a product is known as indirect material.

Example: The thread which is used for tailoring the shirt cannot be measured or quantified in specific length as well as ascertained the cost.

5. ***Indirect Labour:*** Indirect labour is the cost of the labour incurred by the firm other than the direct labour cannot be apportioned.

Example: Cost of supervisor, cost of the inspectors and so on.

6. ***Indirect Expenses:*** Indirect expenses are the expenses other than that of the direct expenses in the production of a product. The expenses which are not directly part of the production process of a product or service known as indirect expenses.

Notes

Example: Rent of the factory, salesmen salary and so on.

Common costs are shared by multiple segments.

Example: Manufacturer of chairs, Segments = Plastic chairs (P) & Wood chairs (W)

Manufacturing vs. Non-manufacturing Costs

Manufacturing costs are product costs consisting of Direct Material (DM), Direct Labor (DL) and Manufacturing Overhead (MOH, OH)

Manufacturing Costs = DM + DL + MOH

Non-manufacturing costs are period costs incurred in selling and administrative activities.

Note MOH = All indirect manufacturing costs, including:

1. Indirect materials
2. Indirect labor — supervision, maintenance, janitorial, etc.
3. Other services — utilities, supplies, rent, insurance, depreciation, taxes, etc. used in production
4. Anything that is related to production (cafeteria, fitness room, etc.)

1.7.2 Technical Classification

Apart from this classification the costs are also classified into various categories according to the purpose and requirements of the firm. Some of the most important classifications are as follows:

1. By nature or element or analytical segmentation
2. By functions
3. Direct and indirect cost
4. By variability
5. By controllability
6. By normality
7. By time
8. According to planning and control
9. For managerial decisions

Let us understand each of them one by one.

By Nature or Element or Analytical Segmentation

The costs are classified into three major categories Materials, Labour, and Expenses.

Notes

By Functions

Under this methodology, the costs are classified into various divisions or functions of the enterprise viz. Production cost, Administration cost, Selling & Distribution cost and so on.

The detailed classification is that total of production cost sub-classified into cost of manufacture, fabrication or construction.

Example: 1. ***Costs of manufacture:*** The cost of materials for packaging, the cost of electricity and water, the cost of promotion and advertising, etc.

2. ***Costs of construction:*** The cost of materials, the cost of equipment, the cost of labour, etc.
   (a) Cost of transportation
   (b) Cost of management and co-ordination
   (c) Depreciation of fixed assets.

And another classification of cost is commercial cost of operations; which is other than the cost of manufacturing and production.

The major components of commercial costs are known as administrative cost of operations and selling and distribution cost of operations.

Example: 1. ***Administrative cost of operations:*** Expense incurred in controlling and directing an organization.

2. ***Selling and distribution cost of operations:*** Any cost incurred by a producer or wholesaler or retailer or distributor (as for shipping, etc.)

Direct and Indirect Cost

1. ***Direct cost:*** This classification of costs are incurred for the manufacture of a product or service. They can be conveniently and easily identified.
   (a) *Material cost for the product manufacture:* It includes the direct material for manufacturing.

Example: For garments factory-cloth is the direct material for ready made garments.

   (b) *Labour cost for production:* Labour cost is the cost of the entire labour who is directly involved in the production of a product as well as attributable to single product expenses and so on.

2. ***Indirect cost:*** The costs which are incurred for and cannot be easily identified for any single cost centre or cost unit known as indirect cost.

   Indirect material cost, Indirect labour cost and Indirect expenses are the three different components of the indirect expenses.

   (a) *Indirect material:*

Example: Cost of the thread cannot be conveniently measured for single unit of the product.

   (b) *Indirect labour:*

Example: Salary paid to the supervisor.

Notes

By Variability

The costs are grouped according to the changes taken place in the level of production or activity.

It may be classified into three categories:

1. ***Fixed cost:*** It is cost which do not vary irrespective level of an activity or production.

Example: Rent of the factory, salary to the manager and so on.

2. ***Variable cost:*** It is a cost which varies in along with the level of an activity or production like material consumption and so on.

Example: The fuel for an airline. The cost for it changes with the number of flights and how long the trips are.

3. ***Semi variable cost:*** It is a cost which is fixed up to certain level of an activity. Later it fluctuates or varies in line with the level of production. It is known in other words as step cost.

Example: Electricity charges

Labour costs in a factory are semi-variable. The fixed portion is the wage paid to workers for their regular hours. The variable portion is the overtime pay they receive when they exceed their regular hours.

By Controllability

The costs are classified into two categories in accordance with controllability, as follows:

1. ***Controllable costs:*** Cost which can be controlled through some measures known as controllable costs. All variable cost are considered to be controllable in segment to some extent.
2. ***Uncontrollable costs:*** Costs which cannot be controlled are known as uncontrollable costs. All fixed costs are very difficult to control or bring down; they rigid or fixed irrespective to the level of production.

By Normality

Under this methodology, the costs which are normally incurred at a given level of output in the conditions in which that level of activity normally attained.

1. ***Normal cost:*** It is the cost which is normally incurred at a given level of output in the conditions in which that level of output is normally achieved.
2. ***Abnormal cost:*** It is the cost which is not normally incurred at a given level of output in the conditions in which that level of output is normally attained.

Normal cost for a defined-benefit pension plan generally represents the portion of the economic cost of the participant's anticipated pension benefits allocated to the current plan year.

Abnormal cost maybe unexpected costs incurred, as a result of natural calamities or fire or accident or such other losses.

Notes

By Time

According to this classification, the costs are classified into historical costs and predetermined costs:

1. ***Historical costs:*** The costs are accumulated or ascertained only after the incurrence known as past cost or historical costs.
2. ***Predetermined costs:*** These costs are determined or estimated in advance to any activity by considering the past events which are normally affecting the costs.

For Planning and Control

The following are the two major classifications, viz. standard cost and budgetary control:

1. ***Standard cost:*** Standard cost is a cost scientifically determined by way of assuming a particular level of efficiency in utilization of material, labour and indirect expenses.

   The prepared standards are compared with the actual performance of the firm in studying the variances in between them. The variances are studied and analysed through an exclusive analysis.

2. ***Budget:*** A budget is detailed plan of operation for some specific future period. It is an estimate prepared in advance of the period to which it applies. It acts as a business barometer as it is complete programme of activities of the business for the period covered.

The control is exercised through continuous comparison of actual results with the budgets. The ultimate aim of comparing with each other is to either to secure individuals' action towards the objective or to provide a basis for revision.

For Managerial Decisions

The major classifications are marginal cost and sunk cost.

Marginal cost is the amount at any given volume of output by which aggregate costs are changed if the volume of output is decreased or increased by one unit.

Sunk costs are costs that cannot be recovered once they have been incurred.

Example: Marginal Cost: Suppose it costs ₹ 1000 to produce 100 units and ₹ 1020 to produce 101 units. The average cost per unit is ₹ 10, but the marginal cost of the 101 unit is ₹ 20.

Sunk Cost: Spending on advertising or researching a product idea.

They can be a barrier to entry. If potential entrants would have to incur similar costs, which would not be recoverable if the entry failed, they may be scared off.

Task Identify the key statements prepared under financial and cost accounting and prepare the proforma of all the relevant statements.

Self Assessment

Notes

Fill in the blanks:

17. ..... are not included as part of the cost of either purchased or manufactured goods and are usually associated with the selling function of the business or its general administration.

18. ..... are product costs consisting of Direct Material (DM), Direct Labor (DL) and Manufacturing Overhead.

19. The major components of ..... are known as administrative cost of operations and selling and distribution cost of operations.

20. A ..... is detailed plan of operation for some specific future period. It is an estimate prepared in advance of the period to which it applies.

1.8 Cost Accounting System

The primary goal of cost systems is to provide information for decision-making like pricing products, managing costs, selecting market segments and distribution channels, evaluating make-buy and outsourcing decisions, establishing transfer prices, evaluation of plant closing and making capital investment and abandonment decisions, etc.

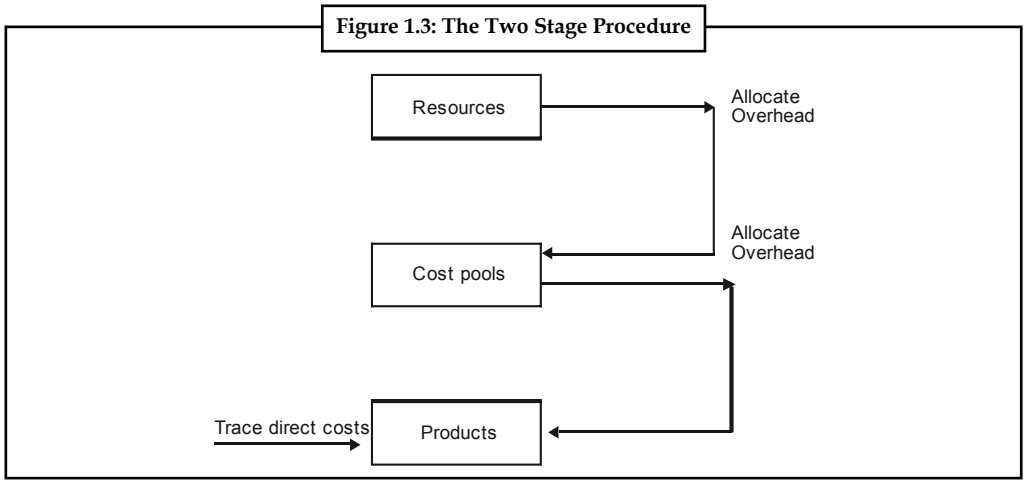
Designing of Costing Systems

Direct costs usually labour and material traced directly to the cost object. Overheads are allocated to products through a two-stage process.

1. In the first stage, overhead costs are allocated to cost pools (e.g. machines, departments and so on) using predetermined allocation criteria or cost drivers.

2. In the second stage, costs allocated to cost pools, are again allocated to cost objects (for example, products) using cost drivers, which are chosen to capture a products consumption of overheads costs. The two-stage procedure is given in the Figure 1.3.

Figure 1.3: The Two Stage Procedure



Traditional costing methods had little trouble in tracing direct labour and direct material to cost objects. But overhead allocation both in the first stage and in the second, have been problematic leading to very inaccurate measurement of product costs as well as costs associated with other decisions.

Notes

Cost System Options

Cost system design options are given below:

Table 1.2: Cost System Design Options

Type of system used for existing products/services Nature of process Whereby goods/ Service are produced	Actual Costing Systems	Standard Costing Systems	Activity-based Costing Systems
Job order production	*Unique product or services *Actual direct labour and material charges *Standard overhead rates *Relatively few first and second stage drivers for overhead	*Unique product or services *Standard direct labour and material charges *Standard overhead rates *Relatively few first and second stage drivers for overhead	*Unique product or services *Actual or standard direct labour and material charges * Actual or Standard overhead rates *Mutiple first and second stage drivers for overhead
Process Production	*Homogeneous products or services. *Actual direct labour and material charges. *Actual overhead charges * Relatively few first and second stage drivers for overhead	*Homogeneous products or services. *Standard direct labour and material charges. *Standard overhead charges * Relatively few first and second stage drivers for overhead. *Variances computed for processes	*Homogeneous products or services. *Actual or standard direct labour and material charges. *Actual or standard overhead charges * Multiple first and second stage drivers for overhead
Mixed Job order/ Process Production	Combines elements of job order and process production and uses all three costing system		

Job-order Production Process: These are suitable for firms that produce many unique products or batches of products, requiring different amounts of labour, material and overhead. Each job is costed separately and work is scheduled as orders are received. Job order production is used in industries as diverse as printing, construction, consulting, auto repair and heavy machinery. Costs of each job are computed by tracing direct labour and direct material to the job and by allocating overhead to the job. In actual costing, we trace actual material and labour costs and allocate overhead. In a standard costing system, we establish standard rates for labour, material and overhead. In an activity based system, we trace labour and material directly to products and overheads is allocated to the products by the use of multi-drivers in the first and second stage of the production process.

Process Production: Process costing is most appropriate in circumstances where multi-phase mass production is the underlying process of production. Process costing production is used to industries as diverse as oil refining, glass, steel, banking, fast-food restaurants and cement. Under process production, products often go through multiple phases of production. The production process is continuous and resources are brought in an ongoing basis, keeping pace with the production process. At the end of the accounting period, there will be incomplete products at varying stages of production, and moving into later phases of the production in the next period.

Notes

Under process production, costs are divided into two categories: materials and conversion. Conversion costs include labour and overhead costs. The cost systems produced to cost units complete and units in progress by calculating the cost per equivalent unit completed during the period. Then it applies the cost per equivalent completed to units complete and to units in progress. In process production using standard costing system, standard unit costs are developed for both direct materials and conversion costs. Variances between standard and actual costs are derived each period for both material and conversion at the departmental level. The variances can then be analysed to determine their approximate causes.

Mixed Job-order and Process Production: The processes are used when the production process has attributes of both job order and process. For example, in the manufacture of certain types of clothing, the items differ in terms of quality of materials used but the other operations are the same. In this case, direct materials costs are traced to each article of clothing as under job-order methods but direct labour and overhead costs are allocated as under process methods.

Self Assessment

Fill in the blanks:

21. The primary goal of cost systems is to provide information for .....
22. ..... is used in industries as diverse as printing, construction, consulting, auto repair and heavy machinery.
23. In a ..... system, we establish standard rates for labour, material and overhead.

1.9 Summary

- Cost denominates the use of resources only in terms of monetary terms.
- In brief, cost is nothing but total of all expenses incurred for manufacturing a product or attributable to given thing.
- Costs which cannot be controlled are known as uncontrollable costs.
- All fixed costs are very difficult to control or bring down; they rigid or fixed irrespective to the level of production.
- A budget is detailed plan of operation for some specific future period. It is an estimate prepared in advance of the period to which it applies.
- It acts as a business barometer as it is complete programme of activities of the business for the period covered.
- Under costing, the role of unit costing is inevitable tool for the industries not only to identify the volume of costs incurred at every level but also to determine the rational price on the commodities in order to withstand among the competitors.
- Direct labour is the cost of the labour which is directly involved in the production of either a product or service.
- Indirect expenses are the expenses other than that of the direct expenses in the production of a product.
- The expenses which are not directly part of the production process of a product or service known as indirect expenses.

Notes

1.10 Keywords

Cost: Expense incurred at the either cost centre or service centre.

Cost Centre: The location at where the cost of the activity is ascertained.

Cost of Production: It is the combination of cost of manufacturing an article or a product and administrative cost.

Cost of Sales: It is the entire cost of a product.

Cost Sheet: It is a statement prepared for the computation of cost of a product/service.

Direct Cost: cost incurred which can be easily ascertained and measured for a product.

Factory Cost: It is the total cost incurred both direct and indirect at the work spot during the production of an article.

Indirect Cost: Cost incurred cannot be easily ascertained and measured for a product.

Product Centre: It is the location at where the cost is ascertained through which the product is passed through.

Profit Centre: It is responsibility centre not only for the cost and revenues but also for profits for the activity.

1.11 Review Questions

1. The cost accounting system is directly concerned with control of inventories, plant assets and funds expanded on functional activities. Discuss.
2. Is there any difference between cost accounting and financial accounting?
3. How will you visualize the costs of poor product quality, rework, repair, etc.?
4. Illustrate indirect and direct expenses with the help of suitable examples.
5. Once standard costs are established, what conditions would require the standards to be revised? Give your opinion.
6. What is cost classification? Classify it, in detail.
7. Illustrate the different types of cots with suitable examples.
8. Briefly write a note on key elements of cost.
9. How will you determine the scope of cost accounting?
10. Critically evaluate the relationship between cost accounting and financial accounting.
11. Process costing is most appropriate in circumstances where multi-phase mass production is the underlying process of production. Why?

Answers: Self Assessment

1.	False	2.	True
3.	True	4.	Cost control
5.	cost audit	6.	Budgeting
7.	True	8.	False
9.	False	10.	cost reduction

Notes

11. cost accounting
12. cost centre
13. process cost centre
14. production
15. False
16. True
17. Period costs
18. Manufacturing costs
19. commercial costs
20. budget
21. decision-making
22. Job-order production
23. standard costing

1.12 Further Readings

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Prasanna Chandra, *Financial Management - Theory and Practice,* Tata McGraw Hill, New Delhi (1994).

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Online link

www.futureaccountant.com

Notes

Unit 2: Unit and Output Costing

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Objectives

After studying this unit, you will be able to:

- Make direct and indirect cost classification
- Prepare cost sheet

Introduction

Under costing, the role of unit costing is an inevitable tool for the industries not only to identify the volume of costs incurred at every level but also to determine the rational price on the commodities in order to withstand among the competitors. The determination of the selling price is being done through the process of determining the cost of the product. After having finalized the cost of the product, the profit margin has to be added in order to derive the final selling price of the product.

Cost sheet is a statement which is prepared periodically to provide detailed cost of a cost unit or cost centre. A cost sheet not only shows the total cost but also the various components of the total cost. Period covered by a cost sheet may be a year, a month or a week, etc. Cost sheet serves the following purposes:

- It discloses various elements of cost,
- It discloses the per unit cost as well as total cost of production,
- It facilitates preparation of tender price, and
- It facilitates comparison of total cost.

Notes

2.1 Cost Sheet – Definition

"It is a statement of costs incurred at every level of manufacturing a product or service."

"It is a statement prepared to depict the output of a particular accounting period alongwith break up of costs."

Did u know? **How to find a total cost of the product or service?**

To find the total cost of the product or service, the costs incurred are grouped under various categories.

Unit or output costing is one of the important objectives of Cost Accounting. For this, it is essential to classify cost into certain constituents or categories. These are known as elements of cost. Elements of cost are:

1. Direct Material
2. Direct Labour
3. Direct Expenses, and
4. Factory Overheads
5. Office and Administrative Overheads
6. Selling and Distribution Overheads

Caution To find out the unit cost of the product, the statement of cost plays a pivotal role in determining the cost of production, cost of goods sold, cost of sales and selling price of the product at every stage.

During the preliminary stage of preparing the cost statement of the product, there are two things to be borne in our mind at the moment of classification.

1. Direct cost classification
2. Indirect cost classification

Self Assessment

Fill in the blanks:

1. Cost sheet is a statement which is prepared periodically to provide detailed cost of a cost unit or ..... .
2. Unit or output costing is one of the important objectives of .....

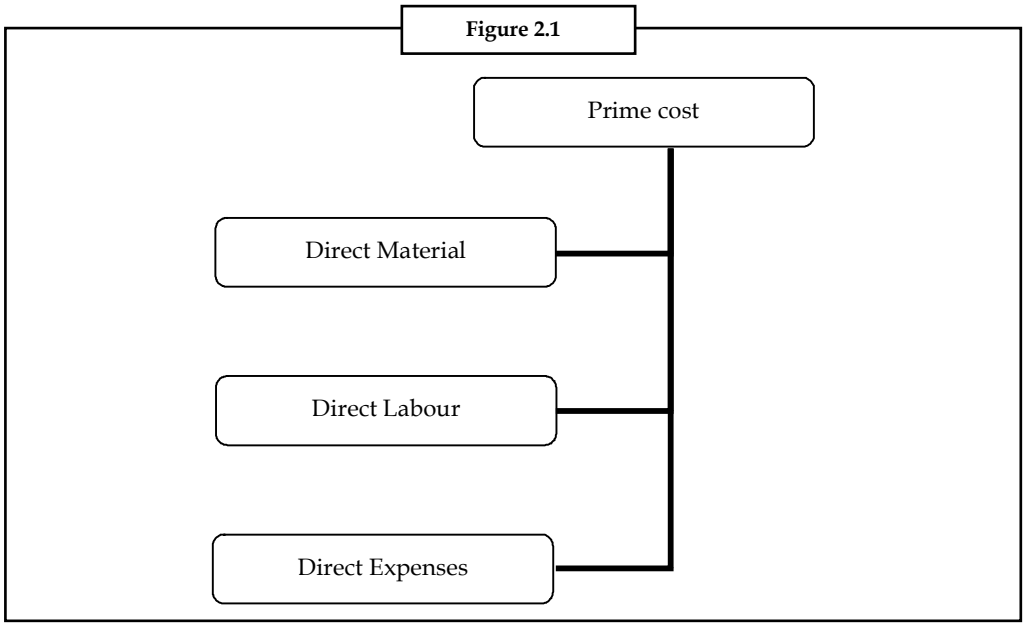
2.2 Direct Cost Classification

Under this classification, the direct costs of the product or service are added together to know the volume of total direct cost. The total volume of direct cost is known as "Prime Cost."

Direct Materials + Direct Labour + Direct Expenses = Prime cost

Notes

Figure 2.1



The next stage in the unit costing to find out the factory cost. The factory cost could be computed by the combination of the indirect cost classification.

Self Assessment

Choose the appropriate answer

3. Direct cost is
   - (a) Direct Materials
   - (b) Direct labour
   - (c) Direct Expenses
   - (d) Prime cost
4. Prime cost is the summation of
   - (a) Direct and indirect costs
   - (b) Product and administrative costs
   - (c) Cost of sales and profit margin
   - (d) Direct materials, direct labour and direct expenses

2.3 Indirect Cost Classification

Among the classification of the overheads, the first and foremost is factory overheads. The factory overheads and work overheads are synonymously used. The factory overheads are nothing but the indirect costs incurred at the factory site. The total factory cost or works cost incurred in the factory could be derived by adding the both direct cost and indirect cost incurred during the factory process.

Notes

Factory Cost = Prime cost + Factory Overheads

Prime costs include direct labour, materials, bought-outs and sub-contracts, while factory overheads are nothing but the indirect expenses incurred during the individual process.

Example: Calculate the factory cost from the following data:

	₹
Cost of Direct Materials	2,00,000
Direct Wages	50,000
Direct Expenses	10,000
Wages of Foreman	5,000
Electric Power	2,000
Lighting of the Factory	4,000
Storekeeper's Wages	2,500
Oil and Water	1,000
Rent of the Factory	10,500
Depreciation in Plant	1,000
Consumable Store	5,000
Repairs and Renewal Plant	7,000

Solution:

Factory Cost = Prime Cost + Factory Overheads

Prime Cost = Cost of Direct Materials + Direct Wages + Direct Expenses

= ₹ 2,00,000 + ₹ 50,000 + ₹ 10,000

= ₹ 2,60,000

Factory Overheads = Wages of Foreman + Electric Power + Lighting of the Factory + Storekeeper's Wages + Oil and Water + Rent of the Factory + Depreciation in Plant + Consumable Store + Repairs and Renewal Plant

= 2,00,000 + 50,000 + 10,000 + 5,000 + 2,000 + 4,000 + 2,500 + 1,000 + 10,500 + 1,000 + 5,000 + 7,000

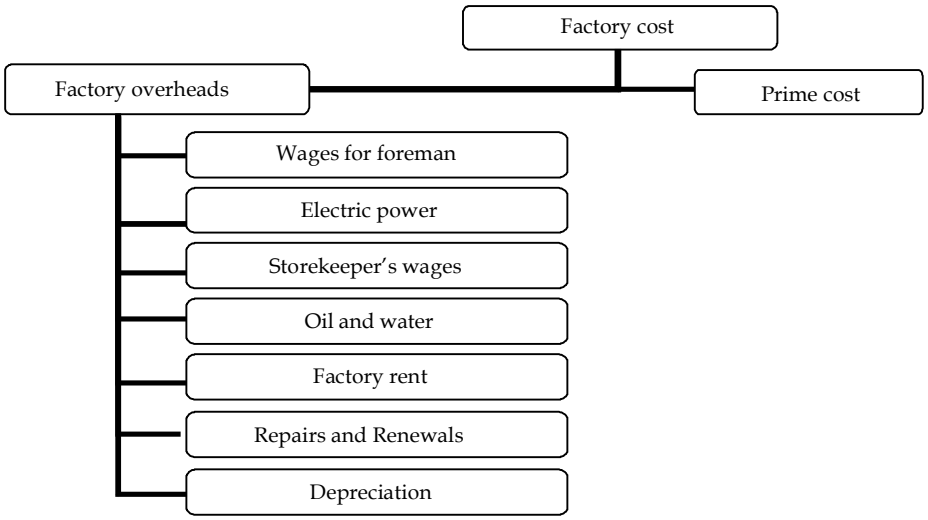
= ₹ 2,98,000

Hence, Factory Cost = 2,60,000 + 2,98,000

= ₹ 5,58,000

Notes

Figure 2.2



The next stage in the process of the unit costing is to find out the cost of the production. The cost of production is the combination of both the factory cost and administrative overheads.

Cost Production = Factory Cost + Administrative Overheads

Cost Production = Factory Cost + Administrative Overheads

Administrative overheads is the indirect expenses incurred during the office administration for the smooth flow production of finished goods.

Example: In the previous example discussed to measure factory cost, if the following data is added

	₹
Office Rent	6,000
Office Lighting	1,250
Office Depreciation	3,500
Director's Fees	2,500
Manager's Salary	10,000
Office Stationery	1,000
Telephone Charges	500
Postage and Telegrams	250

Calculate Production Cost.

Solution:

Production Cost = Factory Cost + Administrative Cost

Factory Cost = ₹ 5,58,000 (from the previous example)

Administrative Cost = Office Rent + Office Lighting + Office Depreciation + Director's Fees + Manager's Salary + Office Stationery + Telephone Charges + Postage and Telegrams

Notes

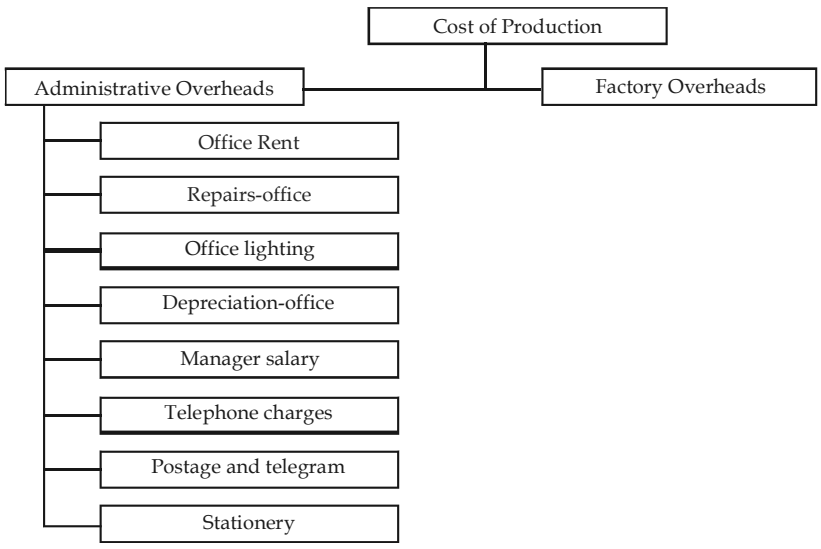
= 6,000 + 1,250 + 3,500 + 2,500 + 10,000 + 1,000 + 500 + 250

= ₹ 25,000

Hence, Production Cost = 5,58,000 + 25,000

= ₹ 5,83,000

Figure 2.3



Immediate next stage to determine in the process of unit costing is the component of cost of sales. The cost of sales is the blend of both, selling overheads and cost of production.

Whatever the cost involved in the production process in the factory as well in the administrative proceedings are clubbed with the selling overheads to determine the cost of sales.

Cost of Sales = Cost of Production + Selling Overheads

Selling overheads are nothing but the indirect expenses incurred by the firm at the moment of selling products. In brief, whatever the expenses in relevance with the selling and distribution are known as selling overheads.

Example: In the example continued, if we add the following data,

	₹
Salesman's Salary	10,500
Travelling Expenses	1,000
Carriage Outward	750
Advertising	3,500
Warehouse Charges	₹ 1,000

Calculate the cost of sales.

Solution:

Cost of Sales = Cost of Production + Selling Overheads

Cost of Production = ₹ 5,83,000 (from the previous example)

Notes

Selling Overheads = Salesman's Salary + Travelling Expenses + Carriage Outward + Advertising + Warehouse Charges

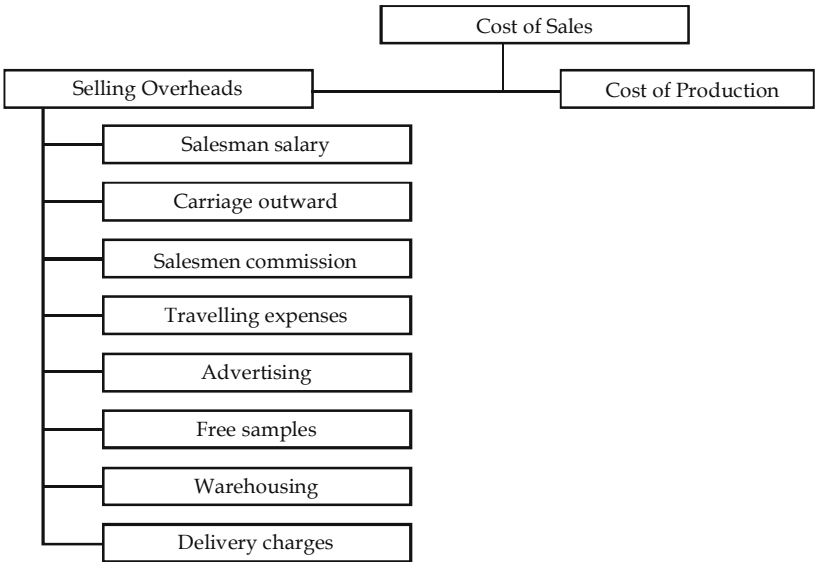
= 10,500 + 1,000 + 750 + 3,500 + 1,000

= ₹ 16,750

Hence, Cost of Sales = 5,83,000 + 16,750

= ₹ 5,99,750

Figure 2.4



The last but most important stage in the unit costing is determining the selling price of the commodities. The selling price of the commodities is fixed by way of adding both the cost of sales and profit margin out of the product sales.

Sales = Cost of Sales + Margin of Profit

Example: In the example continued, if we add the profit that can be earned to be ₹ 48,900. Calculate the product sales expected.

Solution:

Sales = Cost of Sales + Margin of Profit

= 5,99,750 (from the previous example) + 48,900

= ₹ 6,48,650

Under the unit costing, the selling price of the product can be determined through the statement form.

Example: Calculate the prime cost, factory cost, cost of production cost of sales and profit form the following particulars:

Notes

	₹		₹
Direct materials	2,00,000	Office stationery	1,000
Direct wages	50,000	Telephone charges	250
Direct expenses	10,000	Postage and telegrams	500
Wages of foreman	5,000	Salesmen's' salaries	2500
Electric power	1,000	Travelling expenses	1,000
Lighting: Factory	3,000	Repairs and renewal plant	7,000
Office	1,000	Office premises	1,000
Storekeeper's wages	2,000	Carriage outward	750
Oil and water	1,000	Transfer to reserves	1,000
Rent: Factory	10,000	Discount on shares written off	1000
Office	5,000	Advertising	2,500
Depreciation Plant	1,000	Warehouse charges	1000
Office	2,500	Sales	3,79,000
Consumable store	5,000	Income tax	20,000
Managers' salary	10,000	Dividend	4,000
Directors' fees	2,500		

Solution:

Cost Statement/Cost Sheet

Particulars	₹	₹
Direct Materials	2,00,000	
Direct wages	50,000	
Direct expenses	10,000	
Prime Cost		**2,60,000**
Factory Overheads:		
Wages of foreman	5,000	
Electric power	1,000	
Lighting: Factory	3,000	
Storekeeper's wages	2,000	
Oil and water	1000	
Rent: Factory	10,000	
Depreciation Plant	1000	
Consumable store	5,000	
Repairs and Renewal Plant	7,000	35,000
Factory Cost		**2,95,000**
Administration Overheads:		
Rent Office	5,000	
Depreciation office	2,500	
Managers' salary	10,000	
Directors' fees	2,500	
Office stationery	1,000	
Telephone charges	250	
Postage and telegrams	500	
Office premises	1,000	
Lighting: Office	1,000	23,750
Cost of production		**3,18,750**

Contd...

Notes

Selling and distribution overheads:		
Carriage outward	750	
Salesmen's salaries	2500	
Travelling expenses	1,000	
Advertising	2500	
Warehouse charges	1000	
	7,750	
Cost of Sales		**3,26,500**
Profit		**52,500**
Sales		**3,79,000**

The next stage in the preparation of the cost statement is to induct the stock of raw materials, work in progress and finished goods.

2.3.1 Stock of Raw Materials

The raw materials stock should be taken into consideration for the preparation of the cost sheet. The cost of the raw materials is nothing but the direct materials cost of the product. The cost of the materials is in other words cost of the materials consumed for the production of a product.

Particulars	₹
Opening stock of raw materials	XXXXX
(+) Purchases of raw materials	XXXXX
(–) Closing stock of raw materials	XXXXX
Cost of materials consumed	**XXXXX**

2.3.2 Stock of Semi-finished Goods

The treatment of the stock of semi-finished goods is mainly depending upon the two different approaches, viz.

1. Prime cost basis, and
2. Factory cost basis.

The factory cost basis is considered to be predominant over the early one due to the consideration of factory overheads at the moment of semi finished goods treatment. The indirect expenses are the expenses converting the raw materials into semi-finished goods which should be relatively considered for the treatment of the stock valuation rather than on the basis of prime cost.

Particulars	₹
Prime cost	XXXXXX
(+) Factory overheads incurred	XXXXXX
(+) Opening work in progress	XXXXXX
(–) Closing work in progress	XXXXXX
Factory cost	**XXXXXX**

2.3.3 Stock of Finished Goods

The treatment of the stock of finished goods should carried over in between the opening stock and closing stock and adjusted among them before the finding the cost of goods sold.

Notes

Particulars	₹
Cost of production	XXXXX
(+) Opening stock of finished goods	XXXXX
(–) Closing stock of finished goods	XXXXX
Cost of goods sold	XXXXX

Example: The following data has been from the records of Centre corporation for the period from June 1 to June 30, 2005, Draft the cost sheet.

Particulars	2005, 1st June	2005, 30th June
Cost of raw materials	60,000	50,000
Cost of work in progress	24,000	30,000
Cost of finished good	1,20,000	1,10,000
Transaction during the month		
Purchase of raw materials	9,00,000	
Wages paid	4,60,000	
Factory overheads	1,84,000	
Administration overheads	60,000	
Selling overheads	40,000	
Sales	18,00,000	

Solution:

Cost Sheet

Particulars	₹	₹
Opening stock of raw materials 1st June	60,000	
(+) Purchase of raw materials	9,00,000	
(-) Closing stock of raw materials 30th June	50,000	
Raw materials consumed during the month		9,10,000
(+) Wages paid		4,60,000
Prime cost		**13,70,000**
Factory overheads	1,84,000	
(+) Opening stock of semi goods	24,000	
(-) Closing stock of semi goods	30,000	
Factory overheads		1,78,000
Factory or Works cost		**15,48,000**
(+) Administration overheads		60,000
Cost of Production		**16,08,000**
(+) Opening stock of finished goods	1,20,000	
(–) Closing stock of finished goods	1,10,000	
Cost of goods sold		16,18,000
(+) Selling overheads		40,000
Cost of Sales		16,58,000
Net profit		1,42,000
Sales		**18,00,000**

Notes

Example: From the following information, extracted from the records of the M/s Sundaram & Co., prepare cost statement of M/s Sundaram & Co.

The stock position of the firm is:

Particulars	₹ 1-4-2000	₹ 31-3-2001
Stock of raw materials	80,000	1,00,000
Stock of finished goods	2,00,000	3,00,000
Stock of work in progress	20,000	28,000

Particulars	₹	Particulars	₹
Indirect labour	1,00,000	Administrative expenses	2,00,000
Oil	20,000	Electricity	60,000
Insurance on fixtures	6,000	Direct labour	6,00,000
Purchase of raw materials	8,00,000	Depreciation on Machinery	1,00,000
Sale commission	1,20,000	Factory rent	1,20,000
Salaries of salesmen	2,00,000	Property tax on building	22,000
Carriage outward	40,000	Sales	24,00,000

Solution:

Cost Sheet

Particulars	₹	₹
Opening stock of raw materials on 1st April, 2000	80,000	
(+)Purchase of raw materials	8,00,000	
(-)Closing stock of raw materials on 31st March	1,00,000	
Raw materials consumed during the year		7,80,000
(+)Direct labour		6,00,000
Prime cost		**13,80,000**
Factory overheads:		
Indirect labour	1,00,000	
Oil	20,000	
Insurance on fixtures	6,000	
Electricity	60,000	
Depreciation on machinery	1,00,000	
Factory rent	1,20,000	
Property tax on factory building	**22,000**	**4,28,000**
(+)Opening stock of semi-finished goods	20,000	
(-)Closing stock of semi-finished goods	28,000	
Factory cost		18,00,000
(+)Administration overheads		2,00,000
Cost of Production		20,00,000
(+)Opening stock of finished goods		2,00,000
(-)Closing stock of finished goods		3,00,000

Contd...

Notes

Cost of goods sold		19,00,000
Selling overheads:		
Sales commission		1,20,000
Salaries of salesmen		2,00,000
Carriage outward		40,000
Cost of sales		**22,60,000**
Profit margin		**1,40,000**
Sales		**24,00,000**

Note: Property tax on the plant is to be included under the factory overheads. The tax is paid by the firm on the plant which is engaged in the production process.

Self Assessment

Fill in the blanks:

5. The factory overheads are nothing but the ..... incurred at the factory site.
6. The total ..... incurred in the factory could be derived by adding the both direct cost and indirect cost incurred during the factory process.
7. The ..... is the combination of both the factory cost and administrative overheads.
8. The ..... is the blend of both, selling overheads and cost of production.
9. The cost of the ..... is nothing but the direct materials cost of the product.
10. The treatment of the stock of ..... should carried over in between the opening stock and closing stock and adjusted among them before the finding the cost of goods sold.
11. The ..... are the expenses converting the raw materials into semi-finished goods which should be relatively considered for the treatment of the stock valuation rather than on the basis of prime cost.

Choose the appropriate answer:

12. Factory cost is the total of
    (a) Direct and indirect costs
    (b) Product and administrative costs
    (c) Cost of sales
    (d) Profit margin
13. Selling price is the summation of
    (a) Direct and indirect costs
    (b) Product and administrative costs
    (c) Cost of sales and profit margin
    (d) Direct materials, direct labour and direct expenses

Notes

14. Production cost is the summation of
    (a) Direct and indirect costs
    (b) Product and administrative costs
    (c) Cost of sales and profit margin
    (d) Direct materials, direct labour and direct expenses
15. The statement prepared for the computation of a product/service cost is known as
    (a) Standard Costing
    (b) Marginal Costing
    (c) Prime Costing
    (d) None of these

Task

Mr Anand provides the following information which is related to the product of his enterprise for the month of December 2005.

	₹
Raw materials consumed	30,000
Direct labour charges	18,000
Machine hours worked	1,800
Machine hour rate	10
Administrative overheads	20% on works cost
Selling overheads	₹ 1 per unit
Units produced	26,400 units
Units sold	25,000 units ₹ 8 per unit

Draft the cost statement and determine the cost per unit, profit per unit sold and profit during the period.

2.4 Summary

- Cost sheet is a statement which is prepared periodically to provide detailed cost of a cost unit or cost centre.
- A cost sheet not only shows the total cost but also the various components of the total cost.
- During the preliminary stage of preparing the cost statement of the product, there are two things to be borne in our mind at the moment of classification.
    - Direct cost classification
    - Indirect cost classification
- Under this classification, the direct costs of the product or service are added together to know the volume of total direct cost. The total volume of direct cost is known as "Prime Cost."

Notes

- The total factory cost or works cost incurred in the factory could be derived by adding the both direct cost and indirect cost incurred during the factory process.
- The cost of production is the combination of both the factory cost and administrative overheads.
- The cost of sales is the blend of both, selling overheads and cost of production.
- The selling price of the commodities is fixed by way of adding both the cost of sales and profit margin out of the product sales.
- The cost of the raw materials is nothing but the direct materials cost of the product. The cost of the materials is in other words cost of the materials consumed for the production of a product.
- The indirect expenses are the expenses converting the raw materials into semi-finished goods which should be relatively considered for the treatment of the stock valuation rather than on the basis of prime cost.
- The treatment of the stock of finished goods should carried over in between the opening stock and closing stock and adjusted among them before the finding the cost of goods sold.

2.5 Keywords

Cost of Production: It is the combination of cost of manufacturing an article or a product and administrative cost.

Cost of Sales: It is the entire cost of a product.

Cost Sheet: It is a statement prepared for the computation of cost of a product/service.

Direct Cost: Cost incurred which can be easily ascertained and measured for a product.

Factory Cost: It is the total cost incurred both direct and indirect at the work spot during the production of an article.

Indirect Cost: Cost incurred cannot be easily ascertained and measured for a product. The combination of various overheads.

Prime Cost: Combination of all direct costs viz direct materials, direct labour and direct expenses.

Selling Price or Sales: The summation of cost of sales and profit margin.

2.6 Review Questions

1. Define cost unit. Give five examples of cost unit applicable to different industries.
2. Distinguish between direct cost and indirect cost.
3. What are the components of total cost? Draw a format of cost sheet.
4. Prepare the cost sheet to show the total cost of production and cost per unit of goods manufactured by a company for the month of Jan. 2005. Also find the cost of sale and profit.

Notes

Particulars	₹	Particulars	₹
Stock of raw materials 1.1.2005	6,000	Factory rent and rates	6,000
Raw materials procured	56,000	Office rent	1,000
Stock of raw material 31.1.2005	9,000	General expenses	4,000
Direct wages	14,000	Discount on sales	600
Plant depreciation	3,000	Advertisement expenses	1,200
Loss on the sale of plant	600	Income tax paid	2000
Sales	₹ 1,50,000		

5. XYION Co. Ltd. is an export oriented company manufacturing internal-communication equipment of a standard size. The company is to send quotations to foreign buyers of your product. As the cost accounts chief you are required to help the management in the matter of submission of the quotation of a cost estimate based on the following figures relating to the year 2004.

   Total output (in units) 20,000.

Particulars	₹	Particulars	₹
Local raw materials	20,00,000	Excise duty	4,00,000
Imports of raw materials	2,00,000	Administrative office expenses	4,00,000
Direct labour in works	20,00,000	Salary of the managing director	1,20,000
Indirect labour in works	4,00,000	Salary of the joint managing director	80,000
Storage of raw materials and spares	1,00,000	Fees of directors	40,000
Fuel	3,00,000	Expenses on advertising	3,20,000
Tools consumed	40,000	Selling expenses	3,60,000
Depreciation on plant	2,00,000	Sales depots	2,40,000
Salaries of works personnel	2,00,000	Packaging and distribution	2,40,000

   Prepare the cost statement in columnar form.

6. How would you determine find the cost sheet format of a company and how does it finalise the product cost?

7. In a cost sheet, should the administration overheads come before or after the adjustments for the opening and closing stock of finished goods? Support your answer with reason.

8. In a factory, there are two different types of hard disk drives manufactured viz SUMO 160 GB and BRAYON 320 GB models. From the following particulars, prepare the cost sheet showing all the necessary information of cost as well as profit per USB sold. There is no opening and closing stock.

Particulars	SUMO 160 GB ₹	BRAYON 320 GB ₹
Materials	54,600	2,17,360
Labour	31,200	1,25,840

   Works overhead is charged at 80% on labour and office overhead is taken at 15% on works cost. The selling price of both hard disk drives amounted to ₹ 2,000; 156 SUMO 160 GB and 572 BRAYON 320 GB hard disks were sold.

Notes

9. From the following information, prepare the balance sheet from the cost records of Aditya Chemicals Ltd. for 2003.

Particulars	₹
Finished goods	50,000
Raw material	10,000
Work in progress	14,000
Direct labour	1,60,000
Purchase of raw material	98,000
Indirect labour	40,000
Heat, light and power	20,000
Factory, Insurance and Taxes	5,000
Repairs to plant	3,000
Factory supplies	5,000
Depreciation –factory building	6,000
Depreciation –plant	10,000
Factory cost of goods produced in 2003	2,80,000
Raw material consumed in 2003	95,000
Cost of goods sold in 2003	1,60,000

No office and administration expenses were incurred during the year 2003. Prepare a statement of cost for the year ending 2003 giving maximum possible information and its break up.

10. Discuss analytically, direct and indirect costing.

Answers: Self Assessment

1. cost centre
2. Cost Accounting
3. (d) Prime cost
4. (d) Direct materials, direct labour and direct expenses
5. indirect costs
6. factory cost or works cost
7. cost of production
8. cost of sales
9. raw materials
10. finished goods
11. indirect expenses
12. (a) Direct and indirect costs
13. (c) Cost of sales and profit margin
14. (b) Product and administrative costs
15. (d) None of these

2.7 Further Readings

Books

I.M. Pandey, *Financial Management,* Vikas Publishing, New Delhi.

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Online link www.futureaccountant.com

Unit 3: Material Control

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Objectives

After studying this unit, you will be able to:

- Explain the meaning and definition of material control
- Describe the methods and techniques of material control
- Illustrate the pricing of material issues

Introduction

Material is a very important factor of production in a manufacturing organization. It is the first and the most important element of cost. Materials account for nearly 50-60 per cent of the cost of production. This fact can be inferred from an analysis of the financial statements of a large number of organizations.

Uninterrupted supply of materials of acceptable quality and in required quantity as and when required by the production department is a pre-requisite for carrying out production activities uninterruptedly, because the non-availability of materials will bring the entire production activities to a standstill. And, the implications of production stoppage are very well known. Further, the cost of materials forms a major part of total cost of production and sales as it ranges from 50-60% depending upon the nature of industries. Besides, this element of cost provides a number of avenues for cost control such as at the time of purchase, during the process of manufacturing. Hence, greater emphasis is to be laid on the control of material and material cost as the success of any company depends, to a greater extent, upon the efficient purchase, storage and usage of materials.

Notes

3.1 Meaning and Definition of Material Control

The success of any industry or enterprise depends, to a greater extent, upon the successful control of material. Further, this input provides a number of avenues and wide scope for improvement of overall performance of the industry. Inventory control, therefore, aims at ensuring the availability of required quality material in required quantity, at required time or period and place with minimum cost. Inventory involves investment of money and locking up of precious space which has alternate uses. It is said that inventory is a necessary evil. As a result, proper control has to be exercised over it. In controlling inventory, firms or industries use a number of techniques and models. Inventory control is generally exercised over raw materials and work in progress. The basic purpose of inventory control is to maintain optimum level of inventory.

The objectives of material control are as follows:

1. Proper estimation of inventory requirements-quantity, quality, specifications of inventory, etc. This will help the purchase manager to quality and quantity of materials. The purchase department has to exercise utmost care to procure the quality materials at lower prices.
2. The stores department has also an effective role to play for stock levels. By keeping only the required quantities of materials, excess employment of capital on materials can be avoided. Further, it can reduce the loss of materials during the storage period and keep the materials in good condition.
3. It is the production departments which are capable of extracting the maximum output from each unit of materials thereby contributing heavily to minimize the loss of materials during the production period and to maximize the productivity.

Self Assessment

Fill in the blanks:

1. The basic purpose of inventory control is to maintain ..... .
2. Inventory control is generally exercised over raw materials and ..... .
3. The purchase department has to exercise utmost care to procure the quality materials at ..... .
4. By keeping only the required quantities of materials, excess employment of ..... can be avoided.

3.2 Methods and Techniques of Material Control

There are many methods and techniques of material control, the most important being:

3.2.1 Economic Ordering Quantity

The ordering of materials is usually tagged with three different components of costs viz:

- Acquisition cost of materials
- Ordering cost of materials and
- Carrying cost of materials

The ordering quantity of materials may be either larger or lesser in volume, which carries its own advantages and disadvantages.

Notes

If the quantity ordered is larger in volume, the following are some of the important advantages:

- The bulk purchase order reduces the ordering cost of the materials.
- The greater the size of the order leads to reduce the number of the orders in procuring the materials.

Quantity discounts: The discount can be classified into two categories viz trade discount and cash discount.

Caution ***What is trade discount?***

Trade discount is the discount granted by the supplier to the buyer of materials at the moment of bulk purchase. This % of discount is greatly possible only during the periods of greater volume of purchase, which reduces the overall cost of the acquisition.

If the quantity is procured in lesser volume, the following are construed as advantages:

- The carrying cost will come down in the case of lesser inventories.
- The cost of storage is lesser as far as the lesser quantities of materials.
- Loss due to deterioration, obsolescence, wastage will be minimum.
- Insurance cost is less due to lesser volume of materials.

Note

The formula to compute EOQ is:

$$\text{Economic Ordering Quantity (EOQ)} = \sqrt{\frac{2AO}{I}}$$

A = Annual requirement in units

O = Ordering cost

I = Cost of storing per year or cost of carrying the inventory

Example:

Annual requirement = 20,000 units

Ordering cost = ₹ 100 per order

Cost per unit = ₹ 4

Carrying cost = 16%

Determine the EOQ of the firm and finally justify the EOQ

$$\text{Economic Ordering Quantity (EOQ)} = \sqrt{\frac{2AO}{I}}$$

$$= \sqrt{\frac{2 \times 20,000 \times ₹100}{16\% \text{ on } ₹4}}$$

$$= 2,500 \text{ units}$$

Notes

The following table illustrates the justification of the EOQ at the level of 2,500 units.

					Annual requirement of 20,000 units
Particulars	**1**	**2**	**3**	**4**	**5**
Size of the Orders	20,000	10,000	5000	2,500	500
Number of order to placed $= \frac{\text{Total Annual Need}}{\text{Size of the order}}$	1	2	4	8	40
Average stock = $\frac{\text{Size of the order}}{2}$	10,000	5,000	2,500	1,250	250
Average stock value =Average stock × cost per unit ₹	40,000	20,000	10,000	5,000	1,000
Carrying cost = Average Stock value × 16% ₹	6,400	3,200	1,600	800	160
Ordering cost ₹	100	200	400	800	4,000
Total cost ₹	6,500	3,500	2,000	1,600	4,160

Example: Calculate EOQ

Annual requirement = 1600 units

Cost of materials per unit = ₹ 40

Cost placing and receiving = ₹ 50

Annual carrying cost of inventory = 10% on value

$$Economic\,Ordering\,Quanitity\,(EOQ) = \sqrt{\frac{2AO}{I}}$$

$$EOQ = \sqrt{\frac{2 \times 1600 \times ₹50}{10\%\ on ₹40}} = 200\,units$$

Example: Consumption during the year = 600 units

Ordering cost = ₹ 12 per order

Carrying cost = 20% on price

Price per unit = ₹ 20

$$Economic\,Ordering\,Quantity\,(EOQ) = \sqrt{\frac{2AO}{I}}$$

$$EOQ = \sqrt{\frac{2 \times 600 \times ₹12}{20\%\,on ₹20}} = 60\,units$$

Task Given the annual consumption of material is 1,800 units, ordering costs are ₹ 2 per order, price per unit of material is 32 paise and storage costs are 25% per annum of stock value. Find the economic order quantity.

Notes

3.2.2 ABC Analysis

Normally the materials are classified on the basis of the following covenants viz

- Volume and
- Value

Based on the following basis, the materials are classified into three categories:

- Lesser percentage in volume and Greater percentage in Value – Category A
- Greater percentage in volume and Lesser percentage in Value – Category B and
- Percentage in volume and Percentage in value are more or less similar – Category C

Example: A store has 4,000 items of consumption and a monthly consumption of ₹ 20,00,000. 320 items will have a consumption of ₹ 15,00,000. 500 items will account for ₹ 4,00,000 and 2,680 items consume material worth ₹ 1,00,000 only.

Table of Items and Value

Group	No. of Items	% of Items	Value ₹	% of Value
A	320	8%	15,00,000	75%
B	1000	25%	4,00,000	20%
C	2,680	67%	1,00,000	5%
Total	4,000	100%	20,00,000	

The importance of the analysis is exercising the control on the inventory.

Did u know? ***How is the control of the inventory being exercised?***

- Group A items are high valued items among the other items of the enterprise, requiring greater monitoring and controlling.
- Group B items are comparatively lesser in value among the three items given next to the Group A, require less rigid control and monitoring.
- Group C items are the major volume of items among the 4000 items of the enterprise which are least in value, need very little control and monitoring.

Example: The following shows the control of inventory on A, B and C items of the enterprise:

Group	No. of Items	Level of Control	% of Items	Value ₹	% of Value
A	320	Rigid Control	8%	15,00,000	75%
B	1000	Moderate Control	25%	4,00,000	20%
C	2,680	Very little Control	67%	1,00,000	5%

From the above table, it is obviously seen that the items which have greater percentage (75%) in the total value require rigid control than any other quantity of materials. The Group C items bear 67% of total consumption amount to 5% of total value of the items procured by the enterprise.

Notes

The unique features of the ABC analysis:

Nature	A Group of Items	B Group of Items	C Group of Items
Level of Control	Rigid control	Moderate control	Very little control
Order frequency	Frequency of ordering-weeks, fortnights	Once in 2 months	Once in 6 months
Lead time problem	To be cut off drastically	To be reduced moderately	Lead time problem due to clerical should be cut off
Safety stock level	Due to greater value least volume of safety stock is to be maintained	Due to moderate value-lesser safety stock is required	Due to lower value higher safety stock is required
System of Purchase	Higher value demands centralized system of procurement	Moderate value requires centralized and decentralized system of purchase	Lower value needs decentralized system of purchase
Supervision	By Senior officers	By Middle level managers	By clerical staff

Advantages

1. It guides the management to exercise the control based on the value of goods to the total composition.
2. Systematic inventory control can be exercised through this analysis on the basis of value of the materials. The high value materials of Group A are rigidly controlled which finally led to lesser investments.
3. Scientific system helps to lessen the storage cost of the inventory.

Self Assessment

State whether the following statements are true or false:

5. As per ABC analysis the A category of inventory includes the inventory of lesser percentage in volume and Greater percentage in Value.
6. Cash discount is the discount granted by the supplier to the buyer of materials at the moment of bulk purchase.
7. The bulk purchase order increases the ordering cost of the materials.
8. The greater the size of the order leads to reduce the number of the orders in procuring the materials.

Task Pennila &Co. is a direct exporter as well as market leader in the domestic market among acute competition. The firm is expected to have an opening stock of 2000 kg of raw materials at the rate of ₹ 4 per kg. The firm should have to price the issue of materials in two different ways, one for the domestic market and another one for the export order which was already obtained.

Date	Receipts Qty kg	Rate per kg ₹	Issue Qty kg
Jan 6			400
Jan 10	800	4.40	
Jan 15	600	4.80.	
Jan 20			1000

Contd...

Notes

Jan 21			400
Jan 24	1000	5.20	
Jan 25			600
Jan 28			400

1. Which method of stores ledger is most suitable to the domestic market? How are the issue prices of materials going to penetrate the perfect competition at the domestic level?
2. Which method is considered to be most suitable for the export of goods? How will the issue price of materials help the firm to reap greater profits through the export of goods?

3.3 Pricing of Material Issues

The important operation of the inventory management is inventory valuation through stores register. Inventory valuation under pricing is being executed through the following various methodologies:

1. First in First out (FIFO)
2. Last in First out (LIFO)
3. Highest in First out (HIFO)
4. Simple Average Method (SAM)
5. Weighted Average Method (WAM)
6. Base Stock Method

3.3.1 First in First out (FIFO)

The material which is first issued from the earliest consignment on hand and priced at the cost at which that consignment was placed in stores.

The materials which are received at first to be issued first.

This is the method suitable for the trend of falling prices in the market.

Did u know? ***Why it is considered as a suitable method for falling prices?***

The issues of the materials are made at higher prices against the low price of replacement of materials. The low price of replacement of materials against the issues is possible only during the trend of falling prices.

Advantages

- It is very simple to understand.
- It is issued on the basis of purchases.
- The materials are issued at purchase price.
- It is most advantageous during the moment of falling prices due to lower cost of replacement through purchases against the issues.
- The closing stock reflects the market price due to recent purchase of materials.

Notes

Disadvantages

- There may be the possibility of clerical errors at the moment of maintaining the stock register due to price fluctuations.
- The comparison between the jobs cannot be made possible due to various prices involved. The materials issued for one job is at earlier prices which do not agree with the materials issued for another job at later prices. When the price of materials do not agree with each other, they will not be considered for comparison.
- The issue prices do not reflect the market price due to upward price trend. The main reason is that the issues are only due to earliest consignments.

Example: Prepare stores ledger account on the basis of FIFO.

Jan 1 Opening balance 500 units @ ₹ 8

Jan 5 Received from vendor 200 units @ ₹ 8.5

Jan 12 Received from vendor 150 units @ ₹ 8.20

Jan 20 Received from vendor 300 units @ ₹ 9

Jan 25 Received from vendor 400 units @ ₹ 8

Issues of materials were as follows:

Jan 10–400 units	Jan 14–200 units	Jan 15–100 units
Jan 19–100 units	Jan 26–200 units	Jan 30–250 units

The first step is to mention the opening balance of materials under the balance side of the stores ledger account.

The most important step is to issue the materials from the available source of materials in the hands of the firm. If the available source of materials is available in terms of various price categories, the issues are to be made from the earliest consignments till the requirement of issue is to be met. If the issue is not met within the single price band, the next price bands are to be considered for the fulfillment of the requirements of the issue.

The remaining value of the materials at the end of the transaction is known as value of the closing stock.

Stores Ledger Account First In First Out (FIFO)

Date	Particulars	Receipts			Issues			Balance		
		Qty.	Total cost ₹	Unit cost ₹	Qty.	Total cost ₹	Unit cost ₹	Qty.	Total cost ₹	Unit cost ₹
Jan 1	Opening balance	----------			----------			500	8	4,000
Jan 4	Requisition Slip No				200	8	1,600	300	8	2,400
Jan 5	Receipt No	200	8.50	1,700	----------			300	8	2,400
								200	8.50	1,700
Jan 10	Requisition Slip No	----------			400 }	300	8	2,400	100	8.50	850
						100	8.50	850			
Jan 12	Receipt No	150	8.20	1,230	----------			100	8.50	850
								150	8.20	1,230

Contd...

Notes

Jan 15	Requisition slip No	----------			100	8.50	850	150	8.20	1,230
Jan 19	Requisition slip No	----------			100	8.20	820	50	8.20	410
Jan 20	Receipt No	300	9	2,700	----------			50	8.20	410
								300	9	2,700
Jan 25	Receipt No	400	8	3,200	----------			50	8.20	410
								300	9	2,700
								400	8	3,200
Jan 26	Requisition No	----------			200 } 50 150	8.20	410	150	9	1,350
						9	1,350	400	8	3,200
Jan 30	Requisition No	----------			250 } 150 100	9	1,350	**Closing stock value**		
						8	800	**300**	**8**	**2,400**

3.3.2 Last in First out (LIFO)

Under this method, the issues are made at the price of latest consignment. The current cost of the jobs/work orders are denominated only in terms of the price of the latest consignment. During the rising prices, this is considered to be a most suitable method.

This method helps the management to quote competitive prices on the basis of latest consignments. This method was considered by all the firms in the US as a predominant one over the others in fixing the price on the commodities competitively during the post Second World War years.

Advantages

- It has greater applicability only when the transactions are very minimal and prices are steady in the environment.
- The recent purchase through the latest consignment reflects the current market prices in the cost of sales of the firm.
- The issue of materials through latest consignments are denominated in terms of higher prices; led to illustrate lesser profits due to higher charge during the production and lessens the income tax burden.

Disadvantages

- Greater possibility for more number of clerical errors.
- This method also helps to compare the jobs or works.
- There may be a possibility of either overstating or understating the value of the stock in the balance sheet.

