PG CM S4-04 (DSC) (Accounting)

TWO YEAR MASTER'S DEGREE COURSE

(CBCS in Accordance with NEP 2020)

SEMESTER - IV

ADVANCED COST AND MANAGEMENT ACCOUNTING

COMMERCE

Maniram Dewan School of Management

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

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MASTER OF COMMERCE

ADVANCED COST AND MANAGEMENT ACCOUNTING

DETAILED SYLLABUS

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COURSE INTRODUCTION

'Advanced Cost and Management Accounting' is the forth Course of 4th Semester under *Accounting Specialization* and overall the Sixteenth Course of M.Com. Programme. 'Advanced Cost and Management Accounting' is an important and useful branch of accounting. It is a form of accounting that aims to maximise profit by managing revenues and expenses. It provides data and reports used by managers to inform their strategies around long-term profit and growth. Cost accounting is used internally by management in order to make fully informed business decisions. Managerial accounting is the process of identification, measurement, analysis, and interpretation of accounting information that helps business leaders make sound financial decisions and efficiently manage their daily operations.

This course which starts with the unit discussing the concept of cost and decision making. The first seven units consist of Cost concepts in Decision-making, Standard Costing as Control Accounts, Standard Costing as Control Accounts, Marginal Costing, Cost Audit, Cost Reduction and Cost Control, and Activity Based Costing. Whereas, the last five units encompass with Capital Budgeting, Decision Tree Analysis, Management Control System, Responsibility Accounting, Budgetary control, Management Information System, Social Cost Benefit Analysis and Strategic Management Accounting.

Each unit of the course includes some along-side boxes to help you know some of the difficult, unseen terms. Some "EXERCISES" have been included to help you apply your own thoughts. You may find some boxes marked with: "LET US KNOW". These boxes will provide you with some additional interesting and relevant information. Again, you will get "CHECK YOUR PROGRESS" questions. These have been designed to self-check

your progress of study. It will be helpful for you if you solve the problems put in these boxes immediately after you go through the sections of the units and then match your answers with “ANSWERS TO CHECK YOUR PROGRESS” given at the end of each unit. At the end of each section, you will get “CHECK YOUR PROGRESS” questions to check yourselves.

UNIT DISTRIBUTIONS

This course encompusses with the following twelve units:

Unit 1 : Cost Concepts in Decision making

Unit 2 : Standard Costing

Unit 3 : Sales Variance

Unit 4 : Marginal Costing

Unit-5 : Cost Audit and Management audit

Unit 6 : Capital Budgeting - I

Unit 7 : Capital Budgeting - II

Unit 8 : Decision Tree Analysis

Unit 9 : Management Control System

Unit 10 : Responsibility Accounting

Unit 11 : Budgetary Control

Unit 12 : Social Cost Benefit Analysis

UNIT 1 : COST CONCEPTS IN DECISION MAKING

UNIT STRUCTURE

1.1 Learning Objectives

1.2 Introduction

1.3 Cost Vs. Expense and Loss

1.4 Classification of Costs

- 1.4.1 Based On Nature Of Cost/ Expenses.
- 1.4.2 Based On Relation To Cost Centre.
- 1.4.3 Based On Functions / Activities.
- 1.4.4 Based On Behavior.
- 1.4.5 Based On Management Decision Making.
- 1.4.6 Based On Product Cost And Period Cost.

1.5 Prime Cost

1.6 Overheads

1.7 Cost Sheet

1.8 Advantages of preparing Cost Sheet

1.9 Specimen of Cost Sheet

1.10 Relevance of costs in taking various decisions.

- 1.10.1 Decisions in pricing
- 1.10.2 Product Mix
- 1.10.3 Make or Buy Decision
- 1.10.4 Shut Down Decision

1.11 Let Us Sum Up

1.12 Further Reading

1.13 Answers to Check Your Progress

1.14 Model Questions

1.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- know the concept of cost
- various types of cost
- take various decisions relating to the manufacture of various products operation of the business.

1.2 INTRODUCTION

This unit describes the basic costs terms and concepts that are used in cost and management accounting.

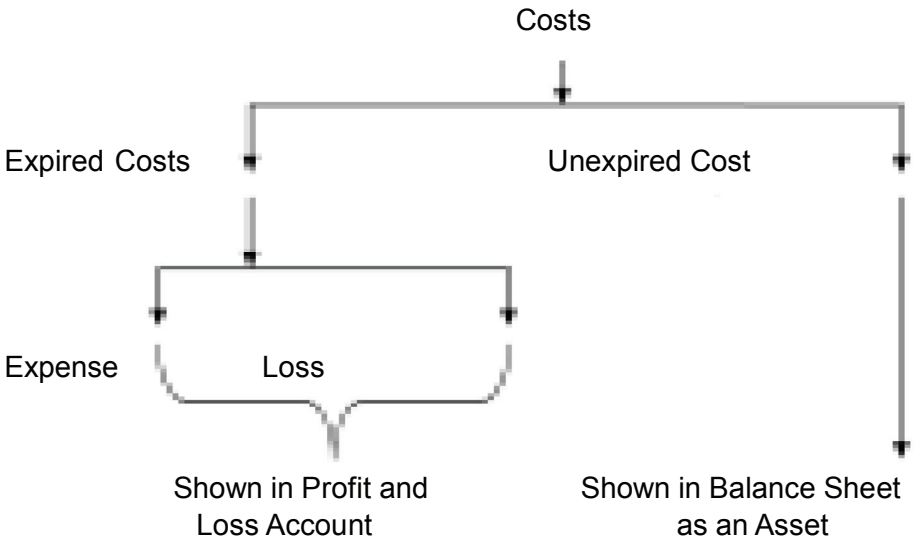
The term 'cost' is very important in cost and management accounting. Though it is very difficult to define 'cost' as the meaning of cost changes from situation to situation, some authors and institutions try to define it.

According to W. M. Harper, "A cost is the value of economic resources used as a result of producing or doing the things costed".

According to Cambridge International Dictionary of English, cost means 'the amount of money needed to buy, do or make something'.

So, in simple, cost is the resources which are used to produce, buy or exchange for some goods or services expressed in terms of money or monetary units.

1.3 COST VS. EXPENSE AND LOSS



The word 'Cost' and 'Expense' often are used interchangeably. But the meaning of both is different. The cost can be classified as expired cost and unexpired cost. The expired costs are known as expenses. Expired cost is the cost which is related to current year i.e., expenses are the part of total costs which

is consumed or used in the current year and shown in the debit side of the Profit and Loss Account. The unexpired costs are that part of the costs which is not yet consumed during the current year and it is shown in the assets side of the balance sheet.

Loss is an expired cost resulting from the decline the service potential of assets that generated no benefit to the firm. For example: destruction stock due to fire or obsolescence etc.

1.4 CLASSIFICATION OF COSTS

Classification of costs can be done based on some common bases which are given below:

1. Based on nature of cost/ expenses.
2. Based on relation to cost centre.
3. Based on functions / activities.
4. Based on behavior.
5. Based on management decision making.
6. Based on product cost and period cost.

1.4.1 Based on Nature of Cost/ Expenses

On the basis of nature of cost/ expenses, the cost can be classified as :

a. Material Cost: Material cost is the amount of material used in the manufacturing of product or rendering service. For example: in manufacturing of furniture, cost of plywood, wood, glue etc. will be classified under material cost.
b. Labour cost: Labour cost is the amount of remuneration paid to the workers for manufacturing product or rendering the service. For example: in manufacturing of furniture, remuneration paid to the carpenter will be classified under labour cost.
c. Expenses: Other than material cost and labour cost, amounts incurred for the manufacturing of product or rendering service are fall under this category. For example: rent, taxes will be classified under expenses.

1.4.2 Based on Relation to Cost Centre/ Traceability

On the basis of relation to cost centre, the cost can be classified as:

a. Direct material cost: Direct material cost is the amount of materials that can be identified in the product and can easily be measured and charged to the product. For example: raw cotton for making textiles, steel and aluminum for making automobile body.
b. Direct labour cost: Direct labour cost is the amount paid to the workers that are directly connected with the manufacturing of the product. For example: wages paid to machine man, workers working in the productive department.
c. Direct expenses: All the expenses other than material and labour, that can be directly connected and involved in the manufacturing of the product is known as direct expenses. For example: royalties paid in connection with the manufacture of a production to its owner of copyright or patent right.
d. Indirect material cost: Indirect materials are those which are required to manufacture the product but cannot be traced with any specific product. For example; glue used in manufacturing furniture.
e. Indirect labour cost: Indirect labour costs represents salary and wages paid to the employees who are not involved in the production process but help in manufacturing the product. For example: salary paid to supervisors.
f. Indirect expenses: Indirect expenses are those expenses that cannot directly be traced to a product or cost centre. For example: rent, municipal taxes etc.

1.4.3 Based on Functions/ Activities

On the basis of function, the cost can be classified as :

a. Production cost: The total amount of costs incurred in the production of goods or rendering services are known as production cost. It includes all kinds of direct costs and production overheads. Production costs are treated as inventories if are not sold and recognized in the balance sheet.

b. Administrative cost: The amount of costs incurred for general office and administrative purposes are known as administrative cost. Administrative costs are indirect in nature. For example: salary to HR manager, system manager, accountants etc.

c. Selling/ Marketing cost: Costs incurred in selling and marketing the product is known as selling and marketing cost. For example: advertisement cost, salary to marketing manager etc.

d. Distribution cost: Cost incurred for transferring the products from factory godown to customers are known as distribution cost. For example: transportation cost, packaging cost etc.

e. Research and Development cost: Cost incurred for developing new products or services are known as research and development costs. For example: cost of running laboratories, salaries paid to research staff etc.

1.4.4 Based on Behavior

On the basis behavior of cost, the cost can be classified as :

a. Fixed cost: Fixed cost is that part of cost which remains fixed irrespective of level of production or services. But fixed cost per unit decreases when output increases. For example: Rent of the building/godown, insurance premium etc.

b. Variable cost: Variable cost is that part of cost which varies in direct proportion to the changes in the volume of production or services. But variable cost per unit remains the same irrespective of level of production. For example: power and fuel, tools and spares etc.

c. Semi variable cost: Semi variable cost is partly fixed and partly variable. This type of cost is initially fixed but beyond a particular point it varies according to the changes in the production. For example: telephone charge. Fixed amount must be paid as a rental and a variable cost will be incurred depending upon the number and time duration of the calls.

DIFFERENCE BETWEEN FIXED COST AND VARIABLE COST

Fixed Cost	Variable Cost
Fixed costs do not vary directly with volume of output	Variable costs vary directly with volume of output.
Fixed costs are always expressed in terms of time.	Variable costs are expressed in terms of units.
Fixed costs per unit decreases with the increase in the volume of output.	Variable costs per unit remain same irrespective of level of production
The control of fixed cost rests on top level management.	The control of variable cost mainly depends on department head, factory supervisors, works manager etc.
Fixed cost generally apportioned to various departments.	Variable costs are directly allocated to the cost centre.

1.4.5 Based on Management Decision Making

On the basis of management decision making, the costs are classified as:

a. Differential cost: The change in cost due to the change in the method of production, technique or level of activity or alternatives is known as differential cost. For example: ABC Ltd. can produce a component part of a product and it will cost per unit Rs. 10. If ABC Ltd. purchases it from XYZ Ltd. then it will cost Rs. 9 per unit. Here the differential cost is Rs. 1 per unit.

b. Relevant cost: That part of the cost which will be affected by the decision of the management is known as relevant cost. For further processing cost of a product.

c. Sunk cost: Sunk cost is that part of total cost which is incurred in the past and has no influence in the future decision making process. Suck cost is irrecoverable. For example, market research costs.

d. Opportunity cost: Opportunity cost is the amount of potential benefit that sacrificed due to the selection of the best among all the alternatives. For example: a firm has a cash amount of Rs. 1,00,000. The firm has two options to invest this amount either in fixed deposit in bank at 10% interest per annum or in debentures at 11% interest per annum. If the firm chooses to invest the amount in debentures, then the firm

has to forgo bank interest of Rs. 10,000 and this forgone amount is known as opportunity cost.

1.4.6 Based on Product Cost and Period Cost

On the basis of product cost and period cost, the costs can be classified as:

a. Product cost: Product cost is the total amount of cost that is required for acquiring or manufacturing a product.
b. Period Cost: Period cost is that part of total cost which are not included in the production cost.

1.5 PRIME COST

Prime cost is the primary cost of a product or group of products. Prime cost is the total of all direct costs. So, prime cost includes direct material, direct labour and direct expenses.

Prime Cost = Direct Material + Direct Labour + Direct Expenses + Opening Stock of Working Progress at Prime Cost + Closing Stock of Working Progress at Prime Cost

1.6 OVERHEADS

Overhead is the total of indirect material, indirect labour and indirect expenses that are related with the manufacturing process. It includes cost of services also. All the expenses that cannot be traced or identified with the product are collectively known as overheads.

Overheads can be classified as:

i. Production overheads,
ii. Office and Administrative overheads,
iii. Selling overheads,
iv. Distribution overheads

1.7 COST SHEET

Cost sheet is a statement showing detailed information about the costs and ascertain the total costs of product or services manufactured during a particular product. The cost sheet is prepared for a particular period e.g. monthly, quarterly, half yearly etc.

1.8 ADVANTAGES OF PREPARING COST SHEET

The preparation of cost sheet provides following advantages:

i. It helps to ascertain the total costs and costs per unit for a particular period.

ii. It helps to fix the selling price of the product.

iii. It helps to control the costs of various products

iv. It helps to make comparison between the current costs with the costs of the corresponding period.

v. It helps to identify the causes of inefficiencies and wastages and helps to take corrective measures.

vi. It helps businessmen to submit quotation against tenders.

vii. It provides management a base for formulating suitable production policy.

1.9 SPECIMEN OF COST SHEET

The following is the specimen of a cost sheet :

COSTS SHEET OR STATEMENT OF COST

Particulars	Total Cost	Cost per Unit
	Rs.	Rs.
Direct Material Consumed	xxx	xxx
Direct Labour	xxx	xxx
Direct Expenses	xxx	xxx
Prime Cost	xxx	xxx
Add: Factory Overheads	xxx	xxx
Factory Cost	xxx	xxx
Add: Administration Overheads	xxx	xxx
Cost of Production	xxx	xxx
Add: Selling and Distribution Overheads	xxx	xxx
Total Cost or Cost of Sales	xxx	xxx

Treatment of Stock

While preparing cost sheet, stock requires special treatment. Here, stocks are categorized as:- raw material, work-in-progress and finished goods.

Raw Materials

If opening stock of raw materials, purchase of raw materials and closing stock of raw materials are given, then raw material consumed is calculated with the help of the following formula:

Opening Stock of Raw Materials	xxx
Add : Purchase of Raw Materials	xxx
	xxx
Less: Closing Stock of Raw Materials	xxx
Raw Material Consumed	xxx

Stock of Work-In-Progress

When opening work-in-progress and closing work-in-progress is given, it is treated in the following way in the cost sheet:

Prime Cost	xxx
Add: Factory Overhead	xxx
Add: Work-in-progress in the Beginning	xxx
	xxx
Less: Work-in-progress at the end	xxx
Factory Cost	xxx

Stock of Finished Goods

If opening stock and closing stocks of finished goods given, then these are shown in the cost sheet in the following manner:

Cost of Production	xxx
Add: Opening Stock of Finished Goods	xxx
	xxx
Less: Closing Stock of Finished Goods	xxx
Cost of Goods Sold	xxx

Example : 1

Calculate Prime Cost, Factory Cost, Cost of Production, Cost of Sales and Profit from the following particulars :

Particulars	Rs.	Particulars	Rs.
Direct Materials	1,00,000	Depreciation:	
Direct wages	30,000	Factory Plant	500
Wages of foreman	2,500	Office Premises	1250
Electric power	500	Consumable Stores	2500
Lighting: Factory	1,500	Manager's Salary	5000
Office	500	Directors Fees	1250
Storekeeper's wages	1,000	Office Stationery	500
Oil and water	500	Telephone Charge	125
Rent: Factory	5,000	Postage and Telegrams	250
Office	2,500	Salesman Salaries	1250
Repairs and Renewals:		Travelling Expenses	500
Factory Plant	3,500	Advertising	1250
Office Premises	500	Warehouse Charges	500
Transfer to Reserves	1,000	Sales	189500
Discount on Shares written off	500	Carriage Outward	375
Dividend	2,000	Income tax	10,000

Solution :

Statement of Cost and Profit

Particulars	Rs.
Direct Material	1,00,000
Direct Wages	30,000
Prime Cost	1,30,000
Add: Factory Overhead	17,500
Factory Cost	1,47,500
Add: Administration Overhead	11,875
Cost of Production	159,373
Add: Selling and Distribution Overheads	3,875
Cost of Sales	1,63,250
Profit	26,250
Sales	189500

Working Notes:

1. Factory Overheads

Particulars	Rs.
Wages of foreman	2,500
Electric Power	500
Storekeeper's wages	1,000
Oil and water	500
Factory rent	5,000
Repairs and renewals- factory plant	3,500
Factory lighting	1,500
Depreciation-factory plant	500
Consumable stores	2,500
	17,500

2. Administration Overhead

Particulars	Rs.
Office rent	2,500
Repairs and renewals- office premises	500
Office Lighting	500
Depreciation- office premises	1,250
Manager's salary	5,000
Directors' salary	1,250
Office stationery	500
Telephone charges	125
Postage and Telegram	250
	11,875

3. Selling and Distribution Overheads

Particulars	Rs.
Carriage Outward	375
Salesman salaries	1,250
Travelling Expenses	500
Advertising	1,250
Warehouse Charges	500
	3,875



CHECK YOUR PROGRESS

1. Define the term “cost”.
2. Give two examples of administrative cost.
3. Give two examples of selling and distribution cost.
4. Mention two differences between fixed cost and variable cost.

1.10 RELEVANCE OF COSTS IN TAKING VARIOUS DECISIONS

The measurement of various costs helps management in taking various crucial decisions of the firms like pricing the products, selecting best product mix, making or buying decisions, shut down decisions etc.

1.10.1 Decision in Pricing

One of the major functions of the management is setting or fixing the price of the products that are manufactured in the firm. There are a number of factors that affect the pricing decision of a firm. One of the main factors affecting the pricing decision of a firm is the costs that incurred in the manufacture of the products. The strategy adopted by a firm in the fixation of the price of the product are discussed below:

a. In normal circumstances the price of the product must cover the total cost i.e., the price of the product should be more than the total cost of the product and then only the firm would be able to earn profits.

b. In other circumstances like competition, taking additional orders for utilizing spare capacity, exploring new markets, the price of the product may be fixed lower than the total cost of the product but should not be less than the marginal cost. This strategy is necessary to meet the situation arising due to competition, taking additional orders for utilizing spare capacity, exploring new markets etc. This strategy is only for a short run. In the long run it will hamper the firm affecting the very existence of the firm.