Example: The early Example's information has been considered for LIFO.

The first step is to highlight the opening balance under the balance column of the store ledger of LIFO method.

The next step is to enter the receipts if any receipts are made initially.

Notes

The next most important step is to issue the materials out of latest consignments at first. If the latest consignments do not carry sufficient volume to issue, the next later receipt should be taken into consideration in addition to the latest consignments.

Finally, whatever the closing balance available at the end of all transactions is known as the value of the closing stock of the materials.

Stores Ledger Account Last in First out (LIFO)

Date	Particulars	Receipts			Issues			Balance		
		Qty.	Total cost ₹	Unit cost ₹	Qty.	Total cost ₹	Unit cost ₹	Qty.	Total cost ₹	Unit cost ₹
Jan 1	Opening balance	----------			----------			500	8	4,000
Jan 4	Requisition Slip No				200	8	1,600	300	8	2,400
Jan 5	Receipt No	200	8.50	1,700	----------			300	8	2,400
								200	8.50	1,700
Jan 10	Requisition Slip No	----------			400 } 200	8.50	1,700	100	8	800
					200	8	1,600			
Jan 12	Receipt No	150	8.20	1,230	----------			100	8	800
								150	8.20	1,230
Jan 15	Requisition slip No	----------			100	8.20	820	100	8	800
								50	8.20	410
Jan 19	Requisition slip No	----------			100 } 50	8.20	410	50	8	400
					50	8	400			
Jan 20	Receipt No	300	9	2,700	----------			50	8	400
								300	9	2,700
Jan 25	Receipt No	400	8	3,200	----------			50	8	400
								300	9	2,700
								400	8	3,200
Jan 26	Requisition No	----------			200	8	1,600	50	8	400
								300	9	2,700
								200	8	1,600
Jan 30	Requisition No	----------			250 } 200	8	1,600	**Closing stock value**		
					50	9	450	**300 } 250**	**9**	**2,250**
								50	**8**	**400**
								TOTAL	**2,650**	

3.3.3 Highest in First out (HIFO)

The major underlying assumption of this method is to value the closing stock as minimum as possible at the end of concluding the stores register. The high priced materials are issued one after the another, among the various consignment of the materials available in the stores. This method may not only assist the firm to devalue the stock, but also to price the issue exorbitantly. It leads to a charge through cost plus contracts. It may be possible for the firm during the monopoly situations to increase the price of materials.

Notes

Example: The stock of material M/s Murugan & Co. as on January 2004 is 1000 units at ₹ 2 per unit. The following purchases and issues of this item were made subsequently:

Date	Receipts Qty. Units	Rate per unit ₹	Issue Qty Units
Jan 6			400
Jan 10	800	2.20	
Jan 15	600	2.40.	
Jan 20			1000
Jan 21			400
Jan 24	1000	2.60	
Jan 25			600
Jan 28			400

Stores Ledger (Highest In First Out)

Date	Particulars	Receipts			Issues			Balance		
		Qty.	Total cost ₹	Unit cost ₹	Qty.	Total cost ₹	Unit cost ₹	Qty.	Total cost ₹	Unit cost ₹
Jan 1	Opening balance	----------			----------			1000	2	2,000
Jan 6	Requisition Slip No	----------			400	2	800	600	2	1,200
Jan 10	Receipt No	800	2.20	1,760	----------			600	2	1,200
								800	2.20	1,760
Jan 15	Receipt No	600	2.40	1,440	----------			600	2.40	1,440
								800	2.20	1,760
								600	2	1,200
Jan 20	Requisition slip No	----------			1000 } 600	2.40	1,440	400	2.20	880
					400	2.20	880	600	2	1,200
Jan 21	Requisition slip No	----------			400	2.20	880	600	2	1,200
Jan 24	Receipt No	1000	2.60	2,600	----------			1000	2.60	2,600
								600	2	1,200
Jan 25	Requisition No	----------			600	2.60	1,560	400	2.60	1,040
								600	2	1,200
Jan 28	Requisition No	----------			400	2.60	1,040	Closing Stock Value		
								600	2	1,200

The closing stock is priced at ₹ 2 per Kg which leads to a minimum value of ₹ 1,200.

3.3.4 Method of Average

In practice, the issue of materials cannot be made from any singular lot purchases. Normally speaking, the materials are grouped together in categories on the basis of similar characteristics but not on the basis of purchase price. If the materials are grouped together irrespective of purchase price, the issues should be done appropriately on the basis of average cost method.

The average cost method is bifurcated as follows:

- Simple Average Method
- Weighted Average Method
- Base Stock Method

Notes

Simple Average Method (SAM)

Under the simple average method, the issues are made only on the basis of simple average price.

Definition: "Simple Average Price"

"A price which is calculated by dividing the total of the prices of materials in the stock from which the material to be priced could be drawn by the number of prices used in that total"

The following example will help to understand:

Example: A pillow manufacturer purchases raw cotton from three different quantities at three different prices.

Quantity Kg	₹ per Kg
10,000	20
20,000	30
30,000	40

As a manufacturer of pillows, he should find out the cost of the raw cotton material at the moment of issuance to the production centre. The issue price should be computed as follows:

$$\text{Simple Average Price} = \frac{P_1 + P_2 + P_3 \ldots\ldots\ldots\ldots\ldots\ldots P_n}{N}$$

P_1 = Price of the material purchased at the first instance, P_2, P_3 and so on.

N = Number of prices involved

$$\text{Simple average price} = \frac{₹\,20 + ₹\,30 + ₹\,40}{3} = ₹\,30/-$$

The following transactions took place in respect of a material:

Illustration 1:

Date	Receipt of Qty	Rate ₹	Issue of Qty
03-3-2005	200	4.00	
10-3-2005	300	4.80	
15-3-2005			250
22-3-2005	250	5.20	
29-3-2005			200

Stores Ledger Account in Simple Average Method

Date	Particulars	Receipts			Issues			Balance	
		Qty.	Total cost ₹	Unit cost ₹	Qty	Total cost ₹	Unit cost ₹	Qty.	Unit cost ₹
3-3-2005	Receipts	200	4.00	800	----------			200	800
10-3-2005	Receipts	300	4.80	1,440				500	2,240
15-3-2005	Issue	----------			250	4.40*	1,100	250	1,140
22-3-2005	Receipt	250	5.20	1,300	----------			500	2,440
29-3-2005	Issue				200	5**	1,000	Closing Stock Value	
								300	1,440

Notes

The next method is weighted average method to issue the materials from the stores. Why is the weighted average method considered to be a superior method over the simple average method?

This simple average method does not facilitate the recovery of the cost price of the materials through the issue price of the material calculated.

From the above cited example, first the cost of the materials is to be computed.

Cost of the materials = (10,000 Kg × ₹ 20 +20,000 Kg × ₹ 30 + 30,000 Kg × ₹ 40)

= ₹ 2,00,000+ ₹ 6,00,000 + ₹ 12,00,000

= ₹ 20,00,000/-

Recovery through issue under simple average method = 60,000 Kg × ₹ 30 per Kg = ₹ 18,00,000

If the issue is made through the simple average method, the cost of materials cannot be recovered i.e. under recovery

= Cost of the materials- issue price of the material

= ₹ 20,00,000 – ₹ 18,00,000 = ₹ 2,00,000 (Under recovery)

It means that the total issue price is less than that of the cost of the materials by ₹ 2,00,000.

In order to overcome the above bottleneck which is associated, the method of weighted average is introduced to replace the early method.

Weighted Average Method (WAM)

Under the weighted average method, the issue price is found out through the appropriate assignment of weights considered for the determination of weighted average price.

Weighted Average Price

"Weighted average price which is calculated by dividing the total cost of materials in the stock from which the materials to be priced could be drawn by the total quantity of materials in that stock."

$$\text{Weighted average price} = \frac{Q_1P_1 + Q_2P_2 + Q_3P_3 .....Q_nP_n}{Q_1 + Q_2 + Q_3 .....Q_n}$$

Q = Quantity of materials

P = Price of the materials

Q = Assigned as weights i.e. volume of the quantities are used weights

The above example is taken for the computation weighted average price

$$= \frac{(10,000 \text{ Kg} \times ₹\ 20 + 20,000 \text{ Kg} \times ₹\ 30 + 30,000 \text{ Kg} \times ₹\ 40)}{10,000 + 20,000 + 30,000}$$

= ₹ 33.33 per Kg

Illustration 2:

Stores Ledger Account in Weighted Average Method

Date	Particulars	Receipts			Issues			Balance	
		Qty.	Total cost ₹	Unit cost ₹	Qty.	Total cost ₹	Unit cost ₹	Qty.	Unit cost ₹
3-3-2005	Receipts	200	4.00	800	----------			200	800
10-3-2005	Receipts	300	4.80	1,440				500	2,240
15-3-2005	Issue	----------			250	4.48*	1,120	250	1,120
22-3-2005	Receipt	250	5.20	1,300	----------			500	2,420
29-3-2005	Issue				200	4.84**	968	Closing Stock Value	
								300	1,452

Notes

* $\left(\frac{800+1,140}{200+300}\right) = ₹\ 4.48$ ** $\left(\frac{1120+1,300}{250+250}\right) = ₹\ 4.84$

How it is considered as a superior method over the early one?

The cost of the materials amounts to ₹ 20,00,000. The total issue price of the materials is as follows:

= 60,000 Kg × ₹ 33.3333 per K.g = ₹ 19,99,998 approximately equals to the cost of the materials i.e. ₹ 20,00,000/-

Advantages

- This method is a most rational method in finding out the issue price of the materials.
- It never takes into consideration the price fluctuations either during the trend of rising or falling.
- Issue prices mainly depend upon the number of purchases.
- Under this method, the issue price is able to recover the cost of the materials.
- The issue price reflects or resembles the market price.

Disadvantages

- Due to different volumes of materials, clerical errors may arise.
- It lost its expression in terms of actual price of materials due to average price.

Base Stock Method

Under this method, the minimum or safety stock of materials is to be stored from the initial lot of purchase by the enterprise. The ultimate purpose of maintaining the stock in order to meet the emergency whenever arises. Once the base stock is created out of the first lot of purchase, should be considered as a fixed volume forwarded from one point of time to another.

It is the only method having the prime objective of issuing the materials to the tune of current prices. This method normally carries out its operations either with FIFO or LIFO. While applying the FIFO or LIFO method in the applications of the base stock method it bears the advantages and disadvantages of the fundamental procedures of earlier two methods.

The basic objective of the method could be met out only with the conjunction of LIFO method.

Illustration 3:

The stock of material Z as on Jan 2004 is 500 units at ₹ 2 per unit. The following purchases and issues of this item were made subsequently:

Date	Receipts Qty. Units	Rate per unit ₹	Issue Qty Units
Jan 6			200
Jan 10	400	2.20	
Jan 15	300	2.40.	
Jan 20			500
Jan 21			200
Jan 24	500	2.60	
Jan 25			300
Jan 28			200

Notes

Prepare a store ledger account showing how the value of the above issues should be arrived at under the base stock method when it operates in conjunction with LIFO. Base stock is 200 units.

Stores Ledger Base Stock Method (Last In First Out Model)

Date	Particulars	Receipts			Issues			Balance		
		Qty.	Total cost ₹	Unit cost ₹	Qty.	Total cost ₹	Unit cost ₹	Qty.	Total cost ₹	Unit cost ₹
Jan 1	Opening balance	----------			----------			500	2	1,000
Jan 6	Requisition Slip No	----------			200	2	400	300	2	600
Jan 10	Receipt No	400	2.20	880	----------			300	2	600
								400	2.20	880
Jan 15	Receipt No	300	2.40	720	----------			300	2	600
								400	2.20	880
								300	2.40	720
Jan 20	Requisition slip No	----------			300	2.40	720	300	2	600
					200	2.20	440	200	2.20	440
Jan 21	Requisition slip No	----------			200	2.20	440	300	2	600
Jan 24	Receipt No	500	2.60	1,300	----------			300	2	600
								500	2.60	1,300
Jan 25	Requisition No	----------			300	2.60	780	300	2	600
								200	2.60	520
Jan 28	Requisition No	----------			200	2.60	520	**Closing Stock Value**		
								300	2	600

Self Assessment

Fill in the blanks:

9. The ..... method helps the management to quote competitive prices on the basis of latest consignments.
10. Under the weighted average method, the ..... is found out through the appropriate assignment of weights considered for the determination of weighted average price.
11. Under ....., the minimum or safety stock of materials is to be stored from the initial lot of purchase by the enterprise.
12. This ..... method does not facilitate the recovery of the cost price of the materials through the issue price of the material calculated.
13. The major underlying assumption of ..... method is to value the closing stock as minimum as possible at the end of concluding the stores register.
14. If the materials are grouped together irrespective of purchase price, the issues should be done appropriately on the basis of ..... method.
15. The ..... of replacement of materials against the issues is possible only during the trend of falling prices.

Notes

3.4 Summary

- Inventory control, therefore, aims at ensuring the availability of required quality material in required quantity, at required time or period and place with minimum cost.
- Inventory involves investment of money and locking up of precious space which has alternate uses.
- Inventory control is generally exercised over raw materials and work in progress.
- The basic purpose of inventory control is to maintain optimum level of inventory.
- The ordering of materials is usually tagged with three different components of costs viz:
  - Acquisition cost of materials
  - Ordering cost of materials and
  - Carrying cost of materials
- A system of classifying materials and supplies according to value is known as A.B.C. Analysis
- The important operation of the inventory management is inventory valuation through stores register. Inventory valuation under pricing is being executed through the following various methodologies:
  - First in First out (FIFO)
  - Last in First out (LIFO)
  - Highest in First out (HIFO)
  - Simple Average Method (SAM)
  - Weighted Average Method (WAM)
  - Base Stock Method

3.5 Keywords

ABC Analysis: Analysis of exercising the control on the inventory on the basis of value. Always Better Control Analysis; A- High control for high value goods; B- Moderate control for lesser value goods and C- Little control on the least value goods.

Carrying Cost: Cost incurred for carrying the materials from the place of purchase to place of production centre/profit centre.

E.O.Q: Economic Order Quantity of materials to be ordered/procured.

Inventory: Stock of Raw materials, Stock of Work in Progress, Stock of Finished Goods and Stock of Spares, but not Stock of Loose tools.

Ordering Cost: Cost incurred at the moment of placing the order of goods or materials, administration costs, cost of communication and so on.

3.6 Review Questions

1. The basic purpose of material control is to maintain optimum level of inventory. Discuss.
2. Which method is most suitable for perishable commodities? Why? Reason out the suitability of the model.

Notes

3. Which method is most suitable for precious metals? Why? Explain the reasons.

4. Why does the firm need to install inventory control? Explain the conflicting objectives among the heterogeneous departments in maintaining the inventory.

5. You are required to suggest an inventory control mechanism for the following:

   (a) Stores department of the Ball-bearing Manufacturing Company Ltd.

   (b) Retail Medical Stores

   (c) Wholesale Automobile Showroom

6. Explain the meaning and applications of the various tools of inventory level under the inventory management.

7. Critically evaluate the roles of carrying costs and ordering costs on the economic order quantity.

8. The stock in hand of a material as on 1-9-2002 was 500 units at ₹ 1 per unit. The following purchases and issues were subsequently made. Prepare the stores ledger account showing how the value of the issues would be recorded under (a) FIFO and (b) LIFO method.

	Purchased		**Issued**
6-9-2002	100 units @ ₹ 1.20	9-9-2002	500 units
20-9-2002	700 units @ ₹ 1.20	22-9-2002	500 units
27-9-2002	400 units @ ₹ 1.30	30-9-2002	500 units
13-10-2002	1,000 units @ ₹ 1.40	15-10-2002	500 units
20-10-2002	500 units @ ₹ 1.50	22-10-2002	500 units
17-11-2002	400 units @ ₹ 1.60	11-11-2002	500 units

9. A manufacturer buys certain essential spares from outside suppliers at ₹ 40 per set. Total annual requirements are 45,000 sets. The annual cost of investment in inventory is 10% and costs like rent, stationery, insurance, taxes, etc. per unit per year work to ₹ 1. Cost of placing an order is ₹ 5. Calculate the Economic Order Quantity.

10. Find out the Economic order quantity from the following information's:

    Annual usage : 3,000 units; Cost of material per unit: ₹ 10; Cost of placing and receiving one order ₹ 60; and Annual carrying cost per unit: 10% of inventory value.

11. From the following transactions, prepare separately the stores ledger account, using the FIFO and LIFO methods of pricing:

January	1	Opening Balance 100 units @ ₹ 5 each.	
	″	5	Received 500 units @ ₹ 6 each.
	″	20	Issued 300 units.
February	5	Issued 200 units.	
	″	6	Received 600 units @ ₹ 5 each.
March	10	Issued 300 units.	
	″	12	Issued 250 units.

12. Select a manufacturing concern and outline a system of materials control for it. Give specimen of various forms you will require.

Notes

Answers: Self Assessment

1. optimum level of inventory
2. work in progress
3. lower prices
4. capital on materials
5. True
6. False
7. False
8. True
9. LIFO
10. issue price
11. Base Stock method
12. simple average
13. HIFO
14. average cost
15. low price

3.7 Further Readings

Book

Richard G. Schroeder, Myrtle W. Clark, Myrtle W. Clark, Jack M. Cathey, *Financial Accounting Theory and Analysis: Text Readings and Cases,* John Wiley & Sons Inc.

Online links

www.futureaccountant.com

www.managementstudyguide.com

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Unit 4: Costing and Control of Labour

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Objectives

After studying this unit, you will be able to:

- Compute labour turnover
- Illustrate the methods of wages payment and incentive plans

Introduction

Labour is the most sensitive element in any manufacturing activity. The performance of labour has a direct bearing on all other elements of cost too.

Labour may be classified as direct when (a) there is a direct relationship of the labour to a particular production unit or process, (b) the labour cost is measurable in terms of such production unit or process, and (c) the labour cost is sufficiently significant in amount and easily identifiable with particular production unit or process. Indirect labour costs are those costs which are necessary for production purposes but are not identifiable with a particular production unit. Such costs consist of (a) labour costs in service departments, such as, purchasing, engineering, time-keeping, etc. (b) labour cost of certain works of production departments, viz, salaries of foremen, helpers, clerical assistants, and (c) labour costs connected with general factory services, viz, salaries of works manager, chief inspector, factory office staff, etc.

Note The classification of indirect labour depends upon the manufacturing methods and pattern of the organisation and there cannot be any universally acceptable set of classification for indirect labour.

4.1 Labour Turnover

It denotes the percentage change in the labour force of an organisation. It is a common occurrence that the workers do change their jobs. Either they leave their jobs for better prospects or better

Notes

environments or they are forced to leave an employment. Such mobility is quite normal and known as labour turnover.

Cost of labour turnover is treated as an overhead expense and should not be charged direct to any work order.

1. Labour turnover according to separation method

   = Number of employees left during a period/Average number of employees during a period × 100

2. Labour turnover according to flux method

   = Number of addition + seperations during a period/Average number of employees during a period × 100.

4.1.1 Causes of Labour Turnover

A study into the causes of labour turnover helps the management in proper planning and action for reducing this rate. The reasons may be divided into two categories:

(a) Avoidable Causes, and

(b) Unavoidable Causes.

(a) ***Avoidable Causes of Labour Turnover:*** The various avoidable causes are:

   (i) Lower wages being paid in the organisation,

   (ii) Lack of planning of higher management,

   (iii) Unsatisfactory working conditions in the factory,

   (iv) Lack of job satisfaction,

   (v) Lack of medical and transport facilities,

   (vi) Discrimination between one worker and another worker,

   (vii) Bad relationship with supervisors and management,

   (viii) Lack of proper adjustment with workers,

   (ix) Unauthorized long absence from duty,

   (x) Migratory character of Indian industrial workers, and

   (xi) Lack of safety measures.

(b) ***Unavoidable Causes of Labour Turnover:*** The various unavoidable causes responsible for labour turnover are:

   (i) Death, retirement disablement of the worker,

   (ii) Domestic disputes of the workers,

   (iii) Illness or accidents making the worker permanently handicapped,

   (iv) Discharge due to unsuitability,

   (v) Marriage and pregnancy in case of female workers,

   (vi) Inefficiency of the workers,

   (vii) Other reasons such as lack of housing and transport facilities, and

   (viii) Immoral character of worker.

Notes

4.1.2 Effects of Labour Turnover

It results an increase in cost of production due to the following reasons:

1. Cost of replacing workers, i.e., cost of selection,
2. Cost of training for new workers,
3. Loss arising out of defective work and increased wastage in production process,
4. Newly employed workers are likely to mishandle of machines and equipments, and
5. With frequent changes, production planning cannot be properly executed and as a result, there is loss in production.

Example: The personnel department of an organisation gives you the following information regarding labour. Calculate labour turnover rate using the various methods of labour turnover.

Number of workers on the payroll:

At the beginning of the month	2,900
At the end of the month	1,100

During the month, 20 persons quit while 80 persons are discharged. 300 workers are required during the month. Of these, 50 workers are recruited in the vacancies of those leaving while the rest were engaged in accordance with an expansion scheme.

Solution:

Average number of workers during the month:

$$= \frac{2900+1100}{2} = 2000$$

Labour Turnover Rate by:

1. Separation Method = $\frac{\text{Number of separations during a period}}{\text{Average number of workers during the period}}$

   LTR = $\frac{20+80}{2000} \times 100$

   LTR = 5%

2. Flux Method = $\frac{\text{Number of separations + Number of replacements}}{\text{Average number of workers during the period}} \times 100$

   LTR = $\frac{100+50}{2000} \times 100$

   LTR = 7.5%

4.2 Idle Time

Usually, there is bound to be some difference between the time booked to different jobs or work orders and gate time. The difference of this is known as idle time. Idle time is that time for which the employer pays, but from which he obtains no production. Idle time is of two types:

1. Normal idle time, and
2. Abnormal idle time

Notes

Normal Idle Time

This represents the time wastage that cannot be avoided and, therefore, the employer must bear the labour cost of this time. Following are some examples of normal idle time:

1. The time taken in going from the factory gate to the department in which the worker is to work, and then again the time coming from the department to the factory gate at the end of the day.
2. The time taken in packing up the work for the day.
3. The time which elapses between the completion of the job and the commencement of the next job.
4. The time taken for personal needs and tea breaks.
5. The time lost when production is interrupted for machine maintenance.

As it is unavoidable cost and as such should be included in cost of production.

Abnormal Idle Time

It is that time wastage which can be avoided if proper precautions are taken. Examples of abnormal idle time can be cited as below:

1. The time wasted due to breakdown of machinery on account of the inefficiency of the work engineers.
2. Time wasted on account of the failure of the power supply.
3. The time wasted due to strike or lockouts in the factory.

Caution It is a principle of costing that all abnormal expenses and losses should not be included in costs and as such wages paid for abnormal idle time should not form part of the cost of production. The wages paid for abnormal idle time should be debited to costing Profit & Loss Account.

Self Assessment

Fill in the blanks:

1. ..... denotes the percentage change in the labour force of an organisation.
2. Cost of labour turnover is treated as an ..... and should not be charged direct to any work order.
3. ..... is that time for which the employer pays, but from which he obtains no production.
4. ..... represents the time wastage that cannot be avoided and, therefore, the employer must bear the labour cost of this time.
5. The ..... includes the time wasted on account of the failure of the power supply.
6. The wages paid for abnormal idle time should be debited to costing ..... .
7. Labour turnover according to ..... .

   = Number of employees left during a period/Average number of employees during a period × 100

Notes

4.3 Methods of Wages, Payments and Incentive Plans

Remuneration and incentive systems, according to their characteristics, fall under the following broad categories:

1. Time rates
2. Piece rates
3. Bonus system
4. Indirect monetary incentives and
5. Non-monetary incentives

Time Rates at Ordinary Levels

Payment is made at a rate on attendance by hour, day, week or a month regardless of output.

Time Rates at High Wages Levels: Under this system, wages are paid at an appreciably higher rate than the normal wage for the industry and return a much higher stand of performance and output from the workers are expected.

Graduated Time Rates: This takes the form of wage rate which varies with changes in the local cost of living index.

Straight Piece Rates: This is a payment of a fixed sum per fixed unit produced without regard to time taken.

Piece Rates

Piece rates with guaranteed day rates:

A piece rate system with the guaranteed minimum wage may take one of the following forms:

1. Piece work with a guaranteed day rate: If earning according to piece rates is less than the worker's time pay, he gets his time pay. If the piece work earning is more, then of course, he gets more than his time pay.
2. Piece work with a flat cost of living bonus or dearness allowance.
3. A guaranteed rate per hour, day of week worked plus a piece rate payment for output above a required minimum.

Did u know? ***What is Differential Piece Rate?***

Under such scheme, earnings vary at different stages in the range of output, sometimes proportionally more, sometimes less, or sometimes in proportion to output, designed to reward efficient workers with the further object of encouraging less efficient workers or a trainee to improve.

Premium and Bonus Plan

The object of a premium plan is to increase the production by giving an inducement to the workers in the form of higher wages for less time worked.

Some of the important premium plans are as follows:

Notes

Halsey Premium Plan

Under this method, standard time for doing each job or operation is fixed and the worker is given wages for the actual time to be taken to complete the job or operation at the agreed rate per hour, plus a bonus equal to one half of the time saved. In practice, the bonus may vary from $33\frac{1}{3}\%$ to $62\frac{2}{3}\%$ of the wages of the time saved. Total earnings of the worker will be

$$TT \times HR + \tfrac{1}{2} \times TS \times HR$$

TT = Time Taken

HR = Hourly Rate

TS = Time Saved

Time saved is the difference between Time Allowed (Standard Time) and Time Taken. Normal wages may be ascertained and bonus may be added to arrive at total earnings.

Rowan Plan

Under this method, the worker is again guaranteed wages at the ordinary rate for the time taken by him to complete the job or operation. The difference between Halsey plan and Rowan plan is only in the calculation of the bonus. Bonus under this system will be calculated as:

$$TS/TA \times \text{Time Taken} \times \text{Hourly Rate}$$

The total earnings will be

$$TT \times HR + [\,(TA - TT) / TA] \times TT \times HR$$

TT = Time Taken

HR = Hourly Rate

TA = Time Allowed

Alternatively:

Normal wages + Bonus will be total earnings.

Therefore, Normal wages = Time Taken × Hourly Rate

Bonus = (Time Saved / Time allowed) × Normal Wages

Example: From the following particulars, workout the earnings of a worker under:

1. Halsey premium system and
2. Rowan system

Standard time	10 hours
Standard Rate	₹ 2 per hour
Time Taken	8 hours

Solution:

Halsey Premium System:

Normal wages = Time taken × Hourly Rate

= 8 × 2 = ₹ 16.00

Bonus 50% of time saved.

1/2 × Time saved × Hourly Rate

Notes

1/2 × 2 × 2 = ₹ 2.00

Total earnings ₹ 18.00

Rowan System:

Normal wages = Time taken × Hourly Rate

8 × 2 = ₹ 16.00

Bonus = Time Saved/Standard Time × Normal Wages

= 2/10 × 16 = ₹ 3.20

Total earnings ₹ 19.20

Note: Time saved is 10 hours

Time allowed (standard time) 8 hours

Less: Time taken 2 hours

Example: Calculate the total earnings of worker A and worker B under

1. Halsey plan, and
2. Rowan plan

Time Allowed	24 hours
Hourly Rate	8 per hour
Time taken by A	20 hours
Time taken by B	18 hours

Solution:

Total earnings of worker A	
Under Halsey plan	
Normal wages TT × HR = 20 x 8	= ₹ 160
Bonus ½ × TS × HR = ½ × 4 × 8	= ₹ 16
Total earnings	= ₹ 176
Under Rowan Plan	
Normal wages = TT × HR = 20 × 8	= ₹ 160.00
Bonus TS/TA × Normal wages	
4/24 × 160	= ₹ 26.67
Total earnings	= ₹ 186.67
Total earnings of worker B	
Under Halsey Plan:	
Normal wages = TT + HR = 18 × 8	= ₹ 144
Bonus 1/2 × TS × HR = 1/2 × 6 × 8	= ₹ 24
Total earnings	= ₹ 168
Under Rowan Plan:	
Normal wages = TTx HR = 18 × 8	= ₹ 144
Bonus TS/TA × NW = 6 × 144/24	= ₹ 36
Total earning	= ₹ 180

Notes

Example:

Time Allowed 20 hours

Time Saved 4 hours

Hourly Rate ₹ 5 per hour

Calculate total earnings under:

1. Halsey and
2. Rowan Plan

Solution:

Time taken is not given. Hence, it is to be ascertained.

Time Allowed	= 20 hours
Less: Time Saved,	= 4 hours
Time taken	= 16 hours
Total earnings under Halsey Plan:	
Normal wages = TT × HR=16 × 5	= ₹ 80
Bonus 1/2 × TS × HR = 1/2 × 4 × 5	= ₹ 10
Total earnings	= ₹ 90
Total earnings under Rowan Plan:	
Normal wages = TT × HR = 16 × 5	= ₹ 80
Bonus TS/TA × NW – 4/20 × 80	= ₹ 16
Total earnings	= ₹ 96

Example: From the following particulars, work out the earnings for the week of a worker under:

1. Straight Piece Rate
2. Differential Piece Rate
3. Halsey Premium System
4. Rowan System

Number of working hours per week - 48

Wages per hour - ₹ 3.75

Normal time per piece - 20 minutes

Normal output per week - 120 Pieces

Actual output for the week - 150 Pieces

Differential piece rate - 80% of piece rate

When output is below standard and 12% when above standard.

Solution:

Weekly wages 48 × 3.75 = ₹ 180.00

Rate per unit = 180/120 = ₹ 1.50

Notes

1. ***Straight piece rate:***

   Actual output x Rate per unit

   150 × 1.50= ₹ 225

2. ***Different piece rate system:***

   when output is above standard:

   Actual x Rate per unit x (Normal Output/100)

   150 × 1.50 × 120/100 = ₹ 270.

   Halsey Premium System:

   Time allowed = 150 × 20 minutes = 50 hours

   Hours worked = 48 hours

   Time saved = 2 hours

   Time taken (hours worked) × H.R. + 1/2 × TS × HR

   48 × 3.75 + (1/2 × 2 × 3.75)

   = 180 + 3.75 = ₹ 183.75

   Rowan Systems:

   TT × HR – H ^1 × Normal Wages

   48 × 3.75 + (2 × 180)/50

   = 180 + 7.2 = 187.2

Example: A worker manufactures 300 articles in a week. He receives guaranteed wages of 48 hours per week at ₹ 4 per hour. The estimated time to produce one article is 10 minutes and under incentive scheme the time allowed is increased by 20%. Calculate the total earnings.

Solution:

1. ***Piece Rate:***

48 hours at ₹ 4 per hour	192
12 hours at -do-	48
60 total earnings	240

2. ***Halsey Plan:***

Normal wages 48 × 4	192
Bonus 1/2 × TS × HR	
1/2 × 12 × 4	24
	216

3. ***Rowan Plan:***

Normal wages	192
Bonus TS/TA × NW (2 × 192)/60	38
	230

Notes

Note:

One unit is produced in 10 minutes

300 unit is produced in 300 × 10 = 3,000 minutes

i.e.,	50 hours
+ 20% increase	10 hours
Time Allowed	60 hours
Time taken	48 hours
Time Saved	12 hours

Example: A worker takes 9 hours to complete a job on daily wages and 6 hours on a scheme of payment by results. His day rate is 0.75 paise an hour. The cost of material is ₹ 4.00, overhead is 150 percent of total direct wages.

Compute the factory cost under: (a) Piece rate, (b) Halsey scheme, and (c) Rowan scheme.

Solution:

Direct wages:

1.	Piece rate 75 paise × 6 hours	4.50	
2.	Halsey		
	Normal wages (NW)	4.50	
	Bonus 1/2 × 3 × 0.75	1-12	5.62
3.	Rowan		
	Normal wages	4.50	
	Bonus -TS/TA × NW 3/9 × 4.50	1.50	6.00

Computation of Factory Cost

Particulars	Piece Rate ₹	Halsey ₹	Rowan ₹
Material	4.00	4.00	4.00
Direct wages	4.50	5.62	6.00
Overhead 150% of			
Direct wages	6-75	8.43	9.00
Factory Cost	15.25	18.05	19.00

Task The standard time for a job is 60 hours. The hourly rate of guaranteed wages is ₹ 0.75. Because of the saving in time, a worker gets an hourly wage of ₹ 0.90 under Rowan premium bonus system. For the same saving in time, calculate the hourly rate of wages. A worker will get under Halsey premium bonus system (assuming 40 percent to worker.)

Self Assessment

Notes

State whether the following statements are true or false:

8. Guaranteed Time Rates is a payment of a fixed sum per fixed unit produced without regard to time taken.
9. Time saved is the difference between Time Allowed (Standard Time) and Time Taken.
10. Normal wages may be ascertained and bonus may be added to arrive at total earnings.
11. The difference between Halsey plan and Rowan plan is only in the calculation of the bonus.
12. Straight Piece Rates takes the form of wage rate which varies with changes in the local cost of living index.

Fill in the blanks:

13. Bonus under ..... will be calculated as: TS/TA × Time Taken × Hourly Rate
14. Total earnings = ... + Bonus
15. ..... = (Time Saved/Time allowed) × Normal Wages

4.4 Summary

- Labour may be classified as direct when (a) there is a direct relationship of the labour to a particular production unit or process (b) the labour cost is measurable in terms of such production unit or process and (c) the labour cost is sufficiently significant in amount and easily identifiable with particular production unit or process.
- Indirect labour costs are those costs which are necessary for production purposes but are not identifiable with a particular production unit.
- Indirect labour costs consist of (a) labour costs in service departments, such as, purchasing, engineering, time-keeping, etc. (b) labour cost of certain works of production departments, viz, salaries of foremen, helpers, clerical assistants, and (c) labour costs connected with general factory services, viz, salaries of works manager, chief inspector, factory office staff, etc.
- Labour turnover denotes the percentage change in the labour force of an organisation. It is a common occurrence that the workers do change their jobs.
- Idle time is that time for which the employer pays, but from which he obtains no production. Idle time is of two types:
  - Normal idle time, and
  - Abnormal idle time
- Remuneration and incentive systems, according to their characteristics, fall under the following broad categories:
  - Time rates
  - Piece rates
  - Bonus system
  - Indirect monetary incentives and
  - Non-monetary incentives

Notes

- Under Differential Piece Rate scheme, earnings vary at different stages in the range of output, sometimes proportionally more, sometimes less, or sometimes in proportion to output, designed to reward efficient workers with the further objective of encouraging less efficient workers or a trainee to improve.
- The object of a premium plan is to increase the production by providing an inducement to the workers in the form of higher wages for less time worked.

4.5 Keywords

Abnormal Idle Time: It is that time wastage which can be avoided if proper precautions are taken.

Differential Piece Rate: Under this scheme earnings vary at different stages in the range of output, sometimes proportionally more, sometimes less, or sometimes in proportion to output, designed to reward efficient workers with the further object of encouraging less efficient workers or a trainee to improve.

Idle time: Idle time is that time for which the employer pays, but from which he obtains no production.

Labour Turnover: It denotes the percentage change in the labour force of an organisation.

Normal Idle Time: This represents the time wastage that cannot be avoided and, therefore, the employer must bear the labour cost of this time.

4.6 Review Questions

1. Cost of labour turnover is treated as an overhead expense and should not be charged direct to any work order. Why?
2. Do you think that there is a direct relationship of the labour to a particular production unit or process?
3. Idle time is that time for which the employer pays, but from which he obtains no production. Discuss.
4. During one week, workman B produced 200 units. He receives wages for a guaranteed 4 hours week at the rate of ₹ 1.50 per hour. The estimated time to produce one article is 1/4 hours and under incentive scheme the time allowed is increased by 20 percent. Calculate the gross wages under each of the following methods of remuneration:
   (a) Time rate
   (b) Piece work with a guaranteed weekly wage
   (c) Halsey plan
   (d) Rowan plan.
5. An employee working under a bonus scheme saves 4 hours in a job for which the standard time is 32 hours. Calculate the rate per hour worked and wages payable for time taken under the following alternative scheme (award rate is ₹ 1 per hour).
   (a) Employee receives an increase in the hourly rate based on percentage that the time saved bears to the time set.
   (b) A bonus of 10 percent on award rate is payable when standard time (namely, 100% efficiency) is achieved plus a further bonus of 1% on award rate for each 1% in excess of 100 percent efficiency.

Notes

6. Critically evaluate the rate system and bonus system of wages payment.
7. Under Time Rate method payment is made at a rate on attendance by hour, day, week or a month regardless of output. What are the key significance and drawbacks of time rate method?
8. Do you think idle time can be reduced by implementing some effective strategies? Discuss.
9. What factors would you take into consideration in introducing an incentive scheme?
10. Discuss the advantages and disadvantages of the piece rate method of payment of wages. Do you consider that workers remunerated by reference to this method should be required to maintain time records?
11. Standard time is 24 hours. The hourly rate of guaranteed wage is ₹ 3. Because of time saved, a worker Mr. Rajesh gets an effective hourly wage rate of ₹ 3.75 under Rowan Premium Plan. For the same saving in time, calculate the effective hourly rate of wages for a worker Mr. Rajesh under Halsey System.
12. Two workers A and B were given an identical job. The labour cost was estimated at ₹ 15 per hour for 32 hours. Overhead are recovered at ₹ 45 per labour-hour. Material used by both the workers is valued at ₹ 1,200 each.

    The works cost of production came to ₹ 2,700 and ₹ 2,910 respectively for two jobs with Halsey Plan (50%). Find the time taken by A and B.

Answers: Self Assessment

1.	Labour turnover	2.	overhead expense
3.	Idle time	4.	Normal idle time
5.	Abnormal idle time	6.	Profit & Loss Account
7.	separation method	8.	False
9.	True	10.	True
11.	True	12.	False
13.	Rowan Plan	14.	Normal wages
15.	Bonus		

4.7 Further Readings

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Online links

www.futureaccountant.com

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Notes

Unit 5: Overheads

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Objectives

After studying this unit, you will be able to:

- Make classification of overheads
- Describe the absorption of overheads
- Illustrate under and over absorption of overheads

Introduction

Overhead has been defined by the Institute of Cost and Work Accountants, London as "the aggregate of indirect material cost, indirect wages and indirect expenses". By indirect, it means one "which cannot be allocated, but which can be apportioned to or absorbed by cost centre or cost unit". Overheads are those indirect costs which cannot be directly related to any product, job or process, because they cannot be directly attached to production activities. A major part of the total cost is overheads. The total cost is divided into: Prime Cost, Factory Cost and Administrative Cost. Overhead comprises of indirect material, indirect labour and indirect expenses.

Blocker has defined the overhead costs as "Operating of a business enterprise which cannot be traced directly to a particular unit of output". Overheads are the indirect costs which cannot be directly allocated to any particular job and production activity or process as they are not capable of being specifically identified to any particular activity.

5.1 Classification of Overheads

The method to be adopted for classification of overhead depends upon the type and size of the business, nature of product or service rendered and policy of the management. Overhead costs may be classified according to: (1) Functions, (2) Elements, and (3) Behaviour-wise classification.

Notes

Function-wise Classification

This classification is done on the basis of major function of a concern. It, therefore, includes production overhead, administration overhead and selling and distribution overhead.

Element-wise Classification

This classification is done according to the expenditure and follows the definition of overhead. Under this method, overhead is broken down into indirect material, indirect labour and indirect expense.

Behaviour-wise Classification

This classification is done on the basis of variability in relation to production. Based on this behaviour, the overhead expenses may be classified into three groups:

1. Fixed expenses, that is, expenses that are not affected by changes in output or sales such as rent, salaries, etc.
2. Variable expenses, that is, expenses that change in the same proportion in which output (or sales) changes for example, power consumed, indirect materials, insurance in transit, carriage outwards, etc.
3. Semi-variable expenses, that is, expenses that change in the same proportion to which output (or sales) changes but not in the same ratio. Depreciation is not doubled if output is doubled it may be 50% more. Semi-variable expenses are partly fixed and partly variable.

Self Assessment

Fill in the blanks:

1. ..... are those indirect costs which cannot be directly related to any product, job or process, because they cannot be directly attached to production activities.
2. The total cost is divided into: Prime Cost, ... and Administrative Cost.
3. Overhead comprises of ....., indirect labour and indirect expenses.
4. ..... are not affected by changes in output or sales.
5. Variable expenses change in the same proportion in which ..... changes.
6. ..... expenses are partly fixed and partly variable.

5.2 Absorption of Overheads

Different methods may be adopted for determination of absorption rates for fixed and variable overheads. The fixed overhead rate serves as a measure of utilisation of the facilities while the extent of idle capacity is indicated by under absorption.

The following are the main methods of absorbing factory overheads:

1. Percentage on direct material cost
2. Percentage on direct wages
3. Percentage on prime cost
4. Direct labour hour rate

Notes

5. Machine hour rate
6. Rate per unit of output

1. ***Percentage on Direct Material Cost:*** Under this method, the percentage of factory expenses to material is calculated on the basis of past records and the factory expenses in the current year are charged to the factory on the jobs according to that percentage. For example, the factory expenses in the previous year are ₹ 12,000 on a material of ₹ 48000. That means the percentage of factory overhead to direct material is 25%. Therefore, even in the current year, same percentage will be calculated.

2. ***Percentage on Direct Wages:*** Sometimes, on the basis of estimates, the percentage of factory expenses to direct wages is calculated and jobs are charged according to this percentage. This method of absorption can be adopted under the following circumstances:

   (a) Where production is uniform.

   (b) Where labour employed and type of work performed are uniform.

   (c) Where, the ratio of skilled and unskilled labour is constant.

   (d) Where there are no variations in the rates of pay.

3. ***Percentage of Prime Cost:*** It is argued that both materials and labour give rise to overhead expenses and therefore, both should be taken into consideration in determining the factory expenses.

4. ***Direct Labour Rate:*** This is a scientific method as most of the overhead expenses are related to the time factor. This method can be applied in those departments or factories where manual labour is predominant.

   The direct labour hour rate is obtained by dividing the total overhead of the department for a particular period by the total number of direct labour hours of that department for the same period. Each job is changed at this rate for the number of direct hours spent thereon. A serious defect of this method is that it fails to take into consideration expenses that are not dependent on labour hours such as power, depreciation, fire insurance, etc.

5. ***Machine Hour Rate:*** Machine hour rate is the cost of running a machine per hour. It is one of the methods of absorbing factory expenses to production. There are two methods of computing the machine hour rate. viz.

   (a) The ordinary machine hour rate, and

   (b) Composite machine hour rate.

   Dual Hour Rate: This is the combination of machine hour rate and direct labour rate. It is adopted in those departments where both manual and machine works are equal.

6. ***Rate Per Unit of Output:*** This method is simple and adopted where products of the same types are manufactured. The rate per unit is obtained by dividing the overheads by the number of units produced. Each unit is exchanged at this rate for the recovery of overhead.

Note Factors in Selecting Methods of Overhead Rate for a Factory

1. ***Adequacy:*** The overhead should be such that overheads should be equally apportioned to the cost centres or cost units. The amount of overhead recovered should also be equivalent to the amount of overheads incurred.

Contd...

Notes

2. ***Convenience:*** The overhead rate should be simple to calculate and easy to understand. It should be convenient in application. It should not require unnecessary or additional clerical work.
3. ***Time Factor:*** Overhead rate should have some relation to the time taken by various jobs for completion. Thus, if a job takes twice as much another job, the first job should be charged twice the amount charged to the second job. It is because of this reason that direct wages percentage rate is preferred over direct material cost percentage rate.
4. ***Manual or Machine Work:*** The work done by manual labour is to be distinguished from work done by machines and different overhead rates should be applied for manual and machine work.
5. ***Different Overhead Rates:*** Different overhead rates should be ascertained for different departments where the nature of work done by one department is different from the work done by other department or departments.
6. ***Information:*** The selection of most appropriate overhead rate depends on the extent of information available or recorded.

Example: From the budgeted figures of Gwalior Soap Factory:

1. Prepare Normal Overhead Application Rates using the:
   (a) Direct Labour Rate Method
   (b) Direct Labour Cost Method, and
   (c) Machine Hours Rate Method.

   Budgeted figures for the year:

Estimated factory overheads	₹ 58,000
Estimated direct labour hours	₹ 1,34,600
Estimated direct labour cost	₹ 97,800
Estimated Machine-hours	₹ 50,500

2. Prepare a comparative statement of cost showing the result of the application of each of the above rates of Batch No. 488 from the data given below:

Direct materials consumed	₹ 42
Direct labour	₹ 45
Direct labour hours	30
Machine hours	20

Solution:

1. Computation of Normal Overhead Application Rates from the following Methods:
   (a) Direct Labour Hour Rate Method:

Estimated Factory Overheads	₹ 58,000
Estimated Direct Labour Hours	1,34,600

$$\text{Overhead Application Rate} = \frac{58,000}{1,34,600} = ₹\ 0.431$$

Notes

(b) Direct Labour Cost Method:

Estimated Factory Overheads ₹ 58,000

Estimated Labour Cost ₹ 97,800

Overhead Application Rate = $\frac{58,000}{97,800} \times 100 = 59.3\%$

(c) Machine Hour Rate Method:

Estimated Factory Overheads ₹ 58,000

Estimated Machine Hours ₹ 50,500

Overhead Application Rate = ₹ 1.149

2. Comparative Statement of Cost of Batch No. 488

Particulars	Direct Labour Rate Method	Direct Labour Cost Method	Machine Hour Rate Method
Direct Materials Consumed	42	42	42
Direct Labour	45	45	45
Prime Cost	87	87	87
Factory Overhead	12.93	26.68	22.98
	99.93	113.68	109.98

Example: The production department of a factory furnishes the following information for the month of June, 2007.

Material	₹ 54,000
Director Wages	₹ 45,000
Labour-hours worked	36,000
Hours of machine operation	30,000
Overheads chargeable to the department	₹ 36,000

For an order executed by the department during the period, the relevant information was as under:

Material used	₹ 6,000
Direct wages	₹ 3,200
Labour hours worked	3,200
Hours of machine operation	2,400

Calculate the overhead charges chargeable to the job by the following methods: (a) Direct materials cost percentage rate, (b) Labour hour rate, and (c) Machine hour rate.

Solution:

1. Direct Material Cost Percentage Rate:

$$= \frac{\text{Overhead expenses}}{\text{Direct material cost}} \times 100$$

Notes

$$= \frac{36,000}{54,000} \times 100 = 66.67\%$$

Overhead charges @ 66.67% chargeable to the job for which materials used accounted for ₹ 6,000.

$$= 6,000 \times \frac{66.67}{100} = 4,000$$

2. Labour Hour Rate:

$$= \frac{\text{Overhead expenses}}{\text{Direct labour hours}}$$

$$= \frac{36,000}{36,000} = ₹\ 1$$

Overhead for the job @ ₹ 1 for 3,200 hours

= ₹ 3,200

3. Machine Hour Rate:

$$= \frac{\text{Overhead expenses}}{\text{Machine hours}}$$

$$= \frac{36,000}{30,000} = ₹\ 1.20$$

Overhead for the job @ ₹ 1.20 for 2,400 hours

= ₹ 2,880

Example: The following annual expenses are incurred in respect of a machine where annual labour is almost zero and where the work is done by means of five machines of exactly similar type and specifications.

	₹
• Rent and rates (Proportioned to the floor space occupied for the shop)	4,830
• Depreciation on each machine	500
• Repairs and maintenance for five machines	1,000
• Power (as per metre) @ ₹ 1 per 16 units consumed for the shop	3,750
• Electric charges for light in the shop	540
• Attendant: There are two attendants for the five machines and they are each paid ₹ 60 per month	
• Supervision: There is one supervisor for the five machines whose salary are ₹ 250 per month	
• Sundry supplies, such as lubricants, jute and cotton waste, etc., for the shop	494
• Hire-purchase installment payable for the machines (including ₹ 300 as interest)	
• The machine uses 10 units of power per hour	1,200

Notes

Solution:

Computation of Machine Hour Rate

Particulars		Amount (₹)
(A) Standing Charges:		
Rent and Rates per machine (₹ 4,830 ÷ 5 machines)		961
Lighting charges in shop per machine (₹ 540 ÷ 5)		108
Attendants salary per machine (₹ 60 × 2 × 12 ÷ 5)		288
Supervision per machine (₹ 250 × 12 ÷ 5)		600
Sundry supplies per machine (494 ÷ 5)		90
Hire-purchase interest per machine (₹ 300 ÷ 5)		60
	Total Standing Charges	2,116
(B) Hourly Rate for Standing Charges		
(₹ 2,116 ÷ 1,200 hours) = 1.76		1.76
Hourly Machine Expenses:		
Depreciation	(₹ 500 ÷ 1,200 hours)	0.42
Repairs and Maintenance	(₹ 200 ÷ 1,200 hours)	0.17
Power	(₹ 750 ÷ 1,200 hours)	0.62
		2.97

Note: It is objected to include higher-purchase installment and interest in computing machine-hour rate, as these are matters of financial nature. Thus, excluding ₹ 60 towards hire-purchase, the machine-hour rate would be ₹ 1.92.

Working notes:

(a) Working hours of the machine have been calculated as under:

₹ 1 is incurred for consuming 16 units of power.

₹ 3,750 will have to incur for consuming

(₹ 3,750 × 16 units) 60,000 units.

But, these 60,000 units are for all the five machines.

Power consumption per machine = 60,000 units ÷ 5 = 12,000 units

Since, machine consumes 10 units per hour

The number of machine-hours worked during the year

= 12,000 units ÷ 10 units per hour

= 1,200 hours.

(b) Hourly rate of power consumption is calculated as follows:

Power consumption per machine during the year

= ₹ 3,750 ÷ 5 = ₹ 750.

Hourly power consumption by the machine during the year

= ₹ 750 ÷ 12,000 hours = ₹ 0.62

Notes

Example: From the data given below calculate the machine hour rate:

	Per Annum (₹)
• Rent of the department (Space occupied by the Machine /5th of the department)	780
• Lighting (number of the men in the department 12, two men are engaged on this machine)	288
• Insurance of the machine	36
• Cotton waste, oil, etc., for the machine	60
• Salary of foreman (1/4th of the foreman's time is occupied by this machine)	6,000

- The cost of the machine is ₹ 9,200 and it has an estimated scrap value of ₹ 200 after 10 years
- It is assumed from the past experience:
  - that the machine will work for ₹ 1,800 hours per annum.
  - that it will incur an expenditure of ₹ 1,125 in respect of repairs and maintenance during the working life of the machine.
  - that it consumes 5 units of power per hour at the cost of 16 paise per unit.
  - that the working life of the machine will be 18,000 hours.

Solution:

Computation of Machine Hour Rate

Particulars	Amount (₹)
(A) Standing Charges:	
Rent of the department (1.5th of ₹ 780)	156
Lighting (₹ 288 ÷ 12 men × 2 men)	48
Insurance	36
Cotton waste, oil, etc.	60
Salary of foreman (1/4th of ₹ 6,000)	1,500
	1,800
Total Standing Charges	1.00
Hourly Rate for Standing Charges	
(₹ 1,800 ÷ 1,800 hours) = 1.00	
(B) Variable Charges:	
Depreciation	0.50(1)
Repairs and Maintenance	0.06(2)
Power (5 units per hour @ ₹ 0.06 per unit)	0.30
Machine Hour Rate	1.86

Notes

Working notes:

1. Hourly rate of depreciation will be calculated as follows:

$$\text{Hourly Rate of Dep.} = \frac{\text{Cost of machine} - \text{Scrap value}}{\text{Hours of working life}}$$

$$= \frac{₹\ 9{,}200 - ₹\ 200}{18{,}000 \text{ Hours}} = ₹\ 0.50$$

2. Hourly Rate of Repair and Maintenance:

$$= \frac{\text{Cost of repairs and maintenance during the working life}}{\text{Total life} \times \text{Yearly normal working hours}}$$

$$= \frac{₹\ 1{,}125}{10 \times 1{,}800 \text{ hours}} = \frac{₹\ 1{,}125}{18{,}000 \text{ hours}} = ₹\ 0.06$$

Task Marathi Motors manufactures jeeps and trucks. They have furnished the following particulars for the quarter ended March 31, 2007.

	₹
Material	2,98,000
Direct wages	42,000
Stores expenses	20,000
Machinery maintenance	4,600
Depreciation	22,300
Staff welfare	12,000
General expenses	30,000
Administration and selling expenses	27,000

Additional information provided by them:

	Jeep	Truck
1. Production (Numbers)	300	400
2. Materials cost ratio per vehicle	1	2
3. Direct labour ratio	2	3
4. Machine hour ratio	1	2

Calculate the cost per crankshaft, of each vehicle, indicating the basis of apportionment adopted by you.

Self Assessment

Fill in the blanks:

7. The ..... serves as a measure of utilisation of the facilities.
8. The extent of idle capacity is indicated by ..... .
9. The direct labour hour rate is obtained by dividing the total overhead of the department for a particular period by the total number of ..... of that department for the same period.

Notes

10. .....is the cost of running a machine per hour.

11. The rate per unit is obtained by dividing the overheads by the number of .....

5.3 Under and Over Absorption of Overheads

The absorption of overheads is based on some pre-determined rates. The actual overheads incurred may or may not be equal to the overheads absorbed.

Did u know? ***What are pre-determined rates?***

Predetermined overhead rates are those which are established well in advance before commencement of production. Predetermined overhead rate is computed by dividing the budgeted overhead expenses by the budgeted base. Predetermination of overhead rates is of practical use in regard to managerial control over costs. On the basis of predetermined overhead rates, prompt preparation of cost estimate and quotations as well as fixation of sales prices is possible. Adoption of predetermined overhead absorption rates is practically useful in organizations following a budgetary control system.

$$= \frac{\text{Estimated factory overhead for the budgeted period}}{\text{Estimated direct material cost of production}} \times 100$$

5.3.1 Under Absorption of Overheads

The overheads are under absorbed if the actual overheads incurred are more than the overheads absorbed.

Did u know? ***What is actual overhead rate?***

Actual overhead rate is determined by dividing the overhead expenses incurred during the accounting period by the actual quantum of the base selected, such as unit of products, direct wages, direct material cost, labour hours, or machine hours. The basic principle in costing is that the recovery of overhead should be made on actual basis, as for as possible, so that overheads may be directly charged to jobs, processes, operations, or products.

$$\text{Actual Rate} = \frac{\text{Actual overhead expenses incurred during a period}}{\text{Actual quantity or value of the base for the period}}$$

Under absorption of Overheads = Incurred overhead – Absorbed overhead

Example:

Dr. **Cr.**

Date	Particular	J/F	Amount (₹)	Date	Particular	J/F	Amount (₹)
01.	To SLCA a/c		210000	01.	By WIP a/c		390000
02.	To WLCA a/c		135000		By closing P/L a/c		20000
03.	To GLA a/c		65000				
			410000				410000

Notes

Caution The adjustment of under absorbed overhead would result in a loss in the form of increase in cost where the under absorption is normal and in the form of abnormal loss where it is abnormal.

5.3.2 Over Absorption of Overhead

The overheads are over absorbed if the actual overheads incurred are less than the overheads absorbed.

Over-absorbed overhead = Absorbed overhead – Incurred overhead

Example:

Dr. **Cr.**

Date	Particular	J/F	Amount (₹)	Date	Particular	J/F	Amount (₹)
01.	To SLCA a/c		200000	01.	By WIP a/c		460000
02.	To WLCA a/c		145000		By closing P/L a/c		10000
03.	To GLA a/c		65000				
04.	To Closing P/L a/c		50000				
			470000				470000

Caution The adjustment of over absorbed overhead would result in a gain in the form of reduction in cost where the over absorption is normal and in the form of abnormal profit where it is abnormal.

Self Assessment

State whether the following statements are true or false:

12. The overheads are under absorbed if the actual overheads incurred are less than the overheads absorbed.
13. Actual overhead rate is determined by dividing the overhead expenses incurred during the accounting period by the actual quantum of the base selected, such as unit of products, direct wages, direct material cost, labour hours, or machine hours.
14. Over-absorbed overhead = Absorbed overhead – Incurred overhead
15. Predetermined overhead rate is computed by dividing the budgeted overhead expenses by the budgeted base.

5.4 Summary

- Cost pertaining to a cost centre or cost unit may be broadly, divided into two portions, direct and indirect.
- The indirect portion of the total cost constitutes "the overhead cost which is the aggregate of indirect material cost, indirect wages and indirect expenses". Broadly speaking, any expenditure over and above prime cost is known as 'overhead.'

Notes

- Overhead costs may be classified according to: (1) Functions, (2) Elements, and (3) Behaviour-wise classification.
- The fixed overhead rate serves as a measure of utilisation of the facilities while the extent of idle capacity is indicated by under absorption.
- The following are the main methods of absorbing factory overheads:
  - Percentage on direct material cost
  - Percentage on direct wages
  - Percentage on prime cost
  - Direct labour hour rate
  - Machine hour rate
  - Rate per unit of output
- The overheads are under absorbed if the actual overheads incurred are more than the overheads absorbed.
- The overheads are over absorbed if the actual overheads incurred are less than the overheads absorbed.

5.5 Keywords

Fixed Expenses: Expenses that are not affected by changes in output or sales such as rent, salaries, etc.

Over Absorption of Overheads: The overheads are over absorbed if the actual overheads incurred are less than the overheads absorbed.

Overheads: Overheads are those indirect costs which cannot be directly related to any product, job or process, because they cannot be directly attached to production activities.

Semi-variable Expenses: Expenses that change in the same proportion to which output (or sales) changes but not in the same ratio. Depreciation is not doubled if output is doubled it may be 50% more. Semi-variable expenses are partly fixed and partly variable.

Under Absorption of Overheads: The overheads are under absorbed if the actual overheads incurred are more than the overheads absorbed.

Variable Expenses: Expenses that change in the same proportion in which output (or sales) changes for example, power consumed, indirect materials, insurance in transit, carriage outwards etc.

5.6 Review Questions

1. What are overheads? How are they classified? Discuss in detail with a chart.
2. Define fixed, variable and semi-variable expenses giving examples of each.
3. Name the different methods of 'absorption of factory overheads' and explain any two of them giving the merits and demerits of each.
4. What is Machine Hour Rate method? Explain and describe its areas of application.
5. Calculate Machine-hour Rate for Machine No. 5 which is one of five machines in operation in a department of a factory.

Notes

You are furnished with the following information:

(a) Cost of Machine No. 5, ₹ 1,000.

(b) Estimated Scrap Value at finish of working life (10 years) ₹ 100

(c) Normal running hours per annum, 1,800.

(d) Machine No. 5 occupies one-fifth of the floor space of the department, the rent, rates, lighting, etc. of which amount to ₹ 350 per annum.

(e) Charges for Electric Power supplied to Machine No. 5, ₹ 200 per annum.

(f) Charges for oil, waste, etc. supplied to Machine No. 5, ₹ 30 per annum.

(g) Repairs and Maintenance throughout working life of machine estimated at ₹ 360.

(h) Cost of supervision and other expenses applicable to Machine No. 5 estimated at ₹ 150 per annum.

(i) Labour cost of operating the machine is to be ignored in making your calculations.

6. From the following information's, compute the Machine-hour Rate:

Cost of Machine	₹ 60,000
Expected Scrap Value	₹ 10,000
Working Life	10,000 hours
Working Hours in the month of March, 2007	200 hours
Repairs for the Whole Life of Machines	₹ 12,500
Standing Charges on Machines for the month of March, 2007	₹ 500

Power used by Machine: 10 units p.h. @ 20 paise p.h.