1.10.2 Product Mix

Product mix means the various combinations of the products that are produced or acquired by a firm. When a firm produces or manufactures more than one product, then it creates a problem for the management to select the best product mix which gives the maximum profits to the firm. The best product mix can be determined with the help of contribution, P/V ratio and Break Even point.

From the contribution point of view, the best production mix is that product mix which yields maximum contribution to the firm. The product which yields maximum contribution will be retained by the firm and increases its volume of production mix. On the other hand, the product which yields a lower contribution will not be retained by the firm or will decrease its volume in the production mix.

From P/V ratio point of view, the best product mix is that product mix which has the highest P/V ratio compared to other product mixes.

From Break Even Point of view, the best product mix is that product mix which has the lowest Break Even Point compared to other product mixes.

1.10.3 Make or Buy Decision

The marginal cost analysis technique of management accounting helps management in taking decisions on whether the firm should make a component part or should buy it from outside suppliers. In making a decision on whether to make the component part or buy the component part, the price asked by the outside suppliers should be compared with the marginal cost of producing the component part. If the marginal cost is lower than the price asked by the outside supplier, then the firm should go for producing the component part.

Nevertheless, before taking the final decision, other factors like idle capacity of the firm, quality of the producing component part, labour relation etc. should also be considered.

For example: the total cost of making a component part is Rs. 10 where fixed cost is Rs. 3 and variable cost is Rs.7. Suppose a supplier is ready to provide the same component at Rs. 8. On the basis of total cost, it is cheaper

to purchase the component parts from the outside market but on the basis of marginal costing, the offer of outside supplier would be rejected because if the supplier's offer is accepted then it will cost Rs. 11 (Rs. 7 as supplier price + Rs. 3 As fixed costs) as fixed costs cannot be saved if the component part is purchased from suppliers.

1.10.4 Shut Down Decision

Sometimes it is necessary for a business firm to shut down or close down their business activities. This shut down decision may be temporary or permanent in nature. This shut down decision is depending on whether the products make a contribution towards fixed cost or not. If the products make a contribution towards their fixed cost then the firm should continue. If the products are not making any contribution towards the fixed cost then the firm should prefer to shut down their business. If the firm makes a decision to shut down their business there may be some fixed costs that will be incurred at the time of shut down which are inevitable in nature like redundancy of payments, maintenance of plant and machinery etc. These costs should be taken into consideration while making a shut down decision.



CHECK YOUR PROGRESS

5. What is the best product mix?
6. What are three factors based on which best product mix is determined?



1.11 LET US SUM UP

In this unit we have discussed the following :

- Cost is the resources which are used to produce, buy or exchange for some goods or services expressed in terms of money or monetary units.
- Classification of costs can be done based on some common bases which are given below:

i. Based on the nature of cost/ expenses.
ii. Based on relation to cost centre.
iii. Based on functions / activities.
iv. Based on behavior.
v. Based on management decision making.
vi. Based on product cost and period cost.

- Measurements of costs help management to take various decisions like :
  i. Pricing decisions.
  ii. Selecting best product mix
  iii. Make or Buy Decisions
  iv. Shut Down Decisions



1.12 FURTHER READING

1) Hanif, M. (2014). *Modern Cost and Management Accounting.* McGraw Hill Education.
2) Arora, M.N. (2015). *Cost and Management Accounting*. Himalaya Publishing House.
3) Jain, S.P. &Narang, K.L. (2013). *Cost Accounting*. Kalyani Publishers.



1.13 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No 1: Cost is the resources which are used to produce, buy or exchange for some goods or services expressed in terms of money or monetary units.

Ans. to Q. No 2: Salary to HR manager, salary to system manager.

Ans. to Q. No 3: Advertisement cost, salary to marketing.

Ans. to Q. No 4:

i. Fixed costs do not vary directly with volume of output. On the other hand, variable costs vary directly with volume of output.
ii. Fixed costs are always expressed in terms of time. On the other hand, Variable costs are expressed in terms of units.

Ans. to Q. No 5: Best product mix is that product mix which gives the maximum profits to the firm.

Ans. to Q. No 6: The three factors based on which best product mix can be determined are contribution, P/V ratio and Break Even point.



1.14 MODEL QUESTIONS

2. What do you mean by the term "cost"?
3. What are the various classifications of costs? Explain each type of cost?
4. Mention five differences between fixed cost and variable cost?
5. What is Cost Sheet? What are the various advantages of cost sheet?
6. Write short note on followings:
    i. Opportunity cost.
    ii. Pricing decisions,
    iii. Product mix,
    iv. Make or buy decisions,
    v. Shut down decisions.
7. From the following particulars prepare a Cost Sheet for the period ended 31st March, 2022.

Particulars	Rs.	Particulars	Rs.
Factory Office Salaries	6,500	Travelling Expenses	2,100
General Office Salaries	12,600	Traveler's Salaries &	7,700
Carriage Outward	4,300	Commission	
Carriage on Purchases	7,150	Productive Wages	1,26,000
Bad Debts written off	6,500	Depreciation- Plant,	6,500
Repairs of Plant, Machinery	4,450	machinery and Tools	
and Tools		Depreciation – Furniture	300
Rent, Rates and Taxes &		Directors' Fees	6,000
Insurance	8,500	Gas and Water – Factory	1,200
-Factory	2000	- Office	400
-Office	4,61,100	Manager's Salary	10,000
Sales		(3/4 Factory and ¼ Office)	

Stock of Materials-		General expenses	3,400
31st March, 2021-	62,800	Income Tax	500
31st March, 2022	48,000	Dividend	1,000
Material Purchased	1,85,000		

Ans. (Material Consumed Rs. 2,06,950; Prime Cost Rs. 3,32,950; Factory Cost Rs. 3,67,600; Cost of Production Rs.3,94,800; Total Cost Rs. 4,15,400; Net Profit Rs. 45,7000)

8. A manufacturing concern requires a statement showing the results of its production operation for April, 2022. Cost records give the following information:

	1/4/2022	30/4/2022
	Rs.	Rs.
Raw Material	1,00,000	1,23,500
Finished Goods	71,500	42,000
Work-in-Progress	31,000	34,500

Transaction during the month of April, 2022:

Purchase of Raw Materials	88,000
Direct Wages	70,000
Work Expenses	39,500
Administration Expenses	13,000
Sale of Factory Scrap	2,000
Selling and distribution Expenses	15,000
Sales	2,84,000

Ans. (Raw Material consumed Rs. 64,500; Prime Cost Rs. 1,34,500; Factory Cost Rs. 1,68,500; Cost of Production Rs. 1,81,500; Cost of Goods Sold Rs. 2,11,000; Cost of Sales Rs. 2,26,000; Profit Rs. 58,000)

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UNIT 2 : STANDARD COSTING

UNIT STRUCTURE

2.1 Learning Objectives

2.2 Introduction

2.3 Standard Cost

2.4 Standard Costing

2.5 Setting of Standards

2.6 Variance Analysis

2.7 Material Variances

2.8 Relationship between Direct Material Cost Variances, Direct Material Price Variances and Direct Material Usage Variance

2.9 Labour Variance

2.10 Overhead Cost Variance

2.11 Let Us Sum Up

2.12 Further Reading

2.13 Answers to Check Your Progress

2.14 Model Questions

2.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- discuss the concept of standard costing, its advantages and limitation
- discuss the concept of variance analysis, types of variance analysis and its application
- Take various decisions relating to cost control.

2.2 INTRODUCTION

There are certain tools and techniques in the management accounting which help management to take various decisions for the firm. One of the technique which helps management to take decisions to control the costs is standard costing. Through standard costing, management can control their costs to a large extent which leads to increase the profitability of the firm.

2.3 STANDARD COST

The word standard means 'norms' or 'criterion'. So the standard cost is the criterion cost based on which performance evaluated by comparing it with the actual cost. It is actually the predetermined cost that should be incurred under prescribed set of working conditions in the organization.

According to ICMA, London "Standard cost is the predetermined cost based on technical estimates for materials, labour and overhead for a selected period of time for a prescribed set of working conditions."

Standards may be divided into the following main classes- basic standards and current standards

Basic standards are those standards which are established for a long period of time. On the basis of basic standard, actual results are measured and variances are calculated. Nevertheless, basic standards do not help to control the cost in practice.

The standards which are set for a short period of time and based on current situations are known as current standards. Revisions of these standards are made on a regular basis. Current standards can be further classified as a) Ideal Standards, b) Expected or practical standards and c) Normal standards.

2.4 STANDARD COSTING

One of the popular and widely used techniques to control the cost is "standard costing". In standard costing, firstly standard costs are predetermined and then compared it with the actual costs incurred. After making comparison, difference between standard cost and actual costs, known as variance, are

measured and analyzed. By analyzing the variances the firm tries to explore the causes of variances and inform these causes of variances to the management so that they can take appropriate action.

According to J. R. Brown and L. r. Howard defines standard costing "as a technique of cost accounting which compares the 'standard cost' of each product and services with the actual cost, to determine the efficiency of the operation, so that any remedial action may be taken".

Thus standard costing involves the following logical steps:

i. Determination of standards of different elements.

ii. Ascertainment of actual results.

iii. Comparison between standards and actual results.

iv. Calculate the variance.

v. Analyze the causes of variances.

vi. Inform the management the causes of variances so that they can take appropriate technique.

Standard costing can be applicable if the following conditions are fulfilled:

i. A sufficient volume of standard products or components should be produced and these products should be produced in repetitive nature.

ii. Methods, operations and processes should be capable of being standardized.

iii. A sufficient number of costs should be capable of being controlled.

Advantages of Standard Casting

Standard costing provides various advantages to the firm which is given below:

i. Standard costing helps a firm to evaluate their performance. It acts as a basis for performance evaluation.

ii. It helps to the management to fix responsibilities of the people and motivate them to work more efficiently.

iii. It guides management to improve their method of works.

iv. It brings cost consciousness among the management staff, workers other employees.

v. It helps to pinpoint the problem areas of the work processes.

vi. It helps management in fixing up prices and formulating policies.

vii. It helps the optimum utilization of resources.

viii. It provides a basis for estimating future cost of products and services.

ix. It makes costing procedure simple.

Limitations of Standard Costing

The standard costing suffers from the following limitations:

i. Standard costing is not effective without proper Budgetary Control.

ii. Adoption of standard costing is very costly and small firms may not afford it.

iii. Standard costing is not appropriate for all types of firms.

iv. The staff may not be able to operate this standard costing system.

v. Standard costing is not suitable in volatile conditions like rapidly changing methods, rates and prices, standards etc.

vi. Standard costing cannot be applied by those industries which are manufacturing non-standardized products.

2.5 SETTING OF STANDARD COSTS

The success of standard costing mainly depends on the accurate, reliable and relevant setting of standards of different elements of costs. All the factors should be taken into consideration while setting the standards. A manufacturing organization sets the standards for –

a. Direct materials;

b. Direct labours; and

c. Manufacturing overheads.

Setting of Direct Materials Standards

Three standards are set while setting the standards for direct materials:

i. Quality of the direct materials;

ii. Price of the direct materials; and

iii. Quantity of direct materials.

The standard quality of the direct materials is determined by the quality of the final product and its prices.

The standard price of the direct materials depends on the supply agreement, price fluctuation, nature of the material, availability of the material etc. Here forecasts the average price of the direct materials used in the manufacturing processes.

The standard quantity of the direct materials mainly depends upon the design of the product and the expected normal wastage at the processing. Here forecasts the average quantity of the direct materials consumed in the manufacturing processes.

Setting of Direct Labours Standards

In case of direct labour, two standards are set :

i. Labour rate; and

ii. Labour time.

Setting of standard labour rate depends upon the skills required to perform the operation and wage structure of the different workers. Here forecasts the average rate or remuneration of the labour to be incurred in the manufacturing processes.

Setting of standard labour time depends upon the manufacturing processes and skill of the labours. Here forecasts the average time required to perform each operation per unit of the product.

Setting of Manufacturing Overheads Standards

Manufacturing overheads consist of indirect material, indirect labour and indirect expenses. Manufacturing overhead incurred at the factory for carrying out production activities. These manufacturing overheads can be classified as fixed overheads and variable overheads. Setting of manufacturing overheads is depends on the nature of the manufacturing overheads. Generally, separate standards are set for variable manufacturing overheads and for fixed overheads.

Steps for setting the standards of variable manufacturing overheads :-

i. Calculate the expected labour hours/output/ machine hours for the period of each production department.

ii. Calculate budgeted variable factory overhead cost for each production department.

iii. Calculate standard variable overhead recovery rate as follows :

$$\frac{\textit{Budgeted Variable Overheads for each Production Department}}{\textit{Expected Labour Hours or Output or Machine Hour}}$$

Steps for setting the standards of fixed manufacturing overheads :-

i. Calculate the normal labour hours/ output/ machine hours for the period of each production department.

ii. Calculate budgeted fixed factory overhead cost for each production department.

iii. Calculate standard fixed overhead recovery rate as follows:

$$\frac{\textit{Budgeted Fixed Overheads for each Production Department}}{\textit{Normal Labours or Output or Machine Hour}}$$

2.6 VARIANCE ANALYSIS

Variance is the difference between the standards and actual. So the variance analysis is the process of ascertaining and analyzing the total variances by sub dividing in such a way that it helps the management to assign the responsibility for any off standard performance.

According to CIMA, London, variance analysis is "the process of computing the amount of variance and isolating the causes of variance between actual and standard."

Favourable and Unfavourable Variance

When the actual cost is less than the standard cost, it is known as 'favourable' or 'credit variance'. Favourable variances are indicated by (+). When the actual cost is more than the standard cost, it is known as 'unfavourable', 'adverse' or 'debit' variance. Unfavourable variances are indicated by (-).



CHECK YOUR PROGRESS

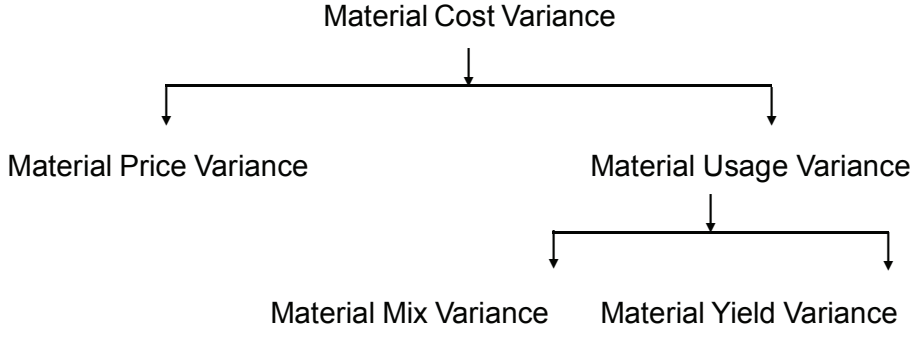
1. What is standard cost?
2. Mention various types of standard.
3. What is standard Costing?
4. Mention three advantages and three limitations of standard costing?
5. What is variance? What is favourable and unfavourable variance?

2.7 MATERIAL VARIANCES

In case of material, the following variances are calculated:

a) Material Cost Variance, b) Material Price Variance, c) Material Usage Variance, d) Material Mix Variance and e) Material Yield Variance.

The following chart shows the division and sub-division of material variance:



Material Cost Variances

Material cost variances is the difference between the standard cost of materials specified and the actual cost of material used. It is calculated as :

Material Cost Variance = Standard Cost – Actual Cost

Material Price Variances

Material price variance is the difference between the standard price and actual price for the actual quantity of material. It is calculated as:

Material Price Variance = (Standard Price- Actual Price) x Actual Quantity

Material Usage Variance

Material usage variance is the difference between the standard quantity specified for actual production and the actual quantity used at standard price. It is calculated as :

Material Usage Variance = (Standard Quantity – Actual Quantity) x Standard Price

Material Mix Variance

Material Mix Variance is that portion of material usage variance which is arises due to the difference between standard and actual composition of a mixture. In case of material mix variance, two situations may arise:

i) Actual weight of mix and the standard weight of mix do not differ.

ii) Actual weight of mix differs from the standard weight of mix.

In case of first situation,Material Mix Variance is calculated as follows the difference between the standard price of standard mix and the standard price of actual mix.

But in case of second situation, Material Mix Variance is calculated with the help of following formula-

$$\frac{\textit{Total Weight of Actual Mix}}{\textit{Total Weight of Revised Actual Mix}}$$ **x Standard Cost of Revised Standard Mix**

–Standard Cost of Actual Mix

Material Yield Variance

Material Yield Variance is that portion of material usage variance which is arises due to the difference between the standard yield specified and actual yield obtained. This variance measures the abnormal loss or savings of materials. Material yield variance may results the following two situations-

i) When standard and actual mix do not differ.

ii) When actual mix differs from standard mix.

In case of first situation, the following formula is used to calculate the material yield variance-

Standard Rate x (Actual Yield – Standard Yield)

$$\textbf{Where Standard Rate} = \frac{Stanadard\ \ Cost\ \ of\ \ Standard\ \ Mix}{Net\ \ Standard\ \ output}$$

And in case of second situation, the following formula is used to calculate the material yield variance-

Standard Rate x (Actual Yield – Revised Standard Yield)

$$\textbf{Where Standard Rate} = \frac{Standard\ Cost\ Revised\ stavdard\ Mix}{Net\ Standard\ output}$$

2.8 RELATIONSHIP BETWEEN DIRECT MATERIAL COST VARIANCES, DIRECT MATERIAL PRICE VARIANCES AND DIRECT MATERIAL USAGE VARIANCE

Material Cost Variance = Material Price Variance + Material Usage Variance.

Example: 1

The following data applies to the production of a standard product known as PX: standard quantity 1,000 kg of material M, standard price per kg. Rs. 2.40. During a certain month 1,150 kg of M was actually used and the actual price paid for material M was Rs. 2.60 per kg.

You are required to compute:

i. The total direct material cost variance.

ii. The direct material price variance.

iii. The direct material usage variance.

Solution:

i. Direct Material Cost Variance = Standard Cost – Actual Cost

= 1,000 x 2.40 – 1,150 x 2.60

= 2,400 – 2,990

= Rs. 590 (A)

ii. Direct Material Price Variance = (Standard Price- Actual Price) x Actual Quantity

= (2.40- 2.60) x 1,150

= Rs. 230 (A)

iii. Direct Material Usage Variance = (Standard Quantity – Actual Quantity) x Standard Price = (1,000 – 1,150) x 2.40 = Rs. 360 (A)

Example: 2

From the following information, compute (a) price, (b) usage and (c) mix variables from the data given below:

	Standard			Actual		
	Quantity Kg	Price Rs.	Total Rs.	Quantity Kg.	Price Rs.	Total Rs.
Material A	10	3	30	15	4	60
Material B	15	4	60	25	3	75
Material C	25	2	50	35	2	70
Total	50		140	75		205

Solution:

(a) Material Price Variance

Actual usage (Standard price – Actual price)

Material A : 15 x (3-4) = 15 (A)

Material B : 25 x (4-3) = 25 (F)

Material C : 35 x (2-2) = Nil

Total Material Price Variance = Rs.10 (F)

(b) Material Usage Variance

Standard rate (Standard Usage – Actual Usage)

Material A : 3 x (10-15) = 15 (A)

Material B : 4 x (15–25) = 40 (A)

Material C : 2 x (25-35) = 20 (A)

Total Material Usage Variance = Rs.75 (A)

(c) Material Mix Variance

$= \frac{Total\ weight\ of\ actual\ mix}{Total\ weight\ of\ standadrd\ mx}$ x Standard cost of standard mix) – Standard cost of actual mix

$= \frac{15+25+35}{10+15+25}$ x 140 – (15 x 3 + 25 x 4 + 35 x 2)

$= \frac{75}{50}$ x 140 -215

= Rs.5 (A)

CHECK YOUR PROGRESS



6. What are the various division and subdivision of material variance?

7.Standard rate = _____

8. X Mfg. Co. which has adopted standard costing furnishes the following information:

Standard	:	Materials for 75 kg. finished products	100kg.
		Price of materials	Rs. 2 per kg.
Actual	:	Output	1,50,000 kg.
		Material used	1,80,000 kg.
		Cost of materials	Rs. 3,42,000

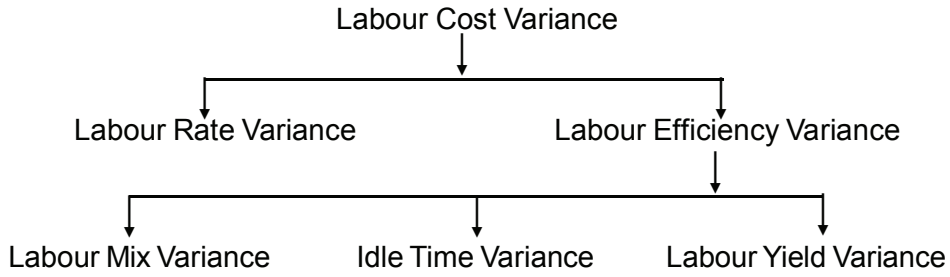
Calculate : a) Material cost variance, b) Material price variance, c) Material usage variance.

2.9 LABOUR VARIANCES

In case of labour, the following variances are calculated:

a) Labour Cost Variance, b) Labour Rate Variance, c) Labour Efficiency Variance, d) Labour Mix Variance, e) Idle Time Variance and f) Labour Yield Variance

The following chart shows the division and sub-division of labour variance:



LABOUR COST VARIANCE

Labour cost variance is the difference between the standard labour cost specified for the activity achieved and the actual labour cost incurred. It is calculated as:

Labour Cost Variance = Standard Labour Cost – Actual Labour Cost

LABOUR RATE VARIANCE

Labour rate variance is the difference between the standard and actual labour hour rate per hour for the total hours worked. It is calculated as:

Labour Rate Variance = (Standard Rate – Actual Rate) x Actual Hours

LABOUR TIME (EFFICIENCY) VARIANCE

Labour time variance is the difference between standard labour hours specified for the output achieved and the actual hours expended. It is calculated as:

Labour Time Variance = (Standard Hours – Actual Hours) x Standard Rate

IDLE TIME VARIANCE

This variance represents that portion of the labour efficiency variance which is due to abnormal idle time, such as power failure, strike, machine break-down etc. it is calculated as :

Idle Time Variance = Idle Hours x Standard Rate

LABOUR YIELD VARIANCE

Labour yield variance is the difference between the Standard Yield and Actual Yield. It is calculated as:

Labour Yield Variance = (Actual Yield – Standard Yield) x Standard Labour Cost per Unit of Output

LABOUR MIX VARIANCE

Labour mix variance is the variance which is arises when more than one grade of workers are employed and the composition of actual grade of workers differ from those specified. It is calculate as:

Labour Mix Variance = (Revised Standard Hours - Actual Standard Hours) x Standard Rate

Example : 3

The following information is obtained from a Standard Cost Card.

Labour Rate Rs. 2.00 per hour

Hours – 3 hours per unit

Actual production data are:

Units produced are 250

Labour rate Rs. 2.25 per hour

Hours worked – 800

Calculate Labour Cost Variance and analyze it.

Solution :

Standard Hours	=	250 x 3	=	750 hrs
Standard Labour Cost	=	750 x 2	=	Rs.1,500
Actual Labour Cost	=	800 x 2.25	=	Rs.1,800

Analysis of Labour Cost Variance	
Labour Cost Variance (Standard Labour Cost–Actual Labour Cost) = (1500-1800)	300 (A)
2. Labour Rate Variance (Standard Rate–Actual Rate) x Actual Hours = (2.00–2.25) x 800	200 (A)
3. Labour Time Variance (Standard Hours–Actual Hours) x Standard Rate = (750-800) x 2	100 (A)
	300 (A)

Example: 4

Standard Output	500 units.
Actual Output	400 units.
Standard Time	1000 hrs.
Standard rate	Rs. 20 per hour.

Calculate Labour Yield Variance.

Solution:

Standard time per unit = 1000 hrs ÷ 500 units = 2 hrs.

Standard Cost per Unit = 2 x 20 = Rs. 40

Labour Yield Variance = (Actual Yield – Standard Yield) x Standard Labour Cost per Unit of Output = (450-500) x 40 = Rs. 2,000 (A)



CHECK YOUR PROGRESS

9. Mention the various division and sub-division of labour variance.

10. Labour cost variance is the difference between …… and ……

11. Data relating to a job are as given below :

Standard rate of wages per hour	Rs. 10
Standard hours	300
Actual rate of wages per hour	Rs. 12
Actual hours	200

You are required to calculate :

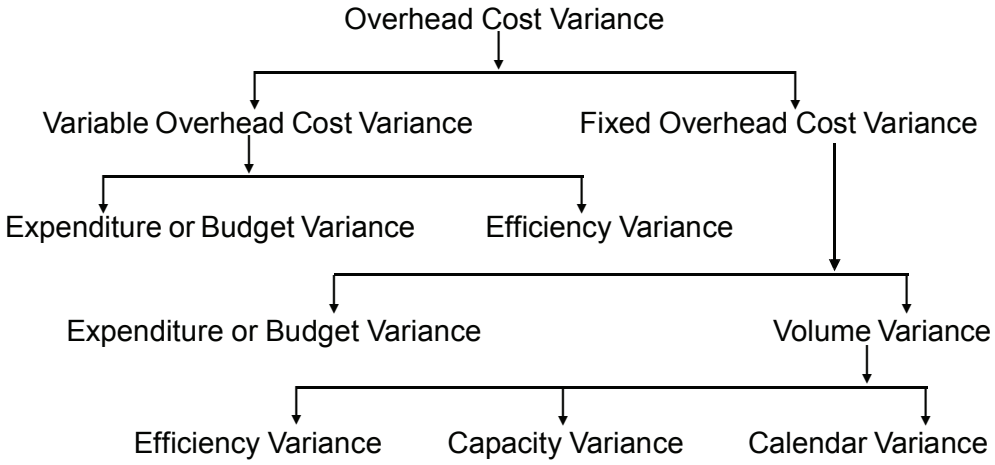
Labour Cost Variance, Labour Rate Variance, Labour Efficiency Variance

2.10 OVERHEAD COST VARIANCE

In case of overhead, the following variances are calculated:

a) Overhead Cost variance, b) Variable Overhead Cost Variance, c) Fixed Overhead Cost Variance, d) Variable Overhead Expenditure or Budget Variance, e) Variable Overhead Efficiency Variance, f) Fixed Overhead Expenditure or Budget Variance, g) Volume Variance,

The following chart shows the division and sub-division of overhead variance:



OVERHEAD COST VARIANCE

Overhead Cost Variance is the difference between the standard cost of overhead allowed for actual output achieved and the actual overhead cost incurred. It is calculated as follows:

Overhead Cost Variance = Actual Output x Standard Overhead Rate per Unit – Actual Overhead Cost

Or

Standard Hours for Actual Output x Standard Overhead Rate per Hour – Actual Overhead

VARIABLE OVERHEAD COST VARIANCE

Variable overhead cost variance is the difference between actual variable overhead incurred and the variable overhead absorbed. It is calculated as:

Variable Overhead Cost Variance = (Absorbed Variable Overhead – Actual Variable Overhead)

Absorbed Variable Overhead = Standard hours for actual output x Standard Variable Overhead rate

VARIABLE OVERHEAD EXPENDITURE VARIANCE

Variable overhead expenditure variance is the difference between the actual overheads incurred and the allowed variable overheads based on the actual hours worked. It is calculated as:

Variable Overhead Expenditure Variance = (Standard Rate – Actual Rate) x Actual Hours Worked

VARIABLE OVERHEAD EFFICIENCY VARIANCE

Variable Overhead Efficiency Variance is the difference between the actual overheads incurred and the absorbed variable overheads. It is calculated as :

Variable Overhead Efficiency = (Standard Rate x Standard Hours) – Actual Hours Worked

FIXED OVERHEAD VARIANCE

Fixed overhead variance is that portion of total overhead variance which is due to the difference between the standard costs of fixed overhead allowed for actual output and the actual fixed overhead incurred. It is calculated as :

Actual Output x Standard Fixed Overhead rate per unit – Actual Fixed Overheads

Or

Standard Hours Produced x Standard Fixed Overhead Rate per Hour – Actual Fixed overhead

FIXED OVERHEAD EXPENDITURE VARIANCE

Fixed overhead expenditure variance is that portion of the fixed overhead variance which is due to the difference between the budgeted fixed overheads and actual fixed overhead incurred during a particular period. It is calculated as :

Budgeted Fixed Overheads – Actual Fixed Overheads

Or

Budgeted Hours x Standard Fixed Overhead Rate per Hour – Actual Fixed Overheads

VOLUME VARIANCE

Volume variance is the difference between the standard costs of fixed overhead allowed for actual output and the budgeted fixed overhead for the period during which the actual output has been produced. It is calculated as :

Actual Output x Standard Rate – Budgeted Fixed Overheads

Or

Standard rate (Actual Output – Budgeted Output)

Or

Standard Rate per Hour (Standard Hours Produced – Actual Hours)

CAPACITY VARIANCE

Capacity variance is that portion of Volume variance which is due to working at higher or lower capacity than the budgeted capacity. So this variance related with over or under utilization of plant and machinery and arises due to strikes, power failure, absenteeism, overtime etc. It is calculated as:

Standard Rate (Revised Budgeted Units – Budgeted Units)

Or

Standard Rate (Revised Budgeted Hours – Budgeted Hours)

CALENDAR VARIANCE

It is that portion of volume variance which is due to the difference between the numbers of working days budgeted during a period and the number of actual working day at that budgeted period. If the numbers of actual working days are more than budgeted working days than the variance will be favourable and vice versa. It is calculated as :

Increase or decrease in production due to more or less working days at the date of budgeted capacity X Standard Rate per Unit

EFFICIENCY VARIANCE

It is that portion of the volume variance which is due to the difference between the budgeted efficiency of production and the actual efficiency achieved. This variance is related to the efficiency of workers and plant. It is calculated as:

Standard Rate per Unit (Actual Production (in units) – Standard Production (in units))

Or

Standard Rate per Hour (Standard Hours produced – Actual Hours)

Example: 5

From the following data, calculate variable overhead variances :

	Budgeted	Actual
Variable Overhead	Rs.2,50,000	Rs.2,60,000
Output in Units	25,000	20,000
Working hours	1,25,000	1,10,000

Solution:

Standard variable overhead per unit = $\frac{2,50,000}{25,000}$ = Rs.10

Standard variable overhead per hour = $\frac{2,50,000}{1,25,000}$ = Rs. 2

Time allowed per unit of output = $\frac{1,25,000}{25,000}$ = 5 hours

Variable Overhead Expenditure Variance = Actual hours worked x Standard rate per hour – Actual overhead = 1,10,000 x 2 – 2,60,000 = Rs. 40,000 (A)
Variable Overhead Efficiency Variance = Standard time for actual production x Standard variable overhead rate per hour – Actual hours worked x Standard variable overhead rate per hour = 1,00,000 x 2 – 1,10,000 x 2 = Rs. 20,000 (A)
Standard time for actual production = 20,000 x 5 = 1,00,000 hours
Total Variable Overhead Variance = Actual output x Standard rate per unit – Actual Overhead = 20,000 x 10 – 2,60,000 = Rs. 60,000 (A)

Example: 6

The standard variable overhead for a particular production department has been budgeted as follows :

Budgeted variable overhead for the period : Rs. 20,000

Budgeted volume of production for the period : 40,000 units

During the period under review the actual variable overheads incurred amounted to Rs. 28,000 and the actual production was 48,000.

Solution:

Standard variable overhead rate per unit = $\frac{Budgeted\ overhead}{Budgeted\ production}$

= $\frac{20,000}{40,000}$

= Rs.0.50 per unit

Variable overhead recovered (i.e. charged to production) = Actual production x Standard rate per unit

= 48,000 x 0.50

= Rs.24,000

Actual variable overhead = Rs.28,000

Variable Overhead Variance = Overhead recovered – Actual overhead

= 24,000 – 28,000

= Rs. 4,000 (A)



CHECK YOUR PROGRESS

12. Mention various division and subdivision of overhead variance.

13. What are the various factors that are related to capacity variance?

14. From the following data, calculate overhead variances:

Particulars	Budgeted	Actual
Output	15,000 units	16,000 units
Number of working days	25	27
Fixed Overheads	Rs. 30,000	Rs. 30,500
Variable Overheads	Rs. 45,000	Rs. 47,000

There was an increase of 5% in capacity.



2.11 LET US SUM UP

In this unit, we have discussed the following -

- Standard costing is a technique of cost accounting which is a very useful technique of cost control through which comparison can be made between the 'standard cost' of each product and services with the actual cost, so that efficiency of the operation can be determined and can take remedial action if required.
- Standard Costing has numerous advantages and disadvantages if a manufacturing concern adopt it.
- Variance analysis is an important step of standard costing. It is a process of ascertaining and analyzing the total variances by sub dividing in such

a way that it helps the management to assign the responsibility for any off standard performance.

- Variance analysis can be made on materials, labour and overheads.



2.12 FURTHER READING

1) Hanif, M. (2014). *Modern Cost and Management Accounting.* McGraw Hill Education.
2) Arora, M.N. (2015). *Cost and Management Accounting*. Himalaya Publishing House.
3) Jain, S.P. &Narang, K.L. (2013). *Cost Accounting*. Kalyani Publishers.



2.13 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No 1 : Standard cost is the criterion cost based on which performance evaluated by comparing it with the actual cost.

Ans. to Q. No 2 : There are two types of standard namely basic standard and current standard.

Ans. to Q. No 3 : Standard costing is a technique of cost accounting is a very useful technique of cost control through which comparison can be made between the 'standard cost' of each product and services with the actual cost, so that efficiency of the operation can be determined and can take remedial action if required.

Ans. to Q. No 4 :

Three advantages of standard costing

i. Standard costing helps a firm to evaluate their performance. It acts as a basis for performance evaluation.
ii. It helps to the management to fix responsibilities of the people and motivate them to work more efficiently.
iii. It guides management to improve their method of works.

Three advantages of standard costing

i. Standard costing is not effective without proper Budgetary Control.
ii. Adoption of standard costing is very costly and small firms may not afford it.
iii. Standard costing is not appropriate for all types of firms.

Ans. to Q. No 5: Variance is the difference between standard and actual.

When the actual cost is less than the standard cost, it is known as 'favourable' or 'credit variance'. Favourable variances are indicated by (+). When the actual cost is more than the standard cost, it is known as 'unfavourable', 'adverse' or 'debit' variance. Unfavourable variances are indicated by (-).

Ans. to Q. No 6: Various division and subdivision of material variance are -

a) Material Cost Variance, b) Material Price Variance, c) Material Usage Variance, d) Material Mix Variance and e) Material Yield Variance.

Ans. to Q. No 7: Standard Rate = $\frac{Stanadard\ Cost\ of\ Standard\ Mix}{Net\ Standard\ output}$

Ans. to Q. No 8:

Standard quantity of material required for actual output

= 1,50,000 x $\frac{100}{75}$

= 2,00,000 kg

Actual quantity of material = 1,80,000 kg

Standard Price Rs. 2 per kg

Actual price = $\frac{3,42,000}{1,80,000}$ = Rs. 1.90 per kg

a) Material Cost Variance

= Standard Cost – Actual Cost

= 2,00,000 x 2 – 3,42,000

= Rs. 58,000 (F)

b) Material Price Variance

= (Standard price – Actual price) x Actual Usage

= (2.00 – 1.90) x 1,80,000

= Rs. 18,000 (F)

c) Material Usage Variance

= Standard Rate x (Standard Usage – Actual Usage

= 2 x (2,00,000 – 1,80,000)

= Rs. 40,000 (F)

Ans. to Q. No 9: Various division and subdivision of labour variance are

a) Labour Cost Variance, b) Labour Rate Variance, c) Labour Efficiency Variance, d) Labour Mix Variance, e) Idle Time Variance and f) Labour Yield Variance

Ans. to Q. No 10: Labour cost variance is the difference between standard labour and actual labour.

Ans. to Q. No 11:

Labour Cost Variance = 300 x 10 – 200 x 12 = Rs. 600 (F)

Labour Rate Variance = (10-12) x 200 = Rs. 400 (A)

Labour Efficiency Variance = (300-200) x 10 = Rs. 1,000 (F)

Ans. to Q. No 12 : The various division and sub-division of overhead variance are :

a) Overhead Cost variance, b) Variable Overhead Cost Variance, c) Fixed Overhead Cost Variance, d) Variable Overhead Expenditure or Budget Variance, e) Variable Overhead Efficiency Variance, f) Fixed Overhead Expenditure or Budget Variance, g) Volume Variance,

Ans. to Q. No 13 : The various factors which are related to capacity variance are over or under utilization of plant and machinery and arises due to strikes, power failure, absenteeism, overtime etc.