7. The following information relates to the activities of a production department of factory for a certain period:

	₹	
Materials used	36,000	
Direct wages	30,000	
Labour hours worked		24,000
Hours of machine operation		20,000
Overhead chargeable to the dept.	25,000	

On one order carried out in the department during the period the relevant data was:

Material used	₹ 2,000	Labour hours	1,650
Direct wages	₹ 1,650	Machine hours	1,200

Calculate by three different methods the overhead chargeable to the job.

8. In a factory, the average annual charges for direct wages amount to ₹ 2,40,000. The following are some of the expenses (average figure for a year) incurred inside the factory:

(a) Works Manager's salary and other emoluments ₹ 25,000.

(b) Factory rent and rates ₹ 18,000. The total area of the factory is 45,000 sq.ft. of which the shops occupy 40,000 sq.ft.

Notes

(c) Wages of caretakers, sweepers, etc. ₹ 3,500.

(d) Other factory overhead charges ₹ 26,500.

A work order is executed in a shop occupying 3,000 sq.ft. and costs ₹ 5,000 in wages. If the total wages for all the work orders executed in this shop amount to ₹ 80,000. Calculate the total amount of factory overhead charges to be debited to the account of the work order in question.

9. What is the process of ascertaining machine hour rate? What factors do you keep in view while ascertaining the rate?

10. Discuss the various methods of absorption of factory overheads. Under what conditions, it is said to be over-absorption of factory overheads?

Answers : Self Assessment

1.	Overheads	2.	Factory Cost
3.	indirect material	4.	Fixed expenses
5.	output (or sales)	6.	Semi-variable
7.	fixed overhead rate	8.	under absorption
9.	direct labour hours	10.	Machine hour rate
11.	units produced	12.	False
13.	True	14.	True
15.	True		

5.7 Further Readings

Books

Richard G. Schroeder, Myrtle W. Clark, Myrtle W. Clark, Jack M. Cathey, *Financial Accounting Theory and Analysis: Text Readings and Cases*, John Wiley & Sons Inc

Arora M. N., *Cost and Management Accounting*, Himalaya Publishing House, 2010

Pandey, IM, *Management Accounting,* Excel Book, New Delhi, 2007

Shah Paresh, *Management Accounting,* Oxford University Press, New Delhi, 2009

Online links

www.futureaccountant.com

www.managementstudyguide.com

Notes

Unit 6: Marginal Costing and Absorption Costing

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Objectives

After studying this unit, you will be able to:

- Define marginal and absorption costing
- Construct CVP analysis
- Compute P/V ratio and Break Even Point (BEP)
- Calculate the margin of safety
- Illustrate the applications of marginal costing

Notes

Introduction

It is one of the premier tools of management not only to take decisions but also to fix an appropriate price and to assess the level of profitability of the products/services. This is a only costing tool demarcates the fixed cost from the variable cost of the product/service in order to guide the firm to know the minimal point of sales to equate the cost of production. It is a tool of analysis highlighting the relationship in between the cost, volume of sales and profitability of the firm.

According to ICMA, London "Marginal cost is the amount at any given volume of output, by which aggregate costs are charged, if the volume of output is increased or decreased by one unit."

6.1 Meaning and Definition of Marginal Costing

According to ICMA, London "Marginal cost is the amount at any given volume of output, by which aggregate costs are charged, if the volume of output is increased or decreased by one unit."

Marginal cost is the cost nothing but a change occurred in the total cost due to changes taken place on the level of production i.e either an increase/decrease by one unit of product.

Example: The firm XYZ Ltd. incurs ₹ 1000 for the production of 100 units at one level of operation. By increasing only one unit of product i.e. 101 units, the firm's total cost of production amounted ₹ 1010.

Total cost of production at first instance (C') = ₹ 1000

Total cost of production at second instance (C") = ₹ 1010

Total number of units during the first instance (U') = 100

Total number of units during the second instance (U") = 101

Increase in the level of production and Cost of production:

Change in the level of production in units = U"-U'= ΔU

Change in the total cost of production = C"– C'= ΔC

$$\text{Marginal Cost} = \frac{\text{Change (Increase) in the Total Cost of Production}}{\text{Change (Increase) in the Level of Production}} = \frac{\Delta C}{\Delta U} = \frac{₹\ 10}{1} = ₹\ 10$$

If the same firm reduces the total volume from 100 units to 99 units, the total cost of production ₹ 990/-

Decrease in the level of production and cost of production:

$$\text{Marginal Cost} = \frac{\text{Change (Increase) in the Total Cost of Production}}{\text{Change (Increase) in the Level of Production}} = \frac{\Delta C}{\Delta U} = \frac{₹\ 10}{1} = ₹\ 10$$

Did u know? ***Why marginal cost is called as incremental cost?***

From the above example, it is obviously understood that marginal cost is nothing but a cost which incorporates the incremental changes in the cost of production due to either an increase or decrease in the level of production by one unit, meant as incremental cost.

Why marginal cost is called in other words as variable cost?

From the following classifications of cost, the inter twined relationship in between the variable cost and marginal cost is explained as below:

Notes

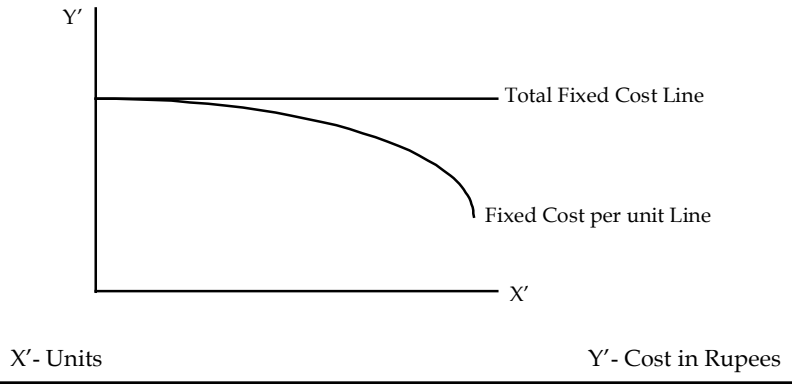
Table 6.1: Statement of Fixed, Variable and Total Costs and Per Unit

S.No.	Units	Fixed Cost (₹)	Fixed Cost per unit (₹)	Variable Cost (₹)	Variable Cost per unit (₹)	Marginal Cost (₹) ΔC/ΔU	Total Cost (₹)
1.	1	500	500	10	10	10	510
2.	50	500	100	500	10	10	1000
3.	100	500	5	1000	10	10	1500
4.	150	500	3.333	1500	10	10	2000

Fixed Cost: It is a cost remains constant or fixed irrespective level of production.

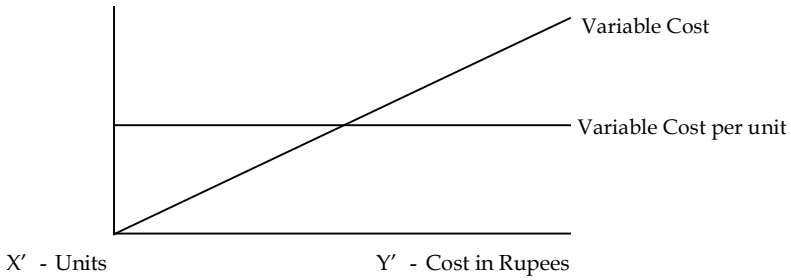
Example: Rent ₹ 5,00/- is to be paid irrespective level of production. It remains constant/ fixed irrespective of changes taken place on the level of production.

Figure 6.1



Variable cost: It is a cost, which varies with level of production.

Figure 6.2



The following are the various components of variable cost:

1. ***Direct Materials:*** Materials cost consumed for the production of goods.
2. ***Direct Labour:*** Wages paid to the labourers who directly involved in the production of goods.
3. ***Direct Expenses:*** Other expenses directly involved in the production stream.
4. ***Variable portion of Overheads:*** Generally the overheads can be classified into two categories, viz. Variable overheads and Fixed overheads.

The variable overheads is the cost involved in the procurement of indirect materials, indirect labour and indirect expenses.

Indirect Material – cost of fuel, oil and so on

Notes

Indirect Labour: Wages paid to workers for maintenance of the firm.

From the Table 6.1 the marginal cost is equivalent to the variable cost per unit of the various levels of production. The fixed cost of ₹ 500 is the cost remains the same at not only irrespective levels of production but also already absorbed at the initial level of production. The initial absorption of fixed overhead led the marginal cost to become as variable cost.

Semi-variable cost: Another major classification is semi variable/fixed cost which is a cost partly fixed/variable to the certain level of production or consumption, e.g., Electricity charges, telephone charges and so on.

It jointly discards the importance of the fixed cost and the semi- variable cost for analysis while ascertaining the marginal cost.

Marginal Costing is defined as "the ascertainment of marginal cost and of the effect on profit of changes in volume or type of output by differentiating between fixed and variable costs."

In marginal costing, the change in the level of cost of operation is equivalent to variable cost due to fixed cost component which is fixed irrespective level of outputs.

Self Assessment

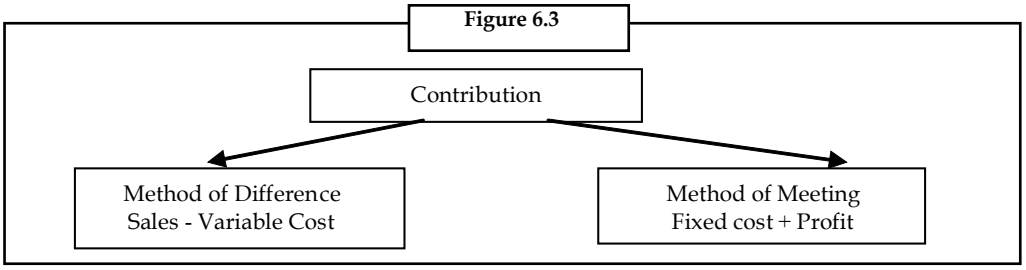
Fill in the blanks:

1. ..... is the cost nothing but a change occurred in the total cost due to changes taken place on the level of production.
2. The ..... is the cost involved in the procurement of indirect materials, indirect labour and indirect expenses.
3. The initial absorption of ..... led the marginal cost to become as variable cost.

6.2 Contribution

The costs are classified into two categories viz. fixed and variable cost. Variable cost per unit is considered as marginal cost of the product. Fixed costs are charged against contribution of the transaction. Selling price of the product = marginal cost + contribution.

Figure 6.3



Marginal costing profitability statement as follows:

Sales	xxxx
Variable Cost	xxxx
Contribution	xxxx
Fixed Cost	xxxx
Profit	xxxx

Notes

Example: Sales ₹ 100,000, variable cost ₹ 25,000/- and fixed cost ₹ 20,000 find out the contribution and profit.

	₹
Sales	1,00,000
Variable Cost	50,000
Contribution	50,000
Fixed Cost	20,000
Profit	30,000

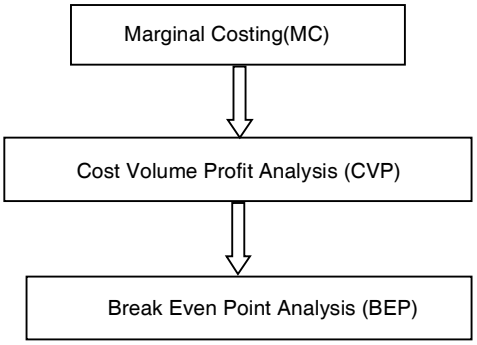
6.2.1 Method of Difference

Under this method, the contribution can be computed through finding the differences in between Sales and Variable Cost i.e. Contribution = Sales – Variable Cost = ₹ 1,00,000 – 50,000 = ₹ 50,000

6.2.2 Method of Coverages

In this method, the contribution is equated with the summation of Fixed cost and Profit i.e. Contribution = Fixed Cost + Profit = ₹ 20000 + 30000 = ₹ 50,000.

Figure 6.4



6.3 Absorption Costing

Absorption costing technique is also known by other names as "Full costing" or "Traditional costing". According to this technique, all costs are recognised or identified with the products manufactured. Both fixed and variable costs of each product manufactured are taken into account to ascertain the total cost.

The absorption costing tells as to how much fixed cost is absorbed besides the variable cost by each product manufactured. According to this technique, while the variable costs are directly charged to each unit of the goods produced, the fixed costs are distributed to each category of product manufactured by the same firm. In absorption costing, "Fixed cost" will also be taken into account in ascertaining the profit on sale.

Notes

Caution This technique is called traditional costing, as this system of costing emerged from the beginning of the factory stage. In this technique, "fixed cost" refers to the closing stock of material held by the firm. These are charged against the sales later, as a part of the goods sold.

6.3.1 Income Determination under Marginal and Absorption Costing

Under marginal costing, only factory overheads costs that tend to vary with volume are charged to product cost in addition to prime cost. While evaluating inventory only direct materials, direct labour and variable factory overheads are included and are considered as product costs. Fixed factory overheads under direct or marginal costing are not included in inventory. It is treated as a period cost and charged against revenue when incurred. Under absorption costing, sometimes called full or conventional costing, all manufacturing costs, both fixed and variable are charged to product costs. Thus, absorption costing is "a principle whereby fixed as well as variable costs are allotted to cost units". It means a system under which cost per unit includes fixed expenses, especially fixed production overheads in addition to the variable cost.

The following format gives an idea as to how income is arrived at in marginal costing techniques.

Absorption Costing	₹	Marginal Costing	₹
Sales Revenue		Sales Revenue	
Less: Manufacturing expenses (both fixed and variable)		Less: All variable costs (both production and non-production)	
Gross profit.	...	Contribution	
Less: Non-production costs (both fixed and variable)	...	Less: All fixed costs (both production and non-production)	
PBT		PBT	
Less: Tax Provision		Less: Tax Provision	...
Net Income		Net Income	

6.3.2 Absorption Costing and Marginal Costing Compared

Since the closing stocks do not have any element of fixed costs, profit shown by marginal costing technique may be different from that shown by absorption costing. When the entire stock is sold, there is no inventory i.e., neither there is opening nor closing stock, the profit revealed by both the methods will be same. But when sales and production are out of balance, difference in net profit is reported. When absorption costing is applied, the fixed manufacturing costs are shifted from one year to another year as a part of the inventory cost i.e. stock. If a company produces more than it sells in a given period, not all of the current manufacturing overheads will be deducted from sales i.e., closing stock will include a portion of fixed overheads. In other words, in absorption costing, inventory will be valued at a higher figure; therefore, profit will be more as revealed by absorption costing than marginal costing. Hence, profits will not necessarily increase with an increase in sale value. The position will be reverse, in case a company produces less than it sells in a given period. Thus, marginal costing can produce a net profit figure which is similar than or greater than or equal to the net profit as shown under absorption costing.

Notes

Note

Difference between Absorption Costing and Marginal Costing

	Absorption Costing		Marginal Costing
(i)	Fixed production overheads are charged to the product to be subsequently released as a part of goods sold i.e., it is included in cost per unit.	(i)	Fixed production costs are regarded as period cost and are charged to revenue along with the selling and administration expenses, i.e., they are not included while computing cost per unit.
(ii)	Profit is the difference between sales and cost of goods sold.	(ii)	Profit in marginal costing is ascertained by establishing the total contribution and then deducting there from the total fixed expenses. Contribution is the excess of sales over variable cost.
(iii)	Costs are seldom classified into variable and fixed. Although such a classification is possible, it fails to establish a cost-volume profit relationship.	(iii)	Cost-volume profit relationship is an integral part of marginal costing studies. Costs have to be classified into fixed costs and variable costs.
(iv)	If inventories increase during a period, this method will reveal more profit than marginal costing. When inventories decrease, less profits are reported because under this method closing stock is valued at higher figures. Since inventories are valued at total cost, a portion of fixed overheads are also included in inventories.	(iv)	If inventories increase during a period, this method generally reports less income than absorption costing; but when inventories decrease, this method reports more net income. The difference in the net income is due to difference in accounting for fixed manufacturing costs as compared to inventory valuation.
(v)	Arbitrary apportionment of fixed costs may result in under or over recovery of overheads.	(v)	Since fixed costs are excluded, there is no question of arbitrary apportionment of fixed overheads and thus under or over absorption of overheads.

Example: The following figures are extracted from the books of KSBS Ltd. Find out profit by using marginal costing and absorption costing. Is there any variations in the results obtained under the two methods is given below?

The basic production data are:

Normal volume of production = 19,500 units per period

Sale price – ₹ 4 per unit

Variable cost – ₹ 2 per unit

Fixed cost – ₹ 1 per unit

Total fixed cost = ₹ 19,500 (₹ 1 × 19,500 units, normal)

Selling and distribution costs have been omitted. The opening and closing stocks consist of both finished gods and equivalent units of work-in-progress.

Other Information

	Period 1	Period II	Period III	Period IV	Total
Opening stock units	–	–	4,500	1,500	–
Production units	19,500	22,500	18,000	22,500	82,500
Sales units	19,500	18,000	21,000	24,000	82,500
Closing stock units	–	4,500	1,500	–	–

Solution: **Notes**

Marginal Costing Method

	Period 1 ₹	Period II ₹	Period III ₹	Period IV ₹	Total ₹
Sales	78,000	72,000	84,000	96,000	3,30,000
Direct cost:					
Opening stock @ ₹ 2 per unit	–	–	9,000	3,000	–
Variable cost:					
@ ₹ 2 per unit	39,000	45,000	36,000	45,000	1,65,000
Closing stock:					
@ ₹ 2 per unit	–	9,000	3,000	–	–
Cost of goods sold	39,000	36,000	42,000	48,000	1,65,000
Contribution	39,000	36,000	42,000	48,000	1,65,000
Fixed cost	19,500	19,500	19,500	19,500	78,000
Profit	19,500	16,500	22,500	28,500	87,000

Absorption Costing Method

Sales	**78,000**	**72,000**	**84,000**	**96,000**	**3,30,000**
Opening stock @ ₹ 3 per unit	–	-–	13,500	4,500	–
Cost of production @ ₹ 3 per unit	58,500	67,500	54,000	67,500	2,47,500
Less: Cost of closing stock @ ₹ 3 per unit	–	13,500	4,500	–	–
Cost of sales (actual)	58,500	54,000	63,000	72,000	2,47,500
Less: Over-absorbed fixed cost			3,000	3,000	6,000
Add: Under-absorbed fixed cost		–	1,500	–	1,500
Profit	19,500	21,000	19,500	27,000	87,000

Self Assessment

State whether the following statements are true or false:

4. Selling price of the product = marginal cost - contribution.
5. Absorption costing technique is also known by full costing.
6. Fixed factory overheads under absorption costing are not included in inventory.

6.4 Cost-Volume-Profit (CVP) Analysis

The Cost-Volume-Profit (CVP) analysis helps management in finding out the relationship of costs and revenues to profit. The aim of an undertaking is to earn profit. Profit depends upon a large number of factors, the most important of which are the costs of the manufacturer and the volume of sales effected. Both these factors are interdependent – volume of sales depends upon the volume of production, which in turn is related to costs. Cost again is the result of the operation of a number of varying factors such as:

1. Volume of production,
2. Product mix,

Notes

3. Internal efficiency,
4. Methods of production,
5. Size of plant, etc.

Of all these, volume is perhaps the largest single factor which influences costs which can basically be divided into fixed costs and variable costs. Volume changes in a business are a frequent occurrence, often necessitated by outside factors over which management has no control and as costs do not always vary in proportion to changes in levels of output, management control of the factors of volume presents a peculiar problem.

As profits are affected by the interplay of costs and volume, the management must have, at its disposal, an analysis that can allow for a reasonably accurate presentation of the effect of a change in any of these factors which would have no profit performance. Cost-volume-profit analysis furnishes a picture of the profit at various levels of activity. This enables management to distinguish between the effect of sales volume fluctuations and the results of price or cost changes upon profits. This analysis helps in understanding the behaviour of profits in relation to output and sales.

Fixed costs would be the same for any designated period regardless of the volume of output accomplished during the period (provided the output is within the present limits of capacity). These costs are prescribed by contract or are incurred in order to ensure the existence of an operating organisation. Their inflexibility is maintained within the framework of a given combination of resources and within each capacity stage such costs remain fixed regardless of the changes in the volume of actual production. As fixed costs do not change with production, the amount per unit declines as output rises.

Absorption or full costing system seeks to allocate fixed costs to products. It creates the problem of apportionment and allocation of such costs to various products. By their very nature, fixed costs have little relation to the volume of production.

Variable costs are related to the activity itself. The amount per unit remains the same. These costs expand or contract as the activity rises or falls. Within a given time span, distinction has to be drawn between costs that are free of ups and downs of production and those that vary directly with these changes.

Study of behaviour of costs and CVP relationship needs proper definition of volume or activity. Volume is usually expressed in terms of sales capacity expressed as a percentage of maximum sales, volume of sales, unit of sales, etc. Production capacity is expressed as a percentage of maximum production, production in revenue of physical terms, direct labour hours or machine hours.

Analysis of cost-volume-profit involves consideration of the interplay of the following factors:

1. Volume of sales
2. Selling price
3. Product mix of sales
4. Variable cost per unit
5. Total fixed costs

The relationship between two or more of these factors may be (a) presented in the form of reports and statements, (b) shown in charts or graphs, or (c) established in the form of mathematical deduction.

Notes

Note **Objectives of Cost-Volume-Profit Analysis**

The objectives of cost-volume-profit analysis are given below:

1. In order to forecast profit accurately, it is essential to know the relationship between profits and costs on the one hand and volume on the other.
2. Cost-volume-profit analysis is useful in setting up flexible budgets which indicate costs at various levels of activity.
3. Cost-volume-profit analysis is of assistance in performance evaluation for the purpose of control. For reviewing profits achieved and costs incurred, the effects on cost of changes in volume are required to be evaluated.
4. Pricing plays an important part in stabilising and fixing up volume. Analysis of cost-volume-profit relationship may assist in formulating price policies to suit particular circumstances by projecting the effect which different price structures have on costs and profits.
5. As predetermined overhead rates are related to a selected volume of production, study of cost-volume relationship is necessary in order to know the amount of overhead costs which could be charged to product costs at various levels of operation.

6.5 Profit-Volume (P/V) Ratio

The ratio or percentage of contribution margin to sales is known as P/V ratio. This ratio is known as marginal income ratio, contribution to sales ratio or variable profit ratio. P/V ratio, usually expressed as a percentage, is the rate at which profits increase with the increase in volume. The formulae for P/V ratio are:

P/V ratio = Marginal contribution/Sales

Or

Sales value - Variable cost/Sales value

Or

1 - Variable cost/Sales value

Or

Fixed cost + Profit/Sales value

Or

Change in profits/Contributions/Changes

Caution All the above formulae mean the same thing.

A comparison for P/V ratios of different products can be made to find out which product is more profitable. Higher the P/V ratio more will be the profit and lower the P/V ratio, lesser will be the profit. P/V ratio can be improved by:

1. Increasing the selling price per unit.
2. Reducing direct and variable costs by effectively utilising men, machines and materials.
3. Switching the product to more profitable terms by showing a higher P/V ratio.

Notes

Self Assessment

Fill in the blanks:

7. Profit depends upon a large number of factors, the most important of which are the costs of the manufacturer and the ..... effected.
8. The Cost-Volume-Profit (CVP) analysis helps management in finding out the relationship of ..... to profit.
9. Cost-volume-profit analysis furnishes a picture of the ..... at various levels of activity.
10. The ratio or percentage of contribution margin to sales is known as ..... .

6.6 Break Even Point

Break even analysis examines the relationship between the total revenue, total costs and total profits of the firm at various levels of output. It is used to determine the sales volume required for the firm to break even and the total profits and losses at other sales level. Break even analysis is a method, as said by Dominick Salnatore, of revenue and total cost functions of the firm. According to Martz, Curry and Frank, a break even analysis indicates at what level cost and revenue are in equilibrium.

In case of break even analysis, the break even point is of particular importance. Break even point is that volume of sales where the firm breaks even i.e., the total costs equal total revenue. It is, therefore, a point where losses cease to occur while profits have not yet begun. That is, it is the point of zero profit.

The conclusion that can be drawn from the above example is that sales volume of 5000 units will be the accurate point at which the manufacturing unit would not make any loss or profit.

$$\text{BEP} = \frac{\text{Fixed Costs}}{\text{Selling price} - \text{Variable costs per unit}}$$

$$\text{For Example,} = \frac{\text{Fixed Costs ₹ } 10,000}{\text{Selling price ₹ } 5 \text{ per unit} - \text{Variable costs ₹ } 3 \text{ per unit}}$$

$$\text{Therefore, BEP} = \frac{₹\ 10,000}{5-3} = 5,000 \text{ units.}$$

6.6.1 Uses of Break-even Analysis

Break even analysis is a very generalised approach for dealing with a wide variety of questions associated with profit planning and forecasting. Some of the important practical applications of break even analysis are:

1. What happens to overall profitability when a new product is introduced?
2. What level of sales is needed to cover all costs and earn, say, ₹ 1,00,000 profit or a 12% rate of return?
3. What happens to revenues and costs if the price of one of a company's product is hanged?
4. What happens to overall profitability if a company purchases new capital equipment or incurs higher or lower fixed or variable costs?
5. Between two alternative investments, which one offers the greater margin of profit (safety)?

Notes

6. What are the revenue and cost implications of changing the process of production?
7. Should one make, buy or lease capital equipment?

6.6.2 Assumptions of Break-even Analysis

The break even analysis is based on certain assumptions, namely:

1. All costs are either perfectly variable or absolutely fixed over the entire period of production but this assumption does not hold good in practice.
2. The volume of production and the volume of sales are equal; but in reality they differ.
3. All revenue is perfectly variable with the physical volume of production and this assumption is not valid.
4. The assumption of stable product mix is unrealistic.

6.6.3 Advantages of Break-even Analysis

The main advantages of using break even analysis in managerial decision making can be the following:

1. It helps in determining the optimum level of output below which it would not be profitable for a firm to produce.
2. It helps in determining the target capacity for a firm to get the benefit of minimum unit cost of production.
3. With the help of the break even analysis, the firm can determine minimum cost for a given level of output.
4. It helps the firms in deciding which products are to be produced and which are to be bought by the firm.
5. Plant expansion or contraction decisions are often based on the break even analysis of the perceived situation.
6. Impact of changes in prices and costs on profits of the firm can also be analysed with the help of break even technique.
7. Sometimes a management has to take decisions regarding dropping or adding a product to the product line. The break even analysis comes very handy in such situations.
8. It evaluates the percentage financial yield from a project and thereby helps in the choice between various alternative projects.
9. The break even analysis can be used in finding the selling price which would prove most profitable for the firm.
10. By finding out the break even point, the break even analysis helps in establishing the point wherefrom the firm can start payment of dividend to its shareholders.

6.6.4 Drawbacks of Break-even Analysis (BEA)

This analysis will be useful only in situations relatively stable and slow moving rather than volatile and erratic ones. In conditions when proper managerial accounting techniques and procedures are maintained, the BEA will be useful. In a particular period costs are affected not by the output of that period but due to past output or a preparation for future output. As such the BEA cannot pin down that cost is the result of output of a particular period. It is difficult to deal with selling costs under the framework of BEA because changes in selling costs are a cause to bring out changes in output and not the result of output sales. In the real world, perfect

Notes

competition is very rare and as such it is necessary to make calculations at different time periods. The relationship between cost, revenue and volume (output) is realistic only over narrow ranges of output and for long ranges. If too many products and too many plants are grouped together in a productive process, the BEA cannot identify which is good or which is bad, since all are grouped together. The BEA assumes that profits are the result of output but ignores that other factors like technological changes, improved management and variations in the proportions of fixed factors are also possible for profits. In spite of these, BEA is an important tool in decision making.

Example: From the following information relating to quick standards Ltd., you are required to find out (i) PV ratio, (ii) break even point, (iii) calculate the volume of sales to earn profit of ₹ 6,000/-

Total Fixed Costs ₹ 4,500

Total Variable Cost ₹ 7,500

Total Sales ₹ 15,000

Solution:

First step to find out the Contribution volume

Sales	₹ 15,000
Variable Cost	₹ 7,500
Contribution	₹ 7,500
Fixed Cost	₹ 4,500
Profit	₹ 3,000

1. Second step to determine the PV ratio

   $$\text{PV ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{7,500}{15,000} \times 100 = 50\%$$

   Third step to find out the Break even sales

2. $$\text{Break even sales} = \frac{\text{Fixed cost}}{\text{PV ratio}} = \frac{4,500}{50\%} = 9,000$$

3. Margin of safety can be found out in two ways

   (a) Margin of Safety = Actual sales – Break even sales

   = ₹ 15,000 – ₹ 9,000 = ₹ 6,000

   (b) $$\text{Margin of Safety} = \frac{\text{Profit}}{\text{PV ratio}} = \frac{₹\ 3,000}{50\%} = ₹\ 6,000$$

4. Sales required to earn profit = ₹ 6,000/-

   To determine the sales volume to earn desired level of profit.

Self Assessment

Fill in the blanks:

11. Break even analysis helps in determining the ..... of output below which it would not be profitable for a firm to produce.
12. Break even point is the point of ..... .

Notes

6.7 Methods Decisions Involving Alternative Choices

The break even analysis can be performed by the following two methods:

1. Break Even Charts
2. Algebraic Method.

6.7.1 Break Even Chart

The difference between Price and Average Variable Cost (P – AVC) is defined as 'profit contribution'. That is, revenue on the sale of a unit of output after variable costs are covered represents a contribution toward profit. At low rates of output, the firm may be losing money because fixed costs have not yet been covered by the profit contribution. Thus, at these low rates of output, profit contribution is used to cover fixed costs. After fixed costs are covered, the firm will be earning a profit.

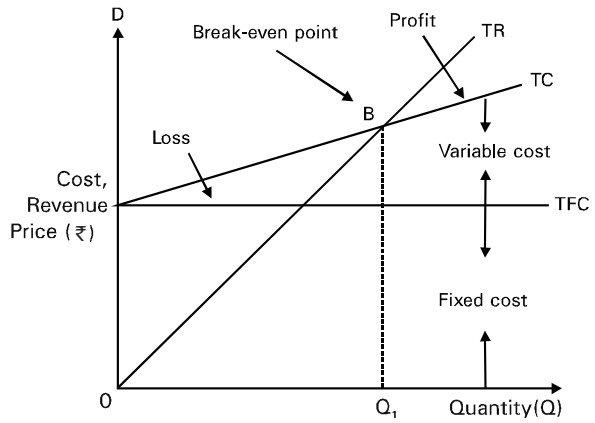
A manager may want to know the output rate necessary to cover all fixed costs and to earn a "required" profit of R. Assume that both price and variable cost per unit of output (AVC) are constant. Profit is equal to total revenue (P.Q.) less the sum of Total Variable Costs (Q.TVC) and fixed costs. Thus

$$\Pi_R = PQ - [(Q.\ AVC) + FC]$$

$$\Pi_R = TR - TC$$

The break even chart shows the extent of profit or loss to the firm at different levels of activity. A break even chart may be defined as an analysis in graphic form of the relationship of production and sales to profit. The Break even analysis utilises a break even chart in which the Total Revenue (TR) and the Total Cost (TC) curves are represented by straight lines, as in Figure 6.5.

Figure 6.5



In the figure total revenues and total costs are plotted on the vertical axis whereas output or sales per time period are plotted on the horizontal axis. The slope of the TR curve refers to the constant price at which the firm can sell its output. The TC curve indicates Total Fixed Costs (TFC) (The vertical intercept) and a constant average variable cost (the slope of the TC curve). This is often the case for many firms for small changes in output or sales. The firm breaks even (with TR=TC) at Q_1 (point B in the figure) and incurs losses at smaller outputs while earnings profits at higher levels of output.

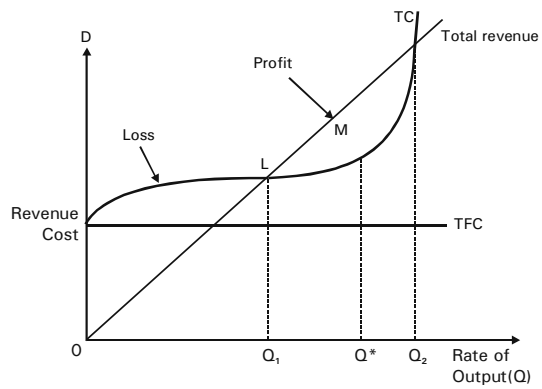
Both the Total Cost (TC) and Total Revenue (TR) curves are shown as linear. TR curve is linear as it is assumed that the price is given, irrespective of the output level. Linearity of TC curve results from the assumption of constant variable costs.

Notes

If the assumptions of constant price and average variable cost are relaxed, break even analysis can still be applied, although the key relationship (total revenue and total cost) will not be linear functions of output. Non-linear total revenue and cost functions are shown in Figure 6.6. The cost function is conventional in the sense that at first costs increase but less than in proportion to output and then increase more than in proportion to output. There are two break even points – L and M. Note that profit which is the vertical distance between the total revenue and total cost functions, is maximised at output rate Q*.

Of the two break even points, only the first, corresponding to output rate Q_1 is relevant. When a firm begins production, management usually expects to incur losses. But it is important to know at what output rate the firm will go from a loss to a profit situation. In Figure 6.6 the firm would want to get to the break even output rate Q_1 as soon as possible and then of course, move to the profit maximising rate Q*. However, the firm would not expand production beyond Q* because this would result in a reduction of profit.

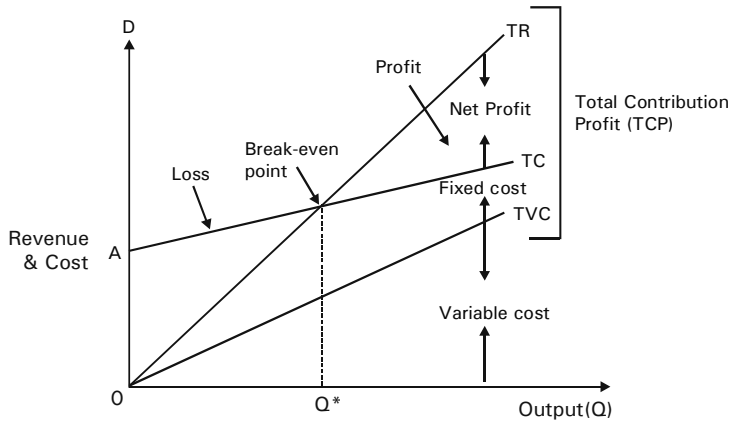
Figure 6.6



Contribution Margin

In the short run, where many of the firms costs are fixed, businessmen are often interested in determining the contribution additional sales make towards fixed costs and profits. Contribution analysis provides this information. Total contribution profit is defined as the difference between total revenues and total variable costs, which equals price less average variable cost on a per unit basis. Figure 6.7 highlights the meaning of contribution profit. Total contribution profit, it can be seen, is also equal to total net profit plus total fixed costs.

Figure 6.7



Notes

Contribution profit analysis provides a useful format for examining a variety of price and output decisions.

As it is clear from Figure 6.7 Total Contribution Profit (TCP) = Total Revenue (TR) – Total Variable Cost (TVC)

= Total Net Profit (TNP) + Total Fixed Cost (TFC)

Therefore, if TNP = 0 then, TCP = TFC. This occurs at break even point. From the above equation it is also clear that

TR = TCP + TVC

= (TNP + TFC) + TVC

Total Contribution Profit (TCP)

= TR – TVC

= Net Profit + Fixed Cost

Example: From the following figures, ascertain the break-even sales and also show the computation by means of a graph.

	₹
Sales	20,00,000
Fixed Costs	5,00,000
Variable costs	12,00,000

Solution:

Total Contribution:	₹
Sales	20,00,000
Variable Cost	12,00,000
Contribution	8,00,000

As percentage of sales or P/V ratio = ₹ 8,00,000/₹20,00,000 × 100 = 40%

Alternatively: (Fixed Cost + Profit)/Sales × 100

(₹ 5,00,000 + ₹ 3,00,000/₹ 20,00,000) × 100 = 40%

Break-even sales:

Fixed Costs/P/V Ratio i.e., ₹ 5,00,000 × 100/40 = ₹ 12,50,000

Proof: Variable Costs:	
60% of ₹ 12,50,000	7,50,000
Fixed Costs	5,00,000
Total Cost	12,50,000

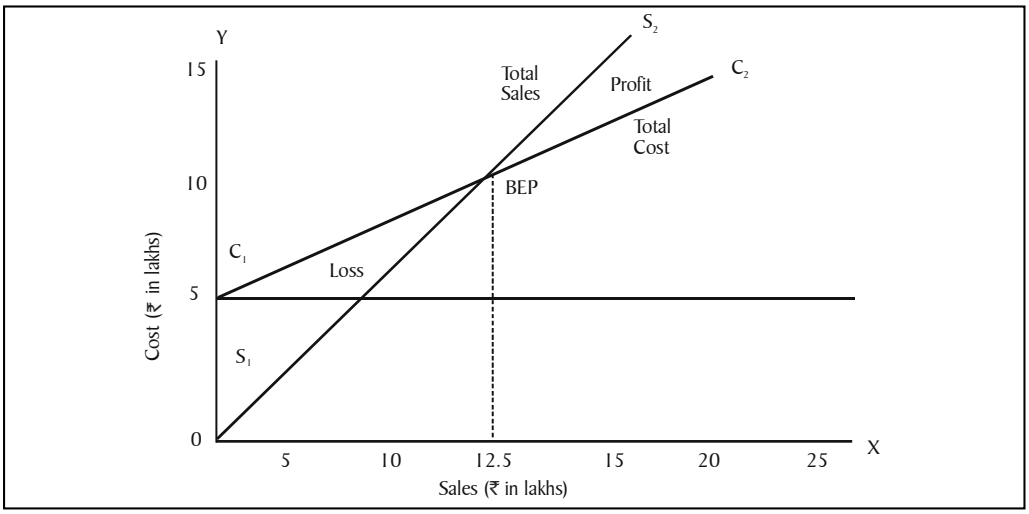
Total costs equal sales; hence there is neither profit nor loss.

Points plotted:

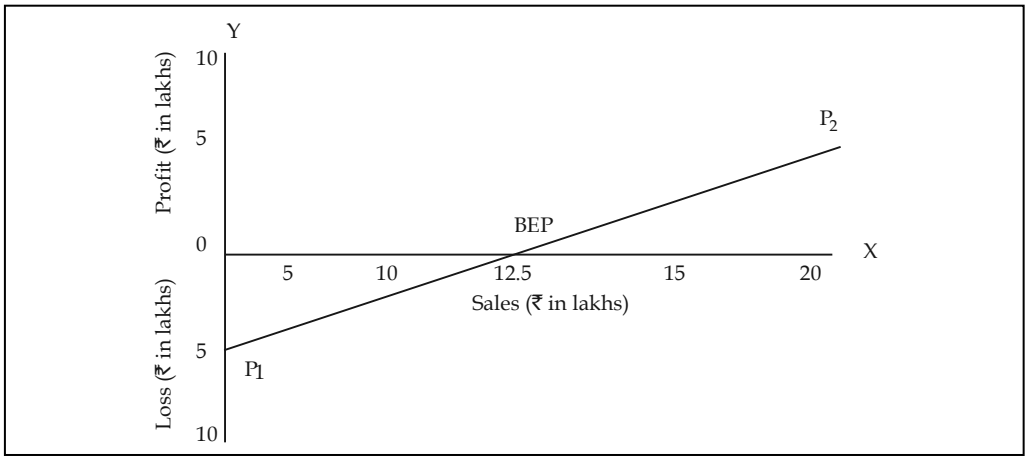
Break-even Chart

Sales ₹	**Variable Costs** ₹ **(60% of sales)**	**Fixed Costs** ₹	**Total Cost** ₹
0	0	5,00,000	5,00,000 (C1)
15,00,000	9,00,000	5,00,000	14,00,000 (C2)

Notes



Profit-Volume Chart: (At zero sale loss is ₹ 5 lakh: at ₹ 20,00,000 sales, profits is ₹ 3 lakh (P2). Draw a line to join there two points. The break-even sale is at the point where it meets the X-axis).



6.7.2 Algebraic Method

Break even analysis can also be performed algebraically, as follows. Total revenue is equal to the selling price (P) per unit times the quantity of output or sales (Q). That is

$$TR = (P).(Q)$$

Total costs equal total fixed costs plus Total Variable Costs (TVC). Since TVC is equal to the Average (per unit) Variable Cost (AVC) times the quantity of output or sales, we have

$$TC = TFC + TVC$$

$$\text{or,} \quad TC = TFC + (AVC).(Q)$$

Setting total revenue equal to total costs and substituting QB (the break even output) for Q, we have

$$TR = TC$$

$$(P).(Q_B) = TFC + (AVC).(Q_B)$$

$$\text{Or, } TFC = P.(Q_B) - (AVC)(Q_B)$$

Notes

$$TFC = Q_B . (P - AVC)$$

$$OB \text{ (the break even output)} = \frac{TFC}{(P - AVC)} = \frac{TFC}{ACM}$$

The denominator in the above equation (i.e., P – AVC) is called the contribution margin per unit (ACM) because it represents the portion of the selling price that can be applied to cover the fixed costs of the firm and to provide for profits.

Task

Break even sales	₹1,60,000
Sales for the year 1987	₹ 2,00,000
Profit for the year 1987	₹ 12,000

Calculate:

1. Profit or loss on a sale value of ₹ 3,00,000.
2. During 1988, it is expected that selling price will be reduced by 10%. What should be the sale if the company desires to earn the same amount of profit as in 1987?

Self Assessment

State whether the following statements are true or false:

13. The difference between Price and Average Variable Cost is defined as 'break even point'.
14. The break even chart shows the extent of profit or loss to the firm at different levels of activity.
15. Contribution profit analysis provides a useful format for examining a variety of price and output decisions.

6.8 Margin of Safety

Margin of safety is the difference between the actual sales and sales at break-even point. Sales beyond break-even volume brings in profits. Such sales represent a margin of safety. It is important that there should be a reasonable margin of safety to run the operations of the company in profitable position. A low margin of safety usually indicates high fixed costs. A margin of safety provides strength and stability to a concern. The margin of safety is an important measure, especially in times of receding sales, to know the real position to operate without incurring losses and to take steps to increase the margin of safety to improve the profitability. The margin of safety is calculated by using the following formulae:

$$\text{Margin of safety} = \text{Actual sales} - \text{Break-even Sales}$$

$$= \frac{\text{Profit}}{\text{P/V ratio}}$$

or

$$= \frac{\text{Profit} \times \text{Selling Price per Unit}}{\text{Selling Price per Unit} - \text{Variable Cost Per Unit}}$$

Margin of safety as % of total sales

$$= \frac{\text{Margin of Safety}}{\text{Total sales}} \times 100$$

Notes

It is important that there should be reasonable margin of safety, otherwise, a reduced level of activity may prove disastrous. The soundness of a business is gauged by the size of the margin of safety. A low margin of safety usually indicates high fixed overheads so that profits are not made until there is a high level of activity to absorb fixed costs.

Caution A high margin of safety shows that break-even point is much below the actual sales, so that even if there is a fall in sales, there will still be a point. A low margin of safety is accompanied by high fixed costs, so action is called for reducing the fixed costs or increasing sales volume.

The margin of safety may be improved by taking the following steps:

1. Lowering fixed costs.
2. Lowering variable costs so as to improve marginal contribution.
3. Increasing volume of sales, if there is unused capacity.
4. Increasing the selling price, if market conditions permit.
5. Changing the product mix as to improve contribution.

Example: KSBS Ltd. furnishes the following information of its Product M.

	(₹)	
Production (units)	**Present 10,000**	**Proposed 10,000**
Selling price p.u.	50	40
Variable cost p.u.	30	30
Fixed cost p.a.	60,000	60,000

Calculate the P.V. ratio, break-even point and margin of safety.

Solution:

Particulars		Present	Proposed
Contribution p.u.		**₹ 20**	**₹ 10**
P.V. ratio	(contribution p.u./selling price p.u.) × 100	40%	25%
Break-even point (units)	(fixed cost/contribution p.u.)	3,000	6,000
Margin of safety	(units) (actual sales - break-even units)	7,000	4,000
Break-even units as % to total production		30%	60%
Margin of safety as % to total production		70%	40%

Interpretation: The reduction in selling price from ₹ 50 to ₹ 40 per unit maintaining the same level of production, variable cost and fixed cost results in the following:

1. The reduction selling price has reduced the contribution per unit and since the P.V. ratio is the function of contribution to sales, it also has decreased from 40% to 25%.
2. The break-even units have increased from 3,000 to 6,000 units due to lower contribution per unit available to meet the total fixed costs.
3. The higher the break-even point means the lower the margin of safety and lower profitability.

Thus, the lowering of selling price has resulted in increase of break-even point and lowering the margin of safety and P/V ratio. The fixed cost, variable cost and selling price have a direct impact on profit. Change in any of these variables means a change in profit.

Notes

Example: From the following data, calculate:

1. Number of units to be sold to earn a profit, ₹ 2,40,000
2. Sales to earn a profit, ₹ 2,40,000

   Selling price per unit ₹ 80

   Variable selling cost per unit ₹ 6

   Variable manufacturing cost per unit ₹ 44

   Fixed factory overheads ₹ 3,20,000

   Fixed Selling cost ₹ 40,000
3. To find out the number of units to be sold to earn a profit of ₹ 2,40,000

Solution:

Before preparing the statement of profit, the following should be computed:

1. Total Variable cost per unit = Variable selling cost per unit

   +

   Variable manufacturing cost per unit

   = ₹ 6 + ₹ 44 = ₹ 50
2. Total fixed cost = Fixed factory overhead

   +

   Fixed selling cost

   = ₹ 3,20,000 + ₹ 40,000

   = ₹ 3,60,000

Profit Statement

Sales	₹ 80
Variable Cost	₹ 50
Contribution	₹ 30
Fixed cost	₹ 3,60,000
Desired level Profit	₹ 2,40,000

Contribution per unit of ₹ 30 should be equated to summation of fixed cost ₹ 3,60,000 and desired level of profit ₹ 2,40,000.

The contribution can be found among the early classification method of coverage/meeting i.e. Fixed cost + Desired level of profit.

Total Contribution at the desired level of profit ₹ 2,40,000

= ₹ 3,60,000 + ₹ 2,40,000 = ₹ 6,00,000

The next step is to find out the number of units to earn the desired level of profit.

Notes

Total contribution = Contribution margin per unit × Number of units

$$\text{Number of units} = \frac{\text{Total contribution}}{\text{Contribution margin per unit}}$$

$$= \frac{\text{Total Contribution (Fixed + Desired Level of profit)}}{\text{Contribution margin per unit}}$$

$$= \frac{₹\ 6,00,000}{₹\ 30} = 20,000 \text{ units}$$

Sales volume at the desired level of profit ₹ 2,40,000

According to the method of coverage, in finding out the total volume of contribution at the desired level of profit

= fixed cost + Desired level of profit

The next step is to find out the volume of sales in rupees at the desired level of profit.

= Number of units × selling price per unit

$$\text{Number of units} = \frac{\text{Contribution (Fixed + Desired level of profit)}}{\text{Contribution margin per unit}}$$

$$= \frac{\text{Fixed cost + Desired level of profit}}{\text{Contribution Margin per unit}} \times \text{selling price per unit}$$

The next step is to find out the PV ratio

$$= \frac{\textit{Contribution}\ \text{Margin}}{\textit{Sales}} \times 100$$

$$= \frac{₹\ 30}{₹\ 80} \times 100 = 37.5\%$$

The last step is to find out the volume of sales in rupees.

$$= \frac{₹\ 6,00,000}{37.5\%} = ₹\ 16,00,000$$

Self Assessment

Fill in the blanks:

16. Margin of safety is the difference between the actual sales and sales at ..... .
17. Sales beyond break-even volume bring in ..... .
18. A low margin of safety usually indicates high ..... .

6.9 Application of Marginal Costing

Marginal cost helps management to make decision involving consideration of cost and revenue. Basically, marginal costing furnishes information regarding additional costs to be incurred if an additional activity is to be taken up or the saving in costs which may be expected if an activity is given up. This can be compared with the benefit expected from the proposed course of action and thus the management will be able to take the appropriate decision.

Notes

Following are the important areas of decision-making or applications of marginal costing:

1. Fixation of Price,
2. Decision to Make or Buy,
3. Selection of a Profitable Product Mix,
4. Decision to Accept a Bulk Order,
5. Closure of a Department or Discontinuing a Product,
6. Maintaining a Desired Level of Profit, and
7. Evaluation of Performance.

6.9.1 Determination of Sales Mix

In the market, dealership is offered by the various companies to the individual intermediaries in promoting the sale of products. Before reaching an agreement with the company to act as a dealer, normally every individual considers the profitability of the product mix offered by the firm. For example, There are two different companies brought forth their advertisements in offering the dealership to the individual trading firms viz. HCL and IBM.

The profitability under the dealership banner should be appropriately considered prior to take decision. To take rational decision, the firm should compare the profitability of both different dealerships of two different giant industrial brands. The greater the share of the profitability in volume will be selected and vice-versa.

Example: From the following information has been extracted of EXCEL Rubber Products Ltd:

Direct materials A	₹ 16
Direct Materials B	₹ 12
Direct wages A	24 Hrs at 50 paise per hour
Direct wages B	16 Hrs at 50 paise per hour
Variable overheads	150% of wages
Fixed overheads	₹ 1,500
Selling price A	₹ 50
Selling price B	₹ 40

The directors want to be acquainted with the desirability of adopting any one of the following alternative sales mixes in the budget for the next period:

1. 250 units of A and 250 units of B
2. 400 units of B only
3. 400 units of A and 100 units of B
4. 150 units of A and 350 units of B

State which of the alternative sales mixes you would recommend to the management?

Solution:

The first step is to determine the contribution margin per unit of A and B

The determination of the contribution of product A and B are through the preparation of Marginal costing statement.

Notes

Particulars	Product A (₹)		Product B (₹)	
Selling price		50		40
Less: Direct Materials	16		12	
Direct wages	12		8	
Variable overheads	18		12	
Variable cost		46		32
Contribution		4		8

The next step is to determine the profit level of every mix.

1. 250 units of A and 250 units of B.

   The first step is to determine the total contribution of the mix. Why the total contribution has to be found out?

   The main reason is to determine the profit level of the mix through the deduction of the fixed overheads

		₹
Product of A	250 units × 4	1,000
Product of B	250 units × 8	2,000
Contribution		**3,000**
Fixed overheads		1,500
Profit		**1,500**

2. 400 units of B only

Product B Contribution	400 units × ₹ 8	3,200
Fixed overheads		1,500
Profit		**1,700**

3. 400 units of A and 100 units of B

Product of A	400 units × ₹ 4	1,600
Product of B	100 units × ₹ 8	800
Contribution		**2,400**
Fixed overheads		1,500
Profit		**900**

4. 150 units of A and 350 units of B

Product A	150 units × ₹ 4	600
Product B	350 units × ₹ 8	2,800
Contribution		3,400
Fixed overheads		1,500
Profit		**1,900**

Mix	A	B	C	D
Contribution	₹ 1,500	1,700	900	1,900

The profit level among the given various mixes, the mix (d) is able to generate highest volume of profit over the others.

Notes

Determining optimum level of operations: Under this method, the level has to be found out which is having lesser selling price, cost of operations and greater profits known as optimum level of operations

6.9.2 Make or Buy Decisions

The firms, which are routinely in need of spares, accessories are bought from the outsiders instead of any production or manufacturing, though the requirement is at regular intervals. Most of the automobile manufacturers are usually buying the components from outside instead of producing them on their own. The Maruti Udyog Ltd. had given a contract to the Nettur Technical Training Foundation, Bangalore to design the tool for the panel and to manufacture regularly to the tune of the orders.

The leading four wheeler manufacture in India is buying the panel from the NTTF on contract basis in stead of manufacturing.

Did u know? ***Why don't they manufacture in spite of buying them from the NTTF?***

The main reason of buying is cheaper than the production of an article.

Example: The management of a company finds that while the cost of making a component part is ₹ 20, the same is available in the market at ₹ 18 with an assurance of continuous supply.

Give a suggestion whether to make or buy this part. Give also your views in case the supplier reduces the price from ₹ 18 to ₹ 16.

The cost information is as follows:

	₹
Material	7.00
Direct Labour	8.00
Other variable expenses	2.00
Fixed expenses	3.00
Total	₹ 20.00

The first point to be found out that the contribution of the transaction. The cost of manufacturing should be compared with the price of the product which is available in the market.

To find out the worth of the transactions, first the cost of manufacturing should be found out

	₹
Material	7.00
Direct Labour	8.00
Other variable expenses	2.00
Total	17.00

The cost of manufacturing a component is ₹ 17.00. While calculating the cost of manufacturing a component, the fixed expenses was not considered. The fixed expenses were not considered for computation. Why?

The costs will be incurred irrespective of the production status of the firm; for which the expenses should not be added.

Notes

If the company manufactures the product/component at ₹ 17 which will facilitate to book profit ₹ 1 from the price of ₹ 18 which is available from the market.

The next stage is decision criteria.

Worth of Production: Cost of the production < Price of the product available in the market

The firm is better advised to take the course of production rather than purchase of the product.

Worth of Purchase: Cost of the production > Price of the product available in the market

The product available in the market is dame cheaper than the manufacturing of a product. The firm is better advised to buy the product rather than the manufacturing of a product. If the product price comes down to the price of ₹ 16 facilitates the firm to save ₹ 1 from the cost of manufacturing.

6.9.3 Own or Hire

Marginal costing helps in taking the decisions regarding the capital investment. Marginal costing helps to take the decisions for owning the capital asset or hire the asset.

Example: If company X needs a machinery for a specific project and after that project there is no use of the machinery then company can decide to hire the machinery for that project.

A company has its own trucks for transporting raw materials and finished products from one place to another. It seeks to replace these trucks by keeping public carriers. In making this decision, of course, the depreciation of the trucks is not to be considered but the management should take into account the present expenditure on fuel, salary to drive and maintenance.

6.9.4 Shut Down or Continue

As discussed earlier, marginal costing technique helps in deciding the profitability of a product. It provides the information in a manner that tells us how much each product contributes towards fixed cost and profit; the product or department that gives least contribution should be discarded except for a short period. If the management is to choose some product out of the given ones, then the products giving the highest contribution should be chosen and those giving the least should be discontinued.

Example: A company manufactures three products X, Y and Z. It has prepared the following budget for the year 2003:

	Total	Product X	Product Y	Product Z
Sales	4,20,000	80,000	2,50,000	90,000
Factory Cost				
Variable	2,90,500	40,000	1,74,000	76,500
Fixed	29,500	5,000	16,000	8,500
Production Cost	3,20,000	45,000	1,90,000	85,000
Selling and Administration Cost				
Variable	35,000	14,000	14,000	7,000
Fixed	8,000	3,500	3,200	1,300
Total Cost	3,63,000	62,500	2,07,200	93,300
Profit	57,000	17,500	42,800	- 3,300 (loss)

Notes

On the basis of above information, we understand that the company management is thinking to discontinue with the production of product Z which has shown loss. The management seeks your expert opinion on the issue before they take a final decision. You are required to comment on the relative profitability of the products.

Solution:

The information contained in the budget may be rearranged in the form of a marginal cost statement as shown below:

Marginal Cost Statement

Particulars	Total	Product X	Product Y	Product Z
Sales	4,20,000	80,000	2,50,000	90,000
Variable Costs:				
Factory Cost	2,90,500	40,000	1,74,000	76,500
Selling and Admn. Cost	35,000	14,000	14,000	7,000
Total Marginal Cost	3,25,500	54,000	1,88,000	83,500
Contribution	94,500	26,000	62,000	6,500
Fixed Costs	37,500	8,500	19,200	9,800
Profit	57,000	17,500	42,800	-3,300 (loss)
Profit-Volume Ratio	22.5%	32.5%	24.8%	7.2%

Profit-Volume (P/V) ratio is the ratio of contribution to sales. It is expressed in terms of percentage. After preparing the above statement and analysis, we can make the following recommendations:

As discussed in the marginal cost statement, the contribution of product Z is ₹ 6,500 which goes toward the recovery of fixed cost of ₹ 9,800. If the production of product Z is discontinued, the company will lose the marginal contribution of ₹ 6,500 while it will have to incur the fixed cost of ₹ 9,800. The total profit of ₹ 57,000 will be reduced to ₹ 50,500 (57,000 - 6,500). Thus, it is advisable that the production of Z should not be discontinued. As regards the relative profitability, product X is more profitable than Y and Z as the P/V ratio in this case is highest. The production and sales of product X should, therefore, be encouraged.

Self Assessment

Fill in the blanks:

19. Marginal cost helps management to make decision involving consideration of .....
20. A decision involves the act of choice and the ..... chosen out of the available alternatives.
21. Marginal costing furnishes information regarding ..... to be incurred if an additional activity is to be taken up or the saving in costs which may be expected if an activity is given up.
22. In the market, dealership is offered by the various companies to the individual intermediaries in promoting the ..... of products.
23. The firms, which are routinely in need of spares, accessories are bought from the outsiders instead of any ....., though the requirement is at regular intervals.
24. Under sales mix, the level has to be found out which is having lesser selling price, cost of operations and greater profits known as ..... of operations.

Notes

6.10 Summary

- Marginal costing is one of the important tools of management not only to take decision, but also to fix an appropriate price and to assess the level of profitability.
- Marginal cost is nothing, but a change occurred in the total cost due to small change in the quantity produced.
- Absorption costing technique is also known by other names as "Full costing" or "Traditional costing".
- The cost-volume-profit analysis is a tool to show the relationship between various ingredients of profit planning.
- The ratio or percentage of contribution margin to sales is known as P/V ratio.
- The crucial step in this analysis is the determination of break-even point.
- BEP is defined as the sales level at which the total revenue equals total cost.
- Margin of safety is the difference between the actual sales and sales at break-even point.
- Sales beyond break-even volume brings in profits.

6.11 Keywords

BEP (Units): It is the level of units at which the firm neither incurs a loss nor earns profit.

BEP (Volume): It is the level of sales in Rupees at which the firm neither incurs a loss nor earns profit.

Contribution: It is an amount of balance available after the deduction of variable cost from the sales.

Fixed Cost: It is a cost which is fixed or remains the same for irrespective level of production.

Marginal Cost: Change occurred in the cost of operations due to change in the level of production.

PV Ratio: Profit volume ration which is nothing but the ratio in between the contribution and sales.

Variable Cost: It varies along with the level of production.

6.12 Review Questions

1. SV Ltd. a multi-product company, furnishes you the following data relating to the year 2000:

Particulars	First half of the year	Second half of the year
Sales	₹ 45,000	₹ 50,000
Total cost	₹ 40,000	₹ 43,000

Assuming that there is no change in prices and variable costs that the fixed expenses are incurred equally in the two half year periods calculate for the year 1979.

Calculate:

(a) PV ration

(b) Fixed expenses

Notes

(c) Break even sales

(d) Margin of safety

2. Analyse the important of the following in relation to break-even analysis:

   (a) Break-even point

   (b) Margin of safety

   (c) Profit volume ratio

3. Illustrate the graphic approach of BEP analysis.

4. Examine the concept of the profit volume ratio.

5. A ball pen manufacturer has developed a new ball pen with unique features. His design development executive has suggested three possible retail prices viz ₹ 15 for super star; ₹ 10 for deluxe and ₹ 7.50 for economy model. His marketing manager opines that the wholesalers and retailers have to be given at least 30% discount.

   The estimated fixed cost would be around ₹ 70,000 and variable cost per unit would be ₹ 3.50.

   Calculate break even point for each model of the ball pen.

6. The PV ratio of a firm dealing precision instrument is 50% and the margin of safety is 40%. You are required to work out the B.E.P and the net profit if sales volume is ₹ 50,00,000.

7. The annual profit plan of ABC Ltd. is given in the following table. From the data given in the table, calculate the breakeven point in units.

Annual profit plan of ABC Ltd.

Particulars	Fixed cost ₹	Variable cost ₹	Total ₹
Budgeted sales (2,00,000 ₹ 21 each)	.	₹ 42,00,000	
Direct labour		8,00,000	
Direct material		9,00,000	
Factory overheads	6,00,000	2,00,000	
Administrative expenses	5,00,000	1,00,000	
Distribution expenses	3,00,000	2,00,000	
Total	14,00,000	22,00,000	36,00,000
Budgeted profit			6,00,000
Capacity of production	2,50,000 units		

8. Explain the relevance of adopting CVP concept in business operations.

9. How do Income statements prepared under marginal and absorption costing differ?

10. Taking suitable data construct a simple break even chart and show the break even point, angle of incidence and margin of safety on the chart.

11. Does the marginal costing concept violate the generally accepted accounting principles? Discuss.

12. Company manufacturing electric motors at a price of ₹ 6,900 each, made up as under:

	Cost in ₹
Direct material	3,200
Direct wages	400

Notes

Variable overheads	1,000
Fixed overheads	200
Depreciation	200
Variable selling overheads	100
Royalty	200
Profit	1,000
Central excise duty	600
Total	6,900

(a) A foreign buyer has offered to buy 200 such motors at ₹ 5,000 each. As a cost accountant of the company would you advise acceptance of the offer?

(b) What should the company quote for a motor to be purchased by a company under the same management if it would be at cost.

(Ans. (a) Accept it because incremental profit is ₹ 40,000 and (b) ₹ 5,200)

13. The management of a company finds that while the cost of making a component part is ₹ 10, the same is available in the market at ₹ 9 with an assurance of continuous supply.

Give a suggestion whether to make or buy this part. Also give your views in case the supplier reduces the price from ₹ 9 to ₹ 8.

The cost information is as follows:

	₹
Material	3.50
Direct labour	4.00
Other variable expenses	1.00
Fixed expenses	1.50
Total	10.00

Answers: Self Assessment

1.	Marginal cost	2.	variable overhead
3.	fixed overhead	4.	False
5.	True	6.	False
7.	volume of sales	8.	costs and revenues
9.	profit	10.	P/V ratio
11.	optimum level	12.	zero profit
13.	False	14.	True
15.	True	16.	break-even point
17.	profits	18.	fixed costs
19.	cost and revenue	20.	alternative
21.	additional costs	22.	sale
23.	production or manufacturing	24.	optimum level

6.13 Further Readings

Notes

Books

B.M. Lall Nigam and I.C. Jain, *Cost Accounting,* Prentice-Hall of India (P) Ltd.

Hilton, Maher and Selto, *Cost Management,* 2nd Edition, Tata McGraw-Hill Publishing Company Ltd.

M.N. Arora, *Cost and Management Accounting*, 8th Edition, Vikas Publishing House (P) Ltd.

M.P. Pandikumar, *Management Accounting*, Excel Books.

Online links

www.allbusiness.com

www.internalaccounting.com

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Unit 7: Variance Analysis

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Objectives

After studying this unit, you will be able to:

- Explain the meaning and importance of variance analysis
- Illustrate the kinds of variances

Introduction

In standard costing, variance means the difference between the standard cost and the actual cost. Variances of different cost items provide the key to cost control. They indicate whether and to what extent standards set have been achieved. This enables management to correct adverse tendencies.

The terminology of ICMA London, defines variance as, "Difference between a standard cost and the comparable actual cost incurred during a period." Variance for each element of cost should be ascertained regularly. If the actual cost is less than the standard cost, it is termed as 'favourable variance. On the other hand, if the actual cost is more than the standard cost, it is known as 'adverse' or 'unfavourable variance.'

1. Computation of individual variances, and
2. Determination of the cause(s) of each variance.

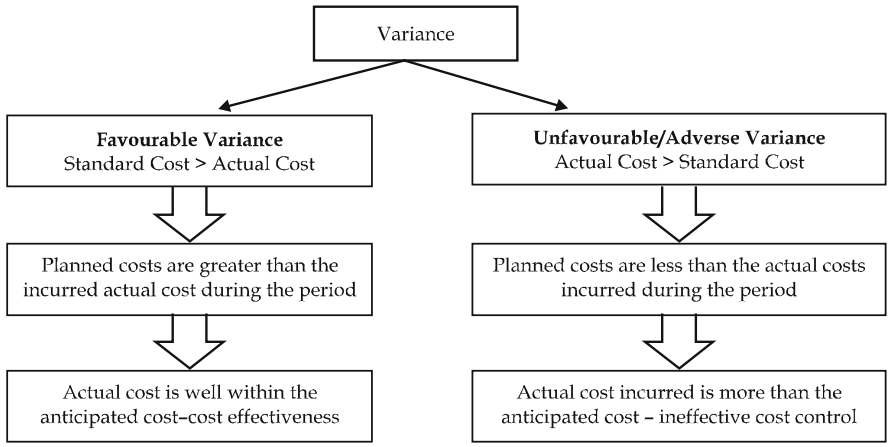
7.1 Meaning and Importance of Variance Analysis

The term "Variance" means deviation, difference and so on. The variance in accordance with standard costing is meant as the difference/deviation in between two different costs viz standard cost and actual cost. According to ICWA, London defines the variance as "deviation in between the standard cost and comparable actual cost incurred during the period."

The variance of the specific element of cost should be periodically checked. The variance is classified into two categories.

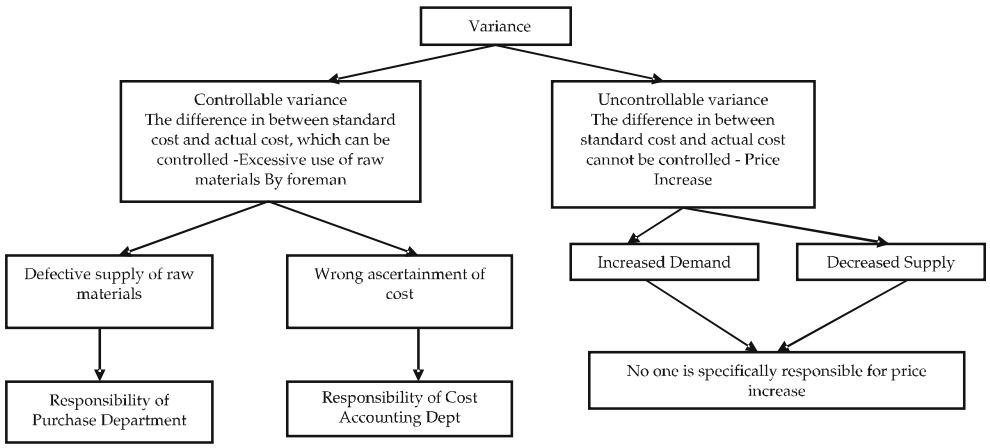
Notes

Figure 7.1: Classification of Variance



The variance can be classified into two categories, based on controllability viz. controllable and uncontrollable variance.

Figure 7.2: Classifications of Variances on the Bases of Controllability



The purpose of standard costing is to correct the variance, which is in between standard cost and actual cost.

Self Assessment

Fill in the blanks:

1. If the actual cost is more than the standard cost, it is known as ..... variance.
2. If the actual cost is less than the standard cost, it is termed as ..... .
3. The purpose of ..... is to correct the variance, which is in between standard cost and actual cost.
4. Variance means the difference between the ..... and the actual cost.
5. Variances of different cost items provide the key to ..... .

Notes

7.2 Kinds of Variances

There are two types of variances viz. cost variance and revenue variance.

Cost Variance: Cost variance can be further classified into three categories:

1. Material Cost Variance
2. Labour Cost Variance
3. Overhead Variance

Revenue Variance:

1. ***Sales Variance:*** Apart from the above classified types, there is a general way of studying variances. Let us discuss every variance in detail in the remaining units.

7.2.1 Material Variances

Material Cost Variance (MCV)

The name of the variance is self-explanatory, means that the difference in between the standard cost of materials and Actual cost of materials. The material cost variance is in between the standard material cost for actual production in units and actual cost.

Material cost variance can be computed into two different ways:

1. ***Direct Method:*** It is a method simply studies the deviation in between the two different cost of materials without giving any emphasis for other factors of influence viz. the quantity of materials and price of a material. Under the direct method, the comparison is in between the standard cost of materials which is the planned cost of materials before commencement, scientifically developed by considering the all other factors of influence and the actual cost of materials, which is actually incurred during the production.

   Did u know? ***Why standard cost is to be tuned to the level of actual cost?***

   The main aim of computing the standard cost for actual output is that the standard cost developed is not to the tune of actual production in units, instead it is available in terms of per unit of a product/for overall production e.g. for a year. To have leveled comparison in between the standard cost has to be designed to the tune of Actual cost.

   Material cost variance = Standard cost of materials for actual output — Actual cost of raw materials

   = (SQAO × SP) – (AQ×AP)

2. ***Indirect Method:*** It is a method which computes the material cost variance by considering two important variances viz. material price variance and material usage variance. Under this method material cost variance is calculated through the summation of the variances viz. price and usage of materials.

   Material Cost Variance = Material Price Variance (MPV) + Material Usage Variance

Example: To manufacture one unit of product, the requirement is 2 Kgs of material @ ₹ 2 per Kg. Actual output is 400 units Actual quantity of materials used is 850 kgs ₹ 1.80 find out the material cost variance.

Notes

Solution:

First step is to find out the standard quantity for actual output

Standard quantity of raw materials = 2 Kg

Actual Production = 400 units

To have leveled comparison, the Standard quantity of materials for actual output to computed; then only the variance intend to encircle will be meaningful or vice versa.

The computation of SQAO should be computed at first:

For the production of one unit of product 2 Kg of raw material was planned and finalized prior to the commencement of production process. The actual production of the firm during the cycle is 400 units. What would be the requirement of the firm in manufacturing 400 units to the tune of planned quantity of materials per unit 2 Kg? This is the standard quantity of materials for actual output computed for an effective comparison with the actual quantity of materials consumed by the firm in manufacturing the 400 units.

SQAO = 400 × 2Kg = 800 Kg

SP = Standard Price = ₹ 2 per Kg

AQ = Actual Quantity = 850 Kgs

AP = Actual Price = ₹ 1.80

Material cost variance = (SQAO × SP) – (AQ × AP)

= (800 Kg × ₹ 2) – (850 Kg × ₹ 1.8)

= ₹ 1600 – ₹ 1530

= ₹ 70 (F)

The material cost variance of the above problem is favourable due to lesser actual cost over the standard cost of materials.

Material Price Variance

It is very simple to understand that the name of the variance is self-explanatory in explaining the meaning of the variance. It is a variance in between two different prices viz. the standard price and actual price of raw materials. The difference should be expressed only in terms of the actual usage of materials. The ultimate of aim of expressing this variance in the lights of actual usage of materials is to identify the deviation of the price changes in line with the purchase of raw materials.

Material Price Variance = (SP – AP) AQ

From the earlier illustration, the material price variance is as follows

Standard price = ₹ 2 per unit

Actual price = ₹ 1.80 per unit

Actual quantity of materials consumed = 850 Kg

Material price variance = 850 Kg (2.00 – 1.80)

Material price variance = ₹170 (F)

Decision Criterion: If the resultant is positive, it means that the planned price which was scientifically developed is more than the actual price. In precise terms, the price fluctuations in the market are well with in the planned price. If it is within the standard, quantified as favourable

Notes

for a firm. If not, otherwise, the excessive/exorbitant cost of purchase of raw material more than the standard is unfavourable/adverse for the firm, the reason is the firm has paid more on the cost towards the purchase of materials than the planned one.

Material Usage or Quantity Variance

The variance/deviation is in between the standard quantity of materials and the actual quantity of materials consumed. The found variance in Kg of raw materials should be expressed in monetary values i.e in terms of Rupees, through the multiplication with the standard price. The ultimate aim of expressing the variance in terms of standard price is the price, which is totally free from market fluctuations i.e. supply and demand factors of the market.

Materials Usage Variance = Standard Price × (Standard quantity of materials for actual output – Actual quantity of materials used)

Example: (Output more than one unit)

Standard quantity of raw materials required to produce one unit of X was 10 kgs @ ₹ 6 per Kg. Actual units produced during that period was 500 units. Actual quantity of materials was 5500 Kgs @ ₹ 5.5 Kg. Calculate the material cost, price and usage variance.

Solution:

From the above problem, it came to understand that the actual production of a firm is more than a unit i.e. 500 units.

Standard quantity of raw materials for actual output has to be computed to the tune of actual production 500 units

Standard quantity of raw materials foe actual output = Standard Quantity of Materials × Acutal Production

For One unit of out put the standard quantity of raw material is 10 Kg

For 500 units of actual production, how much would be the standard quantity of raw materials?

SQAO = 10 Kg × 500 Units = 5000 Kg, Standard Price = ₹ 6 Kg

AQ = 5500 Kgs, Actual Price = ₹ 5.5 Kg

Material Cost Variance = SQAO × SP – AQ × AP

= (5000 Kg × ₹ 6) – (5500 Kg × ₹ 5.5)

= (₹ 30000) – (₹ 30250) = (₹ 250))(A)

Material Price Variance = (SP – AP) × AQ

= (₹ 6 – ₹ 5.5) × 5500 = ₹ 2750(F)

Material Usage Variance = (SQAO – AQ) × SP

= (5000 – 5500)× ₹ 6 = ₹ 3000 (A)

Verification: The indirect method of computing the material cost variance facilitates to verify the answer computed under the material variances.

MCV = MPV + MUV

₹ 250 (A) = ₹ 2750 (F) + ₹ 3000 (A)

L.H.S = R.H.S

Notes

Task If the closing stock of raw materials is given, how the material variance can be computed?

Standard quantity of materials = 5000 Kgs @ ₹ 5 per Kg

Actual quantity of materials purchased = 5500 Kgs @ ₹ 6 per Kg

Closing stock of raw materials = 300 Kgs

Material Mix Variance

This kind of variance arises only due to the mixture of various raw materials to produce and to get an output. Normally, the process of production involves more than two materials to get the output. For example the firm mixes the raw materials of A& B at the ratio of 3:2. The mixture is called Material Mix.

The above mentioned ratio is being changed by the firm for actual production in producing a unit of product as 4:1.

The change in the material mix due to various reasons, those are following:

1. In adequate supply of raw materials
2. Price factor of a material
3. Introduction of a new system of production due to expansion
4. Substitution of a material due better quality and cheaper price than the existing material in current system of procurement.

This material mix variance is highly applicable in the following industries that chemicals, fertilizers, pharmaceuticals, consumables, etc.

The variance should be computed in between two different materials viz. Standard quantity of materials and Actual quantity of materials.

Actual quantity of materials is the volume of materials registered the change in the usage of raw materials mixture but the standard quantity of raw materials is totally free from the change of mixture in the raw materials.

While studying the variance, the factors of comparison should be weighed equally with each other. For instance, the standard quantity of material should not be a rational factor of comparison with actual.

Caution Why must the standard quantity of raw material be revised?

In order to have an appropriate comparison, the standard has to be revised.

The early estimated standard is the measure not considered the reality during the production process due to changes occurred in the procurement of raw materials. While comparing the standard with actual, the earlier is not at par with later in terms of realities. To incorporate the realities, the standards are tuned towards the actual; makes the comparison meaningful in studying the variance among the both.

When the total standard quantity of materials is equivalent to Actual quantity of materials: From the below example, the ultimate aim of revising the standard is explained as follows:

Notes

Example: Before the commencement of production process, the standard mix of materials for the production of one unit of output included two different mixture of quantities of material viz. A&B amounted 70 tons and 30 tons respectively; which formed the 70% and 30% in the production of a unit of out put with the current system of material procurement.

Due to shortage of material A, the firm is required to redesign the material procurement system to have an uninterrupted flow of production of one unit of product. In order to meet out the shortage of raw material A, the firm should replace the shortage only against the adequate supply of material B from the market. The firm should restructure the procurement system of material as follows i.e. 60% of material A and 40% material B. The restructurisation is done only on the actual but not on the standard. While studying the variance analysis in between the quantity of materials, standard of 70% of A and 30% of B should be tuned towards the actual 60% of A and 40% of B procured during the process.

Standard Quantity of Materials		Actual Quantity of Materials	
Material A	70 tons	Material A	60 tons
Material B	30 tons	Material B	40 tons

Revised standard quantity of material

Actual Material = Standard quantity of Material A/B × Total Quantity

Total Quantity of Standard Material

For A = 70/100 × 100 = 70 tons

For B = 30/100 × 100 = 30 tons

Revised Quantity of Material
Revised quantity of Material A = 70 Tons
Revised quantity of Material B = 30 Tons

From the above, if the total quantity of standard materials is equivalent to actual quantity of materials, the revised quantity of materials will be as same as the standard quantity of materials.

When the total standard quantity of materials is not equivalent to total actual quantity of materials consumed: If the Standard quantity of materials of X and Y are 60 tons and 40 tons respectively. The actual quantity of materials 90 tons and 60 tons. The total standard quantity of materials and actual quantity of materials amounted 100 tons and 150 tons respectively.

The revised standard mix of materials of X and Y are as follows:

$$X = \frac{60}{100} \times 150 = 90 \text{ tons}$$

$$Y = \frac{40}{100} \times 150 = 60 \text{ tons}$$

Material Mix Variance = Standard Price (Revised Standard Quantity – Actual Quantity)

From the early discussions, it is clearly understood that the revised standard mix of materials will be the same only during the moment at which the total actual and standard quantity of materials are equivalent to each other and vice versa.

Example: From the following information, calculate the materials mix variance

Materials	Standard	Actuals
A	200 Units @ ₹ 12	160 Units @ ₹ 13
B	100 Units @ ₹ 10	140 Units @ ₹ 10

Due to shortage of material, it was decided to reduce the consumption of A by 15% and increase that of material B by 30%.

The above problem does not have any difference in between the total actual quantity and standard quantity of materials. In both the cases the total quantity of materials are equivalent to 300 units. If both are equivalent to each other, the standard mix would be the revised standard mix of the materials.

Solution:

Revised Standard Mix:

Material A $\frac{200}{300}$ = × 300 Units = 200 units

Material B = $\frac{100}{300}$ × 300 Units = 100 units

After finding out the revised standard mix of the materials, the changes on the consumption should be incorporated due to the shortage of materials to the tune of actual quantity of materials.

For material A, there is reduction in the actual consumption in the quantity of materials amounted 15%.

For material B, there is spurt increase in the consumption of material B due to fill up the shortage of material A i.e 30% increase on material B.

Final Revised standard Mix of Material A : 200 units – 15% of 200 units = 170 units

B : 100 units + 30% of 100 units = 130 units

Material Mix Variance

Material Mix Variance = Standard Price (Revised Standard Quantity – Actual Quantity)

MMV Material A = ₹ 12 (170 units – 160 units)	= ₹ 120 Favourable
MMV Material B = ₹ 10 (130 units – 140 units)	= ₹ 100 Adverse
Total Material Mix Variance	= ₹ 20 Favourable

Notes

The material mix variance is one of the components of material usage variance.

Material Sub-usage Variance

This is the variance in between standard quantity and revised standard quantity of materials denominated in terms of standard price. The purpose of studying the difference in between these two is to analyse the amount of deviation of the standard against the revised standard in line with the actual fluctuation in the quantity of materials consumption during the production process. It is the only variance highlights the difference in between the early set standard and the redesigned standard in terms of actual quantity of materials for meaningful comparison.

Material Sub-usage Variance = Standard Cost per unit (Standard Quantity – Revised Standard Quantity).

If the total actual quantity of materials consumption in units is equivalent to the total standard quantity of materials, nullifies the material sub-usage variance in between the standard quantity of materials and revised standard quantity of materials. It means that the standard quantity of

Notes

materials of the mix will be the revised standard quantity of materials. If both are equivalent to each other, the variance is equivalent to zero in terms of standard price/cost per unit.

Example: Find out the material sub-usage variance from the following:

Materials	Standard	Materials	Actuals
A	60 Kgs @ ₹ 10	A	70Kgs @ ₹ 10
B	40 Kgs @ ₹ 12	B	50Kgs @ ₹ 14
	100		120

Solution:

Revised Standard quantity of Materials:

$$A : \frac{60\,kgs}{100\,kgs} \times 120 \text{ Kgs} = 72 \text{ Kgs}$$

$$B : \frac{40\,kgs}{100\,kgs} \times 120 \text{ Kgs} = 48 \text{ Kgs}$$

Material Sub-usage Variance = Standard Price/Cost per unit (Standard Production for Actual Output – Revised Standard Quantity)

Material A = ₹ 10 (60 Kgs – 72 Kgs) = ₹ 120 (Adverse)

Material B = ₹ 12 (40 Kgs – 48 Kgs) = ₹ 96 (Adverse)

Material Sub-usage Variance = ₹ 216 (Adverse)

From the above example, it is obviously understood that the early set standard is less than the revised standard quantity of materials due to change in the materials mix consumption i.e. unexpectedly to replace one material with the another due to shortage any one of the materials in the mix. The greater the revised standard quantity of materials means that greater the volatility in the actual consumption of materials. If the variance is adverse, means that the standard which was initially set for comparison has not incorporated the fluctuations in the actual; being less than the revised standard which is an index of actual.

This material sub-usage variance is one of the components of the materials usage variance.

Material Usage Variance = Material Sub-usage Variance + Material Mix Variance

Material Yield Variance

It is one of the components of the material usage variance which arises only due to the deviation in between the standard yield determined and the actual yield accrued. This variance highlights either the abnormal loss of materials or saving of materials. This variance plays most important role in the process industries, to assess the loss/wastage of materials. If the actual loss of materials is different from the standard loss of materials will result the variance in two different situations.

When the standard and actual do not differ from each other:

In this case, the yield variance is calculated as follows:

Yield Variance = Standard Rate/Cost per unit (Actual Yield – Standard Yield)

Standard Rate has to be calculated from the following:

$$\text{Standard Rate} = \frac{\text{Standard cost of Standard Mix}}{\text{Net Standard Output (Gross Standard Output} - \text{Standard Loss)}}$$

Notes

When the actual mix differs from the standard mix: In the second case, standard mix has to be tuned to the requirement of actual mix, which is revised standard mix, realistic in sense for meaningful comparison, to highlight the deviation in between two different yields viz. actual yield and revised standard yield. The standard rate has to be calculated only for the revised standard mix of materials.

$$\text{Standard Rate} = \frac{\text{Standard Cost of Revised Standard Mix}}{\text{Net Standard Mix/Output (Gross Standard Output} - \text{Standard Loss)}}$$

Calculate Material Yield Variance

Example: The total standard mix is equivalent to total actual mix

Particulars	Standard		Actual	
	Qty in Kg	Price	Qty in Kg	Price
Material A	90	6	60	5
Material B	60	8	90	9
	150		150	

Normal loss is allowed 10% Actual output 130 units.

Revised standard output has to be computed. In this problem, the total mixes are equivalent to each other, but, the normal loss is a loss 10% expected on the normal output. Though, this problem does not have the difference between the mixes, the revised standard mix should have to be computed to register the expected loss (normal loss) on the standard output.

Revised standard mix = Standard Mix – Normal Loss (Expected Loss)

= 150 Kgs – 10% on 150 Kgs = 135 Kgs

The next step is to find out the standard rate/price

Standard Price per unit

$$\frac{\text{Standard Cost/Price of Standard Mix}}{\text{Net Standard Mix/Output (Gross Standard Output} - \text{Standard Loss)}}$$

$$\frac{(90\text{ kgs} \times ₹\ 6) + (60\text{ kgs} \times ₹\ 8)}{135} = \frac{₹\ 540 + ₹\ 480}{135} = \frac{1020}{135} = ₹\ 7.55/-$$

Material Yield Variance = Standard Price (Actual Yield – Revised Standard Yield)

= ₹ 7.55 (130 Units – 135 Units) = ₹ 7.55 (–5 Units)

= ₹ 37.55 (Adverse)

7.2.2 Labour Variances

Labour Variance is known in other words as Labour Cost Variance. The cost of the labour is usually denominated by the wages paid/incurred during the production. Labour Variance Analysis, is studying the deviation in between the actual cost of the labour incurred and standard/budgeted cost of the labour. This is another most important cost variance, next to material cost variance, which considers the rate of the wage per hour for the computation of the total standard cost of labour and actual cost of labour like price of the materials per kg.

Notes

Labour Cost Variance

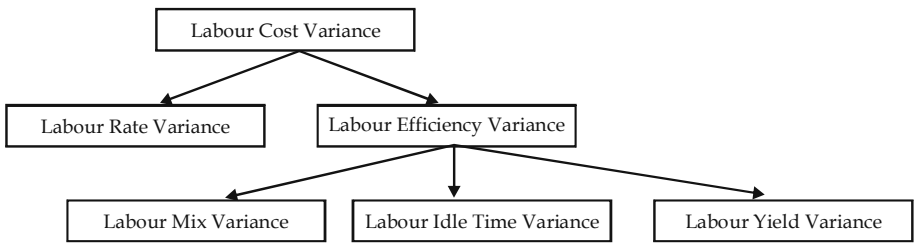
Labour cost variance is the tool studies the deviation in between the total standard cost of the labour and actual cost of labour. The actual labour cost may vary due to many reasons from the planned i.e standard.

Causes for the Variance:

1. The hourly rate of the labour may vary due to demand and supply of the labour force.
2. The hourly rate of the labour may vary due to nature of the labour required i.e. Skilled/ Semi-Skilled/Unskilled. The rate differs from one category to another due to efficiency of the labours.
3. The Labour cost variance is in relevance with the time component of the job. The time required to complete the job may vary due to too many reasons; more specifically time wastage results in the production.

The following is the structure of the labour cost variance, which will illustrate the various components of the labour variance.

Figure 7.3: Structure of Labour Cost Variance



Labour Cost Variance = Standard Cost of the Labour* – Actual Cost of Labour**

*Standard Cost of the Labour = Standard Hours for Actual Output × Standard Hour Wage Rate

**Actual Cost of the Labour = Actual Hours taken for production × Actual Hour Wage Rate

Labour Rate or Wage Pay Variance

This is the variance, resultant, due to the change in the wage rate. The Labour rate variance is the difference between standard wage rate, which already determined and the actual wage rate incurred during the production. The variance should be denominated in terms of the actual hours of production.

Did u know? ***Why is the expression in terms of the actual hours?***

The actual hours taken is into consideration only for reality, that is the time moments consumed by the production process. This expression facilitates to understand the excessive/lesser amount spent on the labour, which depicts, how much was over/under spent by the firm for the payment of wages than the planned during the production.

The causes of labour wage rate or pay variance:

1. It is due to changes occurred in the structure of basic wages.
2. The ratio of the labour mix is varied due to the nature of the order. Undertaken by the firm to meet the needs of the consumers. The special order from the buyer may require

the goldsmith to take more special care in the design of an ornament than the regular or routine design. This leads to involvement of more amount of skilled labour, which finally escalates/increases the cost of the labour.

3. To fulfill the immediate and excessive orders of the consumers which are to be supplied to their requirements leads to greater payment of wages through over time charges; which is normally greater than the regular wage rate.
4. This variance mainly occurs in the industry, which is connected with seasonal business. This variance mainly plays pivotal role in the industries of soft drinks, fans, refrigerator, fertilizer, crackers and so on.

   The Labour Rate Variance (LRV) = Actual hours taken (Standard Rate – Actual Rate)

Labour Efficiency Variance

The efficiency of the labour is denominated only in actual hours for actual output, which should be less than the standard hours expected to perform during the job. The labour efficiency variance is the deviation in between two standard hours for actual output and actual hours taken for actual output. The expression of variance in terms of hours should be expressed in terms of wage rate, i.e. standard wage rate.

Why the expression should be in the standard wage rate?

The aim of expressing Efficiency variance in terms of standard wage is to express them in monetary units and should be free from the demand and supply forces of the labour force which directly has an impact on the basic labour wage rate

Labour Efficiency Variance = Standard Rate (Standard Hours for Actual Output – Actual Hours for Actual Output)

What are causes of this variance?

1. Due to poor working conditions, the efficiency of the working force to complete the job is coming down.
2. Quality of maintenance of the machinery is facilitating the working force to maintain the efficiency.
3. Frequent change in the quality of materials may lead change in the hours required to complete the work.
4. Poor personnel relations of the workers.

Idle Time Variance

The wages which are paid for unproductive hours to the labourers are known as idle time.

The idle time may be classified into two categories:

1. Normal idle time
2. Abnormal idle time

What is normal idle time?

This idle time is known as authorised idle time, which can be understood in other words as unavoidable idle time. Normally the worker is paid for that time during which he does not produce anything.

Notes

Time taken by the employees to change the dress.

Time take by the employees to ease themselves during the hours of production i.e going to the toilet for easing and for refreshment going to the canteen.

The employees are paid during the above-enlisted occasions at when they do not produce anything.

In between two different shifts, the production of finished goods do not normally take place due to change over the control from one employee to another.

What is meant by abnormal idle time?

This is known as avoidable idle time; during which the workers are paid for nil production. This type of idle time could be slashed down or downsized through an effective planning. This idle time is the resultant of too many ineffective schedules, e.g. inadequate supply of raw materials, power shortage/failure, breakdown of machinery and so on. The aforementioned could be easily sorted out through proper planning and scheduling; which will automatically reduce the unproductive time of labour force. Whatever the payment of wages to the working force during the idle time are to be considered as adverse. It means that the firm makes the payment of wages to the labourers/working force without any production/productivity.

Idle Time Variance = Idle hours × Standard Rate (Always "A")

Labour Mix Variance

This variance arises due to deviations in between the actual mixture of labour force for the job and standard mixture of labour force planned to complete the job. The mixture of work force is considered to be most important for completion. Normally, the mixture is in tri colours viz. Skilled, Semi-Skilled and Unskilled. The standards are prepared by considering the requirements of the job to be completed. For completing the job, 5 skilled, 3 semi-skilled and 2 unskilled employees are required. Due to non-availability of skilled labour force, the firm is required to carry out the operations without any lacuna through the induction of more semi-skilled labour force. The actual composition of the labour force is 2 skilled, 6 semi-skilled and 2 unskilled which finally led to labour mix variance.

Reasons for the labour mix variance:

1. Absenteeism
2. Labour turnover
3. Non-availability of required labour force from the business environment.

The above critical factors directly influence the efficiency of the labour force.

Labour Mix Variance = Standard Rate (Revised Standard Hours – Actual Hours)

Standard hours for the job were determined for the Standard mixture of labour force but these hours are not denominated to the tune of actual hours taken by the actual mixture of labours force. To study the variance in between them, the standard hours should be in line with the actual. The standard hours which are converted to the tune of actual hours is known as Revised standard hours considered to be level platform for an effective comparison.

Labour Mix Variance = Standard Rate (Revised Standard Hours – Actual Hours)

Labour Sub-efficiency Variance

It is one of the components of the labour efficiency variance.

Labour Sub-efficiency Variance = Standard Rate (Standard Hours for Actual Output – Revised Standard Hours)

Notes

Labour Yield Variance

It is considered to be as one of the components of labour efficiency variance. This is a variance in between two different outputs of the enterprise viz. standard output for actual hours and actual output.

This is a variance facilitates to study the deviation in between two different levels i.e. how many number of outputs would be produced during the actual hours and how many number of actual outputs were produced during the actual hours.

Labour Yield Variance = Standard Cost per unit (Actual Output – Standard Output in Actual Hours)

OR

= Standard Cost per unit (Actual Yield in Units – Standard Yield in Actual Hours)

If Actual output or Actual yield in units is greater than the standard yield in actual hours, it means that the firm's actual production in units is greater than the standard estimates nothing but favourable to the business enterprise.

Example: The standard and actual data of a manufacturing concern are given:

Standard time	2,000 Hrs
Standard rate per hour	₹ 2
Actual time taken	1,900 Hrs
Actual wages paid per hour	₹ 2.50

Calculate labour variances.

Solution:

First step is to compute the labour cost variance

= (Standard Hrs for Actual Output × Standard Rate) – (Actual Hours × Actual Rate)

= (2,000 Hrs × ₹ 2) – (1,900 Hrs × ₹ 2.50)

= ₹ 4,000 – ₹ 4,750

= ₹ 750 (Adverse)

The next step is to find out the labour rate variance

= Actual Hours (Standard Rate – Actual Rate)

= 1,900 Hours (2 – 2.50) = ₹ 950 (Adverse)

The next variance is to be found out the labour efficiency variance

= Standard Rate (Standard Hours for Actual Output – Acutal Hours)

= ₹ 2.00 (2,000 – 1,900) = ₹ 200 (Favourable)

Verification

Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance

750 (Adverse) = ₹ 950 (Adverse) + ₹ 200 (Favourable)

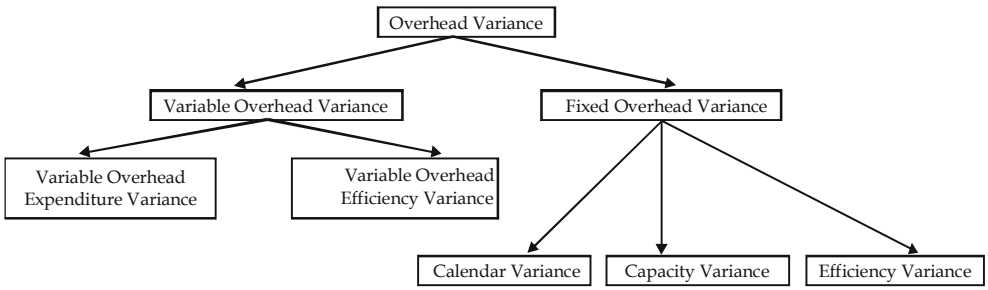
750 (Adverse) = ₹ 750 (Adverse)

Notes

7.2.3 Overhead Variances

The following figure explains the classification of overhead variance:

Figure 7.4: Classification of Overhead Variance



In general, the overhead variance is defined is as the variance in between standard cost of overhead estimated for the actual output and actual cost of overhead really incurred.

With reference to absorption overheads, the variance occurs only during either over or under absorption of overheads.

Under absorption of overheads means that the standard cost of the overhead is more than that of the incurred actual overhead. In brief, it is a favourable situation as far as the firm concerned and vice versa in the case of over absorption of overheads.

1. ***Variable overhead cost variance:*** It is the variance or deviation in between the standard variable overhead for actual production of units and Actual overhead incurred

   = Standard variable overhead rate per unit × Actual output – Actual variable overheads incurred

2. ***Variable overhead expenditure variance:*** This is the variance in between the two different rates of variable overheads viz. standard rate and actual rate; denominated in terms of Actual hours taken consumed by the firm.

   = Actual Hours (Standard Rate – Actual Rate)

3. ***Variable overhead efficiency variance:*** It is another variance which is in between the standard hours for actual output and actual hours consumed during the production; denominated in terms of standard rate.

   = Standard Rate (Standard Hours for Actual Output – Actual Hours)

4. ***Fixed overhead cost variance:*** The most important variance is overhead cost variance

   = Standard Overhead Cost for Actual Output – Actual Overheads

   The second important variance is Budgeted or Expenditure variance

   = Budgeted Overheads – Actual Overheads

   What is the difference in between the budgeted figures and standards?

   Budgeted figures are not adjusted to the actual but the standards could be adjusted or tuned towards the actual.

   The next important variance is overhead volume variance:

   (a) If the standard overhead rate per unit is given

   = Standard Rate per Unit (Actual Production – Budgeted Production)

Notes

(b) If the standard overhead rate per hour is given

= Standard Rate per Hour (Standard Hours for Actual Production – Budgeted Production)

The next important variance is overhead efficiency variance:

(a) If the standard rate per unit is given

= Standard Overhead Rate per Unit (Actual Production – Standard Production in Actual Hours)

(b) If the standard rate per hour is given

= Standard Overhead Rate per Hour (Actual Hours – Standard Hours for Actual Production)

The last as well as most important variance:

(a) If the standard rate per unit is given

= Standard Rate per Unit (Standard Production – Actual Production)

(b) When standard rate per hour is given

= Standard Rate per Unit (Actual Hours – Budgeted Hours of Production)

Example:	Standard hours	= 6 per unit
	Standard cost	= ₹ 4 per hour
	Actual hours taken	= 640 hours
	Actual production	= 100 units
	Actual overheads	= ₹ 2,500

The first step is to determine the variable overhead cost variance

= Standard Variable Overhead Cost – Actual Variable Overhead Incurred

The next step is to find out the standard variable overhead cost for actual production

= Standard Hours per Unit × Standard Cost × Actual Production

= 6 per unit × ₹ 4 per hour × 100 units = ₹ 2,400

The next step is to determine the variance

= ₹ 2,400 – ₹ 2,500 = ₹ 100 (Adverse)

The next one is Expenditure variance

= Actual Hours (Standard Rate – Actual Rate)

The first step is to determine the actual hourly rate of the variable overheads

$$= \text{Actual Hourly Rate of Variable Overheads} = \frac{\text{Total Actual Overheads}}{\text{Actual Hours Taken}} = \frac{₹\ 2,500}{640\ \text{Hours}} = ₹\ 3.91$$

= 640 Hours (₹ 4 per unit – ₹ 3.9 per unit) = ₹ 64 (Favourable)

The next variance is to find out that variable overhead efficiency variance

= Standard Rate (Standard Hours for Actual Output – Actual Hours)

Notes

The next step is to find out the standard hours for actual output

= Standard Hours × Actual Output = 6 hours per unit × 100 Units = 600 Hours

= ₹ 4 (600 Hours – 640 Hours) = ₹ 160 (Adverse)

Example: Budgeted hours for month of Mar. 2004, 180 units

Standard rate of article produced per hour 50 units

Budgeted fixed overheads ₹ 2,700

Actual production March 2004; 9,200 units

Actual hours for production 175 hours

Actual fixed overheads ₹ 2,800

Calculate overhead cost variance, overhead budget variance, overhead volume variance, overhead efficiency variance and overhead capacity variance.

Solution:

The first one to determine the overhead cost variance

= Standard Overhead Cost – Actual Overhead Cost

The standard overhead cost is to be found out

Standard overhead cost for actual production has to be computed from the below given formula

= Standard Rate per Unit × Actual Production in Units

First step is to determine the standard rate per unit =

$$\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Hours} \times \text{Standard Rate of Article Produced per hour}}$$

$$= \frac{₹\ 2{,}700}{180 \times 50} = .3 \text{ paise}$$

The next one is to find out the overhead cost

= 9,200 units × .30 paise = ₹ 2,760

Overhead Cost Variance = ₹ 2,760 – ₹ 2,800 = ₹ 40 (Adverse)

Overhead Budget Variance = Budgeted Overhead – Actual Overhead

= ₹ 2,700 – ₹ 2,800 = ₹ 100 (Adverse)

Overhead Volume Variance = Standard Overhead – Budgeted Overhead

= ₹ 2,760 – ₹ 2,700 = ₹ 60 (Favourable)

The overhead efficiency variance could be calculated in two different ways.

The efficiency is expressed in terms of hours and units. If the firm is able to produce the goods or articles in lesser hours of duration, known as more efficient in time management than the standard.

Likewise, the efficiency could be denominated in terms of units of production. If the actual production is more than that of the standard production in units, the firm is favourable in position in producing the articles than the standard.

Overhead Efficiency Variance = (Actual Production in Units – Standard Production in Units) × Standard Rate

= (9,200 units – 8,750 units) .30 = 450 units .30 = 135 (Favourable)

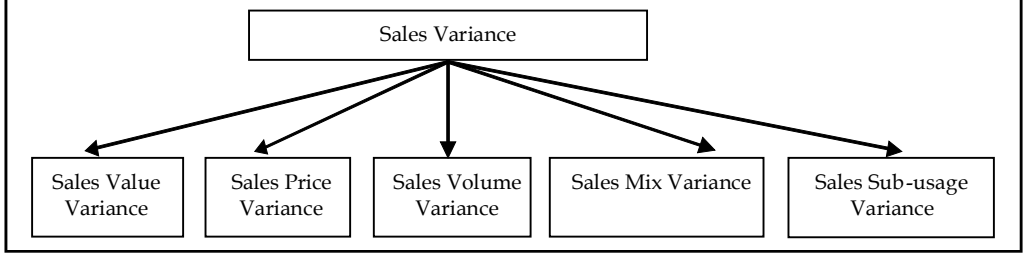
Notes

7.2.4 Sales Variances

Sales variances is the only component accompanied the profit volume variance of the business transaction. The sales variances are computed and analysed in order to study the effect of sales value and facilitates the sales manager to easily understand the various sales efforts taken by the team.

The sales variance can be classified into various categories. They are as follows:

Figure 7.5: Classification of Sales Variance



Sales Values Variance

The name of the variance is self explanatory in explaining the meaning of the variance, that is difference in between the actual value of sales and standard value of sales.

The causes/influences of sales value variance are many more and some of them highlighted for easy understanding about overall picture.

1. The fluctuation in the selling price may lead to variance with the standard selling price — Selling Price Variance.
2. The fluctuation in the actual volume of sales may be due to various factors, mainly the preference of the buyers over the standard/budgeted volume of sales — Sales Volume Variance.
3. Actual mix of various varieties may differ from the standard mix, which leads — Sales mix variance
4. Revised standard sales quantity may be varied from the budgeted sales quantity — Sales quantity/Sub-usage variance

Sales Value Variance = Actual Value of Sales – Standard Value of Sales

The decision criterion is that more the actual sales volume leads to greater and better the position of the firm than the budgeted sales volume, which leads to favourable position for the firm and vice versa.

Sales Price Variance

It is one of the components as well as influences of the sales variances. It is the variance in between two different prices viz. actual price and standard price of the products.

The variance can be computed as follows:

Sales Price Variance = Actual Quantity sold (Actual Price – Standard Price)

The price variance should be finally expressed in terms of the actual number of goods sold. The main aim of expressing them in actual quantity of goods sold is to express the variance in terms of actual performance in units.

Notes

The price variation may be due to many reasons:

1. The price variance may be due to changes taken place in the structure of competition. The nature of competition changes due to market potential for example monopoly to duopoly; duopoly to perfect competition and so on; leads to change in the structure of pricing in order to retain the consumer base in line with the business.
2. The price variance may be due to two courses of action, which are as follows:

   (a) Cost effectiveness strategy, and (b) Distinctiveness Strategy.

Sales Volume Variance

It is one of the elements of sales variance, which is in between the actual sales quantity and budgeted sales quantity. The variance is normally expressed in terms of price i.e. standard price. The purpose of expressing the variance in terms of standard price is that price which is free from market forces.

Sales Volume Variance = Standard Price (Actual Quantity of Sale – Standard Quantity of Sales)

The sales volume variance can be divided into two different streams that sales mix variance and sales quantity variance/sub-usage variance.

Sales Mix Variance

It is the difference in between the actual sales and standard sales mix. This variance will arise only due to change in the proportion of goods sold. This is a most important variance usually computed/calculated, at the moment, the firm which deals more than one commodity.

If both, the standard and actual mixes are equivalent to each other, there will not be any mix variance in between the above mentioned.

If the mixes are totally different from each other, the sales mix variance is to be computed, through the development of revised standard mix of quantities with reference to actual quantities sold, then only the comparison will be meaningful to study the variances occurred in between above mentioned. The sales mix variance is expressed in between two different quantities and finally should be denominated in terms of standard price. The reason for the expression in terms of standard price is the price which is totally free from the demand and supply forces of the market.

Sales Mix Variance = Standard Price (Actual Quantity – Revised Standard Quantity)

Sale Sub-usage Variance

It is another component of usage variance, which expresses the deviation in between the revised standard quantity to the tune of actual quantities sold and the early set standard quantities expected to sell.

This variance also elucidates the differences of the above mentioned only in terms of standard price, which is the ideal indicator free from the market forces i.e free from fluctuation.

Sales Sub-usage Variance = Standard Price (Revised Standard Quantity – Standard Quantity).

Example:

Product	Budgeted		Actual	
	Qty	Price (₹)	Qty	Price (₹)
A	400	30	500	31
B	200	25	100	24

Calculate the various types of sales variances.

Solution: **Notes**

Sales Value Variance:

Sales value variance = Actual Sales – Standard Sales

First step is to find out the Actual Sales

Actual Sales = Actual Quantity × Actual Price

Actual Sales (A) = 500 × ₹ 31= ₹ 15,500

Actual Sales (B) = 100 × ₹ 24 = ₹ 2,400

Next step is to find out the standard quantity of sales

Standard Quantity of Sales = Standard Quantity × Standard Sales

Standard Sales (A) = 400 × ₹ 30 = ₹ 12,000

Standard Sales (B) = 200 × ₹ 25 = ₹ 5,000

Sales Value Variance (A) = ₹ 15,500 – ₹ 12,000	= ₹ 3,500 (Favourable)
Sales Value Variance (B) = ₹ 2,400 – ₹ 5,000	= ₹ 2,600 (Adverse)
Total Sales Value Variance	= ₹ 900 (Favourable)

Sales Price Variance:

Sales Price Variance = (Actual Price – Standard Price) Actual Quantity

Sales Price Variance (A) = 500 (₹ 31 – ₹ 30)	= ₹ 500 (Favourable)
(B) = 100 (₹ 24 – ₹ 25)	= ₹100 (Adverse)
	= ₹ 400 (Favourable)

Sales Volume Variance:

Sales Volume Variance = Standard Price (Actual Quantity – Standard Quantity)

Sales Volume Variance (A) = ₹ 30 (500 – 400)	= ₹ 3,000 (Favorable)
(B) = ₹ 25 (100 – 200)	= ₹ 2,500 (Adverse)
	= ₹ 500 (Favourable)

Sales Mix Variance:

Sales Mix Variance = Standard Price (Actual Quantity – Revised Standard Quantity)

First step in the process of computing the sales mix variance is the Revised standard quantity. As far as this problem concerned, sales mix variance would not arise due to equivalent mixes dealt in the problem viz. standard (budgeted) mix and actual mix amounted 600 each.

Though it is having equal volumes, revised standard quantity can be computed

$$\text{Revised Standard Quantity} = \frac{\text{Standard Quantity}}{\text{Total Standard Quantity}} \times \text{Total Actual Quantity}$$

$$\text{RSQ for A} = \frac{400}{600} \times 600 = 400$$

$$\text{RSQ for B} = \frac{200}{600} \times 600 = 200$$

Notes

Sales Mix Variance (A) = ₹ 30 (500 – 400) = ₹ 3,000 (Favourable)

(B) = ₹ 25 (100 – 200) = ₹ 2,500 (Adverse)

= ₹ 500 (Favourable)

From the above calculations, what is obviously understood?

If the mixes are equivalent to each other, the sales volume variance is equivalent to the sales mix variance. It means that, there would not be a sales mix variance

Sales Sub-usage Variance:

Sales Sub-usage Variance = Standard Price (Revised Standard Quantity – Actual Quantity)

Sales Sub Usage Variance (A) = ₹ 30 (400 – 400) = 0

(B) = ₹ 25 (200 – 200) = 0

0

There is no sub-usage variance.

Verification:

1. Sales Value Variance = Sales Price Variance + Sales Volume Variance

   900(F) = 400(F) + 500(F)

2. Sales Volume Variance = Sales Mix Variance + Sales Sub-usage Variance

   500(F) = 500(F) + 0

Self Assessment

Choose the correct answer:

6. Variance is identified in between
   - (a) Standard and budgeted figures
   - (b) Standard and actual figures
   - (c) Budgeted figures and actual
   - (d) None of the above
7. Variance is/are
   - (a) Cost variance
   - (b) Revenue variance
   - (c) Expense variance
   - (d) Both (a) & (b)
8. Cost variance is classified into
   - (a) Material variance
   - (b) Labour variance
   - (c) Expense variance
   - (d) (a), (b) & (c)

Notes

9. Variance analysis is for
   (a) Cost planning
   (b) Cost control
   (c) Identification of variance and control deviations
   (d) None of the above
10. When the revised standard mix of the materials will not vary with the standard mix of the materials ?
   (a) Both standard and actual mix of materials are different
   (b) Standard mix of materials are greater than the actual mix of materials
   (c) Both are equivalent to each other
   (d) None of the above
11. Why labour efficiency variance is denominated in terms of standard rate?
   (a) Actual rate is not a measure
   (b) Standard rate is free from the demand and supply of labour force
   (c) Actual measure is a measure of demand and supply of labour force
   (d) None of the above
12. Sales value variance is mainly due to
   (a) Price variance
   (b) Quantity variance
   (c) Mix variance
   (d) (a) (b) & (c)
13. Variance is tool of standard costing in determining the deviations of the enterprise from the early
   (a) Estimates
   (b) Budgets
   (c) Costs
   (d) Prices
14. The direct labour total variance is the difference between what the output should have cost and what it did cost, in terms of
   (a) Cash
   (b) Labour
   (c) Material
   (d) None of these
15. The selling price variance is a measure of the effect on expected
   (a) Price
   (b) Profit
   (c) Labour
   (d) None of these

Notes

7.3 Summary

- There are two type of variances viz. cost variance and revenue variance.
- Cost variance can be further classified into three categories: (a) Material Cost Variance, (b) Labour Cost Variance, (c) Overhead Variance.
- Revenue Variance includes Sales Variance.
- The material cost variance is in between the standard material cost for actual production in units and actual cost.
- Material price variance is a variance in between two different prices viz. the standard price and actual price of raw materials.
- Materials Usage Variance = Standard Price × (Standard quantity of materials for actual output – Actual quantity of materials used)
- Material Sub-usage Variance = Standard Cost per unit (Standard Quantity – Revised Standard Quantity).
- Material yield variance is one of the components of the material usage variance which arises only due to the deviation in between the standard yield determined and the actual yield accrued.
- Labour Variance Analysis, is studying the deviation in between the actual cost of the labour incurred and standard/budgeted cost of the labour.
- The overhead variance is defined is as the variance in between standard cost of overhead estimated for the actual output and actual cost of overhead really incurred.
- Sales variances is the only component accompanied the profit volume variance of the business transaction. The sales variances are computed and analysed in order to study the effect of sales value and facilitates the sales manager to easily understand the various sales efforts taken by the team.

7.4 Keywords

Cost variance: Identifying the deviations in between the actual cost and standard cost which was already determined.

Favourable Cost Variance: It is due to greater standard cost over the actual cost.

Favourable Revenue Variance: It is due to greater actual revenue than the standards.

Revenue Variance: Identifying the deviations in between the actual revenue and early determined standard revenue.

Standard: It is a predetermined or estimate figure calculated by considering the ideal conditions of the work environment.

Unfavourable Cost Variance: It is due to greater actual cost than the determined standard cost.

Unfavourable Revenue Variance: It is an outcome due to greater standard sales than the actual sales.

Variance: It is tool of standard costing in determining the deviations of the enterprise from the early estimates.

Notes

7.5 Review Questions

1. Elucidate the various kinds of variances.
2. Write elaborately on the cost variance and their causes.
3. From the data given below, find out the material mix variance.

   Consumption of 100 units of product.

Raw Material	Standard	Actual
A	40 units @ ₹ 50 per unit	50 units @ ₹ 50 per unit
B	60 units @ ₹ 40 per unit	60 units @ ₹ 45 per unit

4. From the following data, calculate materials yield variance.

Actual	Standard		Actual	
	Qty in Kg	Price	Qty in Kg	Price
Material A	200 units	₹ 12	160 units	₹ 13
Material B	100 units	₹ 10	140 units	₹ 10
	300 units		300 units	

   Standard loss allowed is 10% of input. Actual output is 275 units.

5. From the following, find out the material yield variance.

Actual	Standard		Actual	
	Qty in Kg	Price	Qty in Kg	Price
Material A	60 units	₹ 3,000	300 units	₹ 15,300
Material B	40 units	₹ 1,200	200 units	₹ 5,600

   Standard loss allowed is 10% of input and standard rate of scrap realization is ₹ 6 per unit. Actual output is 440 units.

6. Find out the various labour variances from the following data:

   Standard hours per unit = 20 Hours

   Standard rate per unit = ₹ 5

   Actual Production = 1000 units

   Actual time taken = 20,400 Hours

   Actual Rate paid = ₹ 4.80

7. From the following information calculate the labour variances:

Standard	Actual	
Number of men employed	100	90
Output in units	2,500	2,400
Number of working days in a month	20	18
Average wages per man per month	₹ 200	₹ 198

8. A gang of workers normally consists of 30 men, 15 women and 10 boys. They are paid at standard hourly rates as under:

   Men ₹ 80

   Women ₹ 60

   Boys ₹ 40

Notes

In a normal working week of 40 hours, the gang is expected to produce 2,000 units of output.

During the week ended 31st Dec. 2004, the gang consisted of 40 men 10 women and 5 boys. The actual wages paid were @ ₹ 70, ₹ 65 and ₹ 30 respectively 4 hours were lost due to abnormal idle time and 1,600 were produced.

Calculate: (a) Labour cost variance (b) Wage variance (c) Labour efficiency variance (d) Gang composition variance (e) Labour idle time variance.

9. Calculate various overhead variances.

Items	Budget	Actual
No. of working days	20	22
Man hours per day	8,000	8,400
Output per man hour in units	1	.9
Overhead cost	₹ 1,60,000	₹ 1,68,000

10. Maris Ltd. has furnished the following information for the month of July 1979.

	Budget	Actual
Output (Units)	30,000	32,500
Hours	30,000	33,000
Fixed overheads	₹ 45,000	₹ 50,000
Variable overheads	₹ 60,000	₹ 68,000
Working days	25	26

Calculate the variances:

(a) Total overhead variances

(b) Fixed overhead variances

(c) Variable overhead variances.

11. Vision Ltd. furnishes the following information relation to budgeted sales and actual sales for June 1988.

Product	Budgeted		Actual	
	Qty	Price (₹)	Qty	Price (₹)
A	1200	15	880	18
B	800	20	880	20
C	2000	40	2640	38

Calculate sales variance.

Answers: Self Assessment

1. 'adverse' or unfavourable
2. favourable variance
3. standard costing
4. standard cost
5. cost control
6. (b)
7. (d)
8. (d)
9. (c)
10. (c)

11. (c)
12. (d)
13. (a)
14. (b)
15. (b)

Notes

7.6 Further Readings

Books

B.M. Lall Nigam and I.C. Jain, *Cost Accounting*, Prentice-Hall of India (P) Ltd.

Hilton, Maher and Selto, *Cost Management*, 2nd Edition, Tata McGraw-Hill Publishing Company Ltd.

M.N. Arora, *Cost and Management Accounting*, 8th Edition, Vikas Publishing House (P) Ltd.

M.P. Pandikumar, *Management Accounting*, Excel Books.

Online links

www.authorstream.com

www.allinterview.com

Notes

Unit 8: Budgetary Control

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Objectives

After studying this unit, you will be able to:

- Explain the meaning of budgetary control
- Describe the objectives of budgetary control
- Construct the different types of budgets

Introduction

Budget is an estimate prepared for definite future period either in terms of financial or non-financial terms. Budget is prepared for any course of action or business or state or Nation, as a whole. The budget is usually expressed in terms of total volume.

According to ICMA, England, a budget is as follows "a financial and or quantitative statement prepared and approved prior to a defined period of time, of the policy to be pursed during the period for the purpose of attaining a given objective."

Notes

It is in other words as "detailed plan of action of the business for a definite period of time." It is a statement of financial affairs/quantitative terms of an activity for a defined period, to achieve the enlisted objectives.

Did u know? ***What is budgeting?***

Budgeting is the course involved in the preparation of budget of an activity.

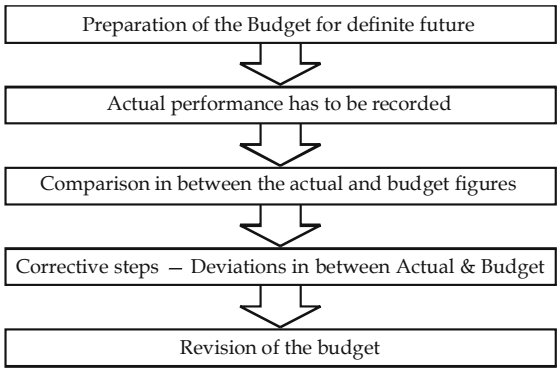
8.1 Meaning of Budgetary Control

Budgetary control contains two different processes one is the preparation of the budget and another one is the control of the prepared budget.

According to J. Batty, "Budgetary control is a system which uses budgets as a means of planning and controlling all aspects of producing and/or selling commodities and services."

According to ICMA, England, a budgetary control is, "the establishment of budgets relating to the responsibilities of executives to the requirements of a policy and the continuous comparison of actual with budgeted results, either to secure by individual action the objectives of that policy or to provide a basis for its revision".

Figure 8.1: Steps Involved in Budgetary Control



8.2 Objectives of Budgetary Control

The following are the key objectives of budgetary control:

1. To use different levels of management in a co-operative endeavour for achievement of the objectives of the firm.
2. To facilitate centralised control with delegated authority and responsibility.
3. To achieve maximum profitability by planning income and expenditure through optimum use of the available resources.
4. To ensure adequate working capital in other resources for efficient operation of business.
5. To reduce losses and wastes to the minimum.
6. To bring out clearly where effort is needed to remedy the situation.
7. To see that the firm is not deflected from marching towards its long-term objectives without being overwhelmed by emergencies.
8. Various activities like production, sales, purchase of materials, etc., are co-ordinated with the help of budgetary control.
9. To define the goal of the enterprise.

Notes

Self Assessment

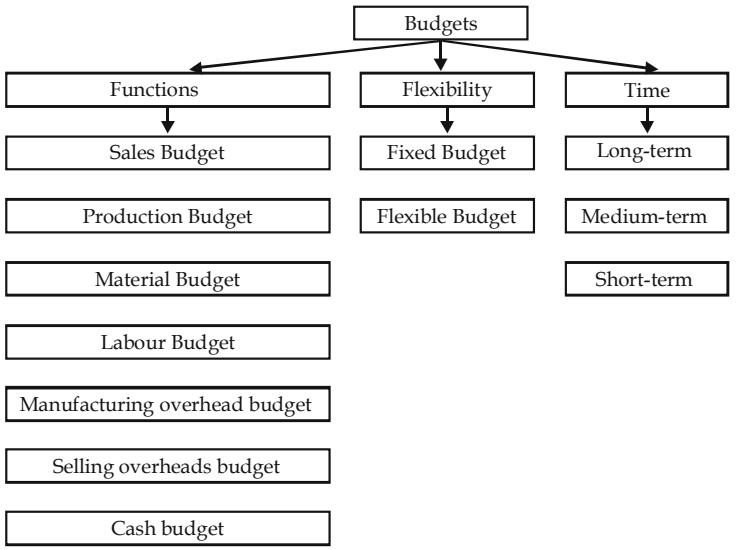
Fill in the blanks:

1. Budget is a statement of ..... .
2. ..... contains two different processes one is the preparation of the budget and another one is the control of the prepared budget.
3. Budget is an estimate prepared for definite ..... period.
4. Budgetary control facilitates centralised control with ..... authority and responsibility.
5. The budget is usually expressed in terms of ..... .