Ans. to Q. No 14 :

a) Total Overhead Cost Variance

= Actual unit x Standard rate – Actual Overhead

= 16,000 x (2+3) – (30,500 + 47,000)

= 80,000 – 77,500

= Rs. 2,500 (F)

Standard Rate : Fixed = $\frac{30,000}{15,000}$ = Rs. 2

Variable = $\frac{45,000}{15,000}$ = Rs. 3

b) Variable Overhead Expenditure Variance

= Actual Units x Variable Overhead Standard Rate – Actual Variable Overhead Cost

= 16,000 x 3 – 47,000

= Rs. 1,000 (F)

c) Fixed Overhead Variance

= Actual Unit x Fixed Overhead Standard Rate - Actual Fixed Overhead Cost

= 16,000 x 2 – 30,500

= Rs. 1,500 (F)

d) Volume Variance (Part of Fixed Overhead Variance)

= Actual Units x Fixed Overhead Standard Rate – Budgeted Fixed Overheads

= 16,000 x 2 – 30,000

= Rs. 2,000 (F)

e)Expenditure Variance (Part of Fixed Overhead Variance)

= Budgeted Fixed Overhead – Actual fixed Overhead

= 30,000- 30,500

= Rs. 500 (A)

f) Capacity Variance (Part of volume variance)

= Standard Rate of Fixed Overheads x (Revised Budgeted Units – Budgeted Units)

= 2 x (17,010- 16,200)

= Rs. 1,620 (F)

Budgeted units for 25 days = 1,500 units

Budgeted Units for 27 days = $\frac{1,500}{(25)}$ x 27 = 16,200

Revised budgeted units after 5% increase in capacity

= 16,200 x $\frac{105}{100}$

= 1,710

g) Capacity Variance (Part of volume variance)

= Increase or decrease in production due to more or less working days x Standard rate

= (16,200 – 15,000) x 2

= Rs. 2,400 (F)

h) Efficiency Variance (Part of volume variance)

= Standard Rate x (Actual production – Standard production)

= 2 x (16,000-17,010)

= Rs. 2,020 (A)



2.14 MODEL QUESTIONS

1. Define standard cost and standard costing. What are the steps followed in standard costing?
2. What are the advantages and limitations of standard costing?
3. What is variance analysis?
4. Describe briefly the procedure of establishing standard costs within the division of materials, labour and overhead costs.
5. "The basic variances are price and usage variance." Discuss this statement in relation to material, labour and overhead.
6. "Variance analysis is an integral part of standard costing system." Explain.
7. In a system of standard costing, enunciate and explain any six variances, two each under materials, labour and overheads.

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UNIT 3 : SALE VARIANCE

UNIT STRUCTURE

3.1 Learning Objectives

3.2 Introduction

3.3 Meaning of Sales Variances

3.4 Causes of Sales Variance

3.5 Types of Sales Variance

- 3.5.1 Turnover Method or Sale Value Method
- 3.5.2 Profit or Sales Margin Method

3.6 Let Us Sum Up

3.7 Further Reading

3.8 Answers to Check Your Progress

3.9 Model Questions

3.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- explain the meaning of sales variances
- discuss the causes and types of sales variance
- discuss the various methods of sales variance

3.2 INTRODUCTION

Most of the companies calculate the variances relating to material, labour and overheads only. But order to get the full benefits of standard costing technique; some companies also calculate sales variances. Material variances, labour variances and overhead variances are concerned with the cost and their effect on the budgeted profit, but sales variances are concerned with change in sales price or sales quantity and their effect on the budgeted profit.

3.3 MEANING OF SALES VARIANCES

Sales variance may be defined as the difference between the actual sales and budgeted sales.

3.4 CAUSES OF SALES VARIANCE

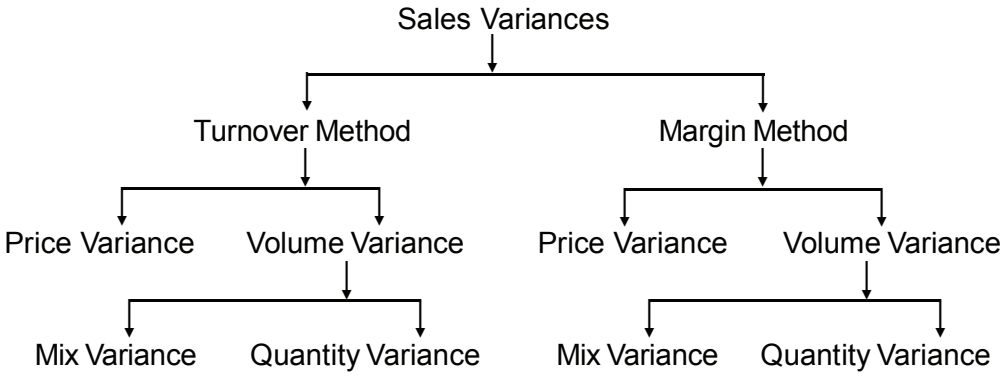
Sales variances are mainly due to –

i. Change in the selling price of the product;

ii. Change in the volume of sales quantity.

3.5 TYPES OF SALES VARIANCES

The various types of sales variances shown in the following chart



Turnover method : This method shows effect of change in sales on turnover (value).

Margin Method : This method shows the effect of change in sales on profit margin.

3.5.1 Turnover Method or Sale Value Method

Under this method, all variances are calculated on the basis of Sales Revenue generated from the sales of the products. The following variances are calculated under this method:

i. **Sales Value Variance**

Sales value variance is the difference between the budgeted value of sales and the actual value of sales during a particular period. This variance is calculated as follows :

Sales Value Variance = Budgeted Sales – Actual Sales

Where,

Budgeted Sales = Budgeted Quantity x Standard Selling Price

Actual Sales = Actual Quantity x Actual Selling Price

Sales Volume Variance may arise when

a. Actual sales volume is more or less than the standard sales volume.

b. Actual sales price is more or less than the standard sales price.

c. Actual mix of the product is different from standard mix.

ii. **Sales Volume Variance**

Sales Volume Variance refers to that portion of Sales Value Variance which is due to the difference between actual volume of sales and standard volume of sales. This variance is calculated as follows:

Sales Volume Variance = Budgeted Sales - Standard Sales

Where,

Budgeted Sales = Budgeted Quantity x Standard Selling Price

Standard Sales = Actual Quantity x Standard Selling Price

The causes of Sales Volume Variance are:

a. Ineffective advertising and sales promotion.

b. Unexpected competition.

c. Lack of proper supervision and control of salesmen.

iii. **Sales Price Variance**

Sales Price Variance refers to that portion of sales variance which is due to the change in the standard price specified and actual price charged. This variance is calculated as follows:

Sales Price Variance = Standard Sales – Actual Sales

Where,

Standard Sales = Actual Quantity x Standard Selling Price

Actual Sales = Actual Quantity x Actual Selling Price

iv. **Sales Mix Variance**

It is the difference between Revised Standard Sales and Standard Sales.

It relates to the change in ratio of sale. It is calculated as follows:

Sales Mix Variance = Revised Standard Sales – Standard Sales

Where,

$$\text{Revised Standard Sales} = \frac{Budgeted\ Sales}{Total\ Budgeted\ sales} \times \text{Total Standard Sales}$$

Or

$$\frac{Standard\ Quantity}{Total\ Quantity} \text{ X Actual Quantity x Standard Selling Price}$$

Standard Sales = Actual Quantity x Standard Selling Price

v. **Sales Quantity Variance**

Sales Quantity Variance is the difference between Budgeted Sales and Revised Standard sales. It is calculated as follows:

Sales Quantity Variance = Budgeted Sales – Revised Standard Sales

Or

Budgeted selling Price per Unit x (Budgeted Quantity – Revised Standard Quantity)

Example 1:

From the following information about sales, calculate:

i. Total sales variance;
ii. Sales price variance;
iii. Sales volume variance;
iv. Sales mix variance;
v. Sales quantity variance.

Product	Standard		Actual	
	Units	Rate	Units	Rate
A	5,000	5	6,000	6
B	4,000	6	5,000	5
C	3,000	7	4,000	8

Solution:- Budgeted Sales

Product	Budgeted Quantity (Units)	Budgeted Price (Rs.)	Value (Rs.)
A	5,000	5	25,000
B	4,000	6	24,000
C	3,000	7	21,000
	12,000		70,000

Actual Sales

Product	Actual Quantity (Units)	Actual Price (Rs.)	Value (Rs.)
A	6,000	6	36,000
B	5,000	5	25,000
C	4,000	8	32,000
	15,000		93,000

Standard Sales

Product	Actual Quantity (Units)	Budgeted Price (Rs.)	Value
A	6,000	5	30,000
B	5,000	6	30,000
C	4,000	7	28,000
	15,000		88,000

Revised Standard Sales

Product	Value	Note
A	31,429	Working Note 1
B	30,171	Working Note 1
C	26,400	Working Note 1

i) Total Sales Variance = Budgeted Sales – Actual Sales

= 70,000 – 93,000

= Rs. 23,000 (F)

ii) Sales Price Variance = Standard Sales – Actual Sales

A: 30,000 – 36,000 = 6,000 (F)

B: 30,000 – 25,000 = 5,000 (A)

C: 28,000 – 32,000 = 4,000 (F)

88,000 – 93,000 = 5,000 (F)

iii) Sales Volume Variance = Budgeted Sales – Standard Sales

A: 25,000 – 30,000 = 5,000 (F)

B: 24,000 – 30,000 = 6,000 (F)

C: 21,000 – 28,000 = 7,000 (F)

70,000 – 88,000 = 18,000 (F)

iv) Sales Mix Variance = Revised Standard Sales – Standard Sales

A: 31,429 – 30,000 = 1,429 (A)

B: 30,171 – 30,000 = 171 (A)

C: 26,400 – 28,000 = 1,600 (F)

88,000 – 88,000 = Nil

v) Sales Quantity Variance = Budgeted Sales – Revised Standard Sales

A; 25,000 – 31,429 = 6,429 (F)

B: 24,000 – 30,171 = 6,171 (F)

C: 21,000 – 26,400 = 5,400 (F)

70,000 – 88,000 = 18,000 (F)

Working Notes 1: Calculation of Revised Standard Sales

$$\text{Revised Standard Sales} = \frac{Budgeted\ Sales}{Total\ Budgeted\ sales} \times \text{Total Standard Sales}$$

$$A = \frac{25,000}{70,000} \times 88,000 = \text{Rs. } 31,429$$

$$B = \frac{24,000}{(70,000)} \times 88,000 = \text{Rs. } 30,171$$

$$C = \frac{21,000}{70,000} \times 88,000 = \text{Rs. } 26,400$$



Check Your Progress

1. What is sales variance?
2. What the main causes of sales variance?
3. What are the two methods of sales varizxance?
4. Fill up the gaps.
   i. Sales Volume Variance = _____ - _____
   ii. Sales Price Variance = _____ - _____

3.5.2 Profit or Sales Margin Method

Under this method, all the sales variances are calculated on the basis of sales margin/profit. Under this method, the variances show the effects of change in selling prices and quantity on the profit margin of the organization. The variances calculated under this method are;

i. Total Sales Margin Variance

Total Sales margin variance is the difference between the budgeted profit and actual profit. Here, budgeted profit and actual profit is calculated on the basis of standard costs not the actual costs. The formula for calculating Total Sales Margin Variance is as under-

Total Sales Variance = Budgeted Profit – Actual Profit

Where

Budgeted Profit = Budgeted Selling Price – Standard Cost

Or

Budgeted Quantity x Budgeted Profit per unit

Actual Profit = Actual Selling Price – Standard Cost

Or

Actual Quantity x Actual Profit per unit

ii. Sales Margin Price Variance

Sales margin price variance is the difference between the standard profit and actual profit. It is calculated as follows :

Sales Margin Price Variance = Standard Profit – Actual Profit

Where,

Standard Profit = Actual Quantity x Budgeted Profit per unit

Actual Profit = Actual Quantity x Actual Profit

iii. Sales Margin Volume Variance

Sales Margin Volume Variance is the difference between the actual sales quantity and budgeted sales quantity multiplied by standard profit. It is calculated as follows:

Sales Margin Volume Variance = Standard Profit/Budgeted Profit x (Budgeted Quantity – Actual Quantity)

Or

Budgeted Profit – Standard Profit

Where,

Budgeted profit = Budgeted Quantity x Budgeted Profit per unit

Standard Profit = Actual Quantity x Budgeted Profit per unit

iv. Sales Margin Quantity Variance

It is the difference between budgeted profit and revised standard profit. It is calculated as follows:

Sales Margin Quantity Variance = Budgeted Profit - Revised Standard Profit

Where,

Budgeted Profit = Budgeted Quantity x Budgeted Profit per unit

Revised Standard Profit = Actual Quantity in the budgeted Ratio x Standard Profit per unit

Or

Sales Margin Quantity Variance = Budgeted Profit x (Standard/Budgeted Quantity – Revised Standard Quantity)

Where,

$$\text{Revised Standard Quantity} = \frac{\textit{Budgeted Quanitty of Each Product}}{\textit{Total Budgeted Quantity}} \text{ x Total Actual Quantity}$$

v. Sales Margin Mix Variance

Sales margin mix variance is the difference between revised standard profit and standard profit. It is calculated as follows:

Sales Margin Mix Variance = Revised Standard Profit – Standard Profit

Where,

Revised Standard Profit = Budgeted Profit per unit x Revised Standard Quantity

Standard Profit = Budgeted Profit per unit x Actual Quantity

Example 2

X Ltd. has budgeted the following sales for the month of August,2021:

Product A: 800 units @ Rs. 100 per unit.

Product B: 700 units @ Rs. 200 per unit.

The actual sales for the month were as follows:

Product A: 900 units @ Rs. 110 per unit.

Product B: 800 units @ Rs. 180 per unit.

The standard costs per unit of products A and B were Rs. 80 and Rs. 170 respectively.

You are required to compute the different variance to explain the difference between the budgeted and actual profits.

Solution :

Budgeted Profit per unit

A = Budgeted Selling price per unit – Standard cost price per unit = 100 – 80 = Rs.20

B = Budgeted Selling price per unit – Standard cost price per unit = 200 – 170 = Rs. 30

Actual Profit per unit:

A = Actual Selling price per unit – Standard cost price per unit = 110 – 80 = Rs. 30

B = Actual Selling price per unit – Standard cost price per unit = 180 -170 = Rs. 10

Budgeted Profit

Product	Budgeted Quantity	Budgeted Profit per unit	Amount
A	800	20	16,000
B	700	30	21,000
	1,500		37,000

Actual Profit

Product	Actual Quantity	Actual Profit per unit	Amount
A	900	30	27,000
B	800	10	8,000
	1,700		35,000

Standard Profit

Product	Actual Quantity	Budgeted Profit per unit	Amount
A	900	20	18,000
B	800	30	24,000
	1,700		42,000

Revised Standard Profit

Product	Actual Quantity in standard ratio	Standard/ Budgeted Profit per unit	Amount
A	906.67	20	18,133
B	793.33	30	23,800
	1,700		41,933

Actual Quantity in standard ratio for unit A = $\frac{800}{1,500}$ x 1,700 = 906.67

Actual Quantity in standard ratio for unit B = $\frac{700}{1,500}$ x 1700 = 793.33

i. Total Sales Margin Variance = Budgeted Profit – Actual Profit
= 37,000 – 35,000
= Rs. 2,000 (A)

ii. Sales Margin Price Variance = Standard Profit – Actual Profit
A : 18,000 – 27,000 = 9,000 (F)
B : 24,000 – 8,000 = 16,000 (A)
42,000 – 35,000 = 7,000 (A)

iii. Sales Margin Volume Variance = Budgeted Profit – Standard Profit
A : 16,000 – 18,000 = 2,000 (F)
B : 21,000 – 24,000 = 3,000 (F)
37,000 – 42,000 = 5,000 (F)

iv. Sales Margin Quantity Variance = Budgeted Profit – Revised Standard Profit

A: 16,000 – 18,133 = 2,133 (F)

B: 21,000 – 23,800 = 2,800 (F)

37,000 – 41,933 = 4,933 (F)

v. Sales Margin Mix Variance = Revised Standard Profit – Standard Profit

A : 18,133 –18,000 = 133 (A)

B : 23,800 – 24,000 = 200 (F)

41,933 – 42,000 = 67 (F)

Check:

i. Total Sales Margin Variance = Sales Margin Price Variance + Sales Margin Volume Variance

2,000 (A) = 7,000 (A) + 5,000 (F)

ii. Sales Margin Volume Variance = Sales Margin Quantity Variance + Sales Margin Mix Variance

5,000 (F) = 4,933 (F) + 67 (F)



CHECK YOUR PROGRESS

5. What are the Sales variances calculated under profit margin method?
6. Fill up the gaps:

i. Total Sales Variance = _____ - _____

ii. Under profit margin method, budgeted profit and actual profit is calculated on the basis of _____

iii. Sales Margin Volume Variance = _____ - _____



3.6 LET US SUM UP

In this unit, we have discussed the following-

- In order to get the full benefits of standard costing technique; companies may calculate sales variances. Sales variance may be defined as the difference between the actual sales and budgeted sales.
- Sales variances are mainly due to –

i. Change in the selling price of the product;

ii. Change in the volume of sales quantity.

- There are two methods of sales variance namely turnover method and margin method.
- Under turnover method, following variances are calculated
    i. Sales Value Variance,
    ii. Sales Price Variance,
    iii. Sales Volume Variance,
    iv. Sales Quantity Variance,
    v. Sales Mix Variance.
- Under margin method, following variances are calculated
    i. Total Sales Margin Variance,
    ii. Sales Margin Price Variance,
    iii. Sales Margin Volume Variance,
    iv. Sales Margin Quantity Variance,
    v. Sales Margin Mix Variance.



3.7 FURTHER READING

1) Hanif, M. (2014). *Modern Cost and Management Accounting.* McGraw Hill Education.

2) Arora, M.N. (2015). *Cost and Management Accounting*. Himalaya Publishing House.

3) Jain, S.P. & Narang, K.L. (2013). *Cost Accounting*. Kalyani Publishers.



3.8 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No 1 : Sales variance may be defined as the difference between the actual sales and budgeted sales.

Ans. to Q. No 2 : The main causes of sales variance are-

i. Change in the selling price of the product ;

ii. Change in the volume of sales quantity.

Ans. to Q. No 3 : Two methods of sales variance are turnover method and margin method.

Ans. to Q. No 4 :

i. Sales Volume Variance = Budgeted Sales –Standard Sales

ii. Sales Price Variance =Standard Sales – Actual Sales

Ans. to Q. No 5 : The Sales variances calculated under profit margin method are-

i. Total Sales Margin Variance,

ii. Sales Margin Price Variance,

iii. Sales Margin Volume Variance,

iv. Sales Margin Quantity Variance,

v. Sales Margin Mix Variance.

Ans. to Q. No 6:

i. Total Sales Variance = Budgeted Profit – Actual Profit

ii. Under profit margin method, budgeted profit and actual profit is calculated on the basis of standard costs .

iii. Sales Margin Volume Variance = Budgeted Profit – Standard Profit



3.9 MODEL QUESTIONS

1. What is sales variance? What are the various types of sales variance?
2. Write short note on followings:
    i. Sales Value Variance,
    ii. Sales Price Variance,
    iii. Sales Volume Variance,
    iv. Sales Mix Variance,
    v. Sales Margin Price Variance,
    vi. Sales Margin Volume Variance,
    vii. Sales Margin Quantity Variance.

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UNIT 4 : MARGINAL COSTING

UNIT STRUCTURE

4.1 Learning Objectives

4.2 Introduction

4.3 Meaning of Marginal Costing

4.4 Features of Marginal Costing System

4.5 Advantages of Marginal Costing

4.6 Disadvantages of Marginal Costing

4.7 Differences between Marginal Costing and Absorption Costing

4.8 Contribution

4.9 Profit –Volume Ratio

4.10 Costs-Volume Profit Analysis

4.11 Assumptions of Cost-Volume-Profit analysis

4.12 Advantages of Cost-Volume-Profit Analysis

4.13 Disadvantages of Cost –Volume Profit Analysis

4.14 Break-Even Analysis

4.15 Advantages of Break-Even Analysis

4.16 Disadvantages of Break-Even Analysis

4.17 Methods of Break-Even Analysis

4.18 Margin of Safety

4.19 Let Us Sum Up

4.20 Further Reading

4.21 Answers to Check Your Progress

4.22 Model Questions

4.1 LEARNING OBJECTIVES

After going through this unit, you will be able to –

- explain marginal costing, its assumptions, advantages and dis-advantages.
- differentiate between marginal costing and absorption costing.

- discuss the Profit-Volume Cost Analysis, its assumptions, advantages and disadvantages.
- discuss the Break-even analysis, its assumptions, advantages and disadvantages

4.2 INTRODUCTION

Marginal costing is not like job costing, batch costing which are concerned with calculation of cost of production or services. This marginal costing system is concerned with various short term decisions like sales mix selection, make or buy decisions, acceptance of special order etc. This marginal costing technique also used for cost-control, budgeting, profit planning etc.

4.3 MEANING OF MARGINAL COSTING

Marginal costing is that technique where only variable costs are charged as product costs and included in inventory valuation i.e. only variable costs are considered while calculating the cost of products. Fixed costs are not considered as product costs and treated as a period costs and hence directly charged in Profit & Loss Account.

CIMA, UK has defined marginal costing as “A principle whereby marginal costs of cost units are ascertained. Only variable costs are charged to cost units, the fixed costs attributable to a relevant period being written off in full against the contribution for that period.”

MEANING OF MARGINAL COST

Marginal cost is the same as variable cost. Marginal cost is the additional cost for producing one more additional unit.

CIMA, UK has defined marginal cost as “the amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit.”

For example: a manufacturing organization produces X units at cost of Rs. 10,000 and for X+1 unit at a costs of Rs. 10,500. The cost of an additional unit will be Rs. 500. Therefore the marginal cost will be Rs. 500.

4.4 FEATURES OF MARGINAL COSTING SYSTEM

The following are the characteristics of marginal costing system:

1) Costs are classified into fixed and variable costs.
2) Only variable costs are considered as product costs and taken for calculating the cost of production of a unit.
3) Fixed Costs are treated as period costs and charged in Profit and Loss Account.
4) Price of productsis based on marginal costs and marginal contribution. Contribution is the difference between the sales price and variable costs.
5) Marginal costing technique is useful for making short term decisions only.
6) The relative profitability of products or departments can be determined after a study of the contribution made available by each product or department.
7) Marginal costing technique involves both cost recording and cost reporting.
8) Closing stock is valued on marginal cost.

4.5 ADVANTAGES OF MARGINAL COSTING

The main advantages of marginal costing are given below :

1. It is very simple to understand and to operate.
2. It facilitates more control over variable costs by avoiding arbitrary allocation of fixed costs.

3. It is a very useful tool for management for profit planning as it shows the management about the profitability of the firm at various levels of production and sales.
4. It helps in evaluation of the performance of the various departments, division, products, salesmen etc.
5. It helps in management in taking various decisions as it provides various information in making decisions like make or buy, fixation of selling price etc.
6. In marginal costing, there is no problem of under or over absorption of overhead.
7. Marginal costing is an important addition to standard costing and budgetary control.
8. The valuation of closing stock under marginal costing is more realistic as it avoid the unscientific carry forward of fixed costs of one period to the next period as a part of value of closing stock.

4.6 DISADVANTAGES OF MARGINAL COSTING

The main disadvantages of marginal costing are :

1. In marginal costing, all costs are separated into fixed costs and variable costs. But in reality, no variable cost is completely variable and no fixed cost is completely fixed. Actually, most of the expenses are semi-variable.
2. Time factor is ignored in case of marginal costing which is very important.
3. It lays too much emphasis on selling function of an organization and ignores the production function. But, both these function is equally important for the organization.
4. In marginal costing, the stocks are valued at variable cost only; it may result in undervaluation of the stock.
5. This technique is less effective in long term price policy.
6. This technique is not suitable for external reporting.
7. The income tax authorities do not recognize marginal cost for stock valuation.

8. It will be blunder if marginal cost is confused with total cost at the time of fixing selling price.

4.7 DIFFERENCES BETWEEN MARGINAL COSTING AND DIFFERENTIAL COSTING

The difference between marginal costing and differential costing are:

Sl.No	Marginal costing	Absorption Costing
1	In marginal costing, only variable costs are charged to products. Fixed costs are treated as period costs and charged to Profit and Loss Account.	In absorption costing, both fixed and variable costs are charged to product.
2	In marginal costing, stocks are valued at marginal costs.	In absorption costing, stocks are valued at total costs which include both fixed and variable costs.
3	In marginal costing, relative profitability of products is measured on the relative contribution made by respective product.	In absorption costing, relative profitability of products is measured by profit figures.
4	In marginal costing, fixed costs are written off and hence there is no over-absorption and under absorption of costs.	In absorption costing, apportionment of fixed costs are done arbitrarily resulting over-absorption and under absorption of costs.



CHECK YOUR PROGRESS

1. What is marginal cost?
2. What is marginal costing?
3. Mention two features of marginal costing.
4. Mention two advantages of marginal costing?
5. Mention two disadvantages of marginal costing.
6. Mention two differences between marginal costing and absorption costing.

4.8 CONTRIBUTION

Contribution is the excess of sales revenue over its variable costs. It is the difference between sales price and variable costs. It represents surplus after all variable costs have been covered. It is the amount available to cover all fixed costs and provide profits.

Mathematically contribution is calculated as follows :

Contribution = Sales – Variable Costs

Or

Contribution = Fixed Cost + Profit

Most of the companies take their decisions based on contribution rather than profits as contribution include fixed costs. The amount of contribution per unit will have a heavy influence on what steps a company is ready to take to improve their profits.

Here we found that, Sales – Variable Costs = Fixed Cost + Profit

4.9 PROFIT-VOLUME RATIO (P/V RATIO)

The profit-volume ratio, also known as contribution-sales ratio, is the ratio that establishes the relationship between the contribution and sales. P/ V ratio is calculated as follows :

$$\text{P/V ratio} = \frac{Contribution}{sales}$$

Or

$$\text{P/V ratio} = \frac{Sales - Variable\ Costs}{Sales}$$

Or

$$\text{P/V ratio} = \frac{Change\ in\ contribution}{Change\ in\ Sales}$$

Or

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

Or

$$\frac{Profit}{Margin\ of\ Safety\ Ratio}$$

From Above, it is also found that

a. Contribution = P/V ratio x Sales

b. Sales = $\frac{Contribution}{P/VRatio}$

Example 1 :

Sales = Rs. 10,000

Variable Costs = Rs. 8,000

Calculate P/V ratio.

Solution :-

P/V ratio = $\frac{Sales - Variable\ costs}{Sales}$

= $\frac{10000 - 8000}{10000}$

= $\frac{2000}{10000}$

= $\frac{1}{5}$

=($\frac{1}{5}$ x 100) %

= 20%

Example 2 :

From the following information, calculate P/V ratio :

Year	Sales	Net Profit
2011	20,000	1,000
2012	22,000	1,600

Solution :-

P/V ratio = $\frac{Change\ in\ profit}{Change\ in\ Sales}$ = $\frac{1,600 - 1,000}{22,000 - 20,000}$ x 100 = $\frac{600}{2000}$ x 100 = 30%

Example 3 :

Calculate P/V ratio in each of the following independent situations:

1. Variable cost Rs. 60, Contribution Rs. 40.
2. Sales Rs. 20, variable cost Rs. 15.

3. Ratio of variable cost to sales 84%.
4. Profit Rs. 5,000; Sales Rs. 25,000; Fixed Cost Rs. 8,000.
5. Year I Sales Rs. 50,000, Total Cost Rs. 40,000

   Year II Sales Rs. 60,000, Total Cost Rs. 45,000.

Solution :-

1. P/V ratio = $\frac{Contribution}{Sales} = \frac{Contribution}{Variable\ cost + Contribution} = \frac{40}{60+40}$ x100=40%

   Sales = Fixed Cost + Variable cost + Profit, and Contribution = Fixed Cost + Profit

2. P/V ratio = $\frac{Contribution}{Sales} = \frac{Sales - Variable\ Cost}{Sales} = \frac{20-15}{20}$ x 100 = 25%

3. P/V ratio = 100 – variable cost to sales ratio = 100 - 84 = 16%

4. P/V ratio = $\frac{Contribution}{Sales} = \frac{Fixed\ Cost + Profit}{Sales} = \frac{8,000+5,000}{25,000}$ *x 100* = 52%

5. P/V ratio = $\frac{Change\ in\ profit}{Change\ in\ Sales} = \frac{15,000-10,000}{60,000-50,000}$ x 100 = 50%

   Profit on Year I = Sales – Total Cost =50,000 – 40,000 = Rs. 10,000

   Profit on Year II = Sales – Total Cost = 60,000 – 45,000 = Rs.15,000



CHECK YOUR PROGRSS

7. What is contribution?
8. How contribution is calculated?
9. What is P/V ratio?
10. Calculate P/V ratio from the followings :

Year	Sales	Profit
2020	Rs. 1,20,000	Rs. 8,000
2021	Rs. 1,40,000	Rs. 13,000

4.10 COST-VOLUME-PROFIT ANALYSIS

As we know that there are three basic factors in any organization namely cost of the production, volume of production or sales and profit which are interrelated to each other. Change of one factor has direct impact in the change

of other two factors. The cost of production determines its selling price and the selling price determines its profit. The selling price also affects the volume of sales which directly affects the volume of production resulting in change of cost of production and profits. In nutshell, the variation in volume of production changes the cost of production and its profits. So the studies of these interrelated factors are very important for any organization. Cost- Volume- Profit Analysis is the systematic study and critical analysis of these three factors namely cost of the production, volume of production or sales and its profit.

CIMA, London has defined Cost-Volume-Profit Analysis as "the study of the effects on future profits of changes in fixed cost, variable costs, sales price, quantity and mix."

Cost-Volume-Profit analysis is very important for the management for budgeting and profit planning. It explains the impact of the following on net profit :

1. Changes in selling prices,
2. Changes in volume of sales.
3. Changes in variable costs,
4. Changes in fixed costs.

4.11 ASSUMPTIONS OF COST-VOLUME-PROFIT ANALYSIS

The basic assumptions of cost-volume-profit analysis are-

1. The costs can be classified as fixed costs and variable costs.
2. Selling prices are constant irrespective of level of production.
3. The volume of production is equals to the volume of sales.
4. Material prices and wage rate are same irrespective of level of production.
5. Sale-mix remains constant at every level.
6. Efficiency and productivity remain unchanged.

4.12 ADVANTAGES OF COST-VOLUME-PROFIT ANALYSIS

The main advantages of cost-volume-profit analysis are-

1. Cost-volume-profit analysis helps the organization to plan the profit at different level of activities.

2. Cost-volume-profit analysis helps to prepare a flexible budget indicating costs and profits at different levels of activity.
3. Cost-volume-profit analysis helps to take various decisions like best sales-mix, make or buy decision, election of best channel of distribution, best method of production etc.
4. With the help of cost-volume-profit analysis, an organization can control their costs by evaluating the effects of change of cost on their profitability.

4.13 DISADVANTAGES OF COST-VOLUME-PROFIT ANALYSIS

The main disadvantages of cost-volume-profit analysis are-

1. All costs cannot be easily and accurately segregated into fixed costs and variable costs.
2. Total fixed costs cannot remain fixed when beyond certain ranges of activity level.
3. The sales mix of a firm cannot be remain same. It is vary according to the demand of each product component.
4. If selling price and other factor prices i.e., material prices, wages rates etc. change, it affects the cost-volume-profit relationship.
5. Cost-volume-profit relationship may mislead the results of production capacity changes.

4.14 BREAK-EVEN ANALYSIS

Break-even analysis is widely used technique to study the relationship of cost, volume and profit. It is interpreted in narrow as well as broad sense. In narrow sense, break-even analysis is concerned with determining the break-even point. Break-even point is that level of production and sales where there is no profit and no loss. At this point, total cost is equal to total sales.

In broad sense, break-even analysis is concerned with determining the probable profit or loss at any given level of production or sales. It also helps to determine the required amount of sales to earn the desired profit.

ASSUMPTION OF BREAK-EVEN ANALYSIS

The break-even analysis is based on the following assumption:

1. All costs can be classified into fixed costs and variable costs.
2. Fixed costs remain same at all level of activities.
3. Variable costs change in direct proportion to the volume of output.
4. Selling price remains same irrespective of level of production or sale.
5. Price of raw materials, labour rate etc. remains constant.
6. There is only one product or in the case of multiple products, the sales mix does not change.
7. There is synchronization between production and sales. In other words, volume of production equals volume of sales.
8. Productivity per worker does not change.
9. There will be no change in general price level.

4.15 ADVANTAGES OF BREAK-EVEN ANALYSIS

The advantages of Break-Even Analysis are mentioned below :

1. Break-Even Analysis is very easy to compile and to understand.
2. Break-Even Analysis is an important tools for management to study the relationship of cost, volume and profits.
3. With the help of break-even analysis, business firm can ascertain the strength and its earning capacity.
4. Brea-even analysis help in identifying the best sale-mix and product mix so that the firm can earn the maximum profit.
5. It helps to determine the sales volume to earn desired profits.
6. It helps to make comparison of the profitability of various firms.
7. It helps to determine the cash requirements at different levels of operation.

4.16 DISADVANTAGES OF BREAK-EVEN ANALYSIS

The main disadvantages of Break-Even Analysis are:

1. It is not possible to segregate all the indirect costs into fixed costs and variable costs accurately.

2. Fixed costs remain fixed or constant in the short period only. In the long run, fixed costs are subject to change.
3. Certain variable costs are not change with the direct proportion to the volume of production or sales. Sometimes these variable costs may reduce on account of economies of bulk of sale.
4. The assumption of the selling price remain constant is unrealistic.

4.17 METHODS OF BREAK-EVEN ANALYSIS

Break-Even Analysis may be done by the following two ways :

1. Algebraic Calculation.
2. Graphic Presentation.

Algebraic Method

Under this, the Break-Even Point is the volume of output or sales at which total costs is equal to total sales. The formula for calculating Break-Even Point is:-

$$\text{Break-Even Point (in units)} = \frac{Total\ Fixed\ Costs}{Contribution\ per\ unit}$$

Or

$$\text{Break-Even Point (in rupees)} = \frac{Total\ Fixed\ Costs}{Contribution\ per\ unit} x\ Selling\ price\ per\ unit$$

Or

$$\text{Break-Even Point (in rupees)} = \frac{Total\ Fixed\ Costs}{P/V\ ratio}$$

Example 4 :

From the following data, calculate Break-Even Point.

Total fixed costs = Rs. 12,000

Selling price = Rs. 12 per unit

Variable costs = Rs. 9 per unit.

Solution :-

Contribution = Sales – Variable Costs

= 12 – 9

= Rs.3 per unit

P/V ratio = $\frac{3}{12}$ = 25%

Break-Even Point (in units) = $\frac{Total\ Fixed\ Costs}{Contribution\ per\ unit}$ = $\frac{12,000}{3}$ = 4,000 units

Break-Even Point (in rupees) = $\frac{Total\ Fixed\ Costs}{Contribution\ per\ unit} x\ Selling\ price\ oer\ unit$

= $\frac{12,000}{3}$ x 12 = Rs.48,000

Break-Even Point (in rupees) = $\frac{Total\ Fixed\ Costs}{P/V\ ratio}$ = $\frac{12,000}{25\%}$ = Rs.48,000

Graphic Presentation

The graphical presentation of break-even analysis is done with the help of break-even chart. In this chart, X-axis represents the volume of output or the volume of sales or the volume of production in percentage while the Y-axis represents the costs and sales. The total costs line and total sales line intersect is known as break-even point. The break-even chart provides the following information :

1. Break-even point,
2. Profit/loss at different levels of output.
3. The relationship between variable costs, fixed costs and total costs.
4. The margin of safety.
5. The rate at which profit is being made.
6. The amount of contribution at various levels of sales.