8.3 Types of Budgets

On functional basis, the budgets can be classified into three categories.

Figure 8.2: Classification of Budgets



8.3.1 Production Budget

The preparation of the production budget is mainly dependent on the sales budget. The production budget is a statement of goods, how much should be produced. It may be in terms of quantities, Kilograms in monetary terms and so on.

Did u know? ***What is the purpose of the production budget?***

The ultimate aim of the production budget is to find out the volume of production to be made during the year based on the sale volume. The production and sales volume should go hand-in-hand with each other, otherwise the firm would require to face the acute problem on holding unnecessary excessive stock or inadequate stock to meet the needs of the buyers in time; which will disrepute in the supply of goods in time to them as already agreed upon.

Notes

Units to be produced = Budgeted Sales + Closing Stock – Opening Stock

The methodology of production budget includes three different components, viz. sales, closing stock and opening stock. Sales has to be added with the stock of the year at the end and to be deducted the opening stock.

Why sales has to be given paramount importance in the preparation of production budget?

The major sales of the business enterprise is being regularly made out of only through the current year production.

Why the closing stock has to be added?

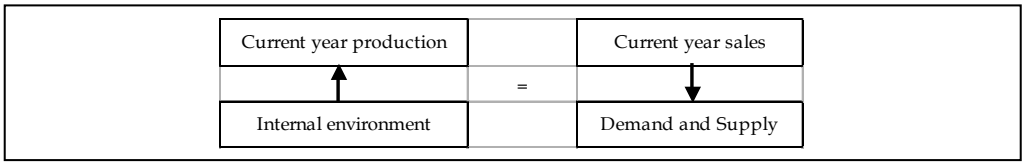
The purpose of the closing stock to be added is that it is a stock at end of the year-end out of the current year production.

Why the opening stock has to be deducted?

The aim of deducting the opening stock is that the stock at the beginning is the stock out of the yester or previous year production.

If sales is normally equivalent to the entire year of production, the firm need not to concentrate on the volume of opening stock and closing stock. It means that, what ever produced during the year is equivalent to current year sales. If the entire production is sold out, there won't be closing stock at the end of the year and opening stock i.e. subsequent years.

If Current year production is equivalent to current year sales



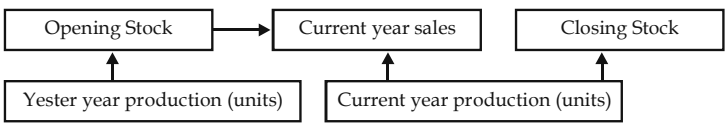
Resultant: No closing stock and opening stock for the subsequent years. This situation may not be possible at always

Why it is not possible at always?

The production volume is connected to the internal environment of the firm, which can be maintained through a systematic approach, but the sales cannot be easily administered by the firm which is being highly influenced by the demand and supply factors of the goods.

If the current year production is not equivalent to the current year sales

Figure 8.3: Flow of goods from Production of one Period to Another



Why the closing stock arises in the business?

The closing stock is stock due to the excessive production over the sales volume. The reasons for excessive production are as follows:

1. Ineffective study of market potential through market research leads to the expression of excessive demand from the market, which signals the production department to produce to the tune of MR conducted.
2. Due to price fluctuations in the market may affect the volume of sales.

Notes

3. Due to meet the future demand.

4. The excessive production due to the cheaper availability of raw materials, which leads to greater amount of closing stock. If the storage cost is more than the hike takes place on the cost of raw materials leads to abnormal storage of the stock.

The above diagram clearly illustrates that the emergence of the opening stock and closing stock during the year out of sales and production volume of the enterprise.

Example: Prepare a production budget for three months ending March 31, 2006 for a factory manufacturing four different articles on the basis of the following information:

Type of the Product	Estimated Stock on Jan 1, 2006 Units	Estimated sales during Jan-Mar, 2006 Units	Desired Closing Stock on Mar 31, 2006 Units
AA	2000	10,000	5,000
BB	3000	15,000	4,000
CC	4000	13,000	3,000
DD	5000	12,000	2,000

Solution:

Production Budget for three months ending March 31, 2006

Particulars	AA Units	BB Units	CC Units	DD Units
Estimated Sales	10,000	15,000	13,000	12,000
Add: Desired closing stock	5,000	4,000	3,000	2,000
	15,000	**19,000**	**16,000**	**14,000**
Less: Opening Stock	2,000	3,000	4,000	5,000
Estimated Production	**13,000**	**16,000**	**12,000**	**9,000**

Task Mr. X Co. Ltd. manufactures two different products X and Y. X forecast of the number of units to be sold in first seven months of the year is given below:

Months	Product X	Product Y
Jan.	1,000	2,800
Feb.	1,200	2,800
Mar.	1,600	2,400
Apr	2,000	2,000
May	2,400	1,600
June	2,400	1,600
July	2,000	1,800

It is expected that (a) there will be no work in progress at the end of every month, (b) finished units equal to half the sales for the next month will be in stock at the end of each month (including the previous December).

Contd...

Notes

Budgeted production and production costs for the whole year are as follows:

Production in Units		Product X	Product Y
		22,000	24,000
Per unit (₹)	Direct Material	10.00	15.00
	Direct Labour	5.00	10.00
Total factory overhead apportioned		88,000	72,000

8.3.2 Materials/Purchase Budget

This budget takes place only after identifying the number of finished products expected to produce to the tune of production budget, in meeting the needs and demands of the customers and consumers during the season.

In order to produce to the tune of production budget to meet the market demands, the raw materials for the production should be maintained sufficient to supply them without any interruption. To have uninterrupted flow of production, the firm should go for the immediate procurement of raw materials through the multiplication of raw material required to produce for a single product with number of units expected to produce.

Caution Why the stock of raw materials is deducted from the expected volume of materials procured for production to the tune of production budget?

If there is any existing stock of raw materials, i.e. opening stock of raw materials available from the yester seasons or years should be deducted from the volume of materials required for production to be ordered and placed. The remaining volume should be the volume to be ordered for production.

Example: The sales manager of the MR Ltd. reports that next year he anticipates to sell 50,000 units of a particular product.

The production manager consults the storekeeper and casts his figures as follows:

Two kinds of raw materials A and B are required for manufacturing the product. Each unit of the product requires 2 units of A and 3 units of B. The estimated opening balances at the commencement of the next year are:

Finished product : 10,000 units

Raw Materials A : 12,000 units Raw Materials B : 15,000 units

The desirable closing balances at the end of the next year are

Finished products : 14,000 units

Raw materials A : 13,000 units Raw materials B : 1,000 units

Prepare production budget and materials purchase budget for the next year:

Solution:

The first step is to prepare the production budget. To identify the volume of materials required for production by considering the production budget and the closing stock of materials of A and B respectively.

Why the closing stock of raw materials has to be added with estimated consumption? The purpose of adding the closing stock of raw materials is to anticipate the future demand of them,

Notes

due to market influence; which warrants the firm to go for placement of order not only taking into consideration of expected consumption of raw materials but also the closing stock of raw materials to be maintained at the end of the season, in order to facilitate to have uninterrupted flow of production.

Why the opening stock of raw materials has to be deducted?

The opening stock of raw materials, which is available in the firm, should be considered for the placement of order of raw materials. The materials to be ordered should be other than that of the materials available in the firm.

Production Budget (Units)

Estimated Sales	50,000
Add: Desired Closing stock	14,000
Less: Opening Stock	**64,000**
	10,000
Estimated Production	**54,000**

Materials Procurement or Purchase Budget (Units)

	Material A	**Material B**
Estimated Consumption		
For A 2 units × 54,000	1,08,000	
For B 3 units × 54,000		1,62,000
Add: Closing Stock	13,000	16,000
	1,21,000	**1,78,000**
Less: Opening Stock	12,000	15,000
Estimated Purchases	**1,09,000**	**1,63,000**

8.3.3 Sales Budget

Sales Budget is an estimate of anticipation of sales in the near future prepared by the responsible person for the sale of a product by considering the various factors of influence. Sales budget is usually prepared in terms of quantity and value. The following factors are normally considered for the preparation of sales budget of a firm:

1. Last sales figures
2. Estimates of the salesmen who is frequently operating in the market, known much greater than any body in the market
3. Capacity of the plant and machinery to produce
4. Funds availability
5. Availability of raw materials to the tune of demand in the respective time period
6. Changes in the taste and preferences of the customer or consumer
7. Changers in the competition structure — Monopoly to Perfect competition — Previously BSNL was known as DOT as a monopoly in the market in affording the services till early 2000. Then later, the changes taken place in the market environment i.e. competition due to invasion of new entrants like Reliance, Hutch, Bharti tele ventures and so on; warrants careful preparation of sales budget of number of telephone connection expected to sell.

Notes

Example: Reynolds Pvt. Ltd. manufactures two brands of pen Light & Elite. The sales department of the company has three departments in different regions of the country.

The sales budgets for the year ending 31st Dec, 2006 Light department I=3,00,000; department II=5,62,500; department III=1,80,000: Elite–department I=4,00,000; department II=6,00,000; department III=20,000.

Sales prices are ₹ 3 and ₹ 1.20 in all departments. It is estimated that by forced sales promotion the sales of Elite in department I will increase by 1,75,000. It is also expected that by increasing production and arranging extensive advertisement, department III will be enabled to increase the sale of Elite by 50,000.

It is recognized that the estimated sales by department II represent and unsatisfactory target. It is agreed to increase both estimates by 20%.

Prepare a sales budget for the year 2006.

Solution:

Sales budget should be prepared to the tune of various influences of forthcoming seasons' sales. The expected increase or decrease in the sales volume should be incorporated at the time of preparing the sales budget from the yester periods sale figures.

1. There is no change in the volume of existing sales of the department of I Light; the existing sales of the department I of the Light should be retained as it is for the computation of the budgeted figures, but there is a change expected to occur in the existing volume of sales of the department I of the Elite. The change expected amounted to increase 1,75,000 units in addition to the volume of existing sales i.e. the total volume of sales is equivalent to 4,00,000 units of existing volume of sales + 1,75,000 units expectation of increase= 5,75,000 units for Elite Department I.
2. In the II department of both Light & Elite expected to have an increase on the volume of existing sales amounted is 20% i.e. 20% increase on the Department II of Light 5,62,500 units amounted 6,75,000 units and similarly in the case of Department II of Elite 6,00,000 units amounted 7,20,000 units.
3. In the III department of Light does not have any change in the volume of existing sales, it means that 1,80,000 units has to be retained as it is in the computation of the budgeted figure but in the case of Elite, department III expected to have an increase in the volume of sales which amounted 20,000 units i.e. 70,000 units.

Sales Budget for the Year 2006

Selling Price	Light ₹ 3		Elite ₹ 1.20		Total
	Quantity	₹	Quantity	₹	₹
Department I	3,00,000	9,00,000	5,75,000	6,90,000	15,90,000
Department II	6,75,000	20,25,000	7,20,000	8,64,000	28,89,000
Department III	1,80,000	5,40,000	70,000	84,000	6,24,000
	11,55,000	**4,65,000**	**13,65,000**	**16,38,000**	**51,03,000**

8.3.4 Sales Overhead Budget

It is one of the important subfunctional budgets, prepared by the sales manager who is responsible for the sales volume of the enterprise to increase through various devices/tools of sales promotion.

Notes

The sales overhead can be classified into two categories viz fixed sales overhead and variable sales overhead.

Did u know? ***What is meant by the Fixed Sales Overhead?***

Fixed sales overhead is the expenses incurred for promoting the sales, which remains the same or fixed irrespective of the volume of the sales.

Example: 1. Salaries to Sales Department

2. Salaries to the Administrative Staff

3. Salary to Salesmen

Variable sales overhead is the expenses incurred for the promotion of the sales, which is varying along with the volume of sales of the firm.

Example: 1. Sales commission

2. Agents commission

3. Carriage outward expenses.

The sales overhead budget is the statement of estimates of the various sales promotional expenses not only based on the early/yester period sales promotional expenses but also on the sales of previous years.

Example: The following expenses were extracted from the books of M/s Sudhir & Sons, to prepare the sales overhead budget for the year 2006:

	₹
Advertisement on	
Radio	2,000
Television	12,000
Salary to	
Sales Administrative Staff	20,000
Sales force	15,000
Expenses of the sales department	
Rent of the building	5,000
Carriage outward	5% on sales
Commission at sales	2%
Agents' commission	6.5%

The sales during the period were estimated as follows:

₹ 80,000 including Agents Sales ₹ 8,000

₹ 1,00,000 including Agents Sales ₹ 10,500

Solution:

The most important step is to find out the variable portion of the sales overhead of M/s Sudhir & Sons.

Notes

1. The calculation of salesmen's commission is on the basis of the sales volume generated by the salesmen force. The total sales volume consists of two different parts viz. Sales contributed by the sales force and another one is contribution of the agents. To find out the sales volume of the sales man, the portion of the agents' sales volume should be deducted from the total sales volume.

   Sales Force's/Men's Volume = Total Sales Volume – Agent's Sales Volume

   Similarly, the agents' sales volume can be computed.

2. From the early step, the amount of commission is to be computed from the volume of sales.

3. Carriage outward should be computed on the volume of sales.

Sales Overhead Budget for the Year 2006

Estimated Sales	₹ 80,000 Level	₹ 1,00,000 Level
Fixed Overhead		
Advertisement on Radio	2,000	2,000
Advertisement on TV	12,000	12,000
Salary to Sales Admin. Staff	20,000	20,000
Salary to Sales force	15,000	15,000
Expenses of the sales dept – Rent	5,000	5,000
Total Sales Fixed Overhead (A)	54,000	54,000
Variable Overhead		
Salesmen's Commission 2%	1,440	10,290
Agents' Commission 6.5%	520	682.5
Carriage outward 5%	4,000	5,000
Total Variable Overhead (B)	5,960	5682.5
Total Sales overhead(A+B)	**59,960**	**59682.5**

8.3.5 Cash Budget

Cash budget is nothing but an estimation of cash receipts and cash payments for specified period. It is prepared by the head of the accounts department, i.e. chief accounts officer.

The utility of the cash budget is as follows:

1. To meet the revenue and capital expenditures with adequate funds.

2. It should highlight the additional requirement cash whenever the need arises.

3. Keeping of excessive funds available in the business firm would not fetch any return to the enterprise but this estimate of future cash needs and resources will guide the firm to plan for an effective investment out of the surplus funds estimated; enhances the wealth of the investors through proper investment planning out of the future funds available.

Cash budget can be prepared in three different ways:

1. Receipts and payments method

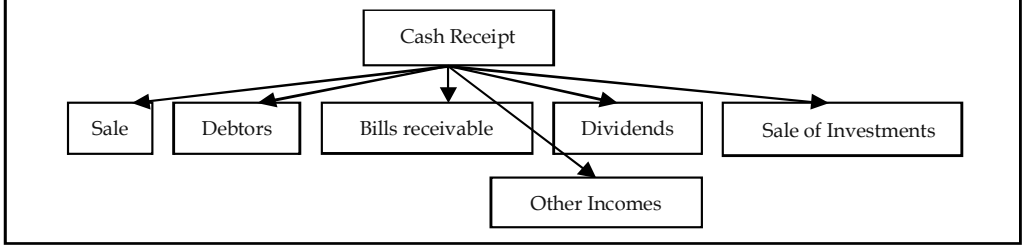
2. Adjusted profit and loss account

3. Balance Sheet Method

Cash receipts can be classified into various categories.

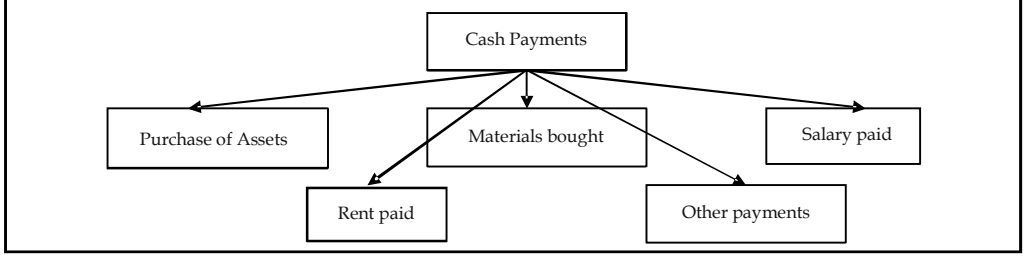
Notes

Figure 8.4: Classification of Cash Receipts



Cash payments are as follows:

Figure 8.5: Classification of Cash Payments



Example: From the estimates of income and expenditure, prepare cash budget for the months from April to June.

Month	Sales (₹)	Purchases (₹)	Wages (₹)	Office Exp. (₹)	Selling Exp. (₹)
Feb.	1,20,000	80,000	8,000	5,000	3,600
Mar.	1,24,000	76,000	8,400	5,600	4,000
Apr.	1,30,000	78,000	8,800	5,400	4,400
May	1,22,000	72,000	9,000	5,600	4,200
June	1,20,000	76,000	9,000	5,200	3,800

1. Plant worth ₹ 20,000 purchase in June 25% payable immediately and the remaining in two equal instalments in the subsequent months.
2. Advance payment of tax payable in Jan. and April ₹ 6,000
3. Period of credit allowed:
   (a) By suppliers 2 months
   (b) To customers 1 month
4. Dividend payable ₹ 10,000 in the month of June.
5. Delay in payment of wages and office expenses 1 month and selling expenses ½ month. Expected cash balance on 1st April is ₹ 40,000.

Solution:

1. Plant worth ₹ 20,000 purchased, payable immediately is 25% i.e. ₹ 5,000 should be paid in the month of June. The remaining cost of the machine has to be paid in the subsequent months, after June. The payments whatever are expected to make after June is not relevant as far as the budget preparation concerned.

Notes

2. Delay in the payment of wages and office expenses is only one month. It means wages and office expenses of Feb. month are paid in the next month, March.

   Selling expenses from the above coloured boxes, it is obviously understood that during the months of April, May and June; the following will be stream of payment of selling expenses.

   April = ₹ 2,000 of Mar. (Previous Month) and ₹ 2,200 of April (Current month) = ₹ 4,200

   May = ₹ 2,200 of April (Previous Month) and ₹ 2,100 of May (Current month) = ₹ 4,300

   June = ₹ 2,100 of May (Previous Month) and ₹ 1,900 of June (Current month) = ₹ 4,000

3. Selling expenses is having the delay of ½ month, which means 50% of the selling expenses is paid only in the current month and the remaining 50% is paid in the next

Particulars	Feb.	Mar.	April	May	June
Selling Expenses	3,600	4,000	4,400	4,200	3,800
Payment 50% in the current month	1,800	2,000	2,200	2,100	1,900
Delay 50% will be paid in the subsequent month	1,800	2,000	2,200	2,100	1,900

   Every month 50% of the selling expenses of the current month and 50% of the previous month selling expenses are paid together; the above coloured boxes depict the payment of 50% of the current selling expenses along with 50% expenses of previous month.

Cash Budget for the Periods (April and June)

Particulars	April (₹)	May (₹)	June (₹)
Opening Cash Balance	40,000	59,800	95,300
Cash Receipts			
Sales	1,24,000	1,30,000	1,22,000
Total Receipts (A)	1,64,000	1,89,800	2,17,300
Payments			
Plant Purchased	----------	----------	5,000
Tax payable	6,000	---------	--------
Purchases	80,000	76,000	78,000
Dividend payable	---------	---------	10,000
Wages	8,400	8,800	9,000
Office expenses	5,600	5,400	5,600
Selling expenses	4,200	4,300	4,000
Total Payments (B)	1,04,200	94,500	1,11,600
Balance (A-B)	59,800	95,300	1,05,700

Self Assessment

Fill in the blanks:

6. The preparation of the production budget is mainly dependent on the ..... budget.

7. The production volume is connected to the ..... environment of the firm.

8. ..... budget takes place only after identifying the number of finished products expected to produce to the tune of production budget.

Notes

9. ..... Budget is one of the important sub functional budgets, prepared by the sales manager.
10. Cost control contains two different processes one is the ..... of the budget and another one is the ..... of the prepared budget.
11. ..... overhead is the expense incurred for the promotion of the sales.

8.4 Classification of the Budget in accordance with the Flexibility

8.4.1 Fixed Budget

It is a budget known as constant budget, never registers the changes in the preparation of a budget, being prepared for irrespective level of output or production. This budget is mainly meant for the fixed overheads of the firm which are constant in volume irrespective level of production. The ultimate utility of the budget is to control the cost as a cost controlling measure, but the fixed budget is meaningless in having comparison with the actual performance.

8.4.2 Flexible Budget

Flexible budget is prepared for any level of production as an estimate of statement of all expenses i.e. the expenses are classified into three categories viz. variable, semi-variable and fixed expenses. The structure of the budget for any output is only to the tune of the actual performance achieved. This is the budget facilitates not only to have comparison in between various levels of production but also to identify the level of lowest production cost.

Note Utilities of the flexible budget:

1. This budget is most useful tool of analysis in studying the sales at when the circumstances are not warranting to predict.
2. It is mostly suited to the seasonal business, where the sales volume is getting differed from one period to another due to changes taken place in the taste and preferences of the buyers.
3. The production is being done on the basis of demand of the products in the market. The demand of the products is studied only through demand forecasting. The flexible budget is more applicable in the case of products, which are greatly finding difficult to forecast the demand.
4. The budget is prepared only during the time of acute shortage of resources of production viz. Men, Material and so on.

Example: Draft a flexible budget for overhead expenses on the basis of following information and determine the overhead rates at 70%, 80% and 90% plant capacity.

Particulars	70% capacity	80% capacity (₹)	90% capacity
Variable Overheads			
Indirect Labour	----------	24,000	----------
Stores including spares	----------	8,000	----------
Semi-variable overheads			
Power 30% fixed ,70% variable		40,000	----------

Contd...

Notes

Repairs and maintenance 80% fixed and 20% variable	----------	4,000	----------
Fixed Overheads			
Depreciation	----------	22,000	----------
Insurance	----------	6,000	----------
Salaries	----------	20,000	----------
Total overheads	**----------**	**1,24,000**	**----------**

Flexible Budget for the Period

Particulars	70% capacity	80% capacity	90% capacity
Variable overheads			
Indirect labour	21,000	24,000	27,000
Stores including spares	7,000	8,000	9,000
Semi-variable Expenses - Power* Fixed 30% **Variable 70%	8,000	8,000	8,000
	28,000	32,000	36,000
Repairs and maintenance ***Fixed 80%	3,200	3,200	3,200
****Variable 20%	700	800	900
Fixed Overheads			
Depreciation	22,000	22,000	22,000
Insurance	6,000	6,000	6,000
Salaries	20,000	20,000	20,000
Total Overheads	**1,15,900**	**1,24,000**	**1,32,100**

Master Budget

Immediately after the completion of functional or departmental level budgets, the major responsibility of the budget officer is to consolidate the various budgets together, which is detailed report of all operations of the firm for a definite period.

Self Assessment

State whether the following statements are true or false:

12. Fixed budget is a budget known as constant budget.
13. Fixed budget is most useful tool of analysis in studying the sales at when the circumstances are not warranting to predict.
14. Flexible budget is prepared for any level of production as an estimate of statement of all expenses

8.5 Zero-base Budgeting (ZBB)

Zero-base budgeting is one of the renowned managerial tool, developed in the year 1962 in America by the Former President Jimmy Carter. The name suggests, it is commencing from the scratch, which never incorporates the methodology of the other types of budgeting in determining the estimates. The Zero base budgeting considers the current year as a new year for the preparation of the budget but the yester period is not considered for consideration. The future activities are forecasted through the zero base budgeting in accordance with the future activities.

Notes

Peter A Pyher "A planning and budgeting process which requires each manager to justify his entire budget request in detail from scratch (Hence zero base) and shifts the burden of proof to each manger to justify why he should spend money at all. The approach requires that all activities be analysed in "decision packages" which are evaluated by systematic analysis and ranked in order of importance."

This type of budgeting requires the manager to reason out the aim of spending, but in the case of traditional budgeting is unlike, which are never emphasize the reasons of spending in terms of expenses.

Note

Traditional Budgeting vs. Zero-base Budgeting

Basis of Difference	Traditional Budgeting	Zero-base Budgeting
Emphasis	It is accounting oriented; emphasis on "How Much"	It is more decision oriented; emphasis on "Why"
Approach	It is monitoring towards the expenditures	It is towards the achievement of objectives
Focus	To study the changes in the expenditures	To study the cost benefit analysis
Communication	It operates only Vertical communication	It operates in both directions horizontally and vertically
Method	It is based on the extrapolation i.e from the yester figures future projections are carried out	Its decision package is totally based on the cost benefit analysis.

8.5.1 Steps involved Zero-base Budgeting

1. The very first step is to prepare the Zero-base Budgeting is to enlist the objectives.
2. The extent of application should be decided in the next phase of the ZBB.
3. The next important stage is to prioritize the activities.
4. The Most important step involved in the process of ABB is cost benefit analysis.
5. The final step is to select, approve the decision packages and finalise the budget.

8.5.2 Benefits of Zero-base Budgeting

1. It acts as guide for the management to allocate the resources more accurately depends upon the priority for an effective implementation.
2. It enhances capability of the managers who prepares the budget for future action.
3. It paves way for optimum utilization of resources available.
4. It is a technique of utilitarian of the resources with reference to the activity involved.
5. It is dome shaped only towards the achievement of organizational goals.

8.5.3 Criticism of Zero-based Budgeting

1. Non-financial matters cannot be considered for the cost and benefit analysis.
2. Difficulties involved in the process of ranking of the decision packages.
3. It needs more time span for preparation and cost of operations is more and more.

Self Assessment

Notes

Fill in the blanks:

15. The ..... considers the current year as a new year for the preparation of the budget.

16. The very first step is to prepare the Zero-base Budgeting is to enlist the ..... .

8.6 Summary

- Budget is an estimate prepared for definite future period either in terms of financial or non-financial terms.
- Cost control contains two different processes one is the preparation of the budget and another one is the control of the prepared budget.
- The production budget is a statement of goods, how much should be produced.
- The ultimate aim of the production budget is to find out the volume of production to be made during the year based on the sale volume.
- Sales Budget is an estimate of anticipation of sales in the near future prepared by the responsible person for the sale of a product by considering the various factors of influence.
- The expected increase or decrease in the sales volume should be incorporated at the time of preparing the sales budget from the yester periods sale figures.
- Cash budget is nothing but an estimation of cash receipts and cash payments for specified period. It is prepared by the head of the accounts department, i.e. Chief Accounts Officer.
- Constant budget is mainly meant for the fixed overheads of the firm, which are constant in volume irrespective level of production.
- Zero-base budgeting is one of the renowned managerial tools, developed in the year 1962 in America by the Former President Jimmy Carter.
- The Zero-base budgeting considers the current year as a new year for the preparation of the budget but the yester period is not considered for consideration.
- The future activities are forecasted through the zero base budgeting in accordance with the future activities.

8.7 Keywords

Budget: A financial statement prepared for specified activity for future periods.

Budgeting: Activity of preparing the budget is known as budgeting.

Budget Control: Quantitative controlling technique to assess the performance of the organization.

Cash Budget: It is a statement prepared by the organization to identify the future needs and receipts of cash from the yester activities.

Flexible Budget: It is a financial statement prepared on the basis of principle of flexibility to identify the cost of the unknown level of production from the existing level of operational capacity.

Notes

8.8 Review Questions

1. From the following figures extracted from the books of KPZ Ltd., Prepare raw materials procurement budget on cost:

Particulars	A	B	C	D	E	F
Estimated stock on Jan. 1	16,000	6,000	24,000	2,000	14,000	28,000
Estimated stock on Jan. 31	20,000	8,000	28,000	4,000	16,000	32,000
Estimated consumption	1,20,000	44,000	1,32,000	36,000	88,000	1,72,000
Standard price per unit	25 p	.10p	.50p	.30p	.40p	.50p

2. Sankaran Bros sell two products A and B, which are manufactured in one plant. During the year 2006, the firm plans to sell the following quantities of each product.

Product	April-June	July-September	October- December	January-March
Product A	90,000	2,50,000	3,00,000	80,000
Product B	80,000	75,000	60,000	90,000

Each of these two products is sold on a seasonal basis Sankaran Bros, plan to sell product A through out the year at price of ₹ 10 a unit and product B at a price of ₹ 20 per unit.

A study of the past experiences reveals that Sankaran bros has lost about 3% of its billed revenue each year because of returns (constituting 2% of loss if revenue allowances and bad debts 1% loss).

Prepare a sales budget incorporating the above information.

3. Gopi & Co. Ltd. produces two products, Alpha and Beta. There are two sales divisions viz. North and South. Budgeted sales of the year ended 31st December 2004 were as follows.

Division	Products	Units	Price per unit (₹)
North	Alpha	25,000	10
	Beta	15,000	5
South	Alpha	24,000	10
	Beta	30,000	5

Actual sales for the period were

Product	North	South
Alpha	28,000 units @ ₹ 10 each	25,000 units @ ₹ 10 each
Beta	18,000 units @ ₹ 5 each	33,000 units @ ₹ 5 each

On the basis of assessments of the salesmen the following are the observations of sales division for the year ending 31st December 2005:

North Alpha budgeted increase of 40% on 2004 budget

Beta budgeted increase of 10% on 2004 budget

South Alpha budgeted increase of 12% on 2004 budget

Beta budgeted increase of 15% on 2004 budget

It was further decided that because of the increased sales campaign in North an additional sales of 5,000 units of product will result.

Prepare the sales budget for 2005 (a) zonewise (b) productwise.

Notes

4. From the following information prepare a cash budget for the months of June and July.

Month	Credit Sales (₹)	Credit Purchase (₹)	Manufacturing (₹)	Selling Overheads (₹)
April	80,000	60,000	2,000	3,000
May	84,000	64,000	2,400	2,800
June	90,000	66,000	2,600	2,800
July	84,000	64,000	2,000	2,600

Additional Information:

(a) Advance tax of ₹ 4,000 payable in June and in December 2004.

(b) Credit period allowed to debtors is two months.

(c) Credit period allowed by the vendors or suppliers.

(d) Delay in the payment of other expenses one month.

(e) Opening balance of cash on 1st June is estimated as ₹ 20,000.

5. The expenses for budgeted production of 10,000 units in a factory are furnished below:

Particulars	Per unit
Material	70
Labour	25
Variable overheads	20
Fixed overheads (1,00,000)	10
Variable expenses (Direct)	5
Selling expenses (10% fixed)	13
Distribution expenses (20% fixed)	7
Administration expenses (₹ 50,000)	5
Total cost per unit	155

Prepare a budget for production of:

(a) 8,000 units

(b) 6,000 units

(c) Calculate the cost per unit at both levels.

Assume that administration expenses are fixed for all level of production.

6. From the following information relating to 2003 and conditions expected to prevail in 2004, prepare a budget for 2004:

State the assumption you have made, 2003 actuals

Sales	1,00,000 (40,000 units)
Raw materials	53,000
Wages	11,000
Variable overheads	16,000
Fixed overheads 2004 prospects	10,000
Sales	1,50,000 (60,000 units)
Raw Materials	5 per cent price increase

Notes

Wages	10 per cent increase in wage rates
	5 per cent increase in productivity
Additional plant	One lathe ₹ 25,000
	One drill ₹ 12,000

7. "Budgetary control is a system which uses budgets as a means of planning and controlling all aspects of producing and/or selling commodities and services." Comment.

8. If the current year production is not equivalent to the current year sales, why does the closing stock arise in the business?

9. What do you think are the causes behind an unfavorable fixed overhead budget variance?

10. Victoria Kite Company, a small Melbourne firm that sells kites on the web wants a master budget for the next three months, beginning January 1, 2005. It desires an ending minimum cash balance of $5,000 each month. Sales are forecasted at an average wholesale selling price of $8 per kite. In January 1, Victoria Kite is beginning Just-In-Time (JIT) deliveries from suppliers, which means that purchases equal expected sales.

    On January 1, purchases will cease until inventory reaches $6,000, after which time purchases will equal sales. Merchandise costs average $4 per kite. Purchases during any given month are paid in full during the following month. All sales are on credit, payable within 30 days, but experience has shown that 60% of current sales are collected in the current month, 30% in the next month, and 10% in the month thereafter. Bad debts are negligible.

    Monthly operating expenses are as follows:

Wages and Salaries	$15,000
Insurance Expired	125
Depreciation	250
Miscellaneous	2,500
Rent 250/Month + 10% of Quarterly	
Sales over	$10,000

    Cash dividends of $1,500 are to be paid quarterly, beginning January 15, and are declared on the fifteenth of the previous month. All operating expenses are paid as incurred, except insurance, depreciation and rent. Rent of $250 is paid at the beginning of each month, and the additional 10% of sales is paid quarterly on the tenth of the month following the end of the quarter. The next settlement is due January 10. The company plans to buy some new fixtures for $3,000 cash in March.

    Money can be borrowed and repaid in multiples of $500 at an interest rate of 10% per annum. Management wants to minimize borrowing and repay rapidly. Interest is computed and paid when the principal is repai(d) Assume that borrowing occurs at the beginning, and repayments at the end of he months in question. Money is never borrowed at the beginning and repaid at the end of the same month. Compute the interest to the nearest dollar.

Assets as on Dec. 31, 2004;	Liabilities as on Dec. 31, 2004
Cash $5,000;	Accounts Payable (Merchandise) $35,550
Accounts Receivable 12,500;	Dividends Payable 1,500
Inventory* 39,050;	Rent Payable 7,800
Unexpired Insurance 1,500	

Notes

Fixed assets, net 12,500

* November 30 inventory balance = $16,000

Recent and Forecasted sales:

October = $38,000, December = $25,000, February = $75,000, April = $45,000

November = 25,000, January = 62,000, March = 38,000

Prepare a master budget including a budgeting income statement, balance sheet, statement of cash receipts and disbursements, and supporting schedules for the months January through March 2005.

11. In the above question, analyse if and why there is a need for a bank loan and what operating sources provides the cash for the repayment of the bank loan?

Answers: Self Assessment

1.	quantitative	2.	Budgetary control
3.	future	4.	delegated
5.	total volume	6.	sales
7.	internal	8.	Materials/Purchase
9.	Sales Overhead	10.	preparation, control
11.	Variable sales	12.	True
13.	False	14.	True
15.	Zero-base budgeting	16.	objectives

8.9 Further Readings

Books

B.M. Lall Nigam and I.C. Jain, *Cost Accounting,* Prentice-Hall of India (P) Ltd.

Hilton, Maher and Selto, *Cost Management*, 2nd Edition, Tata McGraw-Hill Publishing Company Ltd.

M.N. Arora, *Cost and Management Accounting*, 8th Edition, Vikas Publishing House (P) Ltd.

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Notes

Unit 9: Introduction to Management Accounting

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Objectives

After studying this unit, you will be able to:

- Explain the meaning of management accounting
- Describe the nature and scope of management accounting
- State the limitations of management accounting
- Discuss the relationship of financial, cost and management accounting

Introduction

Management accounting as a new branch of accounting is of recent origin. Financial accounting recorded business transactions on double-entry basis and helped ascertainment of profit or loss for the given period and valuation of stock of assets and liabilities on a given date. Financial accounting enabled the concern with the liabilities and safeguard the assets entrusted and therefore was also known as custodial or stewardship accounting. Basically meant for consumption of owners, creditors, statutory authorities, the reporting was for a concern as a whole.

Management accounting is the accounting system for making decisions of the business enterprise. Management accounting furnishes the necessary information to assist the business enterprise to make rational decisions through the development of policies and procedures in order to meet the day to day commitments of the enterprise.

9.1 Meaning of Management Accounting

The term 'Management Accounting' refers to accounting for the management. Management accounting provides necessary information to assist the management in the creation of policy and in the day-to-day operations. It enables the management to discharge all its functions, i.e., planning, organization, staffing, direction and control efficiently with the help of accounting information.

Definitions

Notes

The following are some definitions of management accounting:

"Management accounting is concerned with accounting information that is useful to management."

—R.N. Anthony

"Management accounting is the presentation of accounting information in such a way as to assist management in the creation of policy and in the day-to-day operations of an undertaking."

—Anglo American Council of Productivity

"The phase of accounting that is concerned with providing information to Managers for the use of planning and controlling operations and for use in decision-making."

—Ray K. Harrison

"Any form of accounting which enables a business to be conducted more efficiently."

—Institute of Chartered Accountants, England

"Management accounting is the identification, measurement, accumulation, analysis, preparation, interpretation and communication of information that assists the executive in fulfilling organizational objectives." ***—C.T. Horngren***

"The application of accounting and statistical techniques to the specific purpose of producing and interpreting information designed to assist management in its function of promoting maximum efficiency and in envisaging, formulating and co-ordinating future plans and subsequently in measuring their execution."

—Association of Certified Accountants

"Management accounting is concerned with accounting information which is useful to management." ***—Robert Anthony***

"Management accounting is the presentation of accounting information in such a way to assist management in creation of policy and in the day-to-day operation of the undertaking."

—Anglo American Productivity Report

"More intimate merger of the two older professions of management and accounting means for their satisfaction." ***—Smith***

"Information generated by accountants for managers." ***—Anonymous***

In sum, we can say by going through these definitions, that management accounting by the use of various techniques provides information useful for planning and controlling the progress of an organization towards its goals efficiently.

Caution The accountants generate the information for the use of management.

Self Assessment

Fill in the blanks:

1. ..... provides necessary information to assist the management in the creation of policy and in the day-to-day operations.
2. The accountants generate the information for the use of ..... .

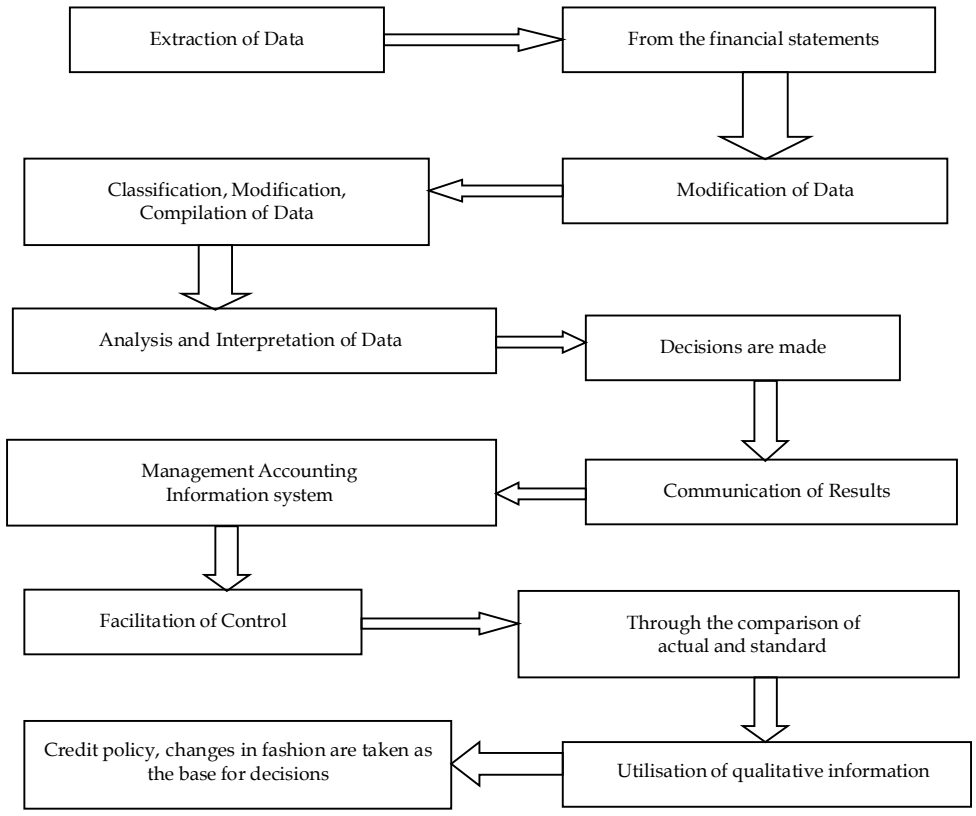
Notes

9.2 Nature and Scope of Management Accounting

The scope of management accounting is broader which draws concept and applications from various disciplines. The two major dominant forces of management accounting are financial accounting and cost accounting.

1. ***Financial Accounting:*** It is a traditional method of accounting that supplies historical information about the firm during the past. Whatever information extracted is being utilized for the constructive future policies and financial forecasting of the firm. For example, from the yesteryear financial statements, the firm could plan the volume of sales, volume of purchases, size of the debtors, creditors, stock of the firm, cash required by the firm on everyday to meet financial commitments and so on.
2. ***Cost Accounting:*** It is another important process of accounting which affords the cost information of either product or service of the firm and analyses and interprets them through various tools viz marginal costing, standard costing, process costing, unit costing, batch costing and so on, for the formulation of policies and assist the firm to carry out the operations of the undertaking.
3. ***Statistical Methods:*** It is another component of management accounting which plays a pivotal role in presentation of information through charts, diagrams etc. by the various departments.
4. ***Operations Research:*** It is an inevitable tool complementing the management accounting in deriving rational decisions through decision tree analysis and so on.

Note **Functions of Management Accounting**



Notes

9.3 Limitations of Management Accounting

The following are the key limitations of management accounting:

1. It is based on the past or yesteryear information of cost accounting and financial accounting which influences the effectiveness of the entire management accounting.
2. Though broader in scope, which paves way for inaccuracy of results.
3. It is nascent in stage, which leads to a lot of confusion among the decision makers while interpreting the information.
4. The installation of a system leads to opposition among the working people due to different rules, regulations, procedures and so on.
5. Management accounting is considered as a tool of management in making decisions; made only by the management but not by the management accountant.

Self Assessment

Fill in the blanks:

3. ..... is a traditional method of accounting that supplies historical information about the firm during the past.
4. ..... is an inevitable tool complementing the management accounting in deriving rational decisions through decision tree analysis and so on.
5. Management accounting is considered as a tool of management in making decisions; made only by the ..... .
6. The two major dominant forces of management accounting are financial accounting and ..... .
7. ..... is another component of management accounting which plays a pivotal role in presentation of information through charts, diagrams etc. by the various departments.

9.4 Relationship of Financial, Cost and Management Accounting

The ICMA, London, defines management accounting as "the application of professional knowledge and skill in the preparation and presentation of accounting information in such a way as to assist management in the formulation of various policies and in the planning and control of the operation of the undertaking".

The American Accounting Association, committee on management accounting, defines management accounting as "the application of appropriate techniques and concepts in processing the historical and projected economic data of an entity to assist management in establishing a plan for reasonable economic objectives and in the making of rational decisions with a view towards achieving these objectives".

Though some number of differences can be identified between cost accounting and management accounting, the line of difference is very thin. Because, cost accounting, at present, comprises of some of the advanced techniques and systems of costing such as budgetary control, marginal costing, standard costing, etc. and therefore, it tends to conform to management accounting. Consequently, not much difference can be found between the two. The main differences between cost accounting and management accounting are given as under:

Notes

Table 9.1: Cost Accounting vs. Management Accounting

Sl.No.	Point of Difference	Cost Accounting	Management Accounting
1.	Objectives	Its main purpose is to ascertain the cost.	Its major objective is to make decisions through supplement presentation of accounting information.
2.	Scope	It deals only with the cost and related aspects.	It not only deals with the cost but also revenue. It is wider than cost accounting.
3.	Utilisation of Data	It uses only quantitative information pertaining to the transactions.	It uses both qualitative and quantitative information for decision-making.
4.	Utility	It ends only at the presentation of information.	It starts from where cost accounting ends; meaningful cost informations are major inputs for decision-making.
5.	Nature	It deals with the past and present data.	It deals with future policies and course of actions.

The cost accounting is very closely-related to financial accounting. Few authorities of accounting consider cost accounting to be the branch of financial accounting. But it may be said that cost accounting is complementary to financial accounting. Financial accounting and cost accounting are both similar in various ways. The main relationship between financial accounting and cost accounting are given as under:

1. The fundamental principles of double entry system are applicable in financial accounting as well as cost accounting.
2. The results of business or organisation are revealed by both the systems of accounts.
3. The determination of future business activities and policy is guided by both accounting systems.
4. A basis for comparison of expenditures is being provided by both the accounting systems.
5. The invoices and vouchers constitute the common basis for recording transactions under both the systems of accounting.
6. The causes for losses and wastages of a business or industry are provided by financial and cost accounting.

The main differences between financial accounting and cost accounting are given as under:

Table 9.2: Financial Accounting vs. Management Accounting

Sl.No.	Point of Difference	Financial Accounting	Management Accounting
1.	Objectives	The supply of information about the enterprise through P&L A/c and balance sheet to outside parties -Mainly for external use.	Information is supplied with the purpose of making decisions – for internal use only.
2.	Analysis of performance	It extends over the total performance of the firm in general.	It deals with detailed analysis of performance of each and every department of the organisation.
3.	Utilisation of Data	It handles only the past data of the enterprise.	It envisages the future policies and plans.
4.	Nature	It is a measurement of performance i.e. more objective.	It is a judgment of performance—more subjective.

Contd...

Notes

5.	Accuracy of results	It has to ensure the accuracy forever.	It need not, instead it is mainly for internal use depends upon approximation.
6.	Legal responsibility	Compulsory for joint stock companies – Accounting period concept.	It is not compulsory but optional.
7.	Limitation on transactions	It provides room only for the monetary transactions.	It considers both monetary and non- monetary transactions at a time together—Qualitative changes are considered.
8.	Exercise the path of control	Being the contributory of past information; not able to monitor the plans properly.	It is able to highlight the deviations of the actual from the plans and earmark the reasons for the deviations.

Task Prepare the proforma of key financial statements prepared under financial accounting and cost accounting.

Self Assessment

Fill in the blanks:

8. The fundamental principles of ..... are applicable in financial accounting as well as cost accounting.
9. ..... deals with detailed analysis of performance of each and every department of the organisation.
10. Main purpose of ..... is to ascertain the cost.
11. ..... uses only quantitative information pertaining to the transactions.
12. The causes for losses and wastages of a business or industry are provided by ..... and cost accounting.
13. Few authorities of accounting consider cost accounting to be the branch of ..... accounting.
14. The major objective of ..... is to make decisions through supplement presentation of accounting information.
15. The key objective of ..... is to supply information about the enterprise through P&L A/c and balance sheet to outside parties.

9.5 Summary

- Management accounting today is a branch of accounting.
- The two major dominant forces of management accounting are financial accounting and cost accounting.
- Financial accounting was found efficient for management decision-making because it reported the state of affairs of the company as a whole posthumously.
- This was all right for the owners and other outsiders. But when management got divested from ownership and the survival of management depended on their competitive performance, financial accounting was found inadequate.

Notes

- Cost accounting became closer to management needs. As time passed by, cost accounting absorbed many decision-making techniques from other branches and became comprehensive.
- Cost finding became one of the many functions. This led to a separate branch called management accounting.
- Management accounting is based on the past or yesteryear information of cost accounting and financial accounting which influences the effectiveness of the entire management accounting.
- The cost accounting is very closely-related to financial accounting.
- Few authorities of accounting consider cost accounting to be the branch of financial accounting.
- The fundamental principles of double entry system are applicable in financial accounting as well as cost accounting.

9.6 Keywords

Cost Accounting: This helps management to conduct performance appraisal and also facilitates in formulating price policies.

Financial Accounting: Financial accounting is a traditional method of accounting that supplies historical information about the firm during the past.

Management Accounting: Management accounting provides necessary information to assist the management in the creation of policy and in the day-to-day operations.

9.7 Review Questions

1. List out the objectives of management accounting.
2. Elucidate the various functions of management accounting.
3. Write brief notes on the scope of management accounting.
4. Distinguish between the management accounting and cost accounting.
5. List out the contradictory areas of interest in between management accounting and financial accounting.
6. Management accounting is the accounting system for making decisions of the business enterprise. Discuss.
7. "Management accounting serves as a tool to management." Analyze this statement.
8. Analysis the scope of management accounting.
9. Write briefly of the evaluation of management accounting.
10. The cost accounting is very closely-related to financial accounting. Give some suggestions to support the above statement.

Answers: Self Assessment

1. Management accounting
2. management
3. Financial Accounting
4. Operations Research

Notes

5. management
6. cost accounting
7. Statistical methods
8. double entry system
9. Management accounting
10. Cost accounting
11. Cost accounting
12. financial
13. financial
14. Management accounting
15. Financial accounting

9.8 Further Readings

Books

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Online link

www.futureaccountant.com

Notes

Unit 10: Analysis of Financial Statements

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Objectives

After studying this unit, you will be able to:

- Describe the tools of financial statement analysis
- Prepare comparative financial statements
- Construct common size statements
- Illustrate trend analysis

Introduction

Financial statement analysis is the process of examining relationships among financial statement elements and making comparisons with relevant information. It is a valuable tool used by investors and creditors, financial analysts, and others in their decision-making processes related to stocks, bonds, and other financial instruments. The goal in analyzing financial statements is to assess past performance and current financial position and to make predictions about the future performance of a company. Investors who buy stock are primarily interested in a company's profitability and their prospects for earning a return on their investment by receiving dividends and/or increasing the market value of their stock holdings. Creditors and investors who buy debt securities, such as bonds, are more interested in liquidity and solvency: the company's short- and long-run ability to pay its debts. Financial analysts, who frequently specialize in following certain industries, routinely assess the profitability, liquidity, and solvency of companies in order to make recommendations about the purchase or sale of securities, such as stocks and bonds.

10.1 Meaning and Concept of Financial Statement Analysis

Analysts can obtain useful information by comparing a company's most recent financial statements with its results in previous years and with the results of other companies in the same

industry. Three primary types of financial statement analysis are commonly known as horizontal analysis, vertical analysis, and ratio analysis.

Horizontal Analysis

When an analyst compares financial information for two or more years for a single company, the process is referred to as horizontal analysis, since the analyst is reading across the page to compare any single line item, such as sales revenues.

Vertical Analysis

When using vertical analysis, the analyst calculates each item on a single financial statement as a percentage of a total. The term vertical analysis applies because each year's figures are listed vertically on a financial statement. The total used by the analyst on the income statement is net sales revenue, while on the balance sheet it is total assets.

Ratio Analysis

Ratio analysis enables the analyst to compare items on a single financial statement or to examine the relationships between items on two financial statements. After calculating ratios for each year's financial data, the analyst can then examine trends for the company across years. Since ratios adjust for size, using this analytical tool facilitates inter-company as well as intra-company comparisons.

Notes The entire financial statement analysis can be classified into various categories:

- Comparative financial statements
- Common size financial statements
- Trend percentages
- Fund flow statements
- Cash flow statements and
- Ratio analysis

Self Assessment

Fill in the blanks:

1. When an analyst compares financial information for two or more years for a single company, the process is referred to as ..... analysis.
2. ..... enables the analyst to compare items on a single financial statement or to examine the relationships between items on two financial statements.
3. When using ....., the analyst calculates each item on a single financial statement as a percentage of a total.

10.2 Tools for Analysis and Interpretation of Financial Statement

In assessing the significance of various financial data, experts engage in ratio analyses, the process of determining and evaluating financial ratios. A financial ratio is a relationship that indicates something about a company's activities, such as the ratio between the company's current assets,

Notes

current liabilities or between its accounts receivable and its annual sales. The basic sources for these ratios are the company's financial statements that contain figures on assets, liabilities, profits, or losses. Financial ratios are only meaningful when compared with other information. Since they are most often compared with industry data, ratios help an individual understand a company's performance relative to that of competitors; they are often used to trace performance over time.

Ratio analysis can reveal much about a company and its operations. However, there are several points to keep in mind about ratios. First, financial statement ratios are "flags" indicating areas of strength or weakness. One or even several ratios might be misleading, but when combined with other knowledge of a company's management and economic circumstances, ratio analysis can tell much about a corporation. Second, there is no single correct value for a ratio. The observation that the value of a particular ratio is too high, too low, or just right depends on the perspective of the analyst and on the company's competitive strategy. Third, a ratio is meaningful only when it is compared with some standard, such as an industry trend, ratio trend, a ratio trend for the specific company being analyzed, or a stated management objective.

In trend analysis, financial ratios are compared over time, typically years. Year-to-year comparisons can highlight trends, pointing to the need for action. Trend analysis works best with five years of data.

The second type of ratio analysis, cross-sectional analysis, compares the ratios of two or more companies in similar lines of business. One of the most popular forms of cross-sectional analysis compares a company's financial ratios to industry ratio averages.

Your report containing the analysis of the financial statements is broken down into the various ratio categories:

1. Predictor Ratios indicate the potential for growth or failure.
2. Profitability Ratios which use margin analysis and show the return on sales and capital employed.
3. Asset Management Ratios which use turnover measures to show how efficient a company is in its operations and use of assets.
4. Liquidity Ratios which give a picture of a company's short-term financial situation or solvency.
5. Debt Management Ratios which show the extent that debt is used in a company's capital structure.

Notes 1. Tools employed in the horizontal analysis are Comparative statements and Trend percentages.

2. Tools employed in the vertical analysis are Common-size financial statements and financial ratios.

Self Assessment

Fill in the blanks:

4. In trend analysis, ... are compared over time, typically years.
5. Financial ..... are only meaningful when compared with other information.
6. Tools employed in the ..... analysis are Common-size financial statements and financial ratios.

Notes

10.3 Comparative Statements

Comparative statements are the financial statements which follow a consistent format but which cover different periods of time. Comparative statements are very useful for spotting trends.

Objectives of Comparative Financial Statements

1. Changes taken place in the financial performance are taken into consideration for further analysis.
2. To reveal qualitative information about the firm in terms of solvency, liquidity profitability and so on are extracted from the analysis of financial statements.
3. With reference to yester financial data of the enterprise, the firm is facilitated to undergo for the preparation of forecasting and planning.

The major part of financial statement analysis is mainly focused on the comparative analysis.

10.3.1 Comparative Balance Sheet

The first and foremost important step is to have the following information and should take preparatory steps:

1. While preparing the comparative statement of balance sheet, the particulars for the financial factors are required.
2. The second most important for the preparation of the comparative balance sheet is yester financial data extracted from the balance sheet or balance sheets.
3. The next most important requirement to have an effective comparison with the yester financial data is current year information extracted from the balance sheet or balance sheet of the firms.
4. After having been procured the financial data pertaining to various time periods are ready for comparison; to determine or identify the level of increase or decrease taken place in the financial position of the firms.
5. To determine the level of increase or decrease in financial position, the percentage analysis to carried out in between them.

Example: From the following information, prepare comparative Balance Sheet of X Ltd.

Particulars	31st Mar, 2004	31st Mar, 2005
Equit share capital	50,00,000	50,00,000
Fixed assets	60,00,000	72,00,000
Reserves and surpluses	10,00,000	12,00,000
Investments	10,00,000	10,00,000
Long-term loans	30,00,000	30,00,000
Current assets	30,00,000	21,00,000
Current liabilities	10,00,000	11,00,000

Solution:

As the first step, we have to segregate the available information into two different categories, viz. Assets and Liabilities.

Notes

*N.C = No change in the position during the two years

Particulars	2004 (₹)	2005 (₹)	Absolute Change (₹)	% Increase	% Decrease
Fixed Assets	60,00,000	72,00,000	12,00,000	20	-
Investments	10,00,000	10,00,000	N.C	-	-
Current assets	30,00,000	21,00,000	(9,00,000)		30
Total Assets	1,00,00,000	1,03,00,000	3,00,000	3	-
Equity share capital	50,00,000	50,00,000	N.C	-	-
Reserves and surpluses	10,00,000	12,00,000	2,00,000	20	-
Long-term loans	30,00,000	30,00,000	N.C	-	-
Current liabilities	10,00,000	11,00,000	1,00,000	10	-
Total Liabilities	1,00,00,000	1,03,00,000	3,00,000	3	-

From the above table, the following are basic inferences:

1. The fixed assets volume got increased 20% from the year 2004 to 2005, amounted ₹ 12,00,000.
2. ₹ 9,00,000 worth of current assets decrease from the year 2004 to 2005 recorded 30%.
3. The total volume of assets recorded 3% increase from the year 2004 to 2005.
4. It obviously understood that 20% increase taken place on the reserves and surpluses.
5. It clearly evidenced that the current liabilities of the firm increased 10% from the year 2004 to 2005.
6. The firm has not recorded any changes in the investments, equity share capital and long-term loans.

10.3.2 Comparative (Income) Financial Statement Analysis

This analysis is being carried out in between the income statements of the various accounting durations of the firm, with other firms in the industry and with the industrial average.

This will facilitate the firm to know about the stature of itself regarding the financial performance. It facilitates to understand about the changes pertaining to various financial data which closely relevantly connected with the financial performance:

1. Change in the gross sales
2. Change in the net sales
3. Change in gross profit and net profit
4. Change in operating profit
5. Change in operating expenses
6. Change in the volume of non-operating income
7. Change in the non operating expenses.

The ultimate purpose of the comparative (income) financial statement analysis is as follows:

1. To study the income earning and expenditure spending pattern of the firm for two or more years.
2. To identify the changing pattern of the income and expenditure of the firms.

Notes

3. The preparatory steps for the preparation of the comparative financial statement (income) analysis

The first and foremost important step is to have the following information and should take preparatory steps:

1. While preparing the comparative statement of Profit & Loss Account, the particulars for the financial factors are required.
2. The second most important for the preparation of the comparative Profit & Loss account is yester financial data extracted from the Profit and Loss A/c or Profit and Loss Accounts.
3. The next most important requirement to have an effective comparison with the yester financial data is current year information extracted from the balance sheet of the firm or of the other firms.
4. After having been procured the financial data pertaining to various time periods are ready for comparison; to determine or identify the level of increase or decrease taken place in the operating financial performance of the firms.
5. To determine the level of increase or decrease in financial performance, the percentage analysis to be carried out in between them.

Example: Prepare the comparative income statement from the following:

Particulars	2004 (₹)	2005 (₹)
Sales	2,00,000	2,50,000
(–) Cost of goods sold	1,00,000	1,30,000
	1,00,000	**1,20,000**
(–) Operating expenses	10,000	10,000
Net profit	**90,000**	**1,10,000**

Solution:

Particulars	2004 (₹)	2005 (₹)	Absolute Change (₹)	% Increase	% Decrease
Sales	2,00,000	2,50,000	50,000	25	-
(–) Cost of goods sold	1,00,000	1,30,000	30,000	30	-
	1,00,000	**1,20,000**	**20,000**	**20**	-
(–) Operating expenses	10,000	10,000	N.C	-	-
Net profit	**90,000**	**1,10,000**	**20,000**	**22.22**	

From the above table, the following inferences can be had:

1. The firm has registered 25% increase in sales from the year 2004 to 2005.
2. Cost of goods sold raised 30% from the year 2004 to 2005.
3. There is no change in the level of operating expenses.
4. The firm has got 22.22% increase in the level of net profits from the year 2004 to 2005.

Self Assessment

Choose the appropriate answer

7. Financial statement analysis is to
   (i) Inter firm comparison

Notes

(ii) Intra firm comparison

(iii) Industrial average comparison

(iv) (i), (ii) & (iii)

8. Comparative financial statement analysis is into

(i) Comparison of income and position statements

(ii) Common size statements

(iii) Trend percentage analysis

(iv) (i), (ii) & (iii)

9. Main objectives of the financial statements analysis is

(i) To study the changes in the financial performance

(ii) To study the liquidity, solvency of the firm

(iii) To undergo financial planning based upon the yester financial performance

(iv) (i), (ii) & (iii)

State whether the following statements are true or false:

10. Comparability between enterprises is more difficult to obtain than comparability within a single enterprise.

11. Computation of ratios for an accounting period is a form of horizontal analysis.

12. Generally, the last concern of a financial analyst is a firm's liquidity.

10.4 Common-size Statements

The next important tool of financial statement analysis is a common size statement analysis which known as predominant tool in intra firm analysis in studying the share of each component.