Example 5 :-

You are given the following data for the year 2013 for a factory :

Output – 40,000 units, Variable Expenses per unit Rs.10,

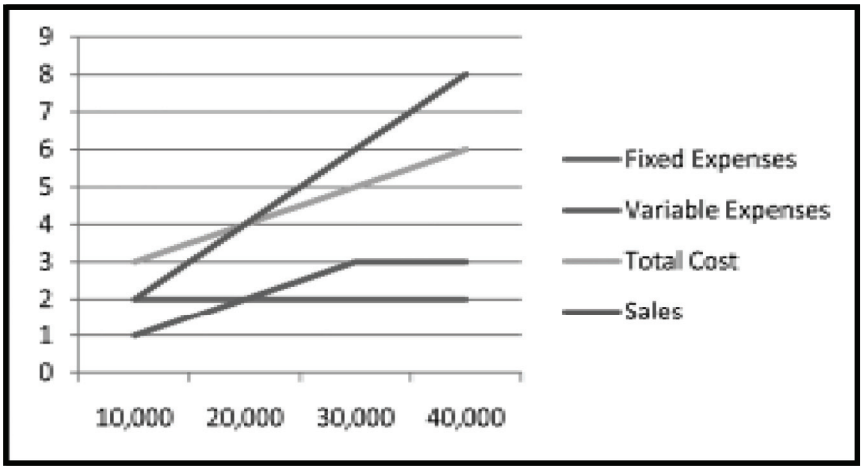
Fixed Expenses Rs. 2,00,000, Selling Price per unit Rs. 20

Draw a break-even chart showing the break-even point.

Solution:

COST AND SALES AT VARIOUS LEVELS OF OUTPUT

Output (Units)	Fixed Expenses	Variable Expenses	Total Cost	Sales
0	2,00,000	0	2,00,000	0
10,000	2,00,000	1,00,000	3,00,000	2,00,000
20,000	2,00,000	2,00,000	4,00,000	4,00,000
30,000	2,00,000	3,00,000	5,00,000	6,00,000
40,000	2,00,000	4,00,000	6,00,000	8,00,000



In the above chart, total cost curve intersects the sales curve at 20,000 units level of output and Sales of Rs. 4,00,000. So the break-even point is 20,000 units or Rs. 4,00,000 sales.

4.18 MARGIN OF SAFETY

Margin of safety may be defined as the difference between actual sales and sales at break-even point. It is the excess of sales over break-even point. Margin of safety is calculated as follows;-

Margin of safety = Actual Sales – Break-even point

Or

$$\text{Margin of Safety} = \frac{Profit}{P/v\ ratio}$$

Example 6:

Calculate margin of safety from the following information :

1. Actual sales Rs. 30,000 and Break-even point is Rs. 22,000.
2. Profit Rs. 6,000 and P/V ratio is 20%.

Solution:-

1. Margin of safety = 30,000 – 20,000 = Rs. 10,000
2. Margin of safety = $\frac{6000}{20\%}$ = Rs. 30,000



CHECK YOUR PROGRESS

11.What is Cost-Volume-Profit analysis?

12. What is break-even analysis?

13. What are the two methods of break-even analysis?



4.19 LET US SUM UP

In this unit we have discussed the following-

- Marginal costing is technique of costing where only variable costs are charged as a product costs.
- Adoption of marginal costing provides both advantages and disadvantages to the organization.
- Cost-Volume-Profit Analysis is a systematic study of the relationship of the three factors namely- cost of production, volume of production and its profit.
- Break-even analysis is the widely used technique of cost-volume-profit analysis. There are two methods of break-even analysis namely algebraic method and graphical presentation.



4.20 FURTHER READING

1) Hanif, M. (2014). *Modern Cost and Management Accounting.* McGraw Hill Education.

2) Arora, M.N. (2015). *Cost and Management Accounting*. Himalaya Publishing House.
3) Jain, S.P. &Narang, K.L. (2013). *Cost Accounting*. Kalyani Publishers.



4.21 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No 1 : Marginal cost is the additional cost for producing one more additional unit.

Ans. to Q. No 2 : Marginal costing is that technique where only variable costs are charged as product costs and included in inventory valuation.

Ans. to Q. No 3 : Two features of marginal costing are-

1) Costs are classified into fixed and variable costs.
2) Only variable costs are considered as product costs and taken for calculating the cost of production of a unit.

Ans. to Q. No 4 : Two advantages of marginal costing are-

1. It is very simple to understand and to operate.
2. It facilitates more control over variable costs by avoiding arbitrary allocation of fixed costs.

Ans. to Q. No 5 : Two disadvantages of marginal costing-

1. In marginal costing, all costs are separated into fixed costs and variable costs. But in reality, no variable cost is completely variable and no fixed cost is completely fixed. Actually, most of the expenses are semi-variable.
2. Time factor is ignored in case of marginal costing which is very important.

Ans. to Q. No 6 : Two differences between marginal costing and absorption costing are-

a. In marginal costing, only variable costs are charged to products. Fixed costs are treated as period costs and charged to Profit and Loss Account. But in absorption costing, both fixed and variable costs are charged to product.

b. In marginal costing, stocks are valued at marginal costs. But in absorption costing, stocks are valued at total costs which include both fixed and variable costs

Ans. to Q. No 7 : Contribution is the excess of sales revenue over its variable costs.

Ans. to Q. No 8 :

Contribution is calculated as follows-

Contribution = Sales – Variable cost

Ans. to Q. No 9 :

P/V ratiois the ratio that establishes the relationship between the contribution and sales.

Ans. to Q. No 10 :

P/V ratio = x 100 = x 100 = x 100 = 25%

Ans. to Q. No 11 :

Cost-Volume-Profit analysis is the systematic study of the relationship of the three factors namely cost of production, volume of production and their profit.

Ans. to Q. No 12: Break-even analysis is the most widely used technique to study the relationship of the three factors namely cost of production, volume of production and their profit.

Ans. to Q. No 13 :

The two methods of break-even analysis are- algebraic method and graphical method.



4.22 MODEL QUESTIONS

1. What is marginal costing? What are features of marginal costing system?
2. “The technique of marginal costing can be valuable aid to management? Discuss.
3. What are disadvantages of marginal costing?

4. What do you mean by Cost-Volume-Profit Analysis? What are the assumptions of Cost-Volume-Profit Analysis?
5. What are advantages of cost-volume-profit analysis?
6. Discuss briefly about the disadvantages of cost-volume-profit analysis?
7. What do you mean by break–even analysis? Explain its use?
8. Mention four differences between marginal costing and absorption costing?
9. Write short notes on-
    a. Contribution,
    b. P/V ratio
    c. Margin of safety

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UNIT 5 : COST AUDIT AND MANAGEMENT AUDIT

UNIT STRUCTURE

5.1 Learning Objectives

5.2 Introduction

5.3 Cost Audit

5.4 Advantages of Cost Audit

5.5 Disadvantages of Cost Audit

5.6 Qualification of Cost Auditor

5.7 Distinction between Cost Audit and Financial Audit

5.8 Distinction between Cost Audit and Cost Investigation

5.9 Cost Audit Rules

5.10 Management Audit

5.11 Appointment of Management Auditor

5.12 Advantages of Management Audit

5.13 Disadvantages of Management Audit

5.14 Difference between Financial Audit and Management Audit

5.15 Difference between Management Audit and Cost Audit

5.16 Let Us Sum Up

5.17 Further Reading

5.18 Answers to Check Your Progress

5.19 Model Questions

5.1 LEARNING OBJECTIVES

After going through this unit, you will be able to -

- describe Cost Audit
- describe Management Audit
- explain the advantages and disadvantages of cost audit and management audit

5.2 INTRODUCTION

In this unit, we are going to discuss about cost audit and management audit, their benefits and limitations to the organization etc.

5.3 COST AUDIT

Cost Audit may be defined as the verification and examination of the correctness and authenticity of various cost records like cost of production, cost of sales, margin of product etc. in order to give true and fair view. Cost auditor verifies the correctness of the cost records of an entity and establishes whether the cost accounting plan has been properly adhered or not. Manufacturing organizations use cost audit as a tool of cost control. It is conducted in addition to financial audit.

According to R.W. Dobson, “Cost audit is the verification of the correctness of cost accounts and a check on the adherence to the cost accounting plans.”

Institute of Costs & Works Accountants of London defines Cost Audit as the verification of the correctness of cost accounts and adherence to the cost accounting plans.

Therefore we can defined cost audit as the process of verifying each and every financial records of an organization so that errors and fraud, if happens, can be detected and gives a true and fair picture of the organization to different stakeholders.

FEATURES OF COST AUDIT

1. Cost audit is the audit of cost records.
2. Cost audit is undertaken by manufacturing concern only.
3. Cost audit is preventive in nature.
4. The scope of cost audit is limited to costs records and costs accounts only.
5. Costs audit is not regular in nature.

6. Cost audit is a forward looking approach.
7. Cost audit can determine the true price of the product.

OBJECTIVES OF COSTS AUDIT

1. To check the correctness of the cost records and accounts.
2. To serve as an effective tool of cost control.
3. To protect the interest of the customers by determining the actual cost the product and fair selling price of the product.
4. To check the wastage of material and labour.
5. To help management in fixing the responsibility and accountability of the employees.
6. To help the management in improving the performance of the workers by exploring and highlighting the deficiencies of the employees.
7. To bring the cost consciousness among the employees.

5.4 ADVANTAGES OF COST AUDIT

Cost audit provides various advantages to the different stakeholders which are as follows:

1. To the Management:
   a. With the help of cost audit, management can control on different element of cost like material, labour, overheads etc.
   b. With the help of cost audit, management can check the wastage of material, labour etc.
   c. By controlling the cost of different element, it helps management to reduce the price of the product or services.
   d. Cost audit helps management to make comparison between actual result and budgeted result with the standard cost.
   e. Cost audit helps management to explore deficiencies of different persons of the organization and accordingly management can take decision regarding this.

f. Cost audit helps in proper valuation of raw materials and work-in-progress.

g. Cost audit helps management in detecting fraud happening in an organization.

2. To the shareholders :

   a. Cost audit ensures proper maintenance of cost records and cost accounts.

   b. Cost audit helps shareholders in determining the fair return on their investment.

   c. Shareholders will get the all kinds of information regarding cost of production, cost of sales, proper utilization of plant and equipment, material, labour etc. in a proper way.

3. To the consumers:

   a. It helps the consumers by fixing fair prices of the products and services.

   b. Cost audit ensures the increase in standard of living of the consumers by bringing stability in fair pricing of the products and services.

4. To the Government:

   a. Cost audit indicates some guidelines to the Government to improve the working conditions of the non-profitable industrial units from time to time.

   b. Cost audit may act as a guide to the Government in deciding whether any subsidy is needed to an industrial unit or not.

   c. Cost audit helps Government in levying tax or duty on the cost of finished products.

   d. Cost audit helps the “Tariff Board” to decide whether tariff protection is required or not to a particular industry.

   e. Cost audit helps the Government for fixing the ceiling price of various products and services and can thereby control the black marketing by industries.

5. To the society:

a. The economic development of a country depends upon the efficiency of the industrial units. Cost audit increase the efficiency of the industrial units which ultimately helps in the economic development of the country.

b. Cost audit ensures the proper utilization of resources. Therefore the society will get the products at the lower price.

c. Cost audit saves the consumers by revealing the true and fair price of the products.

5.5 DISADVANTAGES OF COST AUDIT

The main disadvantages of cost audit are:

1. Cost audit may create interference in the normal workings of companies.
2. Cost audit incur additional costs to the organization.
3. Cost audit may harm the interest of the company as the cost auditor may not be able to maintain the secrecy of the cost records.
4. Most of the cost records are already been audited by financial auditor.

5.6 QUALIFICATION OF COST AUDITOR

To become a cost auditor, a person must have the following qualifications :

1. He/ she must be a cost accountant defined in clause (b) of subsection (1) of Section 2 of the Cost and Works Accountant Act, 1959.
2. He/ she must hold a certificate of practice issued by the Council of the Institute of Cost and works Accountants India under Section 7 of the Cost and Works Accountants Act, 1959.

APPOINTMENT OF COST AUDITOR [Section 148 (3)]

A company appoints cost audit in the following manner :

1. **Where Audit Committee is there**

   A cost auditor will be appointed by the Board on the recommendation of the audit committee. The audit committee shall also decide the remuneration of the cost auditor which shall be ratified later on by the members.

2. Where Audit Committee is not there

The Board shall appoint an individual who is a cost accountant as a cost auditor. The remuneration payable to the cost auditor shall be ratified by the shareholders.

5.7 DISTINCTION BETWEEN COST AUDIT AND FINANCIAL AUDIT

The basic difference between financial audit and cost audit are as follows :

Sl No	Basis of Difference	Financial Audit	Cost Audit
1.	Application	It is applicable to all the companies incorporate under the Companies Act, 2013.	It is applicable to only those concerns engaging production, processing, manufacturing or mining activities.
2.	Objectives	To check the correctness of the financial statements and to establish their reliability.	To check the correctness of the cost records and accounts.
3.	Nature	It is not preventive in nature.	It is preventive in nature.
4.	Auditor's duty	To report whether the financial statement reflects the true and fair picture of the organization or not.	To report whether cost and expenditure has been incurred wisely or not and to suggest the management how to eliminate the wastage.
5.	Scope of Reporting	It has wider scope covering all financial statements i.e. Profit and loss Account, Balance Sheet, Cash flow statement, Accounting Notes.	It has limited scope covering only cost records and accounts.
6.	Orientation	It is organization oriented.	It is product oriented.
7.	Periodicity	It is conducted at the end of the year	It may conduct for a particular year.
8.	Concentration	It concentrates only financial aspect of accounts.	It concentrates on cost aspect of accounts.
9.	Appointment	Appointed by the shareholders of the company in the general meeting.	Appointed by the Board as per the recommendations of the Audit Committee.
10.	qualification	The financial auditor is a chartered accountant.	The cost auditor is a cost accountant in practice.

5.8 DISTINTION BETWEEN COST AUDIT AND COST INVESTIGATION

Though cost audit and cost investigation may sound a bit same but they are different from each other. The basic difference between cost audit and cost investigations are:

Sl No	Basis of Difference	Cost Audit	Cost Investigation
1.	Definition	It is an examination of cost records and cost accounts.	It is a process of knowing a particular fact, truth or incident.
2.	Depth	It is general examination.	It requires depth and extensive investigation.
3.	Nature of Report	General	Confidential
4.	Mandatory	It is mandatory in nature	It is not mandatory in nature
5.	Performing entities	It is performed by a cost accountant.	It is performed by an expert who have knowledge on both accounting and investigation
6.	Duration	It is conducted annual	It is conducted according to the requirement of the client

5.9 COST AUDIT RULES

Cost Records and Cost Audit Applicability

Section 148 of the Companies Act, 2013 contains provisions relating to the cost records and cost audit applicability under Companies Act. The salient feature of section 148 are summarized hereunder –

- Section 148 (1) empowers the Central Government to direct the companies specified in the production of goods or provisions of service to include particulars relating to utilization of material or labour or other items of cost in the books of accounts of the company;
- List of specified companies, which needs to maintain the cost records, is provided under Table A and Table B of rule 3 of the Companies (Cost Records and Audit) Rules, 2014;

- Section 148 (2) empowers the Central Government to direct, based on the net worth or turnover of the company, audit of cost records of the specified class of companies;
- Rule 4 of the Companies (Cost Records and Audit) Rules, 2014 contains the provisions relating to the companies which are liable to get their cost records audited;
- Cost audit shall be conducted by the cost accountant who is appointed by the Board;
- In case of any default on the part of the company, it shall be punishable with the fine of an amount not less than INR 25,000, however, such fine cannot be more than INR 5 Lakhs. Further, every officer, in default, of the company shall be punishable with imprisonment for a term up to 1 year or with the fine not less than INR 10,000, however, the same cannot be more than INR 1,00,000;
- In case the cost auditor is in default, he shall be punishable in the manner as provided under section 147 (2) to section 147 (4).

Meaning of the Term 'Cost Records'

The definition of the word 'cost records' has been provided under rule 2 (e) of the Companies (Cost Records and Audit) Rules, 2014 which means books of account relating to the utilization of materials, labour and other items of cost as applicable to the production of the goods or provision of services as provided in section 148 of the Act and the Companies (Cost Records and Audit) Rules.

Applicability of Cost Records

Rule 3 of the Companies (Cost Records and Audit) Rules, 2014 contains two table namely Table A – regulated sectors and Table B – Non-regulated sectors.

Cost records need to be included in the books of accounts of the companies being engaged in the production of goods or provision of service as covered under the table A or Table B and the total turnover from all its production or service in more than INR 35 crore during the preceding financial year.

In a nutshell, cost records are mandatory in the case following conditions are satisfied –

1. The company is engaged in manufacturing goods or provision of services which are listed in Table A or Table B; and
2. Total aggregate turnover of the company from all its production or service is more than INR 35 Crore in the preceding financial year.

Applicability of Cost Audit

Cost audit applicability provisions are contained under rule 4 of the Companies (Cost Records and Audit) Rules, 2014. According to the said rule 4, the cost audit is applicable in the following situation –

- Table A specified goods/services –
    - Overall annual total turnover of the company from all the products/services is INR 50 Crore or more; and
    - Aggregate turnover from the individual product/service for which cost records are required to be maintained is INR 25 Crore or more.
- Table B specified goods/services –
    - Overall annual total turnover of all the products/services should be INR 100 Crore or more; and
    - Aggregate turnover from the individual product/service for which cost records are required to be maintained should be INR 35 Crore or more.

It must be noted that for the purpose of examination of applicability of cost audit the immediately preceding financial year turnover is to be considered.

Non-Applicability of Cost Audit Requirement

The companies which are covered under rule 3 are not required to get their cost records audited in case of the following situation –

- The company's export revenue exceeds 75% of its total revenue. The export revenue needs to be in foreign exchange; or
- The company which is operating from the special economic zone;
- The company which is engaged in the generation of electricity for captive consumption through Captive Generating Plant



CHECK YOUR PROGRESS

1. Mention whether the following statements are true or false.
   a. Cost audit is conducted in addition to the audit of financial accounts by the statutory auditor appointed by the company.
   b. Cost Audit is not a tool of verification of true cost of production and fair selling price.
   c. Cost Audit is preventive in nature.
2. Fill in the blanks with appropriate word.
   a. Cost audit is an……. audit.
   b. Cost auditor is a …… accountant in practice.
   c. Cost audit is …….oriented.

5.10 MANAGEMNT AUDIT

Management audit is the process of reviewing the performance of management. It examines and evaluates the performance of the various functions performed by management. It covers all the functions of management i.e., planning, organizing, staffing, coordination, directing and controlling etc. It is actually a critical review of policies, processes, procedures and operations. According to T.G. Rose, “Management audit is an advice of independent specialists who have made a study of how to reach maximum efficiency in a certain field of activity.”

Leslie R. Howard defines management audit as “an investigation of a business from the highest level downward order to ascertain whether sound management prevails throughout, thus facilitating most effective relationship with the outside world and the most efficient organization and smooth running of internal organization.”