The components are translated into percentage for analysis and interpretations. For profit and loss account, Net sales is considered as a base for the computation of a share of each financial factor available .

Caution For Balance sheet, total volume of assets and liabilities are taken into consideration for the computation of a share of each financial factor available under the heading of assets and liabilities.

Example: Prepare the common size statement analysis for the firm ABC Ltd.

Liabilities	2000 (₹)	2001 (₹)	Assets	2000 (₹)	2001 (₹)
Share capital	2,00,000	3,00,000	Fixed assets	2,25,000	4,00,000
Reserves and surpluses	1,00,000	2,00,000	Stock	1,29,000	2,00,000
Bank overdraft	60,000	2,00,000	Quick assets	46,000	2,00,000
Quick liabilities	40,000	1,00,000			
	4,00,000	8,00,000		4,00,000	8,00,000

Solution:

Common size statement analysis of the Balance sheet of the firm ABC Ltd.

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Particulars	Amount		% of Balance sheet total	
Assets	**2000 (₹)**	**2001 (₹)**	**2000**	**2001**
Fixed assets	2,25,000	4,00,000	56.25	50
Stock	1,29,000	2,00,000	32.25	25
Quick assets	46,000	2,00,000	11.5	25
	4,00,000	**8,00,000**	**100**	**100**
Liabilities				
Share capital	2,00,000	3,00,000	50	37.5
Reserves and surpluses	1,00,000	2,00,000	25	25
Bank overdraft	60,000	2,00,000	15	25
Quick liabilities	40,000	1,00,000	10	12.5
	4,00,000	**8,00,000**	**100**	**100**

The above illustration highlights the share of every component in the balance sheet out of the total volume of assets and liabilities.

This will certainly facilitate the firm to easily understand not only the share of every component but also facilitates to have a meaningful and relevant comparison with various time horizons.

Self Assessment

State whether the following statements are true or false:

13. Common size financial statements are a widely used vertical analysis technique.
14. A common-size income statement usually shows each revenue or expense item as a percentage of net sales.

10.5 Trend Analysis

The next important tool of analysis is trend percentage which plays significant role in analyzing the financial stature of the enterprise through base years' performance ratio computation. This not only reveals the trend movement of the financial performance of the enterprise but also highlights the strengths and weaknesses of the enterprise.

The following ratio is being used to compute the trend percentage

$$= \frac{\text{Current year}}{\text{Base year}} \times 100$$

This trend ratio is being computed for every component for many numbers of years which not only facilitates comparison but also guides the firm to understand the trend path of the firm.

In the analysis of financial information, trend analysis is the presentation of amounts as a percentage of a base year.

Example: If I want to see the trend of a company's revenues, net income, and number of clients during the years 2001 through 2007, trend analysis will present 2001 as the base year and the 2001 amounts will be restated to be 100. The amounts for the years 2002 through 2007 will be presented as the percentages of the 2001 amounts.

In other words, each year's amounts will be divided by the 2001 amounts and the resulting percentage will be presented. If revenues for the years 2001 through 2007 might have been

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₹ 31,691,000; ₹ 40,930,000; ₹ 50,704,00; ₹ 63,891,000; ₹ 79,341,000; ₹ 101,154,000; ₹ 120,200,000. These revenue amounts will be restated to be 100, 129, 160, 202, 250, 319, and 379.

From this trend analysis we can see that revenues in 2007 were 379% of the 2001 revenues, net income in 2007 was 467% of the 2001 net income, and the number of clients in 2007 was 317% of the number in 2001.

Let's assume that the net income amounts divided by the 2001 amount ended up as 100, 147, 206, 253, 343, 467, and 423. The number of clients when divided by the base year amount are 100, 122, 149, 184, 229, 277, and 317.

Example: In the following example, 2005 has been taken as a base year for the calculation of the sales trend. According to the trend shown below, determine whether the company has made an overall growth or not.

Trend Percentages

	2009	2008	2007	2006	2005
Historical Data					
Inventory	$ 12,309	$12,202	$12,102	$11,973	$11,743
Property & equipment	74,422	78,938	64,203	65,239	68,450
Current liabilities	27,945	30,347	27,670	28,259	26,737
Sales	129,000	97,000	95,000	87,000	81,000
Cost of goods sold	70,950	59,740	48,100	47,200	45,500
Operating expenses	42,600	38,055	32,990	29,690	27,050
Net income (loss)	8,130	(1,400)	7,869	5,093	3,812
Trend Percentages					
Inventory	104.8	103.9	103.1	102.0	100.0
Property & equipment	108.7	115.3	93.8	95.3	100.0
Current liabilities	104.5	113.5	103.5	105.7	100.0
Sales	159.3	119.8	117.3	107.4	100.0
Cost of goods sold	155.9	131.3	105.7	103.7	100.0
Operating expenses	157.5	140.7	122.0	109.8	100.0
Net income (loss)	213.3	(36.7)	206.4	133.6	100.0

Solution:

We have to remember that the base year trend percentage is always 100.0%. A trend percentage of less than 100.0% means the balance has decreased below the base year level in that particular year. A trend percentage greater than 100.0% means the balance in that year has increased over the base year. A negative trend percentage represents a negative number.

Also, if the base year is zero or negative, the trend percentage calculated will not be meaningful.

In this example, the sales have increased 59.3% over the five-year period while the cost of goods sold has increased only 55.9% and the operating expenses have increased only 57.5%. The trends look different if evaluated after four years. At the end of 2008, the sales had increased almost 20%, but the cost of goods sold had increased 31%, and the operating expenses had increased almost 41%. These 2008 trend percentages reflect an unfavorable impact on net income because costs increased at a faster rate than sales. On an overall basis, the trend percentages for net income appear to be higher because the base year amount is much smaller than the other balances.

Using the restated amounts from trend analysis makes it much easier to see how effective and efficient the company has been during the recent years. Trends may be categorized as:

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1. Short-term trends capture rapidly emerging trends.
2. Mid-term trends capture trends developing in between.
3. Long-term trends capture trends developing over long periods.

Trend analysis is also advantageous for (short-term) sales forecasting, growth rates, growth percentages, trend significance, trending types, and so on. Use of trend analysis includes:

1. Sales trend analysis – revenue and volume analysis.
2. Product sales trend analysis.
3. Market trend analysis.
4. Equity (share) price trend analysis.
5. Accounting trend analysis.
6. Work force recruit forecasting.
7. Healthcare fraud detection and so on.

Timely identification of newly emerging trends is very important to businesses. Trend analysis can also include the monitoring of a company's financial ratios over a period of many years.

Self Assessment

Fill in the blanks:

15. In the analysis of financial information, trend analysis is the presentation of amounts as a ..... of a base year.
16. Trend analysis can also include the monitoring of a company's ..... over a period of many years.

Task In financial statement analysis, what is the basic objective of observing trends in data and ratios? Suggest some other standards of comparison.

Case Study

Evaluation of Ford on the basis of Accounting Trends

The success of Ford Motor Company, as well as other corporations, can be measured by analyzing the two most important goals of management, maintaining adequate liquidity and achieving satisfactory profitability. Liquidity can be defined as having enough money on hand to pay bills when they are due and to take care of unexpected needs for cash, while profitability refers to the ability of business to earn a satisfactory income. To enable investors and creditors to analyze these goals, Ford Motor Company distributes annual financial statements. With these financial statements, liquidity of Ford Motor Company is measured by analyzing factors such as working capitol, current ratio, quick ratio, receivable turnover, average days' sales uncollected, inventory turnover and average days' inventory on hand; whereas profitability analyzes the profit margin, asset turnover, return on assets, debt to equity, and return on equity factors.

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Liquidity

Working Capital

Ford Motor Company's working capital fluctuated significantly in the years 1991-1995. This phenomenon is directly attributable to the fact that Financial Services current assets and current liabilities are not included in the total company current asset and current liability accounts. For example, the fluctuation from 1994 ($1.4 billion) to 1995 (-$1.5 billion) of $2.5 billion would suggest that Ford would be unable to pay liabilities during the current period. However, examination of the Financial Services side of the business reveals that surpluses of $13.6 billion existed in both 1994 and 1995, convincingly mitigating the figures indicating negative working capital.

Current Ratio & Quick Ratio

The current ratio in the years 1991-1995 has remained stable, fluctuating between 0.9 and 1.1. The quick ratio has also remained stable, fluctuating between 0.5 and 0.6. The larger fluctuation in the current ratio versus the quick ratio is caused by inventories being included in the asset side of the equation. Although inventories were significantly higher in both 1994 and 1995, current liabilities were also higher. In addition, marketable securities decreased substantially in 1994 and 1995. These factors resulted in the stability of both the current ratio and quick ratio.

Receivable Turnover & Average Days' Sales Uncollected

An examination of trends in Ford Motor Company's receivable turnover and average days' sales uncollected ratios reveal positive indicators of Ford's liquidity position. The receivable turnover, a function of net sales and average accounts receivable, has nearly doubled in the years 1993-1995 versus 1991-1992. This trend indicates an extensive increase of net sales in relation to accounts receivable. Receivables were relatively higher in 1994 than in any other of the five years, affecting the ratio for both 1994 and 1995. However, net sales increased 30% in 1994 and 34% in 1995 over the average net sales of 1991-1993. The average days' sales uncollected ratio has decreased significantly over the same period, from 16.9 days in 1991 to 9.7 days in 1995. The substantial decrease in average days' sales uncollected ratio coupled with the near doubling of the receivable turnover ratio is a reflection of Ford's strong sales and effective credit policies in years 1993-1995.

Inventory Turnover & Average Days' Inventory on Hand

An examination of trends in the inventory turnover and average days' inventory on hand ratios also reveal positive indicators of Ford's liquidity position. Inventory turnover, a function of cost of goods sold and inventories, has remained stable between 14.0 and 16.0 times from 1992-1995. The average ratio over these four years (15.1 times) is 40% higher than that of 1991. The average days' inventory on hand, a derivative of the inventory turnover, has conversely decreased to stable level fluctuating between 23.5 and 26.0 days in the years 1992-1995. The operating cycle of Ford Motor Company has decreased significantly as the table below indicates.

	1991	1992	1993	1994	1995
Days:	50.8	29.0	33.8	31.1	34.3

Profitability

Profit Margin

Profit margin, which is net income divided by net sales, is a measure of how many dollars of net income is produced by each dollar of sales. Ford Motor Company had a substantial 4 year rise in profit margin. Using horizontal analysis, the profit margin increased 98% from

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1991 to 1992, 566% from 1992 to 1993 and then 79% from 1993 to 1994. Although the profit margin from 1994 to 1995 decreased 26%, that is more than acceptable when you look at the substantial increases in the past few years. In the first year, Ford had a profit margin of -3.1%. That means for every dollar of sales, Ford lost $3.10. This is obviously not a good position to be in. During 1991 and then carried over into 1992, it cost Ford more money to make sales than it did when it recorded the income for those sales. They realized at this time it was important for them to keep things such as selling and administrative expenses lower, as well as the cost of sales, which included their production, manufacturing, and warehousing costs. By following a plan more complex than I can describe here, Ford steadily increased it's sales while it lowered it's expenses and it's cost of sales. This directly increased Ford's profit margin at a substantial rate within the next three years.

Asset Turnover

Asset turnover involves Ford's net sales divided by their average total assets. This ratio demonstrates the efficiency of assets used in producing sales. A company like Ford Motor Company has an enormous amount of assets. Computers to heavy equipment to buildings. All of those assets, plus many more, are all taken into consideration when figuring asset turnover. For example, Ford would like to know that if it decides to purchase 20 new computer-aided engineering stations for a cost of about $2,400,000, they would like to see a higher asset turnover to give them the proof that the investment is being used at maximum efficiency. Ford's asset turnover steadily increased in incremental amounts between the years of 1991-1995, but on average it was about .43 for the entire 5 year period. Using trend analysis to understand this ratio would give you a pretty good idea that the asset turnover of Ford Motor Company is stable. Trend analysis would give you an index number for 1992 of 100, while the index number for 1995 would be 112. These index numbers would result in a slightly positive but relatively straight line across the page. As a prospective investor this would probably cause you to investigate more deeply as to why Ford can't more efficiently use their assets to produce sales. As a current stockholder, this trend over the past five years may give you some comfort because of the incremental increases (at least it isn't going down).

Return on Assets

Return on assets is a very good profitability ratio. It is comprehensive when compared to profit margin and asset turnover. Return on assets overcomes the deficiency of profit margin by relating the assets necessary to produce income and it overcomes the deficiency of asset turnover by taking into account the amount of income produced. Mathematically, return on assets is equal to net income divided by average total assets, or more simply put, profit margin times asset turnover. Ford can improve it's overall profitability by increasing it's profit margin, the asset turnover, or both. Looking at the numbers, it was actually Ford's increase in profit margin that really gave it the boost it needed to raise the return on assets from the black to the red. A steady increase in return on assets from -1.3% in 1991 to an acceptable 2.2% in 1994 is a good sign to investors. This steady climb of 169% resulted in an overall increase in the earning power of Ford Motor Company. Ford's increase in profitability shows satisfactory earning power which results in investors continuing to provide capital to it.

Debt to Equity

The debt to equity ratio shows the portion of the company financed by creditors in comparison to that financed by the stockholders. It is total liabilities divided by stockholder's equity. Ford's debt to equity ratio is relatively high. When measuring profitability, a high debt to equity ratio means the company has high debt and must earn more profit to protect the payment of interest to it's creditors. This high debt to equity ratio would also interest

Contd...

Notes

stockholders because it shows what part of the business is financed through borrowing or in other words, is debt financed. Of the five years we analyzed, the lowest debt to equity ratio was during 1991 (6.65) and the highest was in 1993 (11.71). In comparison to return on assets, a higher creditor financed year such as 1991 did not have an positive effect on profitability. It seemed that through increased borrowing in 1993, a higher debt to equity ratio was produced, but overall profitability also went up. Debt to equity is only one part in a full profitability analysis. The only real information that the debt to equity ratio can produce is it can show how much expansion is possible through the borrowing of long-term funds; basically it show's a company's long-term solvency. A higher debt to equity ratio essentially means that the company will be able to borrow less money. The company must rely more on stockholder investment. Ford was able to lower it's borrowing of funds from 1993 through 1994 and into 1995, while still effectively increasing it's profit margin and return on assets. This means Ford was able to use stockholder's investments to increase it's profitability rather than borrow the funds to do it.

Return on Equity

Return on equity is the ratio of net income divided by the average stockholder's equity. This ratio is of great interest to stockholders because it shows how much they have earned on their investment in the business. In the years of 1991 and 1992, stockholders lost money on their investment in Ford Motor Company. No one likes to lose money, even if it is a couple of cents on the dollar. A major stockholder could incur quite a loss because of this. In the next three years, return on equity was on the positive side, the peak being in 1994 when stockholders earned about 28% on every dollar invested. Quite a good return considering some investors are happy with a steady 8% return. Considering the previous years, the return on equity for Ford seems to be positive. Common knowledge dictates that most companies experience a downturn every now and then. Ford's investors are able to remain invested in the company because it's overall 5 year return on equity is high enough to give investors the high returns they seek. A return on equity consistently above 16% with a few negative years mixed in is certainly lucrative enough to maintain a strong profitability measurement and project a positive image to the investors of Ford Motor Company.

Conclusion

Although Ford Motor Company is one of the largest companies in the world, we can still attribute accounting trends to some of the key events in Ford's history. In 1990, Ford acquired Jaguar Cars, Ltd. Jaguar was a company suffering terrible loses due to poor quality, and lack of sales. Jaguar has been in the black since Ford purchased them until 1994. It is important to note that Ford's net income trend from 1991 to 1995 illustrates this. In 1992, the Ford Taurus became the number one selling car in the United States, which helped increase 1992 net earnings, and in 1994 the Ford Falcon was the top selling car in Australia, helping maintain the trend of increasing net income. It is important to note that Ford's net income has increased from 1991 to 1994, and then decreased in 1995. There are several possible causes for this change in the trend. In 1995, Ford acquired 20% equity in a major Chinese truck manufacturer, and launched several new vehicles; including the Ford Contour, Ford Mondeo, Mercury Mystique, Ford F-150, and Ford Taurus. These additional investments and expenses help explain the decrease in net income in 1995. Overall, the company has done well, and with reorganization in 1996 to decrease spending and increase efficiency, Ford is striving for future periods of growth.

Questions

1. What do you see as the main cause behind the result of trend analysis at Ford?
2. "Ford was able to use stockholder's investments to increase it's profitability rather than borrow the funds to do it". Justify the statement on the basis of the case.

Source: www.ghostpapers.com

Notes

10.6 Summary

- Financial statement analysis can be explained as a method used by interested parties such as investors, creditors, and management to evaluate the past, current, and projected conditions and performance of the firm.
- Under the financial statement analysis, the information available are grouped together in order to cull out the meaningful relationship which is already available among them; for interpretation and analysis.
- Three primary types of financial statement analysis are commonly known as horizontal analysis, vertical analysis, and ratio analysis.
- To reveal qualitative information about the firm in terms of solvency, liquidity, profitability, etc., are extracted from the analysis of financial statements.
- Comparative (income) financial statement analysis is being carried out in between the income statements of the various accounting durations of the firm, with other firms in the industry and with the industrial average.
- After having been procured the financial data pertaining to various time periods are ready for comparison; to determine or identify the level of increase or decrease taken place in the operating financial performance of the firms.
- Trend analysis involves calculating each year's financial statement balances as percentages of the first year, also known as the base year. When expressed as percentages, the base year figures are always 100 percent, and percentage changes from the base year can be determined.

10.7 Keywords

Assets: Assets are economic resources owned by business or company.

Balance Sheet: A balance sheet or statement of financial position is a summary of a person's or organization's balances.

Comparative Statements: Comparative statements are the financial statements which follow a consistent format but which cover different periods of time. Comparative statements are very useful for spotting trends.

Financial Statement: A written report which quantitatively describes the financial health of a company.

Trend Analysis: In trend analysis, financial ratios are compared over time, typically years.

10.8 Review Questions

1. From the following information, prepare a comparative income statement:

Particulars	2001 (₹)	2002 (₹)
Sales	10,00,000	8,00,000
Cost of goods sold	6,00,000	4,00,000
Administration Expenses	2,00,000	1,40,000
Other Income	40,000	20,000
Income tax	1,20,000	1,40,000

Notes

2. From the following table, prepare the common size statement analysis:

Particulars	2000 (₹)	2001 (₹)
Sales	20,00,000	24,00,000
Miscellaneous Income	20,000	16,000
	20,20,000	**24,16,000**
Materials consumed	11,00,000	12,96,000
Wages	3,00,000	4,08,000
Factory expenses	2,00,000	2,16,000
Office expenses	90,000	1,00,000
Interest	1,00,000	1,20,000
Depreciation	1,40,000	1,50,000
Profit	90,000	1,26,000
	20,20,000	**24,16,000**

3. A company has owner's equity of ₹ 1,00,000. It has supplied the following accounting ratios:

   Current Debt to Total Debt = 0.40

   Total Debt to Owner's Equity = 0.60

   Fixed Assets to Owner's Equity = 0.60

   Total Assets Turnover = 2 times

   Inventory Turnover = 8 times

   With the information given above, you are required to prepare a summarised Balance Sheet of the company.

4. How is an available-for-sale investment recorded on the financial statements?

5. Comment on the following statements:

   (a) An increase in money sales should always be viewed favorably.

   (b) The influence of price-level changes cannot be detected by using a comparative statement.

   (c) An expansion of plant, property, and equipment should be financed by sales of capital stock.

   (d) Intangible assets should be eliminated when the balance sheet is reconstructed for analytical purposes.

   (e) An increase in liabilities should be viewed with alarm.

6. Is the trend of total liabilities of significance in analyzing the financial condition of a business? If so, what other trends should be used in connection therewith?

7. Write a report in which you list and discuss favorable and unfavorable financial and operating tendencies

8. Analysis shows that Zodiac Corporation incurred the following five-year gross margin and cost histories in serving customer number 128.

	Year 1	Year 2	Year 3	Year 4	Year 5
Gross Margin	602,000	638,000	636,000	652,000	670,000
Cost of engineering changes	6,600	12,120	7,000	7,200	80,250
Special packaging	66,200	73,360	82,600	78,100	80,400

Notes

Prepare a trend analysis (in terms of percentage of gross margin) for these two customer relate costs.

9. What different conclusions might the management draw about the behavior of the two costs in question 8?

10. Which is the better analysis horizontal or vertical and why? Which is better between vertical or horizontal ratio and why?

11. The comparative balance sheet of Oak and Tile Flooring Co. for June 30, 2008 and 2007, is as follows:

	June 30, 2008	June 30, 2007
Cash	$24,700	$23,500
Accounts receivable (net)	101,600	92,300
Inventories	146,300	142,100
Investments	0	0
Land	145,000	0
Equipment	215,000	175,500
Accumulated depreciation	(48,600)	(41,300)
	$594,000	$442,100
Liabilities and Stockholders Equity		
Accounts payable (merchandise creditors)	$100,900	$95,200
Accrued expenses (operating expenses)	15,000	13,200
Dividends payable	12,500	10,000
Common stock, $1 par	56,000	50,000
Paid-in capital in excess of par-common stock	220,000	100,000
Retained earnings	189,600	173,700
	$594,000	$442,100

The following additional information was taken from the records of Oak and Tile Flooring Co:

(a) Equipment and land were acquired for cash.

(b) There were no disposals of equipment during the year.

(c) The investments were sold for $45,000 cash.

(d) The common stock was issued for cash.

(e) There was a $65,900 credit to retain earnings for net income.

(f) There was a $50,000 debit to Retained Earnings for cash dividends declared.

Prepare a statement of cash flow, using the indirect method of presenting cash flows from operating activates.

12. Where is a contract with a customer reported on the balance sheet and why?

Answers: Self Assessment

1. horizontal
2. Ratio analysis
3. vertical analysis
4. financial ratios
5. ratios
6. vertical

Notes

7.	(iv)	8.	(iv)
9.	(iv)	10.	True
11.	True	12.	False
13.	True	14.	True
15.	percentage	16.	financial ratios

10.9 Further Readings

Books

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Online link

www.managementstudyguide.com

Unit 11: Ratio Analysis

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Objectives

After studying this unit, you will be able to:

- Define Ration analysis
- Make classification of ratios
- Compute the key ratios on the basis of liquidity, activity, solvency and profitability

Notes

Introduction

The ratio analysis is one of the important tools of financial statement analysis to study the financial stature of the business fleeces, corporate houses and so on.

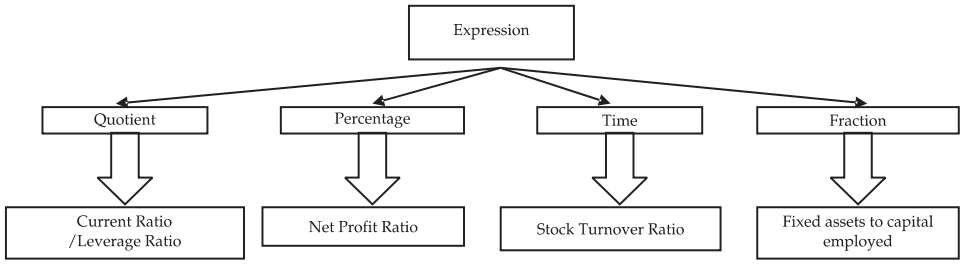
According to J. Batty, "The term accounting ratio is used to describe significant relationships which exist between figures shown in a balance sheet, in a profit and loss account, in a budgetary control system or in any other part of the accounting organization".

Financial statements contain substantial information (figures) relating to profit or loss and financial position of the business. If these items in financial statements are considered independently it may or may not be of much use. To make a meaningful reading of financial statements, these items found in financial statements have to be compared with one another. Ratio analysis, as a technique or analysis of financial statement uses this method of comparing the various items found in financial statements.

11.1 Definition

According to J. Betty, "The term accounting is used to describe relationships significantly which exist in between figures shown in a balance sheet, Profit & Loss A/c, Trading A/c, Budgetary control system or in any part of the accounting organization."

Figure 11.1: Structure of Ratios



According to Myers "Study of relationship among the various financial factors of the enterprise".

Did u know? ***What is meant by the accounting ratio?***

The accounting ratios are computed on the basis available accounting information extracted from the financial statements which are not in a position to reveal the status of the enterprise.

The accounting ratios are applied to study the relationship in between the quantitative information available and to take decision on the financial performance of the firm.

To understand the methodology of expressing the ratios, various expressions of ratios are highlighted in the Figure 11.1.

Note Purposes of the Ratio Analysis:

1. To study the short-term solvency of the firm — liquidity of the firm
2. To study the long-term solvency of the firm — leverage position of the firm

Contd...

Notes

3. To interpret the profitability of the firm — Profit earning capacity of the firm
4. To identify the operating efficiency of the firm — turnover of the ratios.

11.2 Classification of Ratios

The accounting ratios are classified into various categories, viz.:

1. On the basis of financial statements
2. On the basis of functions

11.2.1 On the basis of Financial Statements

1. ***Income Statement Ratios:*** These ratios are computed from the statements of Trading, Profit & Loss account of the enterprise. Some of the major ratios are as following GP ratio, NP ratio, Expenses Ratio and so on.
2. ***Balance Sheet or Positional Statement Ratios:*** These types of ratios are calculated from the balance sheet of the enterprise which normally reveals the financial status of the position i.e. short-term, long-term financial position, share of the owners on the total assets of the enterprise and so on.
3. ***Inter Statement or Composite Mixture of Ratios:*** Theses ratios are calculated by extracting the accounting information from the both financial statements, in order to identify stock turnover ration, debtor turnover ratio, return on capital employed and so on.

11.2.2 On the basis of Functions

1. ***On the basis of solvency position of the firms:*** Short-term and long-term solvency position of the firms.
2. ***On the basis of profitability of the firms:*** The profitability of the firms are studied on the basis of the total capital employed, total asset employed and so on.
3. ***On the basis of effectiveness of the firms:*** The effectiveness is studied through the turnover ratios — Stock turnover ratio, Debtor turnover ratio and so on.
4. ***Capital structure ratios:*** The capital structure position are analysed through leverage ratios as well as coverage ratios.

Self Assessment

Fill in the blanks:

1. Ratio analysis, as a technique or analysis of ..... uses this method of comparing the various items found in financial statements.
2. The accounting ratios are applied to study the relationship in between the ..... information available and to take decision on the financial performance of the firm.
3. The ..... position are analysed through leverage ratios as well as coverage ratios.
4. The ..... of the firms are studied on the basis of the total capital employed, total asset employed and so on.

Notes

11.3 Liquidity Ratios

To study the short-term solvency or liquidity of the firm, the following are various ratios:

1. Current Assets Ratio
2. Acid Test Ratio or Quick Assets Ratio
3. Super Quick Assets Ratio

11.3.1 Current Assets Ratio

It is one of the important accounting ratios to find out the ability of the business fleeces to meet out the short financial commitment. This is the ratio establishes the relationship in between the current assets and current liabilities.

Did u know? ***What is meant by current assets and current liabilities?***

Current assets are nothing but available in the form of cash, equivalent to cash or easily convertible in to cash.

Current liabilities are nothing but short-term financial resources or payable in short span of time within a year.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

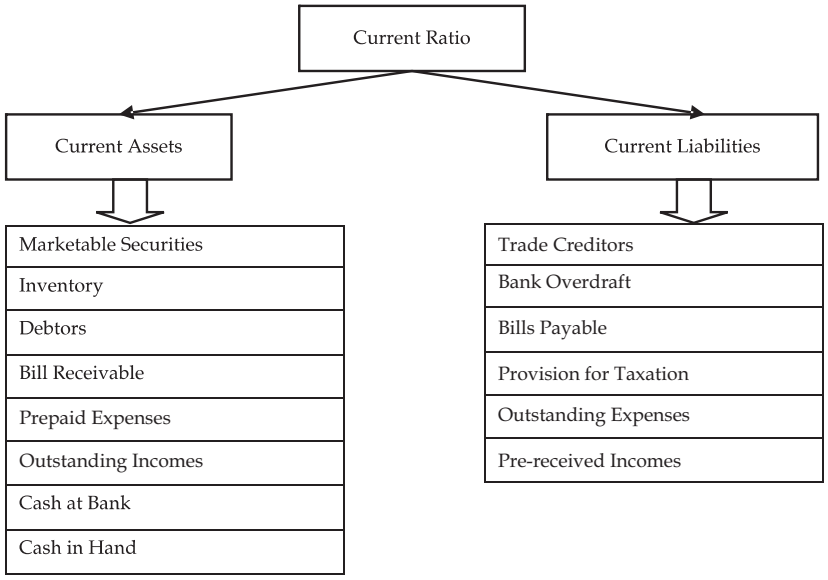
Example: Company XYZ has current assets worth of ₹ 5 lac, while the liabilities amount to ₹ 3 lac. What is the current ratio of the firm?

Solution:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current Ratio = 5/3 = 1.666 (approx)

Figure 11.2: Elements of Current Ratio



Notes

Caution Standard norm of the current ratio:

The ideal norm is 2:1; which means that every one rupee of current liability is appropriately covered by two rupees of current assets.

High ratio leads to greater the volume of current assets more than the specified norm denotes that the firm possesses excessive current assets than the requirement portrays idle funds invested in the current assets.

A big limitation of current ratio is that under this ratio, the current assets are equally weighed against each other to match the current liabilities. One rupee of cash is equally weighed at par with the one rupee of closing stock, but the closing stock and prepaid expenses cannot be immediately realized like cash and marketable securities.

11.3.2 Acid Test Ratio

It is a ratio expresses the relationship in between the quick assets and current liabilities. This ratio is to replace the bottleneck associated with the current ratio. It considers only the liquid assets which can be easily translated into cash to meet out the financial commitments.

$$\text{Acid Test Ratio (Quick Assets Ratio)} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}}$$

Liquid Asset = Current Assets – (Closing Stock + Prepaid Expenses)

Example: A company has a closing stock of ₹ 30,000 while its prepaid expenses are ₹ 5000. What will be its quick assets ratio if the current assets are worth ₹ 50000 while current liabilities are worth ₹ 15000?

Solution:

Liquid Asset = Current Assets – (Closing Stock + Prepaid Expenses)

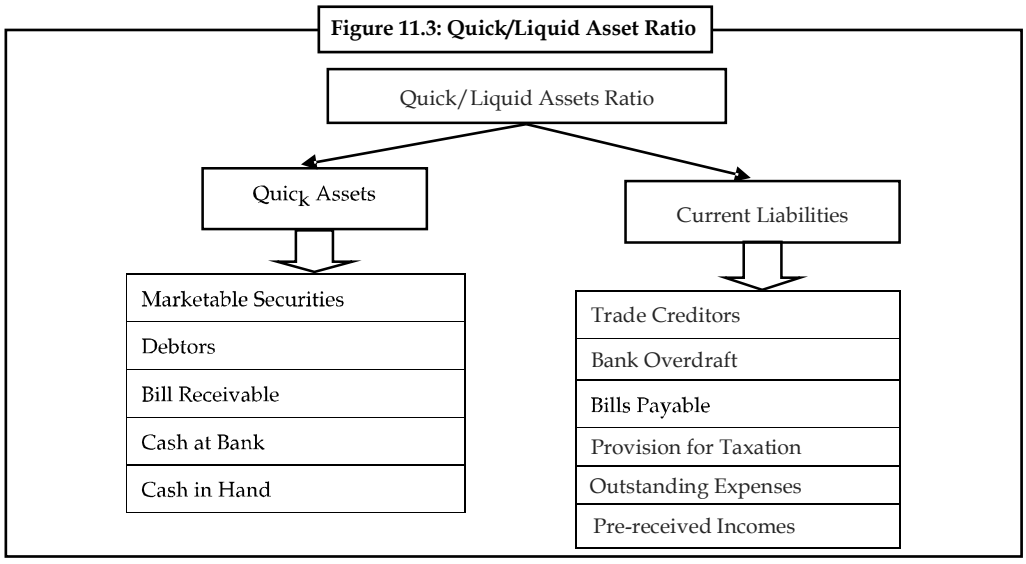
= 50000 – (30000 + 5000)

= 15000

$$\text{Quick Assets Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}}$$

= 15000/15000 = 1:1

Figure 11.3: Quick/Liquid Asset Ratio



Notes

Caution Standard norm of the ratio:

The ideal norm is 1:1 which means that one rupee of current liabilities is matched with one rupee of quick assets.

11.3.3 Super Quick Assets Ratio

It is the ratio which establishes the relationship in between the super quick assets and quick liabilities of the firm.

The super quick assets are nothing but the current assets which can be more easily converted into cash to meet out the quick liabilities.

The super quick liabilities are the current liabilities should have to be met out at faster pace within shorter span in duration.

Super Quick Assets = Cash + Marketable Securities

Super Quick Liabilities = Current Liabilities — Bank Overdraft

$$\text{Super Quick Assets Ratio} = \frac{\text{Super Quick Assets}}{\text{Super Quick Liabilities}}$$

Caution Standard norm of the ratio:

Higher the ratio, better is the position of the firm.

Example: From the following calculate current ratio:

	(₹)
Current Assets:	
Cash in Hand	4,00,000
Sundry Debtors	1,60,000
Stock	2,40,000
Current Liabilities:	
Sundry Creditors	3,00,000
Bills Payable	1,00,000

Solution:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{₹\ 8,00,000}{₹\ 4,00,000} = 2$$

Self Assessment

Fill in the blanks:

5. Current assets ratio establishes the relationship in between the ..... and current liabilities.

Notes

6. Liquid Asset = Current Assets – (..... + Prepaid Expenses)
7. The ..... are nothing but the current assets which can be more easily converted into cash to meet out the quick liabilities.

11.4 Turnover Ratios

It highlights the relationship in between the sales and various assets. The ratio indicates that the rate of speed which is taken by the firm for converting the assets into sales.

11.4.1 Stock Turnover Ratio

The ratio expresses the speed of converting the stock into sales. In other words, how fast the stock is being converted into sales in a year. The greater the ratio of conversion leads to lesser the number of days/weeks/months required to convert the stock into sales.

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Stock}} \text{ or } \frac{\text{Sales}}{\text{Closing Stock}}$$

Caution Standard norm of the ratio:

Higher the ratio is better the firm in converting the stock into sales and vice versa.

The next step is to find out the number of days or weeks or months taken or consumed by the firm to convert the stock into sales volume.

$$\text{Stock Velocity} = \frac{\text{365 days /52 weeks /12 months}}{\text{Stock Turnover Ratio}}$$

Caution Standard norm of the ratio:

Lower the duration is better the position of the firm in converting the stock into sales and vice versa.

Example: The cost of goods sold is ₹ 500,000. The opening stock is ₹ 40,000 and the closing stock is ₹ 60,000 (at cost). Calculate inventory turnover ratio.

Solution:

$$\text{Average Stock} = \frac{\text{Opening Stock + Closing Stock}}{2} = \frac{40,000 + 60,000}{2} = 50,000$$

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average stock}} = \frac{5,00,000}{50,000} = 10:1$$

11.4.2 Debtors Turnover Ratio

This ratio exhibits the speed of the collection process of the firm in collecting the overdues amount from the debtors and against Bills receivables. The speediness is being computed through debtors velocity from the ratio of Debtors Turnover Ratio.

$$\text{Debtors Turnover Ratio} = \frac{\text{Net Credit Sales}}{\text{Average Debtors}} \text{ or } \frac{\text{Net Credit Sales}}{\text{Debtor + Bills Receivable}}$$

Notes

Caution Standard norm of the ratio:

Higher the ratio is better the position of the firm in collecting the overdue means the effectiveness of the collection department and vice versa.

Debtors velocity: This is an extension of the earlier ratio to denote the effectiveness of the collection department in terms of duration.

$$\text{Debtors Velocity} = \frac{\text{365 days /52 weeks /12 months}}{\text{Debtor Turnover Ratio}}$$

Caution Standard norm of the ratio:

Lesser the duration shows greater the effectiveness in collecting the dues which means that the collection department takes only minimum period for collection and vice versa.

Example: Sundaram & Co. Sells goods on cash as well as credit basis. The following particulars are extracted from the books of accounts for the calendar 2005:

Particulars	₹
Total Gross sales	2,00,000
Cash Sales (included in above)	40,000
Sales Returns	14,000
Total Debtors	18,000
Bills Receivable	4,000
Provision for Doubtful Debts	2,000
Total Creditors	20,000

Calculate average collection period.

Solution: To find out the average collection period, first debtors turnover ratio has to computed

$$\text{Debtors Turnover Ratio} = \frac{\text{Net Credit Sales}}{\text{Bills Receivable + Debtors}}$$

Net Credit Sales = Gross Sales – Cash Sales – Sales Return

= 2,00,000 – 40,000 – 14,000 = 1,46,000

$$\text{Debtor Turnover Ratio} = \frac{1{,}46{,}000}{4{,}000 + 18{,}000} = 6.64 \text{ times}$$

$$\text{Debtors Velocity} = \frac{\text{365 days}}{\text{Debtors Turnover Ratio}} = \frac{\text{365 days}}{\text{6.64 times}} = 55 \text{ days}$$

11.4.3 Creditors Turnover Ratio

It shows effectiveness of the firm in making use of credit period allowed by the creditors during the moment of credit purchase.

$$\text{Creditors Turnover Ratio} = \frac{\text{Credit Purchase}}{\text{Average Creditors}} \text{ or } \frac{\text{Credit Purchase}}{\text{Bills Payable + Sundry Creditors}}$$

Notes

Caution Standard norm of the ratio:

Lesser the ratio is better the position of the firm in liquidity management means enjoying the more credit period from the creditors and vice versa.

$$\text{Creditors Velocity} = \frac{\text{365 days /52 weeks /12 months}}{\text{Creditors Turnover Ratio}}$$

Caution Standard norm of the ratio:

Greater the duration is better the liquidity management of the firm in availing the credit period of the creditors and vice versa.

Example: Find out the value of creditors from the following:

Sales ₹ 1,00,000	Opening stock ₹ 10,000
Gross profit on sales 10%	Closing stock ₹ 20,000
Creditors velocity 73 days	Bills payable ₹ 16,000

Note: All purchases are credit purchases

Solution: To find out the volume of purchases, the formula of cost of goods sold should be taken into consideration.

$$\text{Cost of goods sold} = \text{Opening Stock + Purchases – Closing Stock}$$

$$= \text{10,000 + Purchases – .20,000}$$

$$\text{Cost of goods sold} = \text{Sales – Gross Profit}$$

$$= \text{1,00,000 – 10\% on 1,00,000 = 90,000}$$

The next step is to apply the found value in the early equation

$$\text{Purchases} = \text{90,000 – 10,000 + 20,000 = 1,00,000}$$

To find out the value creditors, the creditor velocity and creditors turnover ratio:

$$\text{Creditors Velocity} = \frac{\text{365 days}}{\text{Creditors Turnover Ratio}}$$

$$\text{Creditors Turnover Ratio} = \frac{\text{Credit Purchases}}{\text{Bills Payable + Sundry Creditors}}$$

$$= \frac{\text{1,00,000}}{\text{16,000 + Sundry Creditors}}$$

The next step is to find out the sundry creditors, the reversal process to be adopted

$$\text{73 days} = \frac{\text{365 days}}{\text{Creditors Turnover Ratio}}$$

$$\text{Creditors Turnover Ratio} = \frac{\text{365 days}}{\text{73 days}} = \text{5 times}$$

The next step is to substitute the found value in the equation of creditors turnover ratio

$$\text{16,000+ Sundry creditors} = \frac{\text{₹ 1,00,000}}{5}$$

$$\text{Sundry Creditors} = \text{20,000 – 16,000 = 4,000}$$

Notes

Task From the following particulars, prepare Trading, Profit & Loss account and a balance sheet.

Current ratio -3

Liquid ratio -1.8

Bank overdraft - ₹ 20,000

Working capital - ₹ 2,40,000

Debtors velocity -1 month; Gross profit ratio -20%

Proprietary ratio (Fixed assets/shareholders' fund) -.9

Reserves and surpluses -.25 of share capital

Opening stock - ₹ 1,20,000; 8% Debentures -₹ 3,60,000

Long term investments -₹ 2,00,000

Stock turnover ratio -10 times

Creditors velocity -1/2 month

Net profit to share capital -20%

Self Assessment

State whether the following statements are true or false:

8. The stock turnover ratio expresses the speed of converting the stock into cash.
9. Higher the duration shows greater the effectiveness in collecting the dues.
10. Greater the duration is better the liquidity management of the firm in availing the credit period of the creditors and vice versa.

11.5 Solvency Ratios

Solvency ratios indicates company's ability to meet its long-term liabilities. Therefore, these ratios are also called long-term solvency ratios. The long-term liability of a company comprises of debentures, long-term loans, unpaid installment on hire-purchase, and long-term creditors. The long-term creditors take interest in those ratios which highlight the long-term financial position of the company so that they may ensure regarding the repayment of their principal amount on maturity as well as regular interest on their dues. For this purpose the following solvency ratio are calculated:

11.5.1 Debt-equity Ratio

It is the ratio expresses the relationship between the ownership funds and the outsiders' funds. It is more specifically highlighted that an expression of relationship in between the debt and shareholders' funds. The debt-equity ratio can be obviously understood into two different forms:

1. Long-term debt-equity ratio
2. Total debt-equity ratio

Let us understand each of them one by one.

Notes

Long-term Debt-equity Ratio

It is a ratio expressing the relationship in between the outsiders' contribution through debt financial resource and shareholders' contribution through equity share capital, preference share capital and past accumulated profits. It reveals the cover or cushion enjoyed by the firm due to the owners' contribution over the outsiders' contribution.

$$\text{Debt-equity Ratio} = \frac{\text{Debt (Long-term Debt = Debentures/Term Loans)}}{\text{Net Worth/Equity (Shareholders' Fund)}}$$

Example: The long-term debt of company ABC is ₹ 3 crores and the networth of the company is ₹ 5 crores. What is the long-term debt-equity ratio of ABC?

Solution:

$$\text{Long-term debt-equity Ratio} = \frac{\text{Debt}}{\text{Net Worth}} = 3/5 = .6$$

Higher ratio indicates the riskier financial status of the firm which means that the firm has been financed by the greater outsiders' fund rather than that of the owners' fund contribution and vice versa.

Caution Standard norm of the Debt-Equity Ratio:

The ideal norm is 1:2 which means that every one rupee of debt finance is covered by two rupees of shareholders' fund.

The firm should have a minimum of 50% margin of safety in meeting the long-term financial commitments. If the ratio exceeds the specification, the interest of the firm will be ruined by the outsiders' during the moment at when they are unable to make the payment of interest in time as per the terms of agreement reached earlier. During the moment of liquidation, the greater ratio may facilitate the creditors to recover the amount due lesser holding held by the owners.

Total Debt-equity Ratio

The ultimate purpose of the ratio is to express the relationship total volume of debt irrespective of nature and shareholders' funds. If the owners' contribution is lesser in volume in general irrespective of its nature leads to worse situation in recovering the amount of outsiders' contribution during the moment of liquidation.

$$\text{Total Debt-equity Ratio} = \frac{\text{Short-term Debt + Long-term Debt}}{\text{Equity (Shareholders' Fund)}}$$

Example: The long-term debt of company ABC is ₹ 3 crores and the networth of the company is ₹ 5 crores. If the company has a short term debt of ₹ 1 crore, what is the total debt-equity ratio of ABC?

Solution:

$$\text{Total Debt-equity Ratio} = \frac{\text{Short-term Debt + Long-term Debt}}{\text{Equity(Shareholders' Fund)}} = \frac{1+3}{5} = 4:5$$

11.5.2 Proprietary Ratio

The ratio illustrates the relationship in between the owners' contribution and the total volume of assets. In simple words, how much funds are contributed by the owners in financing the assets

Notes

of the firm. Greater the ratio means that greater contribution made by the owners' in financing the assets.

$$\text{Proprietary Ratio} = \frac{\text{Owners' Funds or Equity or Shareholders' Funds}}{\text{Total Assets}}$$

Caution Standard Norm of the ratio:

Higher the ratio, better is the position

Higher ratio is better position for the firm as well as safety to the creditors.

Example: The net worth of company ABC is ₹ 30 crores and the total assets are worth ₹ 10 crores. What is the proprietary ratio of the firm?

Solution:

$$\text{Proprietary Ratio} = \frac{\text{Owners' Funds or Equity or Shareholders' Funds}}{\text{Total assets}} = \frac{30}{10} = 3:1$$

The ratio shows that the firm is in quite a good financial position.

11.5.3 Fixed Assets Ratio

The ratio establishes the relationship in between the fixed assets and long-term source of funds. Whatever the source of long-term funds raised should be used for the acquisition of long-term assets; it means that the total volume of fixed assets should be equivalent to the volume of long-term funds, i.e. the ratio should be equal to 1.

$$\text{Fixed Assets Ratio} = \frac{\text{Shareholders' Funds + Outsiders' Funds}}{\text{Net Fixed Assets}}$$

If the ratio is lesser than one means that the firm made use of the short-term fund for the acquisition of long-term assets. If the ratio is greater than one means that the acquired fixed assets are lesser in quantum than that of the long-term funds raised for the purpose. In other words, the firm makes use of the excessive funds for the built of current assets.

Caution Standard norm of the ratio:

The ideal norm of the ratio is 1:1, which means that the long-term funds raised are utilised for the acquisition of long-term assets of the enterprise.

It facilitates to understand obviously about the over capitalization or under capitalization of the assets of the enterprise.

Example: The networth of company ABC is ₹ 30 crores and the net fixed assets are worth ₹ 100 crores. If the outsider's funds are worth ₹ 70 crores, what is the fixed assets ratio of the firm?

Solution:

$$\text{Fixed Assets Ratio} = \frac{\text{Shareholders' Funds + Outsiders' Funds}}{\text{Net Fixed Assets}} = \frac{30+70}{100} = \frac{100}{100} = 1:1$$

Since the ratio is 1:1, it shows that the firm raises the long term funds utilises them only for the acquisition of long term assets of the enterprise.

Notes

11.5.4 Coverage Ratios

These ratios are computed to know the solvency of the firm in making the periodical payment of interest and preference dividends. The interest and preference dividends are to be paid irrespective of the earnings available in the hands of the firm. In other words, these are known as fixed commitment charge of the firm.

Interest Coverage Ratio

The firms are expected to make the payment of interest on the amount of borrowings without fail. This ratio facilitates the prospective lender to study the strength of the enterprise in making the payment of interest regularly out of the total income. To study the capacity in making the payment of interest is known as interest coverage ratio or debt service coverage ratio.

The ability or capacity is analysed only on the basis of Earnings Before Interest and Taxes (EBIT) available in the hands of the firms.

Greater the ratio means that better the capacity of the firm in making the payment of interest as well as greater the safety and vice versa.

$$\text{Interest Coverage Ratio} = \frac{\text{Earnings before Interest and Taxes}}{\text{Interest}}$$

Lesser the times the ratio means that meager the cushion of the firm which may lead to affect the solvency position of the firm in making payment of interest regularly.

Example: Mr Ashmit Ahuja had an earning of ₹ 3,00,000 before he paid the interests and taxes. What will be the interest coverage ratio if he pays ₹ 30,000 as an interest? What will it mean?

Solution:

$$\text{Interest Coverage Ratio} = \frac{\text{Earnings before Interest and Taxes}}{\text{Interest}} = \frac{3,00,000}{30,000} = 10:1$$

Since the interest coverage ratio is substantially high, it means that Mr. Ahuja has quite a good capacity in making the payment of interest and has a high safety.

Dividend Coverage Ratio

It illustrates the firms' ability in making the payment of preference dividend out of the earnings available in the hands of the firm after the payment of taxation. Greater the size of the profits after taxation, greater is the cushion for the payment of preference dividend and vice versa.

The preference dividends are to be paid without fail irrespective of the profits available in the hands of the firm after the taxation.

$$\text{Dividend Coverage Ratio} = \frac{\text{Earnings after Taxation}}{\text{Preference Dividend}}$$

Example: Hindustan Manufacturers have to make a preference dividend of ₹ 60,000. The earnings after taxation is ₹ 3,00,000. What will be the Dividend coverage ratio? What does it mean?

Solution:

$$\text{Dividend Coverage Ratio} = \frac{\text{Earnings After Taxation}}{\text{Preference Dividend}} = \frac{3,00,000}{60,000} = 5:1$$

Notes

Since the value of the dividend coverage ratio is quite high, the company has a strong cushion for the payment of preference dividend.

Self Assessment

Choose the right answer

11. Solvency position of the firm studied and interpreted through
    - (a) Short-term solvency ratios
    - (b) Long-term solvency ratios
    - (c) Coverage ratios
    - (d) (a), (b) & (c)
12. Efficiency and effectiveness of the firm is studied through
    - (a) Liquidity ratios
    - (b) Leverage ratios
    - (c) Turnover ratios
    - (d) Profitability ratios
13. Standard norm of the Debt to Capital
    - (a) 1:2
    - (b) 1:1
    - (c) 2:1
    - (d) 1:5

11.6 Profitability Ratios

These ratios are measurement of the profitability of the firms in various angles, viz.:

1. On sales
2. On investments
3. On capital employed and so on

While discussing the measure of profitability of the firm, the profits are normally classified into various categories:

1. Gross Profit
2. Net Profit
3. Operating Profit Ratio
4. Return on Assets Ratio
5. Return on Capital Employed

All profitability ratios are normally expressed only in terms of (%). The return is normally expressed only in terms of percentage which warrants the expression of this ratio to be also in percentage.

11.6.1 Gross Profit Ratio

The ratio elucidates the relationship in between the gross profit and sales volume.

It facilitates to study the profit earning capacity of the firm out of the manufacturing or trading operations.

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

Example: Om enterprises has earned a gross profit of ₹ 6,00,000 in the first quarter. Calculate the gross profit ratio if the corresponding sales amounted to a value of ₹ 30,00,000. What does it imply?

Notes

Solution:

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100 = \frac{6,00,000}{30,00,000} \times 100 = 20:1$$

The ratio implies that the firm has earned good profits out of sales in the first quarter.

Caution Standard norm of the ratio:

Higher the ratio means that the firm has greater cushion in meeting the needs of preference dividend payment against Earnings After Taxation (EAT) and vice versa.

11.6.2 Net Profit Ratio

The ratio expresses the relationship in between the net profit and sales volume. It facilitates to portray the overall operating efficiency of the firm. The net profit ratio is an indicator of over all earning capacity of the firm in terms of return out of sales volume.

$$\text{Net Profit Ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times 100$$

Example: Om enterprises has earned a net profit of ₹ 3,00,000 in the first quarter. Calculate the net profit ratio if the corresponding sales amounted to a value of ₹ 30,00,000. What does it imply?

Solution:

$$\text{Net Profit Ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times 100 = \frac{30,000}{30,00,000} \times 100 = 1:1$$

The ratio shows that the company is running on a no profit - no loss state.

Caution Standard Norm of the Ratio:

Higher the ratio, the better the position of the firm is, which means that the firm earns greater profits out of the sales and vice versa.

11.6.3 Operating Profit Ratio

The operating ratio is establishing the relationship in between the cost of goods sold and operating expenses with the total sales volume.

$$\text{Operating Ratio} = \frac{\text{Cost of Goods Sold + Operating Expenses}}{\text{Net Sales}} \times 100$$

Example: The cost of goods sold by Mangamal operators is ₹ 2,000. What will be the operating ratio of the firm if the operating expenses are ₹ 50,000 and net sales is that of ₹ 5,00,000? What does it mean?

Solution:

$$\text{Operating Ratio} = \frac{\text{Cost of goods sold + Operating expenses}}{\text{Net sales}} \times 100 = \frac{2,000 + 50,000}{5,00,000} = 1:2$$

Since the ratio is quite low, this means that the firm is in quite favourable position and thus has a high margin of operating profit.

Notes

Caution Standard norm of the ratio:

Lower the ratio, the more favourable and better the firm's position is, which highlights the percentage of absorption, cost of goods sold and operating expenses out of sales and vice versa. The lower ratio leads to a higher margin of operating profit.

11.6.4 Return on Assets Ratio

This ratio portrays the relationship in between the earnings and total assets employed in the business enterprise. It highlights the effective utilization of the assets of the firm through the determination of return on total assets employed.

$$\text{Return on Assets} = \frac{\text{Net Profit After Taxes}}{\text{Average Total Assets}} \times 100$$

Example: If one company has an income of ₹ 1 crore and total assets of ₹ 10,00,000, what will be the return on assets if net profit after taxes is ₹ 5,00,000?

Solution:

$$\text{Return on Assets} = \frac{\text{Net Profit After Taxes}}{\text{Average Total Assets}} \times 100 = \frac{5,00,000}{1,00,0000} \times 100 = 50\%$$

Caution Standard norm of the ratio:

Higher the ratio illustrates that the firm has greater effectiveness in the utilization of assets, means greater profits reaped by the total assets and vice versa.

11.6.5 Return on Capital Employed

The ratio illustrates that how much return is earned in the form of Net profit after taxes out of the total capital employed. The capital employed is nothing but the combination of both non current liabilities and owners' equity. The ratio expresses the relationship in between the total earnings after taxation and the total volume of capital employed.

$$\text{Return on Total Capital Employed} = \frac{\text{Net Profit After Taxes}}{\text{Total Capital Employed}} \times 100$$

Caution Standard norm of the ratio:

Higher the ratio is better the utilization of the long term funds raised under the capital structure means that greater profits are earned out of the total capital employed.

Example: In the previous example, if the total capital employed is worth ₹ 25,00,000, what is the return on total capital employed?

Solution:

$$\text{Return on Total Capital Employed} = \frac{\text{Net Profit After Taxes}}{\text{Total Capital Employed}} \times 100 = \frac{5,00,000}{25,00,000} \times 100 = 20\%$$

Solved Examples

Notes

Example 1: Sundaram & Co. sells goods on cash as well as credit basis. The following particulars are extracted from the books of accounts for the calendar year 2005:

Particulars	₹
Total Gross sales	2,00,000
Cash sales (included in above)	40,000
Sales returns	14,000
Total Debtors	18,000
Bills receivable	4,000
Provision for doubtful debts	2,000
Total creditors	20,000

Calculate the average collection period.

To find out the average collection period, first the debtors' turnover ratio has to be computed

$$\text{Debtor's turnover ratio} = \frac{\text{Net credit sales}}{\text{Bills receivable + Debtors}}$$

$$\text{Net credit sales} = \text{Gross sales - cash sales - sales return}$$

$$= ₹\ 2,00,000 - ₹\ 40,000 - ₹\ 14,000 = ₹\ 1,46,000$$

$$\text{Debtor turnover ratio} = \frac{₹\ 1,46,000}{₹\ 4,000 + ₹\ 18,000}$$

$$= 6.64 \text{ times}$$

$$\text{Debtor's velocity} = \frac{365 \text{ days}}{\text{Debtors turnover ratio}} = \frac{365 \text{ days}}{6.64 \text{ times}}$$

$$= 55 \text{ days}$$

Example 2: Determine the value of the closing stock from the following details:

Sales ₹ 8,00,000

Gross profit 10% on sales

Stock velocity 4 times

Closing stock was ₹ 10,000 in excess of opening stock.

To find out the closing stock, stock turnover ratio is to be taken for consideration.

$$\text{Stock turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average stock}}$$

$$\text{Cost of goods sold} = \text{Sales-Gross profit}$$

$$= ₹\ 8,00,000\text{-}10\% \text{ on } ₹\ 8,00,000$$

$$= ₹\ 8,00,000\text{-}80,000 = ₹\ 7,20,000$$

$$4 \text{ times} = \frac{₹\ 7,20,000}{\text{Average stock}}$$

$$\text{Average stock} = ₹\ 1,80,000$$

Notes

$$\frac{\text{Opening stock + Closing stock}}{2} = ₹\ 1,80,000$$

Now, the closing stock value only is to be computed which is excess of ₹ 10,000 over opening stock.

Closing stock = Opening stock + ₹ 10,000 ...(2)

Substitute the found value of closing stock (2) in the equation (1)

Opening stock + Opening stock + ₹ 10,000 = ₹ 3,60,000

2 Opening stock = ₹ 3,50,000

$$\text{Opening stock} = \frac{₹\ 3,50,000}{2} = ₹\ 1,75,000$$

Closing stock = ₹ 1,75,000 + ₹ 10,000 = ₹ 1,85,000

Example 3: Find out the value of creditors from the following:

Sales ₹ 1,00,000	Opening stock ₹ 10,000
Gross profit on Sales 10%	Closing stock ₹ 20,000
Creditors velocity 73 days	Bills payable ₹ 16,000

All purchases are credit purchases.

To find out the volume of purchases, the formula of cost of goods sold should be taken into consideration.

Cost of goods sold = Opening stock + Purchases - Closing stock

X = ₹ 10,000 + Y - ₹ 20,000

Cost of goods sold = Sales - Gross profit

= ₹ 1,00,000-10% on ₹ 1,00,000

= ₹ 90,000

The next step is to apply the found value in the early equation.

Purchases = ₹ 90,000 - ₹ 10,000 + ₹ 20,000

= ₹ 1,00,000

To find out the value of creditors, the creditor velocity and creditors turnover ratio-

$$\text{Creditors velocity} = \frac{\text{365 days}}{\text{Creditors turnover ratio}}$$

$$\text{Creditors turnover ratio} = \frac{\text{Credit purchases}}{\text{Bills payable + Sundry creditors}}$$

$$= \frac{₹\ 1,00,000}{₹\ 16,000 + \text{Sundry creditors}}$$

The next step is to find out the sundry creditors; the reversal process is to be adopted.

$$\text{73 days} = \frac{\text{365 days}}{\text{Creditors turnover ratio}}$$

$$\text{Creditors turnover ratio} = \frac{\text{365 days}}{\text{73 days}} = \text{5 times}$$

Notes

The next step is to substitute the found value in the equation of creditors turnover ratio.

$$₹\ 16{,}000 + \text{Sundry creditors} = \frac{₹\ 1{,}00{,}000}{5}$$

$$\text{Sundry creditors} = ₹\ 20{,}000 - ₹\ 16{,}000 = ₹\ 4{,}000$$

Self Assessment

Fill in the blanks:

14. The net profit ratio is an indicator of over all ..... of the firm in terms of return out of sales volume.
15. The operating ratio is establishing the relationship in between the ..... and operating expenses with the total sales volume.
16. The ..... is nothing but the combination of both non current liabilities and owners' equity.

11.7 Summary

- Ratio analysis is one of the important tools of financial statement analysis to study the financial structure of the business fleeces.
- Financial ratio analysis is the calculation and comparison of ratios which are derived from the information in a company's financial statements.
- The level and historical trends of these ratios can be used to make inferences about a company's financial condition, its operations and attractiveness as an investment.
- Financial ratios are calculated from one or more pieces of information from a company's financial statements.
- A ratio gains utility by comparison to other data and standards.
- Ratios are classified as liquidity, leverage, profitability, activity, integrated and growth ratio.
- Although financial ratio analysis is well-developed and the actual ratios are well-known, practicing financial analysts often develop their own measures for particular industries and even individual companies.
- Analysts often differ drastically in their conclusions from the same ratio analysis.