In short, management audit is the periodic assessment of the managerial functions of an organization to make comparison of it to the standard set of norms helping the organization to reach the goal in an effective way.

FEATURES OF MANAGEMENT AUDIT

The distinctive features of management audit are:

1. It evaluates the performance and efficiency of the managerial functions of the organization.
2. It considers both monetary and non-monetary factors of the organization that have an impact on the performance of the organization.
3. It is not compulsory in nature.
4. It is both preventive and curative in nature.
5. It is forward looking and concerned with future.
6. It is dynamic and result oriented.
7. It is an extension of internal audit.
8. It can be undertaken by an independent individual who has knowledge on management and managerial functions.

OBJECTIVES OF MANAGEMENT AUDIT

Management audit is carried out to achieve the following objectives :

1. To help management to set sound objectives.
2. To appraise the managerial performance at all levels.
3. To increase the operational profitability.
4. To improve the organizational efficiency of the organization.
5. To detect the decisions those are not in conformity with the objectives of the organization.
6. To assists management in achieving co-ordination among departments.
7. To establishing good relationship with the employees.
8. To effective discharge of duties and responsibilities.

5.11 APPOINTMENT OF MANAGEMENT AUDITOR

Management audit is not compulsory in nature and has no legal requirements. There is no statutory qualification that needs to be required forthe appointment of management auditor. Therefore, it is up to the Board of Directors or to the management to whom they want to be appointed as a management auditor. Any individual who have expertise on management functions and policies can

be considered and taken for management audit. Since, management audit is the extension or expansion of internal audit, so it is better to select internal auditors as the management auditors.

QUALITIES OF MANAGEMENT AUDITOR

A management auditor should possess the following qualities :

1. He should have a proper knowledge and familiar with the management functions.
2. He should have good understanding about the financial statement analysis and about the various tools used in the financial statement analysis.
3. He should know the working conditions and culture of the organization.
4. He should aware of the objectives of the organization.
5. He should able to assess and critically examine the internal control system.
6. He should have the knowledge about the products and production processes of the organization.
7. He should have good knowledge of economics, business laws, accounting etc.

5.12 ADVANTAGES OF MANAGEMENT AUDIT

Management audit provides various advantages to the organization :

1. It helps in detecting the deficiencies and irregularities in management internal control system.
2. It suggests the ways and means to the management about the internal control system.
3. It helps management for effective discharge of responsibilitiesto the people.
4. It increases the operational productivity and efficiency of the organization.
5. It ensures the optimal utilization of resources available to the organization.
6. It diagnosing the conflicting areas of responsibility management system.
7. It makes staff of the organization more responsible by fixing the accountability for poor performance.

5.13 DISADVANATGES OF MANAGEMENT AUDIT

The main disadvantages of management audit are :

1. Management audit does not have well defined scope.
2. It does not have standard techniques,
3. Management audit is suitable in case of large organizations only as it involves high costs.
4. It may create fear and anxiety in the minds of top executives.
5. Management auditor generally familiar to the organization. Sometimes auditor may take decisions in favour of the organization.
6. Lack of flexibility in management audit.

5.14 DIFFERENCES BETWEEN FINANCIAL AUDIT AND MANAGEMENT AUDIT

The main differences between management audit and financial audit are as under:

Sl No	Basis of Difference	Financial Audit	Management Audit
1.	Subject Matter	Review of financial aspect of the organization.	Review of the managerial function of the organization which may be financial and non-financial one.
2.	Objectives	To check the authenticity of the financial statements of the organization reflecting the true and fair view of the organization.	To check the efficiency of the management.
3.	Nature	It is compulsory in nature.	It is not compulsory in nature.
4.	Base	It is based on financial statements.	It is based on managerial functions.
5.	Concentration	Detection and prevention of errors and fraud which are financial in nature.	Appraisal of managerial functions.
6.	Sequence	Financial audit begins where works of Accountants end.	Management audit begins where the financial audit ends.
7.	Qualifications of the auditor	The auditor should be a chartered accountant.	There are no statutory qualifications for management auditor.
8.	Reporting	Financial auditor reports to the shareholders in case of a company.	Management auditor reports to the management of the entity.

5.15 DIFFERENCES BETWEEN MANAGEMENT AUDIT AND COST AUDIT

The main differences between management audit and cost audit are as under:

Sl No	Basis of Difference	Management Audit	Cost Audit
1.	Subject Matter	Review of the managerial function of the organization which may be financial and non-financial one	Review of cost records and costs accounts.
2.	Objectives	To check the efficiency of the management.	To examine the authenticity of cost records and costs accounts
3.	Nature	It is voluntary in nature.	It is mandatory in nature if the company is engaged in production, processing, manufacturing or mining.
4.	Base	It is based on managerial functions	It is based n cost records and cost accounts.
5.	Concentration	Appraisal of managerial functions.	Detection of errors in costs records and ascertainment of true costs of production.
6.	Sequence	Management audit begins where the financial audit ends.	Cost audit can be done at any point of time.
7.	Qualifications of the auditor	There is no statutory qualification for management auditor.	A cost auditor must be a cost accountant or a chartered accountant.
8.	Reporting	Management auditor reports to the management of the entity.	Cost auditor submits his report to the Central Govt. with a copy to company concerned.



CHECK YOUR PROGRESS

3. Fill up the blanks

a. Management is the appraisal of ……. functions of an entity.

b. Management audit begins where ……. audit ends.

c. There is no statutory qualification for the appointment of ……. auditor.

4. Mention whether the following statements are true or false.

a. Management audit is both …… and …… in nature.

b. Management audit is ……. under the law.

c. Management auditor reports to the ……. of the entity.



5.16 LET US SUM UP

In this unit, we have discussed the following :

- Cost audit is the examination of the authenticity of the cost records and cost accounts. It is mandatory for those companies which involved in production, processing, manufacturing or mining activities.
- Cost audit possesses both advantages and disadvantages to the organization.
- Cost audit is done by a cost accountant.
- Management Audit is the audit of the various managerial functions of the organization. It is undertaken in order to judge the efficiency of the management.
- Management audit is not mandatory in nature and it can be undertaken by any individual having expertise on managerial functions.



5.17 FURTHER READING

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5.18 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No. 1:- a. True, b. False, c. True

Ans to Q No. 2:- a. External, b. Cost, c. product

Ans to Q No. 3:- a. Managerial, b. Financial, c. Management

Ans to Q No. 4:- a. preventive and curative, b. not compulsory, c. management



5.19 MODEL QUESTIONS

1. Define cost audit? State its objectives.
2. Mention the features of cost audit.
3. Explain the advantages and disadvantages of cost audit to different stakeholders.
4. Bring out the difference between cost audit and financial audit?
5. Describe the qualifications of a cost auditor and rules regarding his appointment?
6. Bring out the difference between cost audit and cost investigation?
7. What is cost records?
8. Mention the situations where cost audit is applicable.
9. Define management audit? Mention its features.
10. State the objectives of management audit?
11. Explain the advantages and disadvantages of management audit.
12. What are the desirable qualities of a management auditor?
13. Bring out the difference between cost audit and management audit?
14. Bring out the difference between financial audit and management audit?

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UNIT 6 : CAPITAL BUDGETING - I

UNIT STRUCTURE

6.1 Learning Objectives

6.2 Introduction

6.3 Meaning of Capital Budgeting

6.4 Types of Capital Budgeting

6.5 Process of Capital Budgeting

6.6 Cost and Benefit of Capital Budgeting

6.7 Cash Flow Estimation

6.8 Cash Flow Analysis Vs. Accounting Profit Analysis

6.9 Let Us Sum Up

6.10 Further Reading

6.11 Answers to Check Your Progress

6.12 Model Questions

6.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

- explain about the capital budgeting.
- discuss the features and importance of capital budgeting.
- explain the various types of capital budgeting.
- describe the process of capital budgeting.
- explain the cost benefit of capital begetting.

6.2 INTRODUCTION

In this unit, we are discussing about the meaning of capital budgeting, its significance, types, processes, advantages and disadvantages etc.

6.3 MEANING OF CAPITAL BUDGETING

A company has both short-term and long-term assets. These assets are very important for a firm as with the help of these assets, a firm can produce their products or render services. So, the financing of these assets plays an important role in the smooth operation and success of the business. The investment decision of long-term assets of the firm is known as capital budgeting.

According to Milton H. Spencer, "Capital budgeting involves the planning of expenditure for assets, the return for which will be realized in future time period."

According to Charles T. Horngreen, "Capital budgeting is long term planning for making and financing proposed capital outlays."

Thus, Capital budgeting of a firm refers to the decisions of investing their long term funds in long-term assets which gives economic benefit in future. It is a process of deciding whether to invest or not in a project which last for more than one year and will derived benefit for more several years. Capital budgeting decisions involved huge amount and has a great impact in the future growth and success of the firm.

FEATURES OF CAPITAL BUDGETING

The main features of capital budgeting decisions are:

1. It involves huge funds for long period of time.
2. Risk is very high in case of capital budgeting decisions.
3. It has a long-term implication in the profitability and growth of the firm.
4. It has a pattern of cash flow spread over the years. Initially, it blocks a huge amount of funds for acquiring long term assets and later on it generates revenue.
5. As it involves huge amount of funds for long period of time, it will be very difficult for the firm to rectify the decisions if the decision goes wrong.
6. Capital budgeting decisions are strategic investment decisions.

SIGNIFICANCE OF CAPITAL BUDGETING

The success and growth of any firm depends on the proper capital budgeting decisions. The significance of capital budgeting decision is discussed below-

1. A firm's survival is depends on the choosing right kinds of projects which gives maximum benefit to the firm. So, a proper analysis and investigation of capital budgeting decisions is required to select the best kinds of projects for the firm so that they can survive in the market.
2. As the capital budgeting decisions are irreversible once the funds are invested in the long term assets. For instance, if a firm purchase a machine for a project having a useful life of 5 years and later on it is found that the machine is not suitable for the projects. Then the firm does not have any option other than selling this machine at a very low cost. So, the proper capital budgeting decision is important for the firm.
3. Capital budgeting decisions are usually involved huge amount for a long period of time. A large portion of the total funds available for investment are blocked for its useful life if the capital decisions are made for a project leaving very limited funds for other projects. So the profits and revenue generation of the firm depends on that particular projects.
4. The capital budgeting decisions is very risky. Proper capital budgeting decisions may lead to huge profit but if the decision is gone wrong then the firm will suffer a huge loss and will create a question for its survival.

6.4 TYPES OF CAPITAL BUDGETING

The various types of capital budgeting decisions taken by the firm. The capital budgeting decisions based on firm's existence are-

i. **New Firms: -** New firm generally takes capital budgeting decisions regarding selection and location of the plant and machinery and their utilization.

ii. **Existing Firms:** - Existing firm takes various capital decisions like expansion, modernization, diversification, replacement etc.

a. Expansion of the Business:

Expansion decision means the decisions of increasing the production capacity due to the increasing demand and market share.

b. Modernization:-

Modernization decision refers to that decision of purchasing new assets due to the technological advancement in order to increase the productivity level and minimize the cost of production.

c. Diversification:-

Diversification decisions refer to the decision of entering into new market or starting new product line in order to increase the revenue and market share.

d. Replacement:-

Replacement decision refers to the decision of purchasing new assets replacing old one due to the expiry of its estimated life.

6.5 PROCESS OF CAPITAL BUDGETING

The capital budgeting process includes the following processes :

1. **Identification of Investment Proposals**

   Capital budgeting process starts with the identification of various investments proposal available for the management to invest their funds. The proposal or idea of potential investment opportunities may come from the top level management, lower level management or from workers. The head of the department analyses these proposals based on their corporate strategies and then submitted to the Capital Expenditure Planning Committee.

2. **Screening The Proposals**

   The Capital Expenditure Planning Committee will screen these proposals given by the various departments of the organization from various angles ensuring that these proposals are in accordance with the corporate strategy and do not lead the department imbalance.

3. **Evaluation of Various Proposals**

   After screening the various proposals, the next step is to evaluate the proposals based on their profitability. There are various methods like

payback period method, rate of return method, net present value method etc. which are adopted by the organization to evaluate the various proposals.

4. **Fixing Priorities**

   After the evaluation of the various proposals, the unprofitable proposals are rejected directly and then priorities are given to the selected proposals considering urgency, risk factors and their profitability. Priorities are given because it is not possible for the organization to invest the funds in all the projects immediately

5. **Final Approval and Preparation of Capital Expenditure Budget**

   After meeting the entire criterion, the proposals are finally approved and included in the Capital Expenditure Budget. The capital expenditure budget lays down the amount of estimated expenditure on fixed assets during the budgeted period.

6. **Implementing The Proposals**

   After the capital expenditure budget includes the proposal, the next step is the implementation of the proposals. While implementing the projects, the responsibilities should be assigned to various appropriate authorities/ departments. Various network techniques like PERT and CPM are used to control and monitor the implementation of the project.

7. **Performance Review**

   The last step of the capital budgeting process is to review the performance of the projects. The performance of the project is reviewed by post completion audit. In post completion audit, actual expenditure on the project is compared with the budgeted one and actual return is compared with budgeted return. If unfavourable variance is found then causes are identified and necessary actions are taken.



CHECK YOUR PROGRESS

1. Fill in the blanks with appropriate words.

a. The capital budgeting decisions involve _____ degree of risk.

b. The cash flows are _____ by changes in accounting policies.

c. The cash flows are _____ by non cash items.

2. State whether the following statements are true or false.

a. The capital budgeting decisions have short term implications.

b. The capital budgeting decisions are reversible in nature.

c. The cash flows ignore time value of money

6.6 COST AND BENEFIT OF CAPITAL BUDGETING

A capital budgeting provides various kinds of costs and benefits to the firm. Costs associated with capital budgeting decisions are-

i) Capital budgeting required the purchase price of the new asset including installation cost and other incidental expenses to make it feasible.

ii) Opportunity cost of the scare resources will be used for the new project.

iii) Tax liability on gain on sale of an existing asset to be replaced by new asset.

iv) Additional working capital will be required for the new project.

v) Subsequent outflow required on new asset.

The benefits provided by capital budgeting decisions are-

i) To recover value of an existing asset to be replaced by new asset.

ii) Tax savings on loss on sale of existing asset.

iii) Cash profits contributed by the new project over a series of future years during its useful life.

iv) To save value of new asset.

v) Release of working capital at the end of new project life.

The costs and benefits of a capital budgeting decisions are measured on the basis of cash flows from the projects rather than the accounting profit earned by the firm from the projects. The costs of a capital budgeting decisions are calculated on the basis of cash outflow and the benefits of a capital budget decisions are calculated on the basis of cash inflow from the project.

6.7 CASH FLOW ESTIMATION

The cash flow estimation of any capital budgeting decision is very important as the cost-benefit analysis of any capital budgeting decisions is done on the basis of cash flow of the project. Costs of a capital budgeting decisions are measured on the basis of cash outflow whereas benefits of a capital budgeting decisions are measured on the basis of cash inflow from that particular project. Cash flow estimation is the process of estimating cash inflows and outflows at different point of time. Generally it includes initial cash outflows, annual cash inflows and terminal cash inflows.

i. Initial Cash Outflows

Initial cash outflows means cash goes out at the beginning of the projects. The following steps are taken while estimating the initial cash outflows:-

a) Finding out the cost of new assets required for the project,
b) Add installation and other incidental expenses with the cost of new assets purchased,
c) Deductthe scraps value of old assets if any,
d) Deduct tax savings or add tax liability on loss or profit on sale of old asset if any,
e) Add opportunity cost if any,
f) Add increase in working capital if any.

ii. Annual Cash Inflows

The estimation of the annual cash inflows of a particular project is being done with the help of following formula:

Annual Cash Inflows = Profits after Tax + Depreciation + Interest (1 – Tax Rate) – Capital Expenditure

Or

Annual Cash Inflows = Sales – Variable Cost – Fixed Cost – Depreciation – Tax + Depreciation – Capital Expenditure

iii. Terminal Cash Inflows

The estimation of the terminal cash inflows is done by adding the working capital released and scrap value of the new asset to the annual cash inflows of the last year of its useful life. It can also be noted that tax savings on loss on sale of new asset is added to terminal cash inflows while tax liability on profit on sale of new asset is deducted from terminal cash inflows.

6.8 CASH FLOW ANALYSIS VS ACCOUNTING PROFIT ANALYSIS

The basic difference between cash flow analysis and accounting profit analysis are :

Cash Flow Analysis	Accounting Profit Analysis
Cash flow analysis considers the time value of money	Accounting profit analysis does not consider the time value of money.
It measures the economic value through actual cash inflow and cash outflow.	It measures the economic value through the book value of the assets.
It does not consider non-cash items like depreciation, amortization etc.	It considers the non-cash items.
It uses a uniform method for calculation cash flows.	Different methods are used for in accounting profit analysis e.g., inventory valuation, depreciation and amortization etc.
Under cash flow analysis, projects are evaluated through incremental analysis.	Under accounting profit analysis, projects cannot be evaluated correctly as this method considers the profit of a firm in one complete unit not as a separate unit.



CHECK YOUR PROGRESS

3. State whether the following statements are true or false.

a. Capital budgeting decisions is done on the basis of cash flow of the project.

b. Cash flow estimation includes initial cash outflows, annual cash inflows and terminal cash inflows.

c. Accounting profit analysis considers the time value of money.

4. Fill up the blanks with the appropriate word.

a. Accounting profit analysis measures the economic value through the …… of the assets.

b. Cash flow analysis does not consider …… items.

c. Under cash flow analysis, projects are evaluated through …….



6.9 LET US SUM UP

In this unit, we have discussed the followings :

- Capital budgeting of a firm refers to the decisions of investing their long term funds in long-term assets which gives economic benefit in future. It is a process of deciding whether to invest or not in a project which last for more than one year and will derived benefit for more several years.
- Capital budgeting involved huge amount and has a great impact in the future growth and success of the firm.
- Capital budgeting is of various kinds based on firm's existence.
- Capital budgeting decisions is done on the basis of cash flow of the project. Costs of a capital budgeting decisions are measured on the basis of cash outflow whereas benefits of a capital budgeting decisions are measured on the basis of cash inflow from that particular project.



6.10 FURTHER READING

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6.11 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No 1: a. High, b. not affected, c. not affected.

Ans. to Q No. 2: a. False, b. False, c. True.

Ans. to Q No. 3: a. True, b. True, c. False.

Ans. to Q No. 4: a. Book-value, b. non-cash, c. incremental analysis.