11.8 Keywords

Balance Sheet or Positional Statement Ratios: These type of ratios are calculated from the balance sheet of the enterprise which normally reveals the financial status of the position i.e. short-term, long-term financial position, Share of the owners on the total assets of the enterprise and so on.

Capital Structure Ratios: The capital structure position are analysed through leverage ratios as well as coverage ratios.

Current Assets: Current assets are in the form of cash, equivalent to cash or easily convertible into cash.

Current Liabilities: Current liabilities are short-term financial resources or payable in short span of time within a year.

Income Statement Ratios: These ratios are computed from the statements of Trading, Profit & Loss account of the enterprise.

Notes

11.9 Review Questions

1. Is the firm satisfies the standard norm of the current asset ratio and liquid assets ratio?

M/s Shanmuga & Co
Balance sheet as on dated 31st Mar, 2005

Liabilities	₹	Assets	₹
Share capital	42,000	Fixed Assets Net	34,000
Reserve	3,000	Stock	12,400
Annual Profit	5,000	Debtors	6,400
Bank overdraft	4,000	Cash	13,200
Sundry creditors	12,000		
	66,000		**66,000**

2. Liquid Assets ₹ 65,000; Stock ₹ 20,000; Pre-paid expenses ₹ 5,000; Working capital ₹ 60,000. Calculate current assets ratio and liquid assets ratio.

3. The current ratio of Bicon Ltd. is 4.5:1 and liquidity ratio is 3:1 stock is ₹ 6,00,000. Find out the current liabilities.

4. From the following information, prepare a balance sheet show the workings

		₹
(a)	Working capital	75,000
(b)	Reserves and surplus	1,00,000
(c)	Bank overdraft	60,000
(d)	Current ratio	1.75
(e)	Liquid Ratio	1.15
(f)	Fixed assets to proprietors' fund	.75
(g)	Long term liabilities	Nil

(B.Com Madras, April 1980)

5.

Debtors velocity	3 months
Creditors velocity	2 months
Stock velocity	8 times
Capital turnover ratio	2.5 times
Fixed assets turnover ratio	8 times
Gross profit turnover ratio	25%

Gross profit in a year amounts to ₹ 1,60,000 .There is no long term loan or overdraft . Reserves and surplus amount to ₹ 56,000. Liquid assets are ₹ 1,94,666. Closing stock of the year is ₹ 4,000 more than the opening stock Bill receivable amount to ₹ 10,000 and bills payable to ₹ 4,000

(a) Find out

(i) Sales

(ii) Closing stock

Notes

(iii) Sundry debtors

(iv) Fixed assets

(v) Sundry creditors

(vi) Proprietors' fund.

(b) Draft the balance sheet with as many as details as possible.

6. You have been hired as an analyst for Mellon Bank and your team is working on an independent assessment of Daffy Duck Food In(c) (DDF In(c)) DDF In(c) is a firm that specializes in the production of freshly imported farm products from France. Your assistant has provided you with the following data for Flipper Inc. and their industry.

Ratio	2001	2002	2003	2005-Industry Average
Long-term debt	0.45	0.40	0.35	0.35
Inventory Turnover	62.65	42.42	32.25	53.25
Depreciation/Total Assets	0.25	0.014	0.018	0.015
Days' sales in receivables	113	98	94	130.25
Debt to Equity	0.75	0.85	0.90	0.88
Profit Margin	0.082	0.07	0.06	0.075
Total Asset Turnover	0.54	0.65	0.70	0.40
Quick Ratio	1.028	1.03	1.029	1.031
Current Ratio	1.33	1.21	1.15	1.25
Times Interest Earned	0.9	4.375	4.45	4.65
Equity Multiplier	1.75	1.85	1.90	1.88

In the annual report to the shareholders, the CEO of Flipper Inc wrote, "2003 was a good year for the firm with respect to our ability to meet our short-term obligations. We had higher liquidity largely due to an increase in highly liquid current assets (cash, account receivables and short-term marketable securities)." Is the CEO correct? Explain and use only relevant information in your analysis.

7. In the above question, what will you say when you are asked to provide the shareholders with an assessment of the firm's solvency and leverage. Be as complete as possible given the above information, but do not use any irrelevant information.

8. Firm A has a Return on Equity (ROE) equal to 24%, while firm B has an ROE of 15% during the same year. Both firms have a total debt ratio (D/V) equal to 0.8. Firm A has an asset turnover ratio of 0.9, while firm B has an asset turnover ratio equal to 0.4. What can we analyse about the relationship between both the firms?

9. If a firm has ₹ 1,00,000 in inventories, a current ratio equal to 1.2, and a quick ratio equal to 1.1, what is the firm's Net Working Capital?

10. What can you say about the asset management of the firm discussed in question 6? Be as complete as possible given the above information, but do not use any irrelevant information.

11. The data summarised in the table below show the performance of two firms A and B, over five years.

Notes

	Firm	Years				
		1	2	3	4	5
Gross profit margin %	A	42	37	35	37	35
	B	30	32	32	33	34
Net profit margin %	A	16	13	12	12	10
	B	10	11	11	12	12
Returm on capital employeed %	A	14	13	12	12	11
	B	9	10	10	11	11
Acid Test Ratio	A	2.7	2.6	2.5	2.5	2.4
	B	1.7	1.8	1.5	0.8	1.0

(a) Using the information in the table explain the comparative attractiveness of the two firms to a potential investor.

(b) Why is it important that potential investors should be aware of the ratio of ordinary share capital to other forms of long-term finance?

Answers: Self Assessment

1. financial statement
2. quantitative
3. capital structure
4. profitability
5. current assets
6. Closing Stock
7. super quick assets
8. False
9. False
10. True
11. (d)
12. (d)
13. (c)
14. earning capacity
15. cost of goods sold
16. capital employed

11.10 Further Readings

Books

B.M. Lall Nigam and I.C. Jain, *Cost Accounting,* Prentice-Hall of India (P) Ltd.

Hilton, Maher and Selto, *Cost Management,* 2nd Edition, Tata McGraw-Hill Publishing Company Ltd.

M.N. Arora, *Cost and Management Accounting,* 8th Edition, Vikas Publishing House (P) Ltd.

M.P. Pandikumar, *Management Accounting,* Excel Books.

Online links

www.authorstream.com

www.allinterview.com

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Unit 12: Fund Flow Analysis

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Objectives

After studying this unit, you will be able to:

- Explain the meaning of fund flow analysis
- Illustrate the preparation of statement of changes in working capital
- Prepare fund flow statement

Introduction

Every business establishment usually prepares the balance sheet at the end of the fiscal year which highlights the financial position of the yester years. It is subject to change in the volume of the business not only illustrates the financial structure but also expresses the value of the applications in the liabilities side and assets side respectively. Normally, Balance sheet reveals the status of the firm only at the end of the year, not at the beginning of the year. It never discloses the changes in between the value position of the firm at two different time periods/dates.

The method of portraying the changes on the volume of financial position is the analysis of fund flow statement.

12.1 Meaning of Fund Flow Statement

In a narrow sense, the term fund means cash, and the fund flow statement depicts the cash receipts and cash disbursements/payments. It highlights the changes in the cash receipts and payments as a cash flow statement in addition to the cash balances, i.e. opening cash balance and closing cash balance. Contrary to the earlier, the fund means working capital, i.e. the differences between the current assets and current liabilities.

The term flow denotes the change. Flow of funds means the change in funds or in working capital. The change on the working capital leads to the net changes taken place on the working capital,

Notes

i.e. especially due to either increase or decrease in the working capital. Some of the transactions may lead to increase or decrease the volume of working capital. Some other transactions register neither an increase nor decrease in the volume of working capital.

According to Foulke, "A statement of source and application of funds is a technical device designed to analyse the changes to the financial condition of a business enterprise in between two dates."

Various facets of fund flow statement are as follows:

1. Statement of sources and application of funds
2. Statement changes in financial position
3. Analysis of working capital changes and
4. Movement of funds statement
5. Depreciation charged on assets
6. Appropriation of profits to reserves
7. Payment of interim dividends
8. Payment and appropriations in relation to provisions for taxation/dividends where they are treated as non-current liabilities.

Fund flow statement has following objectives:

1. It pinpoints the mobilization of resources and the further utilization of resources.
2. It highlights the financing of the general expansion of the business firms.
3. It exemplifies the utilization of debt finance in the structure of financing.
4. It portrays the relationship between the financing, investments, liquidity and dividend decision of the firm during the given point of time.

Note **Steps in the Preparation of Fund Flow Statement**

1. First and foremost step is to prepare the statement of changes in working capital, i.e. to identify the flow of fund/movement of fund through the detection of changes in the volume of working capital.
2. Second step is the preparation of Non-current A/c items-Changes in the volume of Non-current A/cs have to be prepared only in order to quantify the flow fund i.e. either sources or application of fund.
3. Third step is the preparation Adjusted Profit & Loss A/c, which already elaborately discussed in the early part of the unit.
4. Last step is the preparation of fund flow statement.

Self Assessment

Fill in the blanks:

1. The fund flow statement depicts the ..... receipts and cash disbursements/ payments.
2. Fund flow means a study of ..... .

Notes

12.2 Preparation of Statement of Changes in Working Capital

The ultimate purpose of preparing the schedule of changes in the working capital illustrates the changes in the volume of net working capital which envisages either sources or application of fund. The schedule of changes is focused as follows:

Increase in Current Assets	Increase in Working Capital
Decrease in Current Assets	Decrease in Working Capital
Increase in Current Liabilities	Decrease in Working Capital
Decrease in Current Liabilities	Increase in Working Capital

Particulars	Previous Year	Current Year	Increase in Working Capital (+)	Decrease in Working Capital (-)
(A) Current Assets:				
Cash in Hand				
Cash at Bank				
Marketable Securities				
Bills Receivable				
Sundry Debtors				
Closing Stock				
Prepaid Expenses				
(B) Current Liabilities:				
Creditors				
Bills Payable				
Outstanding expenses				
Pre received Income				
Provision for doubtful and bad debts				
Net Working Capital(A-B)				
Increase/Decrease Working Capital				

Example: From the following details prepare a statement showing changes in working capital during 2005.

Balance Sheet of Pioneer Ltd
as on 31st December

Liabilities	2004 (₹)	2005 (₹)	Assets	2004 (₹)	2005 (₹)
Share capital	5,00,000	6,00,000	Fixed assets	10,00,000	11,20,000
Reserves	1,50,000	1,80,000	Less: Depreciation	3,70,000	4,60,000
Profit and Loss A/c	40,000	65,000		6,30,000	6,60,000
Debentures	3,00,000	2,50,000	Stock	2,40,000	3,70,000
Creditors for goods	1,70,000	1,60,000	Book Debts	2,50,000	2,30,000
Provision for tax	60,000	80,000	Cash in hand	80,000	60,000
			Preliminary expenses	20,000	15,000
	12,20,000	**13,35,000**		**12,20,000**	**13,35,000**

Notes

Solution:

Schedule of Changes in Working Capital

	2004	2005	Increase in Working Capital	Decrease in Working Capital
Current Asset:				
Stock	2,40,000	3,70,000	1,30,000	–
Book debts	2,50,000	2,30,000	–	20,000
Cash in hand	80,000	60,000	–	20,000
	5,70,000	**6,60,000**	**1,30,000**	**40,000**
Current liabilities:				
Creditors for goods	1,70,000	1,60,000	10,000	–
Working capital	4,00,000	5,00,000	1,40,000	40,000
Increase in working capital	1,00,000	–	–	1,00,000
	5,00,000	5,00,000	1,40,000	1,40,000

Self Assessment

State whether the following statements are true or false:

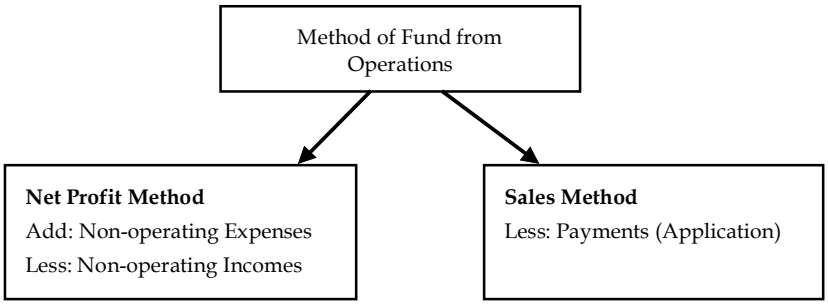
3. Normally, working capital means current assets.
4. Increase in current assets means increase in working capital.
5. Purchase of plant and machinery ₹ 10 lakh through the issue of 1 Lakh shares at ₹ 10 per share; affect the non-current asset and current liabilities accounts.
6. XYZ Ltd. has made a credit purchase of ₹ 1 lakh worth of goods led to ₹ 1 lakh worth of additional stock of tradable goods for the enterprise, leads to increase in the working capital.

12.3 Preparing Funds from Operations

The following are the key methods of preparing fund from operations:

- Net Profit Method
- Sales Method

Figure 12.1 Methods of Funds from Operations



Caution The first method is widely used method by all in determining the volume of Fund from Operations (FFO).

Notes

12.3.1 Net Profit Method

Under the Net Profit Method, fund flow from operations can be computed. Under this method, fund from operations can be determined in two different ways The first method is through the statement format

Net Profit from the Profit & Loss A/c		xxxxx
Add:		
(A)	***Non-funding Expenses:***	
	Loss on Sale of Fixed Assets	xxxx
	Loss on Sale of Long-term Investments	xxxx
	Loss on Redemption Debentures/Preference Shares	xxxx
	Discount on Debentures/Share	xxxx
(B)	***Non-operating Expenses:***	
	Depreciation of Fixed Assets	xxxx
(C)	***Intangible Assets:***	
	Amortization of Goodwill	xxxx
	Amortization of Patent	xxxx
	Amortization of Trade Mark	xxxx
(D)	***Fictitious Assets:***	
	Writing off Preliminary Expense	xxxx
	Writing off Discount on Shares/Debentures	xxxx
(E)	***Profit Appropriation:***	
	Transfer to General Reserve	xxxx
Less:		
(F)	***Non-funding Profits:***	
	Profit on Sale of Fixed Assets	xxxx
	Profit on Sale of Long-term Investments	xxxx
	Profit on Redemption Debentures/Preference Shares	xxxx
(G)	***Non-operating Incomes:***	
	Dividend Received	xxxx
	Interest Received	xxxx
	Rent Received	xxxx
	Fund From Operations/Fund Lost in Operations	xxxxx

The second method of determining the fund from operations under the first classification is the Accounting Statement Format

Adjusted Profit & Loss A/c

Dr Cr

To Depreciation	xxxx	By Opening Balance Profit	xxxx
To Goodwill Written off	xxxx	By Profit on Sale of Fixed Assets	xxxx
To Patent Written off	xxxx	By Profit on Sale of Investments	xxxx
To Loss on Sale of Fixed Asset	xxxx	By Profit on Redemption of Liability	xxxx
To Loss on Sale of Investment	xxxx	By Transfer from General Reserve	xxxx
To Loss on Redemption of Liability	xxxx	By Balancing Figure fund from Operations (FFO)	xxxx

Contd...

Notes

To Preliminary Expenses off	xxxx		
To Proposed Dividend	xxxx		
To Transfer to General Reserve	xxxx		
To Current Year Provision for Taxation	xxxx		
To Current Year Provision for Depreciation	xxxx		
To Balancing Figure			
(Fund Lost in Operations)	xxxx		

12.3.2 Sales Method

Under this method, the following is the statement format is used to arrive fund flow from operations.

Sources:

Sales	xxxxx
Stock at the end	xxxxx
Less:	
Application:	
Stock at Opening	xxxx
Net Purchases(Purchase-Returns)	xxxx
Wages	xxxx
Salaries	xxxx
Telephone expenses	xxxx
Electricity charges	xxxx
Office stationery expenses	xxxx
Other operating cash expenses	xxxx
Fund from Operations	xxxx

Example: From the following details calculate funds from operations:

	₹
Salaries	10,000
Rent	6,000
Refund of Tax	6,000
Profit on Sale of Building	10,000
Depreciation on Plant	10,000
Provision for Taxation	8,000
Loss on Sale of Plant	4,000
Closing Balance of Profit & Loss A/c	1,20,000
Opening Balance on Profit & Loss A/c	50,000
Discount on Issue of Debentures	4,000

Notes

Provision for Bad Debts	2,000
Transfer to General Reserve	2,000
Preliminary Expenses written off	6,000
Goodwill written off	4,000
Dividend Received	10,000
Proposed Dividend	12,000

Solution:

Calculation of Fund From Operation

First Method

Closing Balance of Profit & Loss A/c	1,20,000
Less: Opening Balance	50,000
Balance Forward	70,000
Add: Non-fund/Non-operating Charges	
Depreciation on Plant	10,000
Provision for Taxation	8,000
Loss on Sale of Plant	4,000
Discount on Issue of Debentures	4,000
Provision for Bad Debts	2,000
Transfer to General Reserve	2,000
Preliminary Expenses off	6,000
Goodwill Written off	4,000
Proposed Dividend	12,000
	1,22,000
Less: Refund of Tax	6,000
Profit on Sale of Building	10,000
Dividend Received	10,000
Fund from Operations	96,000

Second Method:

Adjusted Profit & Loss A/c

To Depreciation on Plant	10,000	By Opening Balance b/d	50,000
To Provision for Taxation	8,000	By Profit on Sale of Building	10,000
To Loss on Sale of Plant	4,000	By Dividend Received	10,000
To Discount on issue of debentures	4,000	By Refund of Tax	6,000
To Provision for bad debts	2,000	By Balancing Figure	96,000
To Transfer to general reserve	2,000	Fund from Operations	
To Preliminary expenses off	6,000		
To Goodwill written off	4,000		

Contd...

Notes

To Proposed Dividend	12,000		
To Closing Profit c/d	1,20,000		
	1,72,000		1,72,000

Task Discuss any non-current account transactions affecting the fund position of a firm of your choice.

Self Assessment

Choose the appropriate answer

7. Adjusted profit and loss account is prepared for
   (a) Determining the fund from operations
   (b) Determining the fund lost in operations
   (c) Either (a) or (b)
   (d) None of the above
8. Fund flow statement is categorized into two parts
   (a) Fund inflow and Fund outflow
   (b) Cash inflow and Cash outflow
   (c) Sources and Applications
   (d) None of the above
9. Fund from operations is
   (a) Sources of the firm
   (b) Applications of the firm
   (c) Neither sources nor applications
   (d) None of the above

12.4 Preparing Fund Flow Statement

The next step is to prepare the fund flow statement. The proforma of the fund flow statement:

Sources of Funds	Uses of Funds
• Funds from Business Operation	• Funds Lost in Operations
• Non-trading Incomes	• Redemption of Preference Share Capital
• Sale of Non-current Assets	• Repayment of Loans
• Sale of Long-term Investments	• Purchase of Long-term Investments
• Issue of Shares	• Purchase of Fixed Assets
• Acceptance of Deposits	• Payment of Taxes
• Long-term Borrowings	• Payment of Dividends
• Decrease in Working Capital	• Drawings
	• Loss of Cash
	• Increase in Working Capital

Notes

Example: From the following relating to Panasonic Ltd., prepare funds flow statement.

Balance Sheet of Panasonic Ltd.
as on 31st December

Liabilities	2004 (₹)	2005 (₹)	Assets	2004 (₹)	2005 (₹)
Share capital	6,00,000	8,00,000	Fixed assets	3,80,000	4,20,000
Reserves	2,00,000	1,00,000	Accounts receivable	2,10,000	3,00,000
Retained earnings	60,000	1,20,000	Stock	3,00,000	3,90,000
Accounts payable	90,000	2,70,000	Cash	60,000	1,80,000
	9,50,000	12,90,000		9,50,000	12,90,000

Additional Information:

1. The company issued bonus shares for ₹ 1,00,000 and for cash ₹ 1,00,000.
2. Depreciation written off during the year ₹ 30,000.

Solution:

The first step is prepare the statement of changes in working capital

Schedule of Changes in Working Capital

	2004	2005	Increase in Working Capital	Decrease in Working Capital
Current Asset:				
Cash	60,000	1,80,000	1,20,000	–
Stock in trade	3,00,000	3,90,000	90,000	–
Accounts receivable	2,10,000	3,00,000	90,000	–
	5,70,000	8,70,000		
Current Liabilities:				
Accounts payable	90,000	2,70,000		1,80,000
Working capital	4,80,000	6,00,000	3,00,000	1,80,000
Increase in working capital	1,20,000			1,20,000
	6,00,000	6,00,000	3,00,000	3,00,000

The next step is to prepare the non-current account.

First non-current asset account should have to be prepared.

Dr **Fixed Assets A/c** Cr

Particulars	₹	Particulars	₹
To Balance b/d	3,80,000	By Depreciation (Adjusted Profit & Loss A/c)	30,000
To Cash (Purchase) Balancing fig.	70,000	By Balance c/d	4,20,000
	4,50,000		**4,50,000**

Notes

The next non-current account is that non-current liability which is nothing but Share capital

Dr **Share Capital A/c** Cr

Particulars	₹	Particulars	₹
To Balance c/d	8,00,000	By Cash (Issue of shares)	1,00,000
		By General reserve	1,00,000
		By Balance b/d	6,00,000
	8,00,000		**8,00,000**

And another non-current account is to be prepared that general reserve account.

Dr **General Reserve A/c** Cr

Particulars	₹	Particulars	₹
To Share capital	1,00,000	By Balance b/d	2,00,000
To Balance c/d	1,00,000		
	2,00,000		**2,00,000**

The next step is to prepare the Adjusted Profit & Loss A/c.

Dr **Adjusted Profit & Loss A/c** Cr

Particulars	₹	Particulars	₹
To (Fixed Assets) depreciation	30,000	By Balance b/d (Retained Earnings)	60,000
To Balance c/d	1,20,000	By Fund from operation Balancing fig..	90,000
	1,50,000		**1,50,000**

The next step is to prepare the fund flow statement of the enterprise.

Fund Flow Statement

Sources	₹	Applications	₹
Issue of Shares	1,00,000	Purchase of Land	70,000
Funds from operation	90,000	Increase in working capital	1,20,000
	1,90,000		**1,90,000**

Example: Balance sheets of M/s Black and White as on 1-1-2006 and 31-12-2006 were as follows:

Balance sheet

Liabilities	1-1-2006 ₹	31-12-2006 ₹	Assets	1-1-2006 ₹	31-12-2006 ₹
Creditors	40,000	44,000	Cash	10,000	7,000
Mrs. Whites' Loan	25,000	-	Debtors	30,000	50,000
Loan from P.N. Bank	40,000	50,000	Stock	35,000	25,000
Capital	1,25,000	1,53,000	Machinery	80,000	55,000
			Land	40,000	50,000
			Building	35,000	60,000
	2,30,000	**2,47,000**		**2,30,000**	**2,47,000**

Notes

Additional Information:

During the year, machine costing ₹ 10,000 (accumulated depreciation ₹ 3,000) was sold for ₹ 5,000. The provision for depreciation against machinery as on 1-1-2006 was ₹ 25,000 and on 31-12-2006 ₹ 40,000. Net profit for the year 2006 amounted to ₹ 45,000. You are required to prepare funds flow statement. (M.Com MKU, April 1980).

The very first step is to prepare the statement of changes in working capital.

Changes in working capital between the various current assets and current liabilities are as follows:

Current assets:

- Cash
- Debtors
- Stock

Current liabilities:

- Sundry creditors

Statement of changes in working capital

	1-1-2006 ₹	31-12-2006 ₹	Increase in Working capital	Decrease in Working capital
Current Asset:				
Cash	10,000	7,000	----------	3,000
Debtors	30,000	50,000	20,000	----------
Stock	35,000	25,000	---------	10,000
	75,000	82,000		
Current Liability:				
Sundry creditors	40,000	44,000	----------	4,000
Working capital	35,000	38,000	20,000	17,000
Increase in working capital	3,000			3,000
	38,000	**38,000**	**20,000**	**20,000**

The next step is to determine the cost of the machinery before the charge of depreciation i.e. to find out the Gross value of the assets. In other, words, original cost of the assets to be found out at the moment of purchase.

	1-1-2006	31-12-2006
Written down value of the machinery extracted from the balance sheet as on dated	₹ 80,000	₹ 55,000
Add: Accumulated depreciation or		
Provision for depreciation	25,000	40,000
Original Cost of Machinery	1,05,000	95,000

The ultimate aim is to find out the original cost of the machinery for the preparation of the machinery account.

Before preparing the Machinery account, the worth of the sale transaction of the machinery should be found out.

Notes

Original cost of the Machinery	₹ 10,000
(-) Depreciation	₹ 3,000
Machinery worth for sale	₹ 7,000
(-) Machinery sold	₹ 5,000
Loss on sale of the portion of the machinery sold	₹ 2,000

The entry for the loss on sale of machinery sold

Loss on sale a/c Dr	₹ 2,000
To Machinery a/c	₹ 2,000

The next entry is for the adjusted profit and loss account.

Adjusted Profit & Loss A/c Dr	₹ 2,000
To Loss on sale a/c	₹ 2,000

Dr **Machinery A/c** Cr

Particulars	₹	Particulars	₹
To Balance B/d	1,05,000	By Cash (Sales)	5,000
		By Provision for Depreciation	3,000
		By loss on sale(Adjusted profit and loss account)	2,000
		By Balance c/d	95,000
	1,05,000		**1,05,000**

The next one is the provision for depreciation account or accumulated depreciation account.

Dr **Provision for Depreciation A/c** Cr

Particulars	₹	Particulars	₹
To Machinery A/c	3,000	By Balance B/d	25,000
To Balance c/d	40,000	By depreciation provided during the current year	18,000
	43,000		**43,000**

The next non-current liability account to be prepared is that capital account.

In the additional information net profit for the year 2006 ₹ 45,000 is given.

Net profit is transferred to capital account.

Why the net profit is transferred to capital account?

Income earned in the form of net profit should be added to the capital account.

Net profit A/c Dr	₹ 45,000
To Capital A/c	₹ 45,000

Dr **Capital A/c** Cr

Particulars	₹	Particulars	₹
To Drawings (Balancing fig.)	17,000	By Balance B/d	1,25,000
To Balance c/d	1,53,000	By Net profit	45,000
	1,70,000		**1,70,000**

Notes

At the end of the year, the total volume of the capital should be equivalent to ₹ 1,70,000 but it amounts ₹ 1,53,000. It is only due to the personal drawings of the owner of the enterprise.

The next non-current liability account is loan from P.N.B Bank.

The closing volume of the loan is more than the opening balance of loan; it means that the firm has recently borrowed an amount of ₹ 10,000 in addition to opening balance of the loan borrowings.

While borrowing, what happens in the firm?

Debit what comes in - Cash resources are coming inside the business.

Credit the giver/liabilities - Register the name of the banker who is nothing but the giver of the loan.

Dr **Loan P.N. Bank A/c** Cr

Particulars	₹	Particulars	₹
		By Balance B/d	40,000
To Balance c/d	50,000	By Cash (Balancing fig)	10,000
	50,000		**50,000**

The next non-current liability is Mr.White's loan amount of ₹ 25,000.

The opening balance of the loan amount is greater than the closing balance which amounted to ₹ 25,000; it means that the initial loan amount was paid during the year.

Dr **Mr. White's A/c** Cr

Particulars	₹	Particulars	₹
To Cash (Loan paid)	25,000	By Balance B/d	25,000
To Balance c/d	----------		
	25,000		**25,000**

While repaying the loan amount, what happens in the firm?

The name of the party that receives the amount of loan repayment should be mentioned.

Debit the receiver - Cash resources are going out of the firm during the moment of making the repayment of the loan. Credit what goes out of the firm.

The closing balances of the land and building are greater than the opening balances: this means that additional land and building was procured by the firm for its future prospects.

The purchase of the land & building leads to applications -outflow of fund

The next step is to prepare the Adjusted Profit & Loss Account.

Adjusted Profit & Loss Account

Particulars	₹	Particulars	₹
To Machinery (Loss on sale)	2,000	By Balance B/d	----------
To Provision for Depreciation	18,000	By fund from operations	65,000
To Balance c/d (Net profit)	45,000		
	65,000		**65,000**

The next step is to prepare the fund flow statement.

Notes

Fund Flow Statement

Sources	₹	Applications	₹
Sale of machinery	5,000	Purchase of land	10,000
Loan from P.N.Bank	10,000	Purchase of Building	25,000
Fund from operation	65,000	Drawings	17,000
		Repayment of Mr. White Loan	25,000
		Increase in working capital	3,000
	80,000		**80,000**

Self Assessment

Choose the appropriate answer

10. The meaning of the "To cash (Tax paid)" entry posted in the Provision for taxation account is
    (a) Last year taxation is paid through the current year provision
    (b) Current year taxation is paid through the current year provision
    (c) Last year tax is paid through the last year taxation
    (d) Current year taxation is paid through the last year provision
11. Profit on sale of the fixed assets are considered to be
    (a) Resource to the enterprise
    (b) Non-operating income
    (c) Application of the enterprise
    (d) None of the above
12. The treatment of current year depreciation with the closing balance of profit in determining the fund from operations
    (a) To be added
    (b) To be multiplied
    (c) To be deducted
    (d) To be divided
13. The redemption bank term loan leads to change in the
    (a) Non-current liability account and current asset account
    (b) Current asset account and current liabilities account
    (c) Non-current asset account and current liabilities account
    (d) Non-current asset account and current liabilities account
14. Flow of funds means the change in
    (a) funds
    (b) working capital
    (c) either
    (d) both

Notes

15. Which of the following is not an objectives fund-flow analysis?
    (a) It pinpoints the mobilization of resources and the further utilization of resources
    (b) It highlights the financing of the general expansion of the business firms
    (c) It exemplifies the utilization of debt finance in the structure of financing
    (d) None of these.
16. Which of the following is not a source of fund?
    (a) Purchase of Long-term Investments
    (b) Acceptance of deposits
    (c) Sale of Non-current Assets
    (d) Decrease in Working Capital

12.5 Summary

- Fund flow statements summarize a firm's inflow and outflow of funds.
- Simply put, it tells investors where funds have come from and where funds have gone.
- The statements are often used to determine whether companies efficiently source and utilize funds available to them.
- Fund flow statements are prepared by taking the balance sheets for two dates representing the coverage period.
- The increases and decreases must then be calculated for each item. Finally, the changes are classified under four categories: (1) Long-term sources, (2) Long-term uses, (3) Short-term sources, and (4) Short-term uses.
- It is also important to zero out the non-fund based adjustments in order to capture only the changes that are accompanies by flow of funds.
- However, income accrued but received and expenses incurred but not received reckoned in the profit and loss statement should not be excluded from the profit figure for the fund flow statement.
- Fund flow statements can be used to identify a variety of problems in the way a company operates.
- Meanwhile, a company that is using long-term money to finance short-term investments may not be efficiently utilizing its capital.

12.6 Keywords

Current Assets: Assets which are in the form of cash, equivalent to cash or easily convertible into cash.

Current Liabilities: Short-term financial resources of the firm.

Decrease in Working Capital: Decrease in Net working capital i.e. Excess of current liabilities over the current assets – Resources side of the fund flow.

Flow: Flow means changes occurred in between two different time periods.

Fund: Fund means working capital.

Notes

Fund from Operations: Income generated from only operations.

Fund Lost in Operations: Loss incurred in the operations.

Increase in Working Capital: Increase in Net working capital i.e. Excess of current assets over the current liabilities- Applications side of the fund flow.

Non-current Assets: Long-term assets.

Non-current Liabilities: Long-term financial resources.

Statement of changes in Working Capital: Enlisting the changes taken place in between the current assets and current liabilities of two different time horizons.

12.7 Review Questions

1. From the following two balance sheet as at December 31, 2004 and 2005. Prepare the statement of sources and uses of funds.

	2004 (₹)	2005 (₹)	2004 (₹)	2005 (₹)
Liabilities				
Share capital	80,000	90,000		
Trade creditors	20,000	46,000		
Profit & Loss a/c	4,60,000	5,00,000		
Assets				
Cash			60,000	94,000
Debtors			2,40,000	2,30,000
Stock in trade			1,60,000	1,80,000
Land			1,00,000	1,32,000
	5,60,000	**6,36,000**	**5,60,000**	**6,36,000**

2. Balance sheets of M/s Black and White as on 1-1-2006 and 31-12-2006 were as follows:

Balance Sheet

Liabilities	1-1-2006 (₹)	31-12-2006 (₹)	Assets	1-1-2006 (₹)	31-12-2006 (₹)
Creditors	40,000	44,000	Cash	10,000	7,000
Mrs.Whites'Loan	25,000	-	Debtors	30,000	50,000
Loan from P.N.Bank	40,000	50,000	Stock	35,000	25,000
Captial	1,25,000	1,53,000	Machinery	80,000	55,000
			Land	40,000	50,000
			Building	35,000	60,000
	2,30,000	**2,47,000**		**2,30,000**	**2,47,000**

Additional Information:

(a) During the year machine costing ₹ 10,000 (accumulated depreciation ₹ 3,000) was sold for ₹ 5,000.

(b) The provision for depreciation against machinery as on 1-1-2006 was ₹ 25,000 and on 31-12-2006 ₹ 40,000.

(c) Net profit for the year 2006 amounted to ₹ 45,000.

You are required to prepare funds flow statement.

Notes

3. Discuss the various methods of determining the fund from/lost (in) operations.
4. Explain the process of preparing the statement of changes in working capital.
5. Draft the pro forma of the Fund Flow Statement.
6. From the following balance sheets of A Ltd. on 31st Dec. 2008 and 2009, you are required to prepare Fund flow statement. The following are additional information has also been given

   (a) Depreciation charged on plant was ₹ 4,000 and on building ₹ 4,000

   (b) Provision for taxation of ₹ 19,000 was made during the year 2009.

   (c) Interim Dividend of ₹ 8,000 was paid during the year 2009.

Balance Sheet

Liabilities	2008 (₹)	2009 (₹)	Assets	2008 (₹)	2009 (₹)
Share capital	1,00,000	1,00,000	Good will	12,000	12,000
General Reserve	14,000	18,000	Building	40,000	36,000
Profit & Loss A/c	16,000	13,000	Plant	37,000	36,000
Sundry creditors	8,000	5,400	Investments	10,000	11,000
Bills payable	1,200	800	Stock	30,000	23,400
Provision for taxation	16,000	18,000	Bill receivable	2,000	3,200
Provision for doubtful debts	400	600	Debtors	18,000	19,000
			Cash	6,600	15,200
	1,55,600	**1,55,800**		**1,55,600**	**1,55,800**

7. Prepare schedule of changes in Working Capital and Funds Flow Statement from the following Balance Sheets as on December 31, 2008.

Liabilities	2008 (₹)	2009 (₹)	Assets	2008 (₹)	2009 (₹)
Capital	10,000	10,000	Cash	5,600	5,400
Profit & Loss A/c	5,200	15,400	Debtors	3,400	6,600
Long-term Loan	6,000	8,000	Stock	5,400	9,200
Short-term Loan	2,400	2,400	Long-term Investments	7,000	12,000
Creditors	3,600	3,600	Plant	10,600	9,600
Outstanding Wages	1,400	800	Prepaid Insurance	400	800
Income Tax Provision	3,800	3,400			
	32,400	43,600		32,400	43,600

Plant was sold at its book value, i.e., ₹ 1,000

8. From the following Balance Sheets, prepare a Schedule of changes in Working Capital and Funds Flow Statement:

Notes

Liabilities	31.12.07 (₹)	31.12.08 (₹)	Assets	31.1 2.07 (₹)	31.12.08
Capital	4,80,000	5,10,000	Cash at Bank	24,000	54,000
Profit & Loss a/c	8,50,000	10,50,000	Debtors	9,90,000	11,90,000
Creditors	54,000	30,000	Stock	54,000	42,000
Mortgage Loans	28,000	1,00,000	Land	2,00,000	2,00,000
			Plant	1,44,000	2,04,000
	14,12,000	**16,90,000**		**14,12,000**	**16,90,0**

9. The following is the abstract of balance sheet of Software securities Ltd. for the year 2005 and 2006

Liabilities	2005 (₹)	2006 (₹)	Assets	2005 (₹)	2006 (₹)
Provision for depreciation	108000	396000	Land	26000	81000
Retained earning	244800	370800	Building	60000	360000
9% Debenture	270000	198000	Accumulated depreciation on building	19800	37800
Account payable	72000	41400	Equipment	122400	347400
Expense payable	0	18000	Accumulated depreciation on Equipment	18000	50400
			Stock in hand	10800	97200
			Account receivable	36000	122400
			Cash in hand	66600	97200
			Preliminary expenses	10800	7200

The income statement of Software Securities Ltd. is as under

Sales	1602000
less cost of sale	837000
less operating exp.	397800
less interest exp.	21600
loss on sale of equipments	3600
	126000
Net income before tax	342000
Provision of tax	117000
Net Income after tax	225000

Additional information:

(a) Operating expenses include depreciation of ₹ 59400 and charges from preliminary expenses of ₹ 3600.

(b) Land was sold at its book value.

(c) Cash dividend paid for the year 2006 amounted to ₹ 27000 and fully paid bonus shares were given in the ratio of 2 shares for every 3 shares hel(d).

(d) Interest expenses was paid in cash.

Notes

(e) Equipment with a cost of ₹ 298800 was purchased for cash .Equipment with a cost of ₹ 73800 (book value ₹ 64800) was sold for ₹ 61200.

(f) Debenture for ₹ 18000 were redeemed for cash and for ₹ 54000 were redeemed by converting into equity shares at par value.

(g) Equity shares of ₹ 162000 were issued for cash at par.

(h) Income tax paid during the year amounted to ₹ 117000.

Prepare the fund flow statement with both the methods.

10. "Fund flow statements can be used to identify a variety of problems in the way a company operates." Illustrate the statement by the help of suitable examples.

Answers: Self Assessment

1.	cash	2.	working capital change
3.	False	4.	True
5.	False	6.	False
7.	(c)	8.	(a)
9.	(a)	10.	(a)
11.	(b)	12.	(a)
13.	(a)	14.	(d)
15.	(d)	16.	(a)

12.8 Further Readings

Books

B.M. Lall Nigam and I.C. Jain, *Cost Accounting,* Prentice-Hall of India (P) Ltd.

Hilton, Maher and Selto, *Cost Management,* 2nd Edition, Tata McGraw-Hill Publishing Company Ltd.

M.N. Arora, *Cost and Management Accounting,* 8th Edition, Vikas Publishing House (P) Ltd.

M.P. Pandikumar, *Management Accounting,* Excel Books.

Online links

www.authorstream.com

www.allinterview.com

Notes

Unit 13: Cash Flow Analysis (As Per AS-3)

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Objectives

After studying this unit, you will be able to:

- Explain the meaning of cash flow statement
- Compute the cash flow form operating, investing and financing activity
- Prepare cash flow statement as per AS-3

Introduction

Cash is considered one of the vital sources of the firm to meet day to day financial commitments. The cash is considered to be as most important source of life blood of the business. The day to day financial commitments are met out only out of the available resources. The cash resources are availed through two different types of receipts viz. sales, dividends, interests known as regular receipts and sale of assets, investments known as irregular receipts of the business enterprise. To have smooth flow of business enterprise, it should have ample cash resources for its operations. The availability of cash resources is mainly depending on the cash inflows of the enterprises. The smoothness in operations of the enterprise is obtained through an appropriate matching of cash inflows and cash outflows.

To have smoothness in the operations of the enterprise, the firm should have an appropriate volume of cash resources at speedier rate as well as more than the financial commitments of the firm. This smoothness could be attained by way of an appropriate planning analysis on the cash resources of the firm. The meaningful analysis is only possible through cash flow statement analysis which facilitates the firm to identify the possible sources of cash as well as the expenses and expenditures of the firm.

13.1 Meaning of Cash Flow Statement

The cash flow statement is being prepared on the basis of extracted information of historical records of the enterprise. Cash flow statements can be prepared for a year, for six months, for

quarterly and even for monthly. The cash includes not only means that cash in hand but also cash at bank.

The following are the main motives of preparing the cash flow statement:

1. To identify the causes for the cash balance changes in between two different time periods, with the help of corresponding two different balance sheets.
2. To enlist the factors of influence on the reduction of cash balance as well as to indicate the reasons though the profit is earned during the year and vice versa.

Utility of Cash Flow Statement

1. To identify the reasons for the reduction or increase in the cash balances irrespective level of the profits earned by the firm.
2. It facilitates the management to maintain an appropriate level of cash resources.
3. It guides the management to take futuristic decisions on the prospective demands and supply of cash resources through projected cash flows.
   (a) How much cash resources are required?
   (b) How much cash requirements could be internally settled?
   (c) How much cash resources are to be raised through external sources?
   (d) Which types of instruments are going to be floated for raising the required resources?
4. It helps the management to understand its capacity at the moment of borrowing for any further capital budgeting decisions.
5. It paves way for scientific cash management for the firm through maintenance of appropriate cash levels, i.e. optimum level cash of resources.
6. It avoids in holding excessive or inadequate cash resources through proper planning of cash resources.
7. It moots control through identification of variations occurred in the cash expenses and expenditures.

Table 13.1: Cash Flow Statement vs Fund Flow Statement

Cash Flow Statement	Fund Flow Statement
Cash inflow and outflow are only considered	Increase or decrease in the working capital is registered
Causes & changes of cash position	Causes & changes of working capital position
Considers only most liquid assets pertaining to cash resource; which fosters only for very short span of planning	Considers in general i.e. current assets; the duration of the liquidity of the current assets are longer in gestation than the liquid assets; which paves way for long span of planning
Opening and closing balances of cash resources are considered for the preparation	Increase or decrease of working capital is considered but not the opening and closing balance for preparation
The flow in the statement means real cash flow	The flow in the statement need not be real cash flow

Self Assessment

Fill in the blanks:

1. The cash flow statement is being prepared on the basis of extracted information of ..... of the enterprise.

Notes

2. The ..... are availed through two different types of receipts viz. sales, dividends, interests known as regular receipts and sale of assets, investments known as irregular receipts of the business enterprise.

3. The cash includes not only means that cash in hand but also ..... .

13.2 Classification of Cash Flow

As per AS-3 (revised) the cash flow statement is prepared in a manner reporting the cash flows into following categories:

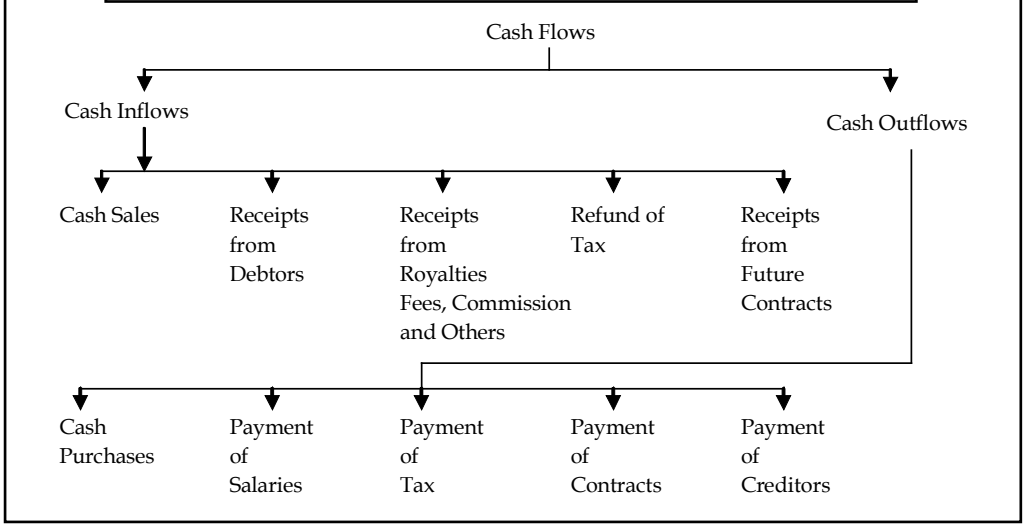
13.2.1 Cash Flow from Operating Activities

Cash flows from operating activities are earned from the principal revenue - producing activities of an enterprise. Through these activities the net profit or loss of the business is also determined. Examples of such a flow from operating activities are given in AS-3 (revised) as follows:

1. Cash receipts from the sale of goods and rendering of services;
2. Cash receipts from royalties, fees, commissions and other revenue;
3. Cash payments to suppliers for goods and services;
4. Cash payments to and on behalf of employees;
5. Cash receipts and cash payments of an insurance enterprise for premiums and claims, annuities and other policy benefits;
6. Cash payments or refunds of income taxes unless they can be specifically identified with financing and investing activities, and
7. Cash receipts and payments relating to future contracts, forward contracts, option contracts and swap contracts when the contracts are held for dealing or trading purposes.

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

Figure 13.1: Diagrammatic Presentation of Cash Flows from Operating Activities



Notes

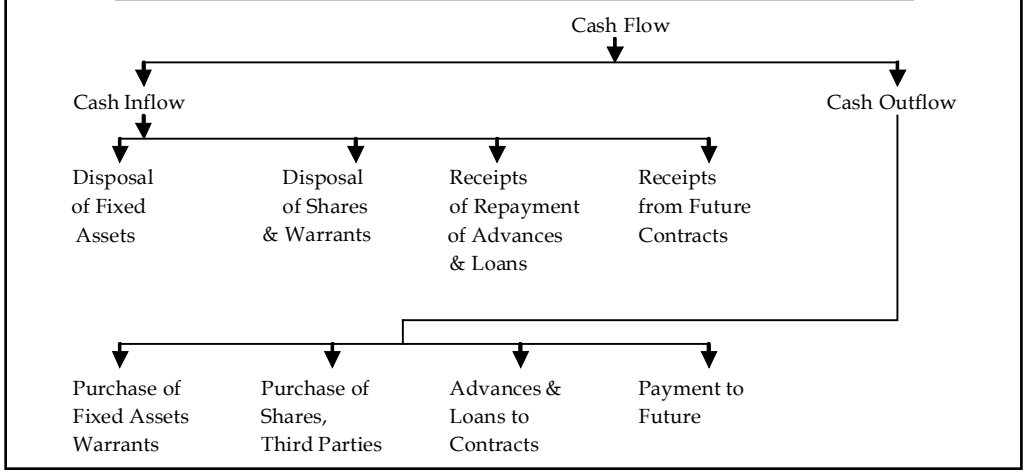
13.2.2 Cash Flow from Investing Activities

Investing activities of an enterprise include the purchase of fixed assets (as plant and machinery, land and buildings, furniture and fixtures) with an intention to generate the future incomes. On account of being an important activity, a separate disclosure of the cash flows from these activities is made. Examples of cash flows arising from investing activities are in AS-3 (revised) as follows:

1. Cash payments of acquired fixed assets (including intangibles). These payments include those relating to capitalized research and development costs and self-constructed fixed assets;
2. Cash receipts from disposal of fixed assets (including intangibles);
3. Cash payments to acquired shares, warrants or debt instruments of other enterprises and interests in joint ventures (other than payments for those instruments considered to be cash equivalents and those held for dealing or trading purposes);
4. Cash receipts from disposal of shares, warrants or debt instruments of other enterprises and interests in joint ventures (other than receipts from those instruments considered to be cash equivalents and those held for dealing or trading purposes);
5. Cash advances and loans made to third parties (other than advances and loans made by a financial enterprise);
6. Cash receipts from the repayment of advances and loans made to third parties (other than advances and loans of a financial enterprise);
7. Cash payments for future contracts, forward contracts, option contracts and swap contracts except when the contracts are held for dealing or trading purposes, or the payments are classified as financing activities; and
8. Cash receipts from future contracts, forward contracts, option contracts and swap contracts except when the contracts are held for dealing or trading purposes, or the receipts are classified as financing activities.

Did u know? When a contract is accounted for as a hedge of an identifiable position, the cash flows of the contract are classified in the same manner as the cash flows of the position being hedged.

Figure 13.2: Diagrammatic Presentation of Cash Flow from Investing Activities



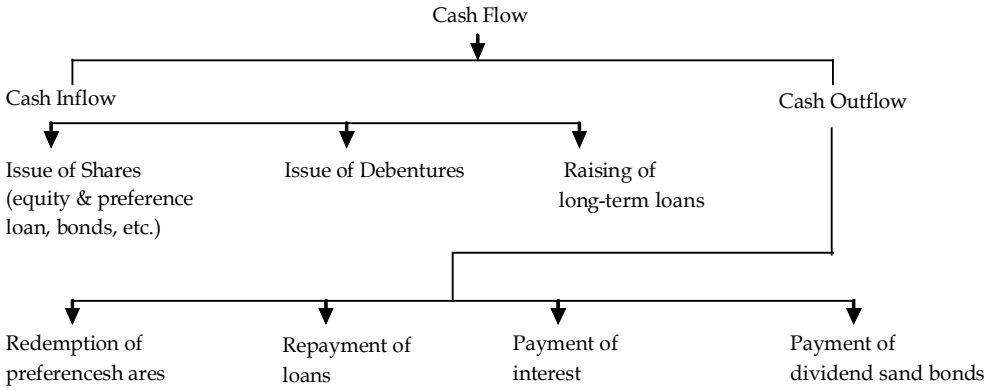
Notes

13.2.3 Cash Flow from Financing Activities

Under financial activities those activities are included which are relating to the size and composition of capital (equity and preferences) and borrowing or loans. As per AS-3 (revised), the separate disclosure of cash flows arising from financing activities is important because it is useful in predicting claims on future cash flows by providers of funds (both capital and borrowings) to the enterprise. Examples of cash flows arising from financing activities are:

1. Cash proceeds from issuing shares or other similar instruments;
2. Cash proceeds from issuing debentures, loans, notes, bonds and other short or long-term borrowings; and
3. Cash repayments of amounts borrowed.

Figure 13.3: Diagrammatic Presentation of Cash Flow from Financing Activities



Note **Treatment of Other Items**

Besides the above cash flow activities AS-3 (revised) also give the dealing of the some other items. These other items are as follows:

1. ***Foreign Currency Cash Flow:*** Unrealized gain or loss on account of change in the foreign exchange rate is not treated as cash flow. But the effect of change of foreign exchange on the cash and cash equivalents held in a foreign currency is recorded in the cash flow statement to reconcile the cash and cash equivalents at the beginning and at the end of the period. This amount is not adjusted with operating, investing and financing activities but it is shown separately.
2. ***Extra-ordinary Items:*** Cash flow arising from the extra-ordinary item is shown in the cash flow statement after classifying it into operating, investing and financing activities. This is done so that ordinary users may understand them easily. For example, loss by fire in store is compensated by insurance company. It will be treated as cash flow from operating activities.
3. ***Interest and Dividends:*** If a financial enterprise is receiving interest and dividend then such a cash flow arising from interest and dividend will be considered into operating activities. If interest and dividend are received by other enterprise, such a cash flow arising from interest and dividend will be considered into investing activities and if interest and dividend is paid, such a cash flow arising from interest

Contd...

Notes

and dividend is considered into financing activities. This cash flow arising from interest and dividend paid or received is disclosed separately.

4. ***Taxes on Income:*** If no adverse information is given relating to taxes paid on incomes, cash flow arising from the taxes paid as income is classified in operating activities. If taxes are paid on such income which is relating to finance, such a cash flow will be classified into financial activities.

5. ***Non-cash Transactions:*** The non-cash transactions are not recorded in cash flow statement because they do not have a direct impact on the current cash flow while they affect the capital and assets as purchase of fixed assets by the issue of shares or debentures. In AS-3 (revised) examples of non-cash transactions are mentioned as below:

   (a) The acquisition of assets by assuming directly related liabilities,

   (b) The acquisition of an enterprise by means of issue of shares, and

   (c) The conversion of debt to equity

6. ***Balances of Foreign Branches:*** In some situations, the balance of cash and cash equivalent held with foreign branches are not available due to foreign exchange control or other legal restrictions. So the management should use that amount which can be measured in cash and cash equivalent.

Self Assessment

Fill in the blanks:

4. Cash flows from ..... activities are earned from the principal revenue - producing activities of an enterprise.

5. ..... activities of an enterprise include the purchase of fixed assets.

6. Cash proceeds from issuing shares or other similar instruments are the examples of cash flow from ..... activities.

7. The ..... are not recorded in cash flow statement because they do not have a direct impact on the current cash flow while they affect the capital and assets as purchase of fixed assets by the issue of shares or debentures.

8. Cash flow arising from the ..... is shown in the cash flow statement after classifying it into operating, investing and financing activities.

13.3 Preparation of Cash Flow Statement

Cash flow statement provides information about the cash receipts and payments of an enterprises for a given period. It provides important information that supplements the profit and loss account and balance sheet.

The statement of cash flows is required to be reported by Accounting Standard-3 (Revised) issued by the Institute of Chartered Accountants of India in March 1997 Which replaces the 'Changes in Financial Position' as per AS-3.

There are certain changes in the preparation of cash flow statement from the previous methods as a result of the introduction of AS-3 (Revised).

Notes

AS-3 (Revised) is mandatory in nature in respect of accounting periods commencing on or after 1-4-2001 for the following:

1. Enterprises whose equity or debt securities are listed on a recognised stock exchange in India, and enterprises that are in the process of issuing equity or debt securities that will be listed on a recognised stock exchange in India as evidenced by the board of directors' resolution in this regard.
2. All other commercial, industrial and business reporting enterprises, whose turnover for the accounting period exceeds ₹ 50 crores.

There are two methods of converting net profit into net cash flows from operating activities:

(i) Direct method, and

(ii) Indirect method.

Direct Method

Under direct method, cash receipts from operating revenues and cash payments for operating expenses are arranged and presented in the cash flow statement. The difference between cash receipts and cash payments is the net cash flow from operating activities. It is in effect a cash basis profit & loss account. In this case, each cash transaction is analysed separately and the total cash receipts and payments for the period are determined. The summarised data for revenue and expenses can be obtained from the financial statements and additional information. We may convert accrual basis of revenue and expenses to equivalent cash receipts and payments. Make sure that a uniform procedure is adopted for converting accrual base items to cash base items.

The following are some examples of usual cash receipts and cash payments resulting from operating activities:

1. Cash sales of goods and services;
2. Cash collected from debtors (customers);
3. Cash receipts of interest or dividends;
4. Cash receipts of royalties, fees, commission and other revenues;
5. Cash payments to suppliers (creditors);
6. Cash payments for various operating expenses, i.e., rent, rates, power, etc.
7. Cash payments for wages and salaries to employees;
8. Cash payments for income tax, etc.

Indirect Method

In this method, the net profit (loss) is used as the base and converted to net cash provided by (used in) operating activities. The indirect method adjusts net profit for items that affected net profit but did not affect cash. Non-cash and non-operating charges in the profit & loss account are added back to the net profit, while non-cash and non-operating credits are deducted to calculate operating profit before working capital changes. It is a partial conversion of accrual basis profit to cash basis profit. Necessary adjustment are made for increase/decrease in current assets and current liabilities to obtain net cash from operating activities.

Format of Cash Flow Statement

Notes

1. Cash Flow Statement (Direct Method)

Cash Flow Statement (Direct Method)

		(₹)
Cash Flows from Operating Activities		
Cash receipts from customers		(xxx)
Cash paid to suppliers and employees		xxx
Cash generated from operations		(xxx)
Income-tax paid		xxx
Cash flow before extraordinary items		xxx
Proceeds from earthquake disaster settlement, etc.		xxx
Net cash flow from operating activities	(a)	xxx
Cash flows from Investing Activities		
Purchase of fixed assets		(xxx)
Proceeds from sale of equipment		xxx
Interest received		xxx
Dividend received		xxx
Net cash flow from investing activities		**xxx**
Cash flows from Financing Activities		
Proceeds from issuance of share capital		xxx
Proceeds from long-term borrowings		xxx
Repayments of long-term borrowings		(xxx)
Interest paid		(xxx)
Dividend paid		(xxx)
Net Cash flow from financing activities	(b)	**xxx**
Net increase (decrease) in cash and cash equivalents during the period	(a-b+c)	xxx
Cash and cash equivalents at beginning of period		xxx
Cash and cash equivalents at end of period		xxx

2. Cash flow statement (Indirect method)

Cash flow Statement (Indirect Method) (Accounting Standard-3 (Revised)

Particulars		**(₹)**
Cash flow from Operating activities		
Net profit before tax and extraordinary items		xxx
Adjustments for:		
-Depreciation		xxx
-Foreign exchange		xxx
-Investments		xxx

Contd...

Notes

-Gain or loss on sale of fixed assets		(xxx)
-Interest/dividend		xxx
Operating Profit Before Working Capital Changes		xxx
Adjustment for:		
-Trade and other receivables		xxx
-Inventories		(xxx)
-Trade payables		xxx
Cash Generated from Operations		xxx
-Interest paid		(xxx)
-Direct taxes		(xxx)
Cash before Extraordinary Items		xxx
Deferred revenue		xxx
Net cashflow from operating activities	(a)	xxx
Cashflow from Investing activities		
Purchase of fixed assets		(xxx)
Sale of fixed assets		xxx
Sale of investments		xxx
Purchase of investments		(xxx)
Interest received		xxx
Dividend received		xxx
Loans to subsidiaries		xxx
Net cashflow from investing activities	(b)	xxx
Cashflow from Financing Activities		
Proceeds from issue of share capital		xxx
Proceeds from long term borrowings		xxx
Repayment to finance/lease liabilities		(xxx)
Dividend paid		(xxx)
Net cashflow from financing activities	(c)	xxx
Net Increase (decrease) in cash and cash equivalents during the period	(a+b+c)	xxx
Cash and cash equivalents at the beginning of the year		xxx
Cash and cash equivalents at the end of the year		xxx

Note As per the amendment of Clause 32 of the Listing Agreement of SEBI, 1995, all the listed companies have to prepare and publish their Cash Flow Statement as per the above formats with their annual financial statements in the reports. SEBI recommends the indirect method to prepare the cash flow statement.

Notes

Example: From the information as contained in the income statement and the balance sheet of SLV Ltd., you are required to prepare a cash flow statement using (i) Direct Method and (ii) Indirect Method.

1. Income Statement and Reconciliation of Earnings for the year ended 31.3.2007

Particulars		₹
Net Sales		25,20,000
Less: Cost of sales	19,80,000	
Depreciation	60,000	
Salaries and wages	2,40,000	
Operating expenses	80,000	
Provision for taxation	88.000	24.48,000
Net operating profit		72,000
Non-recurring income:		
Profit on sale of equipment		12.000
		84,000
Retained earnings (balance in profit & loss account brought forward)		1,51,800
		2,35,800
Dividend declared and paid during the year		72,000
Profit & Loss account balance as on 31.3.2007		1.63,800

2. Comparative Balance Sheets

Particulars	31.3.2006 ₹	31.3.2007 ₹
Fixed assets		
Land	48,000	96,000
Building and equipments	3,60,000	5,76,000
Current assets		
Cash	60,000	72,000
Debtors	1,68,000	1,86,000
Stock	2,64,000	96,000
Advances	7,800	9,000
	9,07,800	10,35,000
Capital	3,60,000	4,44,000
Surplus in profit & loss A/c	1,51,800	1,63,800
Sundry creditors	2,40,000	2.34,000
Outstanding expenses	24,000	48,000
Income tax payable	12,000	13,200
Accumulated depreciation on building and equipments	1,20,000	1,32,000
	9,07,800	10,35,000

Notes Cost of equipment sold was ₹ 72,000.

Solution:

Direct Method

SLV Limited

Cash Flow Statement for the year ended 31.3.2007

Particulars	₹	₹
Cash Flows from Operating Activities:		
Cash receipts from customers	25,02,000	
Cash paid to suppliers and employees	21,15,200	
Cash generated from operations	3,86,800	
Income tax paid	(86,800)	
Net Cash from Operating Activities		3,00,000
Cash Flows from Investing Activities:		
Purchase of land	(48,000)	
Purchase of building and equipment	(2,88,000)	
Sale of equipment	36,000	
Net Cash used in Investing Activities		(3,00,000)
Cash Flows from Financing Activities:		
Issue of share capital	84,000	
Dividend paid	(72,000)	
Net Cash from Financing Activities		12,000
Net Increase in Cash and Cash Equivalents		12,000
Cash and Cash Equivalents at the beginning		60,000
Cash and Cash Equivalents at the end		72,000

Working Notes

(i)	Cash receipts from customers:		
	Sales revenue		25,20,000
	Add: Debtors at the beginning		1,68,000
		26,88,000	
	Less: Debtors at the end		1,86,000
		25,02,000	
(ii)	Cash paid to suppliers and employees:		
	Cost of goods sold		19,80,000
	Add: Operating expenses		80,000
	Salaries and wages		2,40,000
			23,00,000
	Add: Creditors at the beginning	2,40,000	
	Stock at the end	96,000	
	Advances at the end	9,000	

Contd...

Notes

	Outstanding expenses at the beginning	24,000	3,69,000
			26,69,000
	Less: Creditors at the end	2,34,000	
	Stock at the beginning	2,64,000	
	Advances at the beginning	7,800	
	Outstanding expenses at the end	48,000	5,53,800
			21,15,200
(iii)	Income tax paid:		
	Tax payable at the beginning		12,000
	Add: Provision for taxation		88,000
			1,00,000
	Less: Tax payable at the end		13,200
	Tax paid during the year		86,800
(iv)	Accumulated depreciation written off on equipments (sold)		
	Accumulated depreciation at the beginning		1,20,000
	Add: Depreciation for the year		60,000
			1,80,000
	Less: Accumulated depreciation at the end		1,32,000
			48.000
(v)	Sale price of equipment:		
	Cost price		72,000
	Less: Accumulated depreciation		48,000
			24,000
	Add: Profit on sale		12,000
			36,000
(vi)	Purchase of building and equipments:		
	Balance at the beginning		3,60,000
	Less: Cost of equipment sold		72,000
	Balance		2,88,000
	Balance at the end		5,76,000
	Purchased during the year		2,88.000

Indirect Method
SLV Limited
Cash Flow Statement for the year ended 31.3.2007

Particulars	Dr.	Cr.
Cash Flows from Operating Activities:	₹	₹
Net profit before taxation and extra-ordinary item	1,60,000	
Adjustments for:		
Depreciation	60,000	
Operating profit before working capital changes	2,20,000	

Contd...

Notes

Increase in debtors	(18,000)	
Decrease in stock	1,68,000	
Increase in advances	(1,200)	
Decrease in creditors	(6,000)	
Increase in outstanding expenses	24,000	
Cash generated from operation	3,86,800	
Income tax paid	(86,800)	
Net Cash from Operating Activities		3,00,000
Cash Flows from Investing Activities:		
Purchase of land	(48,000)	
Purchase of building and equipments	(2,88,000)	
Sale of equipment	36,000	
Net Cash Used in Investing Activities		(3,00,000)
Cash Flows from Financing Activities:		
Issue of share capital	84,000	
Dividend paid	(72.000)	
Net Cash from Financing Activities		12,000
Net Increase in Cash and Cash Equivalents		12,000
Cash and Cash Equivalents at the beginning		60,000
Cash and Cash Equivalents at the end		72.000

Example: From the following balance sheets of Sudhir Ltd., for the year ended 31st March, 2006 and 2007, prepare a cash flow statement.

Particulars		**31.3.2006 ₹**		**31.3.2007 ₹**
Assets				
Property		2,00,000		2,50,000
Plant and machinery	4,00,000		4,50,000	
Less: Depreciation	1.40.000	2,60,000	1.50.000	3,00,000
Loans to subsidiary Co.		–		15,000
Share in subsidiary Co.		20,000		20,000
Stock in trade		1,40,000		1,50,000
Debtors		1,00,000		1,50,000
Bank		35,000		1,57,000
		7,55,000		10,42,000
Liabilities				
Equity Share of ₹ 20 each		3,00,000		4,00,000
Share premium		–		10,000
Profit & Loss appropriation A/c		1,00,000		1,00,000
Profit for the year		–		2,00,000
6% Debentures		1,50,000		1,00,000
Profit on Redemption of Debentures		–		2,000
Sundry creditors		1,40,000		1,10,000
Provision for taxation		50,000		1,00,000
Proposed dividend		15,000		20,000
		7,55,000		**10,42,000**

Notes

Additional Information:

During the year, plant costing ₹ 50,000 was sold for ₹ 10,000. Accumulated depreciation on this plant was ₹ 30,000. Loss on sale of plant was charged to profit & Loss account. Income-tax paid during the year was ₹ 60,000.

Solution:

Sudhir Limited
Cash Flow Statement for the year ended 31.3.2007
Cash Flows from Operating Activities

Particulars	₹
Net profit before tax and extraordinary items	2,00,000
Adjustments for:	
Depreciation	40,000
Provision for taxation	1,10,000
Proposed dividend	20,000
Loss on sale of machinery	10,000
Operating profit before working capital changes	3,80,000
Adjustments for:	
Increase in debtors	(50,000)
Increase in stock-in-trade	(10,000)
Decrease in creditors	(30,000)
Cash generated from operations	2,90,000
Tax paid	(60,000)
Net cash from operating activities	2.30,000
Cash flows from investing activities	
Purchase of property	(50,000)
Sale of plant	10,000
Purchase of machinery	(1,00,000)
Loans to subsidiaries	(15,000)
Net cash used in Investing activities	(1,55,000)
Cash flows from financing activities	
Issue of equity share capital at premium	1,10,000
Redemption of debentures	(48,000)
Dividends paid	115,000)
Net cash from financing activities	47,000
Net increase in cash and cash equivalents	
(₹ 2,30,000 - ₹ 1,55,000 + 47,000)	1,22,000
Cash and cash equivalents at the beginning of the year	35,000
Cash and cash equivalents at the end of the year	1.57,000

Notes

Working Notes:

Property Account

Dr. Cr.

Particulars	₹	Particulars	₹
To Balance b/d	2,00,000	By Balance c/d	2,50,000
To Bank (purchases)			
(balancing figure)	50,000		
	2,50,000		**2,50,000**

Plant & Machinery Account

Particulars	₹	Particulars	₹
To Balance b/d	4,00,000	By Bank (plant sold)	10,000
To Bank (purchases)	1,00,000	By Accumulated depreciation	30,000
(balancing figure)		(on plant sold)	
		By Loss on plant sold	10,000
		By Balance c/d	4,50,000
	5,00,000		**5,00,000**

Accumulated Depreciation Account

Particulars	₹	Particulars	₹
To Plant & machinery A/c	30,000	By Balance b/d	1,40,000
(on plant sold)		By Dep. for the year	40,000
To Balance c/d	1,50,000	(balancing figure)	
	1,80,000		**1,80,000**

Loans to Subsidiary Account

Particulars	₹	Particulars	₹
To Bank (balancing figure)	15,000	By Balance c/d (closing)	15,000
	15,000		**15,000**

Equity Share Capital Account

Particulars	₹	Particulars	₹
To Balance c/d	4,00,000	By Balance b/d	3,00,000
		By Bank (balancing figure)	1,00,000
	4,00,000		**4,00,000**

Share Premium Account

Particulars	₹	Particulars	₹
To Balance c/d	10,000	By Bank (balancing figure)	10,000
	10,000		**10,000**

Notes

Debentures Account

Particulars	₹	Particulars	₹
To Bank (balancing figure)	48,000	By Balance b/d	1,50,000
To Profit on redemption A/c	2,000		
To Balance c/d	1,00,000		
	1,50,000		**1,50,000**

Profit on Redemption Account

Particulars	₹	Particulars	₹
To Balance c/d	2,000	By 6% Debentures A/c	2,000
	2,000		**2,000**

Provision for Taxation

Particulars	₹	Particulars	₹
To Bank (tax paid)	60,000	By Balance b/d	50,000
To Balance c/d	1.00,000	By Transfer from P & L A/c	1,10,000
	1,60,000		**1,60,000**

Proposed Dividend

Particulars	₹	Particulars	₹
To Bank (dividends paid)	15,000	By Balance b/d	15,000
To Balance c/d	20.000	By Transfer from P & L A/c	20,000
	35,000		**35,000**

Task Illustrate the impact of the changes taken place on the current assets and current liabilities to the tune of cash flows determination of the firm.

Self Assessment

Choose the appropriate answer

9. Cash position at the opening and closing comprises of
   (a) Cash in hand
   (b) Cash at bank
   (c) Both cash in hand and at bank
   (d) None of the above.
10. Cash flow analysis superior than the fund flow analysis due to
   (a) Shorter span of cash resources are considered
   (b) Real cash flows only taken into consideration
   (c) Opening and closing cash balances are only considered
   (d) (a), (b) & (c).

Notes

11. Sale of the plant and machinery falls under the category of
    (a) Non-current asset sale – cash in flow
    (b) Current asset sale – cash out flow
    (c) Non-current asset sale – cash out flow
    (d) None of the above.
12. Which of the following cannot be included in financing cash flows?
    (a) Payments of dividends
    (b) Repayment of debt principal
    (c) Sale or repurchase of the company's stock
    (d) Proceeds from issuing shares.
13. Which of the following cannot be included in cash outflows?
    (a) Operating and capital outlays
    (b) Family living expenses
    (c) Loan payments
    (d) None of these.
14. Which of the following is not a part to the Statement of Cash Flows (or Cash Flow Statement)?
    (a) Operating Activities
    (b) Investors' Activities
    (c) Financing Activities
    (d) Supplemental Activities.
15. Which of the following is not included under operating activities?
    (a) Receipts from income
    (b) Payment for a new investment
    (c) Payment for expenses and employees
    (d) Funding of debtors.
16. Which of the following is included under cash outflows?
    (a) Buying new assets
    (b) Money the business borrows
    (c) Proceeds from selling an investment
    (d) None of these.
17. Which of the following is not judged about by the cash flow statements?
    (a) Profitability
    (b) Financial condition
    (c) Financial management
    (d) Movement of fund

Notes

13.4 Summary

- Cash flow statement indicates sources of cash inflows and transactions of cash outflows prepared for a period.
- It is an important tool of financial analysis and is mandatory for all the listed companies.
- The cash flow statement indicates inflow and outflow in terms of three components: (1) Operating, (2) Financing, and (3) Investment activities.
- Cash inflows include sale of assets or investments, and raising of financial resources.
- Cash outflows include purchase lo assets or investments and redemption of financial resources.
- There are two methods of converting net profit into net cash flows from operating activities:
  - Direct method, and
  - Indirect method.

13.5 Keywords

Cash: It includes cash in hand and demand deposits with bank.

Cash Equivalents: Refer short-term risk free highly liquid investment

Cash Flow Statement: The statement which indicates the flow (movement) of cash during a period.

Flow of Cash: It means the change in cash. It also includes the inflow and outflow of cash.

13.6 Review Questions

1. The comparative balance sheets of M/s Ram Brothers for the two years were as follows:

Liabilities	**Mar, 31**		**Assets**	**Mar, 31**	
	2004	**2005**		**2004**	**2005**
Capital	3,00,000	3,50,000	Land &Building	2,20,000	3,00,000
Loan from Bank	3,20,000	2,00,000	Machinery	4,00,000	2,80,000
Creditors	1,80,000	2,00,000	Stock	1,00,000	90.000
Bills payable	1,00,000	80,000	Debtors	1,40,000	1,60,000
Loan from SBI		50,000	Cash	40,000	50,000
	9,00,000	**8,80,000**		**9,00,000**	**8,80,000**

Additional Information:

(a) Net profit for the year 2005 amounted to ₹ 1,20,000.

(b) During the year a machine costing ₹ 50,000 (accumulated depreciation ₹ 20,000) was sold for ₹ 26,000. The provision for depreciation against machinery as on 31 Mar., 2004 was ₹ 1,00,000 and 31st Mar., 2005 ₹ 1,70,000.

You are required to prepare a cash flow statement.

Notes

2. Draw the proforma of the Adjusted profit and loss account.

3. Data Ltd., supplies you the following balance on 31st Mar 2005 and 2006.

Liabilities	2005	2006	Assets	2005	2006
Share capital	1,40,000	1,48,000	Bank balance	18,000	15,600
Bonds	24,000	12,000	Accounts Receivable	29,800	35,400
Accounts payable	20,720	23,680	Inventories	98,400	85,400
Provision for debts	1,400	1,600	Land	40,000	60,000
Reserves and Surpluses	20,080	21,120	Good will	20,000	10,000
	2,06,200	**2,06,400**		**2,06,200**	**2,06,400**

Additional Information:

(a) Dividends amounting to ₹ 7,000 were paid during the year 2006.

(b) Land was purchased for ₹ 20,000.

(c) ₹ 10,000 were written off on good will during the year.

(d) Bonds of ₹ 12,000 were paid during the course of the year.

You are required to prepare a cash flow statement.

4. Since everything has some utility, analyse the cash flow statement analysis and explain its various utilities.

5. Discuss the procedure of determining cash provided by operating activities. Give suitable example to illustrate your answer.

6. The following is the abstract of balance sheet of Software securities ltd for the year 2005 and 2006.

Liabilities	2005 (₹)	2006 (₹)	Assets	2005 (₹)	2006 (₹)
Provision for depreciation	108000	396000	Land	26000	81000
Retained earning	244800	370800	Building	60000	360000
9% Debenture	270000	198000	Accumulated depreciation on building	19800	37800
Account payable	72000	41400	Equipment	122400	347400
Expense payable	0	18000	Accumulated depreciation on Equipment	18000	50400
			Stock in hand	10800	97200
			Account receivable	36000	122400
			Cash in hand	66600	97200
			Preliminary expenses	10800	720

The income statement of Software Securities Ltd. is as under

Sales	1602000
less cost of sale	837000
less operating exp.	397800
less interest exp.	21600

Contd...

Notes

loss on sale of equipments	3600
	126000
Net income before tax	342000
Provision of tax	117000
Net Income after tax	**225000**

Additional Information:

(a) Operating expenses include depreciation of ₹ 59400 and charges from preliminary expenses of ₹ 3600.

(b) Land was sold at its book value.

(c) Cash dividend paid for the year 2006 amounted to ₹ 27000 and fully paid bonus shares were given in the ratio of 2 shares for every 3 shares held.

(d) Interest expenses was paid in cash.

(e) Equipment with a cost of ₹ 298800 was purchased for cash .Equipment with a cost of ₹ 73800 (book value ₹ 64800) was sold for ₹ 61200.

(f) Debenture for ₹ 18000 were redeemed for cash and for ₹ 54000 were redeemed by converting into equity shares at par value.

(g) Equity shares of ₹ 162000 were issued for cash at par.

(h) Income tax paid during the year amounted to ₹ 117000.

Prepare the cash flow statement with both the methods.

7. Determine which of the following are added back to [or subtracted from, as appropriate] the net income figure (which is found on the Income Statement) to arrive at cash flows from operations.

   (a) Depreciation

   (b) Deferred tax

   (c) Amortization

   (d) Any gains or losses associated with the sale of a non-current asset.

   Support your answers with elaborative reasoning.

8. Assume that you are thinking of purchasing a new machine that will allow you to offer a new product to your customers. The machine will cost ₹ 100,000 to purchase and install, and after five years (when you plan to sell it) the machine will be worth about ₹ 10,000. Your facility has plenty of room, so you won't have any additional rental costs for space, and you can piggyback advertising for the new product on to your existing advertising budget. You will, however, have to pay for insurance, personal property taxes, and a part-time employee to operate the machinery (these items are included in your fixed costs which will total ₹ 12,000 in the first year). Also, there will be costs for materials, supplies, and electricity that will vary depending on the volume of production. These variable costs will amount to about 60 percent of the sales revenues. Develop a projected cash flow statement for the project.

9. Think of the possible errors that might be committed while developing the cash flow statements and suggest ways to prevent such mistakes beforehand.

10. Show by example how to prepare a cash flow statement using a balance sheet.

Notes

11. Unlike the balance sheet and the income statement, the cash flow statement is not based on accruals accounting, why?

12. For each of the following items, indicate which part (out of Operating, Investing, Financing and Supplemental) will be affected and why.

    (a) Depreciation Expense

    (b) Proceeds from the sale of equipment used in the business.

    (c) The Loss on the Sale of Equipment

    (d) Declaration and payment of dividends on company's stock

    (e) Gain on the Sale of Automobile formerly used in the business.

Answers: Self Assessment

1.	historical records	2.	cash resources
3.	cash at bank	4.	operating
5.	Investing	6.	financing
7.	non-cash transactions	8.	extra-ordinary item
9.	(c)	10.	(b)
11.	(a)	12.	(c)
13.	(d)	14.	(b)
15.	(b)	16.	(a)
17.	(d)		

13.7 Further Readings

Books

B.M. Lall Nigam and I.C. Jain, *Cost Accounting,* Prentice-Hall of India (P) Ltd.

Hilton, Maher and Selto, *Cost Management, 2nd Edition,* Tata McGraw-Hill Publishing Company Ltd.

M. N. Arora, *Cost and Management Accounting,* 8th Edition, Vikas Publishing House (P) Ltd.

M. P. Pandikumar, *Management Accounting*, Excel Books.

Online links

www.authorstream.com

www.allinterview.com

Notes

Unit 14: Introduction to Recent Development in Cost Management

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Objectives
Introduction
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14.2 Target Costing
14.2.1 The Basic Process
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Objectives

After studying this unit, you will be able to:

- Define activity based costing
- Describe target costing
- Discuss the preparation of master budget

Introduction

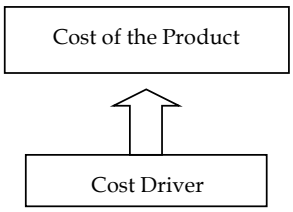
Activity based Costing (ABC) is an accounting technique that allows an organization to determine the actual cost associated with each product and service produced by the organization without regard to the organizational structure. It is developed to provide more-accurate ways of assigning the costs of indirect and support resources to activities, bushiness processes, products, services, and customers. ABC systems recognize that many organizational resources are required not for physical production of units of product but to provide a broad array of support activities that enable a variety of products and services to be produced for a diverse group of customers. The goal of ABC is not to allocate common costs to products. The goal is to measure and then price out all the resources used for activities that support the production and delivery of products and services to customers.

Notes

14.1 Activity based Costing

Activity-based costing is defined as follows: "It is a technique which involves identification of cost with each cost-driving activity and making it the basis for apportionment/assignment of costs over different cost objects/jobs/products/ customers/services."

Figure 14.1



The concept of activity-based costing was evolved on the following set of assumptions:

- The cost has to be assigned to the individual activity: How the cost can be assigned to the individual activity? The cost of any activity is determined on the basis of the volume of consumption of resources. The identification or determination of the volume of resources consumed is only for the determination of the cost of an activity, which is known as resource-driver.

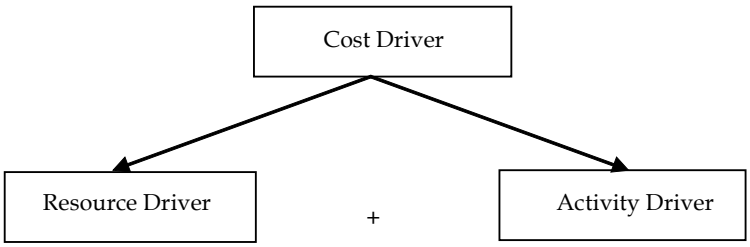
  In ABC, the cost is assigned to activity but in the traditional cost system cost is classified and apportioned on the basis of functions of the enterprise viz Factory, Administrative, Selling & Distribution and so on.

- The second important assumption is the assignment of cost to cost objects: How can the cost be assigned to cost object? Before understanding the methodology of the cost assignment, every one should know about the meaning of the terminology of cost object. It is defined as an item for which the cost measurement is required for the product, job and customer.

The assignment of cost to cost object only on the basis of activity drivers clearly determines the real consumption of the activity.

The activity cost of any object is subject to the number of activities involved. The activity cost of mounting the circuit board of the small transistor involves placing the circuit board appropriately, fitting the screws, checking the quality of mounting and finally checking the process of working.

Figure 14.2



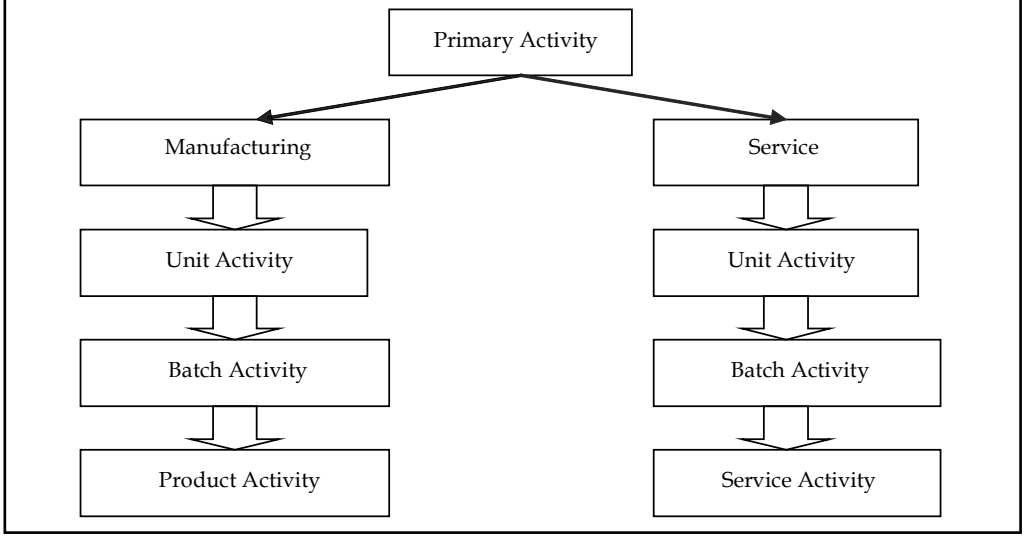
The above-enlisted activity requires labourers to carry out process of mounting, which are normally denominated in terms of labour hours. The speciality of ABC is the number of hours consumed by the labourers and the cost involvement of every activity at every level, but the traditional costing system gives only in the form of direct labour hours without any information.

Notes

The ABC not only enlists the number of activities but also classifies them into two categories viz primary activity and secondary activity.

Primary activity is an activity which directly charges to cost object, which could be classified into two different categories, in accordance with the nature of business viz Product and Service.

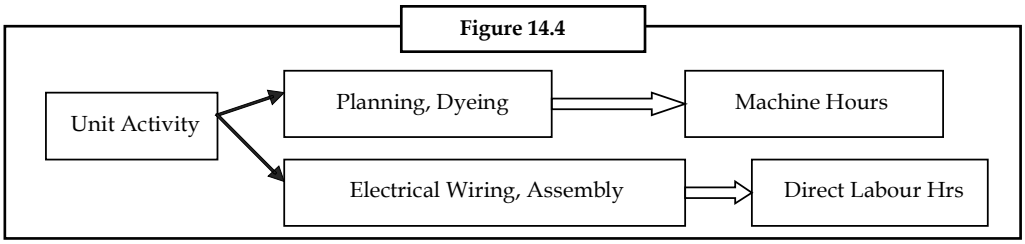
Figure 14.3



Example: Let us discuss the manufacturing activity with an example of car-manufacturing unit.

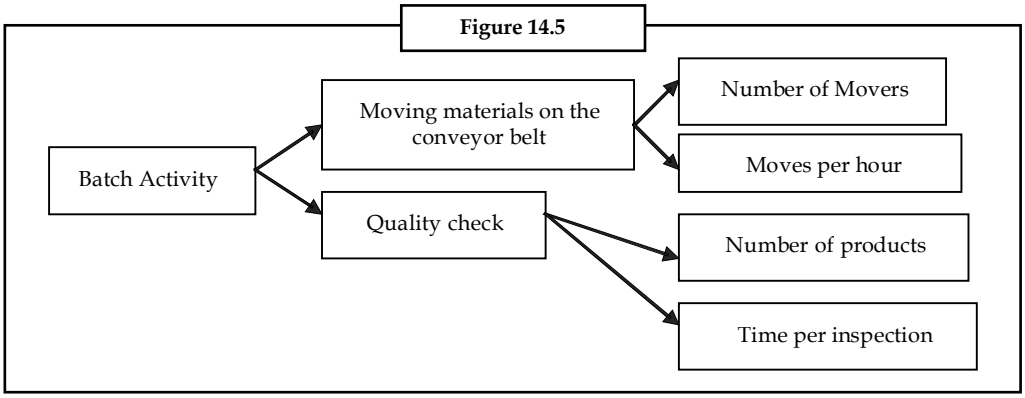
The following unit activity explains the important activities of the car-manufacturing unit and their activity drivers.

Figure 14.4



The next important classification is Batch Activity. It is most suitable in the case of pharmaceuticals, cement, peripherals, watch industry, etc.

Figure 14.5

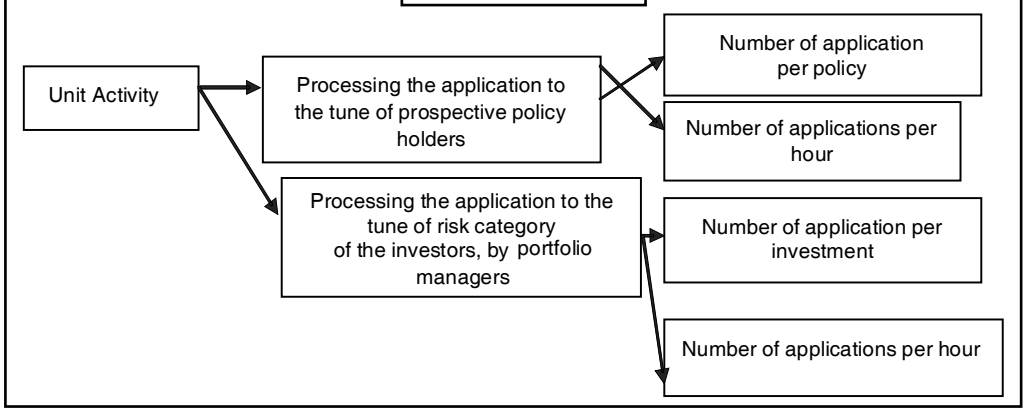


Notes

Another classification is product activity. This activity is totally different from the yester classifications, which plays a pivotal role in the industry in catering the needs and demands of the customers and consumers. Product activity is predominantly used by the car, truck, 3-wheeler manufacturing companies. The products are produced only to the tune of taste and preferences of the consumers.

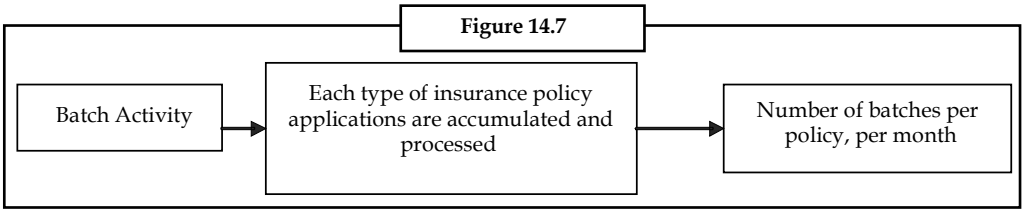
Now we can concentrate on the service industry. It could be discussed with the help of insurance, share broking industry in order to know about the primary activities in detail.

Figure 14.6



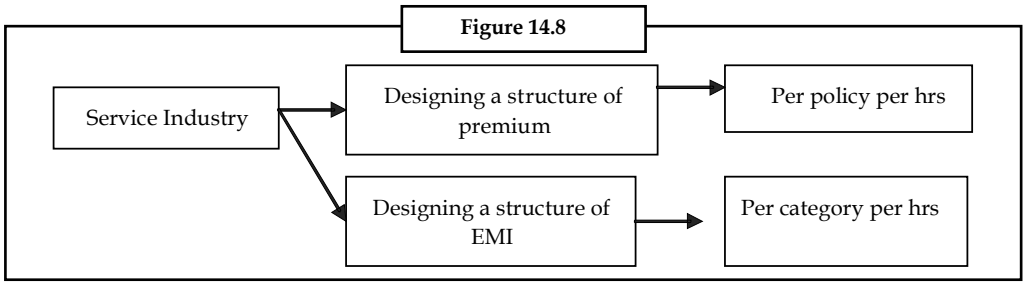
Batch activity is being carried out in the service industry as follows:

Figure 14.7



Service activity is being carried out in the insurance, banking industries as follows:

Figure 14.8



The next segment is nothing but the secondary activity to the cost object. The secondary activity may be classified into two general categories viz support activities of the core activities and non-support activities. The human resource department is the only department which mainly extends support to the core activities of manufacturing i.e. primary activity.

Some of the support activities never go in line with the primary activities of the business firm.

Did u know? ***What are the non-support activities?***

The activities of the office of the corporate entities are to maintain the relationship with the investors and with the legal framework, known as non-support activities.

Notes

14.1.1 Important Factors of Selecting the Cost Drivers

The following are the important factors:

Degree of Correlation: The degree of correlation between the consumption of activity and consumption of cost drivers shows the trend of the cost assignment in the context of cost drivers.

If the firm requires regular inspection of the quality standard of the products during the production for every batch, the number of inspections per hour and per shift will be subject to the previously mentioned norms. If the number of inspection is more and more in line with the volume of production, it means the firm has a positive high correlation between the cost of the activity and cost object.

Trade off in between Cost and Accuracy: Undoubtedly, ABC is the only system able to extend the business intelligence for the firms' survival over the other combatants with the help of more amount of accurate costs for every level of activities, but they are very expensive in the process of implementation as well as in maintenance.

Effects in the Behaviour of ABC Analysts: It not only influences the decisions of the firm which are taken by the ABC analysts but also their behaviour.

The third most important assumption is information about the activities. It only helps to determine the quality customers who generate greater profitability to the firm.

Now the entire structure of assumptions of ABC are over. ABC is considered to be predominant tool of analysis in the manufacturing firm. Why? The following are reasons:

1. ***Dominance of Overheads:*** Nowadays, due to cutthroat competition, every firm is expected to meet the needs and demands through value addition at cheaper cost. These objectives are mutually contradictory. Normally, the process of value addition warrants more and more research and development cost requiring the firm to charge higher price for the absorption of overheads. But the cost cutting is aimed at bringing down the cost on one side as well as to supply the products/services at lower price to attract the buyers through the pricing strategy. This is the only reason for greater volume of overheads over the direct costs.
2. ***Different kinds of Product Range:*** Due to acute competition, every firm is required to meet the varied needs and demands of the ultimate consumer. To supply the car to the tune of the consumer preference, the car has to be painted accordingly. It involves some more activities than the routine supply of a car. It requires the firm to price the value addition appropriately through an appropriate pricing which neither overcharges the customer nor undercharges the firm.
3. ***Varied Overhead rate for Divergent Products:*** Different products use different overheads wherever they incur according to various needs and demands of the market.
4. ***Consumption of Overheads driven by an Activity not by Volume:*** The consumption of overheads is not driven by the volume of output but by the number of activities which are involved in the process.

14.1.2 Objectives of ABC

1. To establish the linkage between the amount of cost and the cost drivers, which are nothing but resource and activity drivers.
2. To determine the cost of every activity and finally to find out the cost of the product or service.
3. To apportion the overheads in accordance with the activities involved in the process only in order to ascertain the accurate cost.
4. To evade the bottlenecks of the traditional cost system through the destruction of charging the overheads on the functional basis.

Notes

If the firm wants to introduce Activity-Based Costing system in practice, it must know the various areas through which it could benefit out of the business intelligence. The areas of decision-making are as follows:

Pricing Strategy: To fix the reasonable as well as competitive price not only to attract the buyers but also to earn handsome profit margin out of the activity.

Make or Buy decisions and outsourcing: The firm should identify the right mode of supplying the goods to the customers either through production or purchase; which is the best alternative to yield profit.

This is being effectively applied by the automobile industry. The demand of the accessories and spare parts are normally met through this method of costing to identify the proper way of supply at right cost without axing the profit margin. It is being calculated through the study of nature and number of activities involved.

Transfer Pricing

Nowadays, most firms process the materials not only for their production process to produce finished goods, but also to fulfill the industrial demands of many firms through the supply of work in progress materials.

Molasses, a residue of the sugar-manufacturing process, is considered a new material by farmers, who use it to enhance the soil's fertility once in two years. Though not a finished product, it is considered as a by-product during the process of manufacturing of sugar. The sugar manufacturing firms are expected to fix appropriate prices during the sale of molasses. It should be neither overpriced nor underpriced by using scientific determination of price i.e. ABC which slashes the cost of production.

The cost of the molasses is normally determined through an effective study of activities involved in the process of production. During the early days, the method of computing the cost for the work in progress was only on the basis of traditional cost system which mainly erred in the process of apportionment of overheads.

Capital Budgeting Decisions: It is one of the most important tools of analysis to study the worth of the long-term investments. The capital investment decisions are irreversible decisions which play vital role to determine the profitability of the firms. In modern business, every firm is required to study the long-term investment decisions only in the context of proposed cost drivers and activity drivers for the manufacture of a product. The selection of the best investment proposal among the available purely depends upon the earning potential over the cost drivers.

Accepting foreign orders: Foreign orders are normally accepted by considering the worth of manufacturing. The worth of manufacturing is how best the firm makes use of the fixed cost of operations. This is being studied through the comparison between the installed capacity and capacity utilized. If the capacity of utilization is less than that of installed capacity, the firm could think of for accepting the additional or foreign orders. This could be better analysed through Activity-Based Costing.

Plant close decisions: The plant close decision is normally by all the firms by considering the cost of resources and activity drivers involved in the process of manufacturing. The following examples will certainly help us to understand the intricacies faced by the firm not only in the manufacturing but also in the service industries. Let us discuss with an example from the service industry.

Example: The coach division of TV Sundaram Iyengar & Sons Ltd. Madurai, wound up its operations due to the dominance of the cost of the resource drivers. The major resource for the coach division is skilled labour in order to meet the expectations of customers, bus owners, fleet owners and so on. The greater demand for skilled labour led to a hike in its costs. To fill the absence of skilled labourers, the firm was supposed to carry out the operations, for which outsourcing was preferred, not considering the quality of unskilled and semi-skilled labourers, leading to consumption of more hours by them. This finally led to increase in the cost of resource

Notes

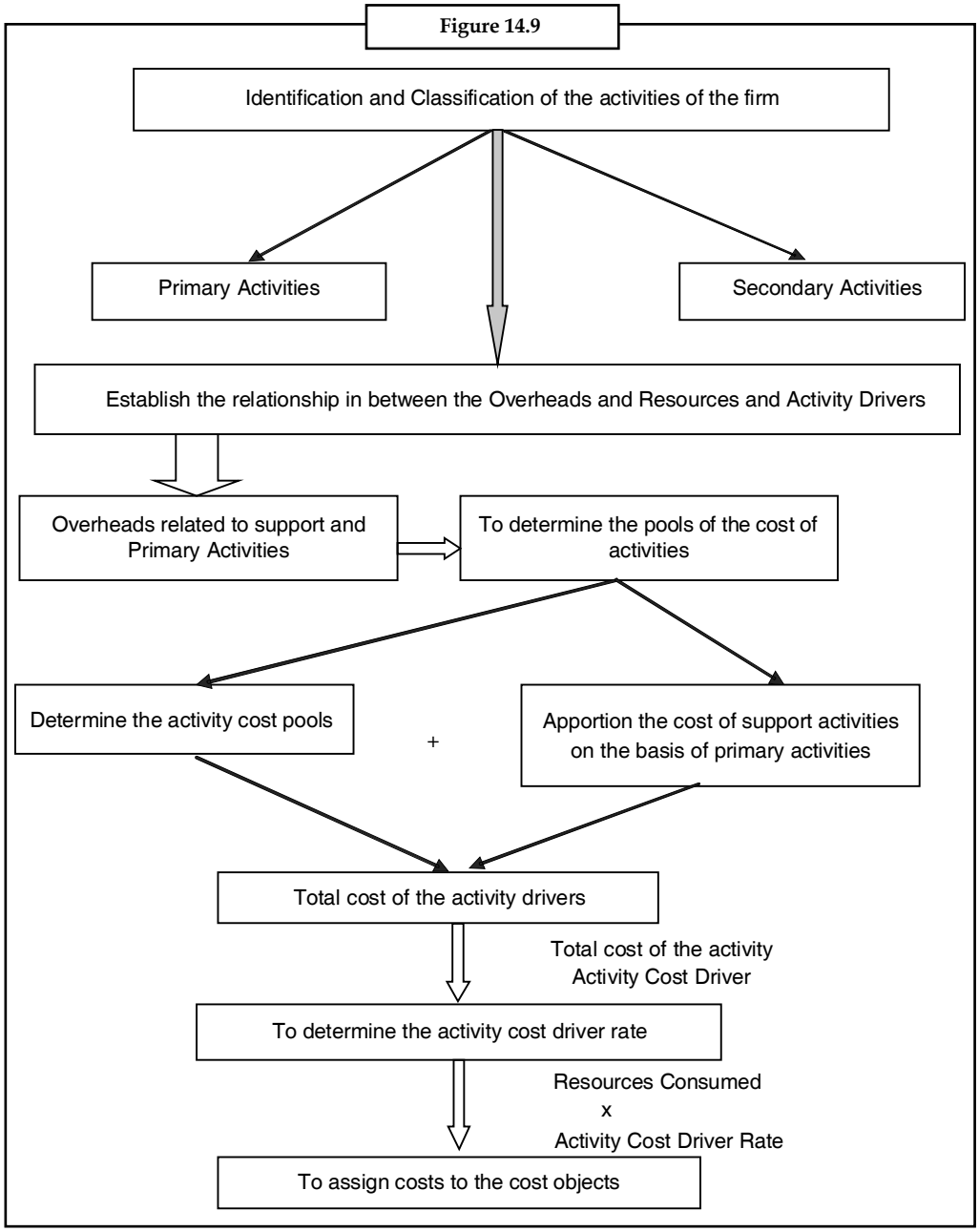
drivers as well as activity drivers. The management of TVS & Sons Ltd., decided to close the plant in Madurai division due to above discussed and later desired to rejuvenate the coach division of Trichy at Viralimalai to meet the market demands at reasonable cost.

Segmentation of new products: The firm should meet the needs and demands of the various classes of people through a wide range of products. The segmentation of the products should be appropriately done only by studying the cost of resource and activity drivers, for meeting the needs and demands of specific class of buyers. The ABC is the proper tool for the firm to introduce new products to cater the demands of various classes of people.

14.1.3 Process of Calculating ABC

The next important stage is to understand the process of calculation under ABC.

Figure 14.9



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Example: This could be understood from the following example M/S Zenith & Co.

Identification of Activities

Purchase of Materials	**Production of Goods**	**Testing of Goods**	**Recreation and Refreshment**
Classification of Activities			
Primary Activities			**Secondary Activity**
Identification of Overheads			
Salary to the manager and staff members, Processing costs :- Advertisement, Inviting the tenders, cost of communication of approval of orders	Fuel, Oil, Gas, Electricity Maintenance, salary of engineering dept., Depreciation of the plant, rent, foreman and so on	Salary of Testing staff & Engineers, Depreciation on testing devices, Cost of chemical products for testing, electricity, etc.,	Cost of coffee/tea/ cold drinks/ snacks, breakfast, lunch, dinner, recreation expenses: salary to the recreation staff, maintenance of carom board, snooker board, subscription for daily, weekly, fortnightly and monthly journals and magazines
₹ 45,000	₹ 25,000	₹ 20,000	₹ 25,000
Apportionment of support activity overheads			
Recreation and refreshment expenses are to be apportioned to the primary activities only on the basis of number of employees in each activity			
₹ 10,000	₹ 10,000	₹ 5,000	(₹ 25,000)
Total Activity cost pool			
₹ 55,000	**₹ 35,000**	**₹ 25,000**	
Determination of Activity Drivers			
Number of Purchase Orders	Hours of Production	Number of Units	
5,000 Orders	3,500 Hrs	12,500 Units	
Calculation of Activity cost driver rate = $\frac{\text{Pool of Activity Cost}}{\text{Activity Driver}}$			
Total Cost of Purchase / Number of Orders ₹ 11 per order	Total Cost of Production / Hr. of Production ₹ 10 per Hr	Total cost of Testing / No of units ₹ 2 per Unit	

Cost Assignment

Job No: 134 requires 40 purchase orders and 40 Hrs of production, 100 units are finally produced and all are individually tested. The total overhead cost is as follows:

Purchase order cost :	40 Orders x ₹ 11 per order	= ₹ 440
Production cost :	40 Hrs x ₹ 10 per Hr	= ₹ 400
Testing costs :	50 units x ₹ 2 per unit	= ₹ 100
		₹ 940

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From the above table, the activity-based costing is obviously understood, It means that the charge of overhead is calculated on the basis of appropriate resources consumption, but the traditional cost system determines the cost on the basis of overhead recovery rate.

Self Assessment

Fill in the blanks:

1. The assignment of cost to cost object only on the basis of ..... clearly determines the real consumption of the activity.
2. ..... is an activity which directly charges to cost object, which could be classified into two different categories, in accordance with the nature of business.
3. The selection of the best investment proposal among the available purely depends upon the earning potential over the ..... .
4. The segmentation of the products should be appropriately done only by studying the ..... and activity drivers, for meeting the needs and demands of specific class of buyers.
5. The degree of correlation between the consumption of ..... and consumption of cost drivers shows the trend of the cost assignment in the context of cost drivers.

14.2 Target Costing

Target Costing is a disciplined process that uses data and information in a logical series of steps to determine and achieve a target cost for the product. In addition, the price and cost are for specified product functionality, which is determined from understanding the needs of the customer and the willingness of the customer to pay for each function.

Another interesting aspect of Target Costing is its inherent recognition that there are important variables in the process that are essentially beyond the control of the design group or even the company.

Example: The selling price is determined by the marketplace – the global collection of customers, competitors and the general economic conditions at the time the product is being sold.

The desired profit is another variable that is beyond the control of the design organization. It may be set at the corporate level. It is influenced by the expectation of the stockholders and the financial markets. And, the desired profit is benchmarked against others in the same industry and against all businesses. In this complicated environment, it is the role of Target Costing to balance these external variables and help develop a product at a cost that is within the constraints imposed. In short, traditional approaches, such as simple "cost-plus" is a recipe for market failure, and giving the customers more than they are willing to pay for is a recipe for insolvency.

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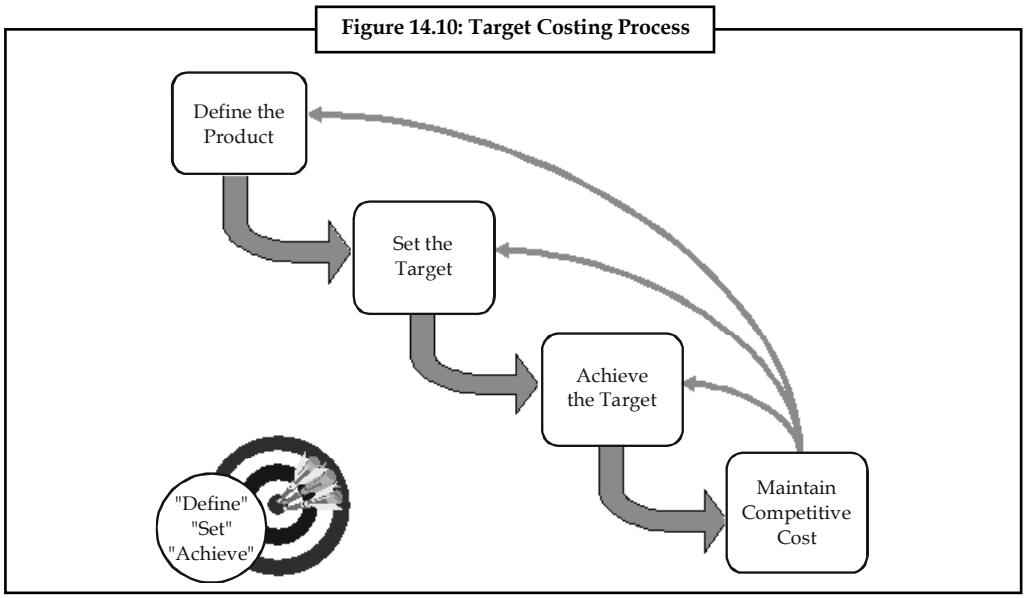
14.2.1 The Basic Process

The Figure 14.10 shows at a high level the basic stages in the Target-Costing process:

Figure 14.10: Target Costing Process



The stages are market-driven:

Stage 1: Define the Product: answers the fundamental questions of

"What are you selling?"

"To whom?"

"What do they want it to do?"

Stage 2: Set the Target: addresses the issue of

"What will they pay for it?"

"What should it cost to produce?"

Stage 3: Achieve the Target: is concerned with

"How can we get there?"

" Are we getting there?"

Stage 4: Maintain Competitive Cost: deals with

"How can we stay ahead?"

One of the key points is that the target cost is the dependent variable. The market-based price must be determined first, then the desired profitability. Finally, the Target Cost is simply the Price minus the Profit. This may seem elementary, but many firms still fall into the trap of first determining the cost of their design, adding a profit margin and letting the sum be the price.

14.2.2 When are Costs Set?

Target Costing recognizes that the costs of a product are established very early in the development cycle. We have seen that by the time a product reaches the manufacturing stage – where traditional cost-reduction takes place – most of the costs are "locked in", and it is quite difficult to find substantial cost improvements. In fact, much of the cost of a product is determined in the early stages of defining the product concept and determining the customer requirements - well before the detailed design is started. Target Costing should begin at the very beginning of the so-called

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"fuzzy front end" of the product-realization process. That is when it is most important to get the product and its functional architecture right the first time. We have found a strong correlation between the cost savings obtained and how early in the product-realization cycle Target Costing was initiated. The moral: start early!

14.2.3 Tools and Techniques

Target Costing is a largely quantitative process. There are many tools and techniques that can be used. Some examples used in the various Target-Costing steps include:

Define the Product: Conjoint Analysis, Quality Function Deployment, Market Analysis, Competitor Analysis, Product Roadmapping, Market-Feature Tables.

Set the Target: Conjoint Analysis, Experience Curves, Price Roadmapping, Competitive Intelligence, Reverse Engineering.

Achieve the Target: Value Engineering & Analysis, Component Roadmapping, Cost Analysis Tools, ABC Practices, Simulation Tools, Supply-Chain Analysis.

Maintain Competitive Cost: Cost-Reduction Methodology.

Mapping the Product to the Market: While it is not as quantitative as some of the other tools, we have found the Market-Feature Table to be a simple but powerful way to focus on customer needs. A depiction is shown below, for one market segments.

Table 14.1

	MARKET SEGMENTS		
	Market 1 (# of customers)	**Market 2 (# of customers)**	**Market 3 (# of customers)**
Premium: Further additional features desired by some customers will to pay a premium price	Feature L Feature M … (2,000)	… … … (200)	… (20)
Step-up: Additional features desired to some customers who are willing to pay a higher price	Feature H Feature I Feature J … (200,000)	… … … … (20,000)	… … … … (2,000)
Basic: Features desired by all customers, that they are all willing to pay for.	Feature A Feature B Feature C Feature D … (2,000,000)	… … … … … (200,000)	… … … … … (20,000)

Target costing generally is focused here.

The idea is to map the features desired by different market segments onto a single page. This forces you to concentrate on the really important features or functionalities at a high level. The Market for the potential product is divided into "natural" market segments. These distinctions may be by geographic region, by customer's type of business, by consumer-government-business, by relative customer affluence, etc. Then the features desired by each market segment are divided into three categories:

Basic: features desired by all customers in the segment, that they are all willing to pay for.

Step-up: additional or optional features desired by some customers in the segment who are willing to pay a higher price to get them.

Premium: further optional features that a few customers want, and that carry a premium price.

The size of the market in each category is also listed, in terms of number of potential units that can be sold, or by potential revenues.

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It is very important to separate the optional features from the basic ones, because if you make an optional feature – that only some customers want – part of the basic product, you will either force all customers in that segment to pay for it, or you will be giving it away. It is also important to establish – and achieve – the target cost for the basic product, because that is where most of the sales or revenues will be and so that is where you have to capture market share while remaining profitable. Finally, we contend that a Market-Feature Table should play as great a role in determining the architecture of a product as do physical and engineering considerations.

14.2.4 First, Price

Once you have established the high-level product requirements, the next step is to establish the market price for the time at which the product is going to be sold. We have found that Experience Curves (sometimes called Learning Curves) are very helpful. In this approach, the historical market price of the product is plotted as a function, not of calendar time, but of the industry's cumulative sales of the product. On a log-log plot, the result is usually a straight line that is a very reliable predictor of prices for some time into the future. Note that often you should not always use the quantities of the product as the "sales", but some key parameter that represents the functionality that the customer is really buying and which is really driving the industry's experience. For example, in the famous "Moore Curve" showing the decrease in price of semiconductor memory, the price per bit of memory is plotted against the cumulative bits that have been sold. (It is not a plot of price per memory chip vs. the cumulative number of chips – the customers are really buying memory bits, not packaged ICs.) If the product were cellular telephone network equipment, you would plot the price of the equipment divided by the number of subscribers that it can serve vs. the cumulative number of cell-phone subscribers in the world.

There are other ways to help triangulate on likely prices. Conjoint Analysis is quite quantitative, and it gives insights about customers' willingness to pay for various specific features and capabilities. Other methods include gleaning information from bids and proposals, competitor's prices, reverse engineering, comparable technologies or products that do similar things, analyst's reports, and so on.

14.2.5 Then, Cost

When you have determined the price for the time when the product will be sold, you can set the target cost. It is important to first decide how much of the company's cost elements to include. Traditionally, people have looked only at cost of goods sold (COGS), the cost of the raw materials and purchased subsystems that go into a product plus the "conversion costs" (labor and manufacturing overheads). In that case, you only need to know the healthy gross margin rate required by the company in order to calculate the target cost (= Price * [100% - G.M.%]). However, we have found it better to try to capture as much of the company's costs as possible (e.g.: engineering, installation, transportation, tariffs & duties, R&D, marketing & sales, taxes, etc.) If you use the company's required net margin then you can establish a full-stream target cost. The benefit is that, as ways to reach the target cost are explored, it is possible that design and other choices can significantly reduce costs that lie beyond the area of COGS. It goes without saying that Activity-Based Costing (ABC), if the company uses it, makes this cost decomposition more meaningful and effective.

Once you have set the overall target cost, the next step is to set cost targets for each of the components, subsystems and elements that go into making up the set of full-stream costs that are being included. We have found that Value Engineering is a valuable tool to assist in this step. Space does not permit a detailed explanation here. But the basic concept is to create a matrix that relates different product features to the various elements that make up the product. The cells of the matrix are filled with the extent (percent) to which each of the elements contributes to each feature. Then, knowing the relative importance (to the customers) of each feature, and applying some matrix multiplication it is possible to get a suggestion of the cost target for each product

element. Comparing those costs with current or projected costs (again, ABC helps substantially) you can discover which elements need the most attention in cost-reduction efforts – based on an understanding of their relative importance to the customer.

Example: If 35% of the value to the customer is derived from a single feature, this feature is allocated 35% of the cost of the product. Actual mapping of the product features to product cost if a bit more complicated in practice but this is the basic point.

14.2.6 Finding Paths to the Targets

At this point, you have a clear idea of what the customers want and what they are willing to pay, a target for the price, and cost targets for the significant elements that are part of the product's cost structure. Frequently it becomes evident that the cost of the product will be too high to sustain a healthy profit. In that case it is necessary to find ways to take cost out of the product without sacrificing capability or quality.

In such case, a cross-functional team approach is best. It is best to use individuals from all the stakeholder organizations – product management, marketing, sales, engineering, design, manufacturing, installation, etc. It is also very beneficial to include subject-matter experts from outside the organizations directly involved in the specific product – they bring fresh ideas and outlooks to the table. Such individuals could even come from suppliers. Once the business needs and target-setting has been laid out before the team, we recommend that it use proper brainstorming techniques to generate cost-reducing ideas. We also recommend that sub-teams, each focused on a specific major product element, have separate brainstorming sessions.

At this point, for fairly complex products, we find that we typically have 100-150 cost-reducing ideas. Then the sub-teams must evaluate the ideas – that is, eliminate redundant and clearly infeasible ones, determine the cost impact of the remainder, and estimate how much incremental effort (if any) it will take to implement them. This usually takes a few weeks. At the end of the evaluation phase, the teams should report to the management their target-cost goals, the ideas to close the cost gaps, and the plan to implement the ideas.

14.2.7 Maintaining Cost

Through the rest of the product-development phase the cross-functional teams are responsible for implementing the cost-reduction ideas, and seeing that the product stays within its cost targets. It is especially important to resist "feature creep" – the temptation to add incremental features to the product. It is one thing if a customer wants a new feature and is willing to pay for it. But if it is deemed necessary to add a feature without increasing the price, then the team has to accept the challenge of finding further cost reductions in order to still achieve the target cost.

Task Analyse your most favourite products in the FMCG industry. What do you think is the better way to go for their accounting and why?

Self Assessment

Fill in the blanks:

6. When you have determined the price for the time when the product will be sold, you can set the ..... .
7. Once you have established the high-level product requirements, the next step is to establish the ..... for the time at which the product is going to be ..... .

Notes

8. Target Costing recognizes that the costs of a product are established very early in the ..... .
9. Cost Object ..... is utilized to identify money losing customers.
10. ..... provide the link between the expenditures of an organization and the Activities performed within the organization.
11. ..... is a simple, straightforward process that can have significant impact on the health and profitability businesses.
12. ..... is the graph that depicts the increases in productivity as reflected in reduced average and marginal costs.

14.3 Master Budget

Master budget is a consolidated summary of the various functional budgets. A master budget is the summary budget incorporating its component functional budgets and which is finally approved, adopted and employed. It is the culmination of the preparation of all other budgets like the sales budget, production budget, purchase budget, etc. It reality, it consists of the budgeted profit & loss account, the balance sheet and the budgeted funds flow statement. The actual composition of the master budget depends upon the size and nature of the business. Still, all master budgets represent the firm's overall plan for the budget period.

The master budget can be split into two major pans: (1) The Operating Budget, and (2) Financial Budget. All revenue aspects are included in the operating budget and all capital aspects are included in the financial budget. The financial budget is based on the operating budget and the balance sheet at the beginning of the financial year.

In the master budget, costs are classified and summarised by types of expenses as well as by departments. This information extends the range of usefulness of the master budget. It is considered as the best mode of understanding the company's micro-economic position relating to the forthcoming budget period. Master budget is not merely a compendium of theoretical calculations. The figures that it contains, are the reflection of the actual intentions of the company relating to different areas for the forthcoming budget period.

Objectives of Master Budget

1. The master budget is prepared by the budget committee on the basis of co-ordinated functional budgets and becomes the target of the company during the budget period when it is finally approved.
2. This budget acts as the company's individualized key to successful financial planning and control.
3. It provides the basis of computing the effect of any changes in any phase of operations, such as sales volume, product mix, prices, labour costs, material costs or change in facilities.
4. It segregates income, costs and profits by areas of responsibility. Master budget presents all this information to the depth appropriate for the top management action.

Note: The detail discussion on master budget is given under Unit 8.

Self Assessment

State whether the following statements are true or false:

13. Master budget is a consolidated summary of the various functional budgets.
14. All capital aspects are included in the operating budget.
15. In the master budget, costs are classified and summarised by types of expenses as well as by departments.

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14.4 Summary

- Activity-based Costing (ABC) is a costing model that identifies activities in an organization.
- It assigns the cost of each activity resource to all products and services according to the actual consumption by each: it assigns more indirect costs (overhead) into direct costs.
- In this way an organization can establish the true cost of its individual products and services for the purposes of identifying and eliminating those which are unprofitable and lowering the prices of those which are overpriced.
- In a business organization, the ABC methodology assigns an organization's resource costs through activities to the products and services provided to its customers.
- It is generally used as a tool for understanding product and customer cost and profitability.
- As such, ABC has predominantly been used to support strategic decisions such as pricing, outsourcing and identification and measurement of process improvement initiatives.
- Target costing is a simple, straightforward process that can have significant impact on the health and profitability of many, if not most, businesses.
- It doesn't require an army of specialists, large-scale software implementations, or complex management structures and procedures.
- It's mostly logical, disciplined common sense that can be imbedded into a company's existing procedures and processes.

14.5 Keywords

Constraint: A constraint is a restriction on the degree of freedom you have in providing a solution.

Cost Object: A cost object is a tangible input for a product manufactured/service provided, like labor or material.

Experience Curve: Graph that depicts the 'experience effect' (increases in productivity) as reflected in reduced average and marginal costs.

Resource Driver: Activity based costing measure of quantity of resource consumed or required by an activity.

14.6 Review Questions

1. How does Activity Based Costing differ from traditional cost accounting systems?
2. How will you suggest to analyse the activities?
3. Analyse the activity-based costing and enumerate its associated pros and cons.
4. Examine the concept of target cost. How do you think it to be useful for finance specialists?
5. What do you think are the potential benefits of target costing for a firm that want to launch its product in the market through
   (a) invention
   (b) innovation
   (c) imitation
6. Is activity based costing an inventory valuation method or a cost accumulation method? Support your answer with reasons.

Notes

7. Sparkling Housecleaning provides housecleaning services to its clients. The company uses an activity-based costing system for its overhead costs. The company has provided the following data from its activity-based costing system.

Activity Cost Pool	Cleaning	Job support	Client support	Other	Total
Total Cost	$645,576	$129,546	$ 20,900	$110,000	$906,022
Total Activity	72,700 hrs	5,400 jobs	760 clients	Not applicable	

The "Other" activity cost pool consists of the costs of idle capacity and organization-sustaining costs.

One particular client, the Lotus family, requested 31 jobs during the year that required a total of 62 hours of housecleaning. For this service, the client was charged $1,620.

Using the activity-based costing system, compute the customer margin for the Lotus family. Round off all calculations to the nearest whole cent.

8. Assume the company of question 7 decides instead to use a traditional costing system in which all costs are allocated to customers on the basis of cleaning hours. Compute the margin for the Lotus family. Round off all calculations to the nearest whole cent.
9. "One of the key points in target based costing is that the target cost is the dependent variable." What is so important about the statement? Analyse and answer.
10. "A fundamental shift in performance often needs a radical change in the way an organisation is managed." Comment.
11. "Historically, target costing has been developed and used in manufacturing companies." Does this imply that target based costing is less/not useful for non-manufacturing companies?
12. A master budget is the summary budget incorporating its component functional budgets and which is finally approved, adopted and employed. Discuss.

Answers: Self Assessment

1. activity drivers
2. Primary activity
3. cost drivers
4. cost of resource
5. activity
6. target cost
7. market price, sold
8. development cycle
9. profitability
10. Resource Drivers
11. Target Costing
12. Experience Curve
13. True
14. False
15. True

14.7 Further Readings

Books

David W. Young, *Techniques of Management Accounting,* McGraw Hill.

McNair, C. J. and L. P. Carr, *Responsibility Redefined: Changing Concepts of Accounting-based Control*.

Online links

www.allbusiness.com

www.internalaccounting.com