6.12 MODEL QUESTIONS

1. What is capital budgeting? What are the features of capital budgeting?
2. Briefly discuss the importance of capital budgeting decisions?
3. What are the various types of capital budgeting decisions?
4. Describe in details about the process of capital budgeting?
5. Bring out the various costs and benefits associated with the capital budgeting decisions?
6. Discuss about Cash flow estimation.
7. Bring out the difference between cash flow analysis and accounting profit analysis.

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UNIT 7 : CAPITAL BUDGETING - II

UNIT STRUCTURE

7.1 Learning Objectives

7.2 Introduction

7.3 Methods of Project Appraisal/Project Evaluation

7.4 Traditional Methods or Non Discounted Method

- 7.4.1 Pay-Back Period Method
- 7.4.2 Accounting Rate of Return Method

7.5 Time-adjusted Method or Discounted Method

- 7.5.1 Net Present value Method
- 7.5.2 Internal Rate of Return Method
- 7.5.3 Profitability Index Method

7.6 Let Us Sum Up

7.7 Further Reading

7.8 Answers to Check Your Progress

7.9 Model Questions

7.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

- explain the Pay-Back Period Method of capital budgeting and can calculate the pay-back period.
- explain the Accounting Rate of Return Method of capital budgeting and can calculate the accounting rate of return.
- explain the Net Present Value method of capital budgeting and calculate the net present value.
- explain the Internal Rate of Return Method of capital budgeting and can calculate the internal rate of return.
- explain the Profitability Index Method of capital budgeting and can calculate the profitability index.

7.2 INTRODUCTION

At any point of time, a firm has a number of proposals regarding various projects. But due to limited availability of funds, a firm cannot invest their funds in all the projects. Firm usually select those proposals which are the potential of earning maximum profits. Selection of a profitable project/ capital budgeting decision helps a firm to maximize its profitability and this maximization of profitability will increase the firms' value and its sustainability in future. So the selection of a project or capital budgeting decision is very important for any business firm. A firm selects projects by evaluating the profitability of the projects. The process of the evaluation of the profitability of projects is known as 'Projects Appraisal'. Project appraisal is the scientific and structured process of assessing the profitability and feasibility of the projects by comparing it with other proposed projects.

7.3 METHODS OF PROJECT APPRAISAL/PROJECT EVALUATION

There are various methods of project appraisal which are broadly classified into two types-

A) Traditional Methods or Non Discounted Method and

B) Time-adjusted Method or Discounted Method.

7.4 TRADITIONAL METHODS OR NON DISCOUNTED METHOD

Under traditional method, there are mainly two methods for project appraisal and these methods are-

i. Pay-Back Period Method,

ii. Accounting Rate of Return Method.

7.4.1 Pay-Back Period Method

Pay-back period refers to the period in which the total investment of a project is recovered. Payback period is also known as pay off or pay out period.

Pay-back period method is based on the principle that the capital expenditures of any project are recovered within a particular period and thereafter it generates the additional earning to the firm. Under this method, various projects are ranked based on their length of payback period and preferred that project which has the shortest pay-back period to the one which has longer payback period. In case of evaluation of single project, the project is accepted if the pay-back period is shorter than the period specified by the management and if the period is longer than the period specified by the management then the project is rejected.

The pay-back period is ascertained in the following manner :

a. Calculate the annual net earnings (profits) before depreciation and after tax known as annual cash inflows.

b. Divide the initial outlay or cost of the project by the annual cash inflow.

$$\text{Pay-back period} = \frac{\textit{Cash Outlay of the project or Original Cost of the Asset}}{\textit{Annual Cash Inflow}}$$

Where the annual cash outflow is unequal, the pay-back period is period when all the cash inflows are equal to the original costs of the project.

Advantages of Pay-Back Period method

The main advantages of pay-back period method are:

i. This method is very simple to understand and easy to calculate the pay-back period.

ii. It requires less time and costs.

iii. This method is good for those firms having liquidity problem as it focuses early recovery of the amounted invested in the project.

iv. It also considers the risk factors associated with the project having longer time periodas it prefer those projects having shorter time period.

Disadvantages of Pay-Back Period method

The main advantages of pay-back period method are:

i. It does not take into account the cash flows associated with a project after the Pay-back period and therefore true profitability of the project cannot be ascertained correctly.

ii. This method ignores time value of money.

iii. This method does not consider the cost of capital which is very important factor of capital budgeting decision.

iv. It ignores the useful life and salvage value of the project.

v. It is very difficult to determine the minimum acceptable pay-back period which is subjective in nature.

vi. It treats each asset separate and individually with other assets which is not feasible in real practice.

Example 1 :

A project costs Rs. 2,00,000 and yields an annual cash flow Rs. 40,000 for 8 years. Calculate its pay-back period.

Solution:

Pay-back period = $\frac{Initial\ outlay\ of\ the\ project}{Annual\ Cash\ Inflow} = \frac{2,00,000}{40,000}$ = 5 years.

Example 2 :

There are two projects X and Y. Each project requires an investment of Rs. 20,000. Which project do you prefer under Pay-back period method from the following information?

Net profit before depreciation and after tax

Year	Project X	Project Y
1st	1,000	2,000
2nd	2,000	4,000
3rd	4,000	6,000
4th	5,000	8,000
5th	8,000	-

Solution:

The pay-back period for Project X is 5 years as net profit before depreciation and after tax, covers the required investment of Rs. 20,000 after 5 years (1,000 + 2,000 + 4,000 + 5,000 + 8,000 = 20,000).

The pay-back period for Project Y is 4 years as net profit before depreciation and after tax, covers the required investment of Rs. 20,000 after 4 years (2,000 + 4,000 + 6,000 + 8,000).

Therefore, Project Y should be preferred to project X.

7.4.2 Accounting Rate of Return Method

Rate of return refers to the expected return of the project. In this method, projects are preferred or given rank based on their respective expected return over their whole life. This method emphasized on the accounting profit or returns rather than cash inflows. The project with the higher return is given preference to the project having lower return. This method is also used for taking decision in accepting or rejecting a project. The project having higher return than the minimum specified return set by the firm, known as cut off rate, is accepted and the project having lower return than the cut off rate is rejected. The return on investment method can be used in various ways:

a. Average Rate of Return Method :

Under this method, average profit after tax and depreciation is divided by the total investment of the project. It establishes the relationship between average annual profits and total investment. Here,

$$\text{Average Rate of Return} = \frac{\textit{Average annual profit}}{\textit{Net Investment in the Project}} \times 100$$

Or

$$\frac{\textit{Total Profits (after depreciation and tax)}}{\textit{Net Investment in the project x No.of years of profit}} \text{ x } 100$$

b. Return per unit of Investment:

In this method, total profit after tax and depreciation is divided by the total investment i.e.,

$$\text{Return per unit of Investment} = \frac{\textit{Total Profit (After depreciation and Taxes)}}{\textit{Net Investment in the project}} \text{ x } 100$$

c. Return on Average Investment Method:

Here the return on average investment is calculated as follows:

$$\text{The Return on Average Investment} = \frac{\textit{Total Profit after depreciation and taxes}}{\frac{\textit{Total Net Investment}}{2}} \text{ x } 100$$

d. Average Return on Average Investment Method:

Here, the Average Return on Average Investment is calculated as follows-

Average Return on Average Investment =

$$\frac{\textit{Average Annual Profit after depreciation and taxes}}{\textit{Average Investment}} \text{ x } 100$$

Or

$$\frac{\textit{Average Annual Profit after depreciation and taxes}}{\frac{\textit{Net Investment}}{2}} \text{ x } 100$$

Example 3 :

A project requires an investment of Rs. 2,00,000 and has a scrap value of Rs. 20,000 after five years. It is expected to earn profit after depreciation and taxes during the five years amounting to Rs. 5,000; Rs. 7,000; Rs. 4,000; Rs. 6,000 and Rs. 8,000. Calculate the average rate of return on investment, Return per unit of investment, return on average investment and average return on average investment.

Solution:

Total profit = 5,000 + 7,000 + 4,000 + 6,000 + 8,000 = 30,000

$$\text{Average Profit} = \frac{30,000}{5} = 6,000$$

Net Investment = 2,00,000 – 20,000 = 1,80,000

Net average investment = $\frac{1,80,000}{2}$ = 90,000

Average rate of return on investment = $\frac{6,000}{1,80,00}$ x 100 = 3.33 %

Return per unit of investment = $\frac{30,000}{1,80,000}$ x 100 = 16.67 %

Return on average investment = $\frac{30,000}{90,000}$ x 100 = 33.33 %

Average return on average investment = $\frac{6,000}{90,000}$ x 100 = 6.67 %

Advantages of Rate of Return Method

The main advantages of Rate of Return Method are :

i. It is a very simple method to understand and easy to operate.

ii. Instead of taking the earnings of the pay-back period only, here entire earning from the project is taken for calculating the rate of return which gives better view of profitability of the project than the pay-back period method.

iii. The information required in this method is easily available from the accounting records.

Disadvantages of Rate of Return Method

The main disadvantages of Rate of Return Method are :

i. This method ignores the time value of money. Here, profits earned in different point of time are given equal weight.

ii. This method does not taken into consideration the cash flow which is very important factor especially for those firms having lack of funds.

iii. This method cannot be applied where investment made in parts.



CHECK YOUR PROGRESS

1. Mention whether the following statements are true or false.
   a. Under Pay-Back Period method, the project is accepted if the pay-back period is shorter than the period specified by the management.
   b. Pay-Back Period ignores the time value of money.
   c. Pay-Back Period method is based on the accounting profit of the project.
   d. Accounting rate of return method emphasized on cash inflows rather than accounting profit,
   e. The minimum specified return set by the firm is known as cut off rate.

7.5 TIME-ADJUSTED METHOD OR DISCOUNTED METHOD

The traditional methods of project appraisal have some serious limitations giving equal weights to the present and future cash flows. The traditional methods do not consider the time value of money. Therefore some new methods are taken into consideration for appraisal of the projects which consider the time value of money. These methods are known as time-adjusted method or discounted method or modern method of project appraisal. Under time-adjusted methods, there are mainly three methods namely-

i. Net Present value Method,
ii. Internal rate of Return Method,
iii. Profitability Index Method,

7.5.1 Net Present Value Method

Net Present Value Method is the modern method of project appraisal considering the factor of time value of money. Net present value is the refers to the surplus of total present of cash flow estimated to be generated from the project over total present value of net cash outflows. Here, the present value of

all the cash inflows and outflows occurringduring the life of the project is determined. The present value of cash inflow and outflow is determined by discounting these flows by a pre-determined rate known as discounting rate or required rate of return or cost of capital.

The present value of cash inflow and outflow is calculated as follows-

i) Compute the present value (PV) of expected cash inflows by multiplying present value factor (PVF) at a given discount rate with expected cash inflows over the project life.
ii) Add the PV of expected cash inflows computed in step (i).
iii) Compute the PV of cash outflows spent or expected to be spent by multiplying PVF at a given discount rate with cash outflows spent or expected to be spent over the project life.
iv) Add the PV of cash outflows computed in step (iii).
v) Deduct total PV of cash outflows calculated in step (iv) from the total PV of expected cash inflows computed in step (ii) to obtain NPV.

The PVF at a certain discount rate r % for nth period can be computed as:

$$\text{PVF (r \%, n)} = \frac{1}{(1+r)^n}$$

Advantages of Net Present Value Method

The advantages of Net Present Value method are:

i. It considers the time value money factor while evaluating the project.
ii. It is suitable for both uniform cash inflows/cash outflows and uneven cash inflows/cash outflows.
iii. It uses cash flows instead of accounting profit.
iv. It takes into account the entire earnings from the project and hence true profitability can be evaluated.
v. It takes into consideration the objective of wealth maximum.

Disadvantages of Net Present Value Method

i. The Net Present Value method is more difficult to understand and operate in comparison to traditional methods of project appraisal.
ii. This method may not give reliable result due to the error in the estimation of cost of capital or discounting rate.

iii. It gives equal ranks to mutually exclusive projects having same Net Present Value but different economic life. However, the project having shorter economic life should be preferred in such case.

iv. This method may not give good result while comparing project with unequal investment of funds.

7.5.2 Internal Rate of Return Method

Internal rate of return method is a modern technique or discounted method of evaluating capital decision. In this method, cash flow from a project is not discounted at a predetermined rate known as cut-off rate, but is discounted at a suitable rate by hit and trial method equating the net present value. Under this method, the rate of discount is determined internally, so this method is known as internal rate of return method. The internal rate of return can be defined as that rate of discount at which the present value of cash-inflows is equal to the present value of cash outflows. It is determined with the help of following formula:-

$$C = \frac{A1}{1+r} + \frac{A2}{(1+r)^2} + \frac{A3}{(1+r)^3} + ... + \frac{An}{(1+r)^n}$$

Where,

C = Initial Outlay at time zero

A1, A2, A3… An = Future cash flows at different periods

r= rate of discount of internal rate of return

Advantages of Internal Rate of Return Method

The main advantages of Internal Rate of Return Method are :

i. In this method, cash flows are used for evaluation of the project instead of accounting profit.

ii. It considers all cash inflows and outflows of a project.

iii. It takes into account the present value of money.

iv. This method is better when cost of capital cannot be determined reliably.

v. This method is compatible with the objectives of maximum profitability and is considered to be more reliable for capital budgeting.

Disadvantages of Internal Rate of Return Method

The main advantages of Internal Rate of Return Method are:

i. This method is difficult to understand compared to Pay-Back Period method, Rate of Return Method, Net Present value Method.

ii. This method is based on the assumption that the earnings or cash inflows are reinvested at the internal rate of return for the remaining life of the project, which is unreliable for mutually exclusive project having different internal rate of return because it is not possible for the same firm at the same time to reinvest cash inflows at two different rates.

iii. It may give indeterminate or multiple IRR for project requiring cash outflows in subsequent years of project life.

iv. This method may give different results when the projects differ in their size, life and timings of cash flows.

Example 4:

Initial Investment	Rs. 60,000
Life of the Asset	4 Years

Estimated net Annual Cash flows :

1st Year	15,000
2nd Year	20,000
3rd Year	30,000
4th Year	20,000

Calculate Internal Rate of Return.

Solution:

Cash Flow Table at various assumed Discount Rates of 10%, 12%, 14% &15%

Year	Annual Cash Flow	At 10%		At 12%		At 14%		At 15%	
		PV Factor	Present Value	PV Factor	Present Value	PV Factor	Present Value	PV Factor	Present Value
1.	15,000	0.909	13,635	0.892	13,380	0.877	13,155	0.869	13,035
2.	20,000	0.826	16,520	0.797	15,940	0.769	15,380	0.756	15,120
3.	30,000	0.751	22,530	0.711	21,330	0.674	20,220	0.657	19,710
4.	20,000	0.683	13,660	0.635	12,700	0.592	11,840	0.571	11,420
			66,345		63,350		60,595		59,285

The present value of net cash flows at 14% rate of discount is Rs. 60,595 and at 15% rate of discount it is Rs. 59,285. So the initial cost of investment which is Rs. 60,000 falls in between these two discount rates. At 14%, the NPV is +595 but at 15% the NPV is -715.

$$\text{Therefore, IRR} = 14\% + \frac{595}{595 + 715} \times (15\% - 14\%) = 14.45\%$$

Comparison between NPV and IRR method

Both Net Present Value (NPV) method and Internal Rate of Return (IRR) method are the modern techniques of capital budgeting. Both take into account the time value of money. Nevertheless, both techniques have certain basic differences which are as under

Net Present Value Method	Internal Rate of Return Method
In NPV method, the present value is determined by discounting the future cash flows of a project by a specified rate known as cut off rate based on cost of capital.	But in Internal Rate of Return Method, the present value is determined by discounting the future cash flows of a project by a rate which is found in hit and trial method at where present value equals to the amount of investment or cash outlay.
NPV method considers the market rate of interest or cost of capital.	But IRR method considers the maximum rate of return that any project may repaid.
The basic assumption of NPV method is that intermediate cash inflows are reinvested at the cut off rate.	But the basic assumption of IRR method is that intermediate cash inflows are reinvested at the internal rate of return.
The result of NPV method is more reliable than the IRR method.	The result of IRR method is less reliable than NPV method.

7.5.3 Profitability Index Method

In this method, a project having higher profitability index is selected over those projects having lower profitability index. Profitability index is the ratio which establishes the relationship between present value of cash inflows and present value of cash outflows. Thus

$$\text{Profitability Index} = \frac{Present\ Value\ of\ Cash\ Inflows}{Present\ Value\ of\ Cash\ Out\ Flows}$$

Or

$$\text{Profitability Index} = \frac{Present\ Value\ of\ Cash\ Inflows}{Initial\ Cash\ Outlay}$$

Or

$$\text{Profitability Index} = \frac{Net\ Prsent\ Value}{Initial\ Cash\ Outlay}$$

Advantages of Profitability Index Method

The main advantages of Profitability Index Method are:

i. This method is very simple to understand.

ii. This method considers the time value of money.

iii. It takes into account the entire earning of the project and hence true profitability of the project can be evaluated.

iv. PI focuses on the profitability of the firm. It also considers the risk factor. It helps to maximize the value of the firm.

Disadvantages of Profitability Index Method

The main disadvantages of Profitability Index Method are:

i. It is very difficult to estimate the cost of capital.

ii. It is also very difficult to calculate and estimate the interest rate or discount rate.

iii. It is difficult to calculate profitability index if two projects having different useful life.

iv. There is a chance of drawing incorrect decision while comparing mutually exclusive capital projects.

Example 5 :

The initial cash outlay of a project is Rs. 70,000 and it generates cash inflow of Rs. 20,000, Rs. 15,000, Rs. 25,000 and Rs. 30,000 in four years. Using the profitability index method evaluate the project assuming 10% discount rate.

Solution:-

CALCULATION OF THE PRESENT VALUE OF CASH INFLOWS

Year	Cash Inflows	Present Value Factor	Present Value
1	20,000	0.909	18,180
2	15,000	0.826	12,390
3	25,000	0.751	18,775
4	30,000	0.683	20,490
		Total	69,835

$$\text{Profitability Index} = \frac{Prsesnt\ Value\ of\ cash\ inflows}{Initial\ Cash\ outlay}$$

$$= \frac{69,835}{50,000}$$

$$= 1.3967$$

As the Profitability Index is more than 1, therefore the project should be accepted.

Notes :- Present Value Factor for the year 1 = $\frac{1}{1+0.10}$ = 0.909

Present Value Factor for the year 2 = $\frac{1}{(1+0.10)^2}$ = 0.826

Present Value Factor for the year 3 = $\frac{1}{(1+0.10)^3}$ = 0.751

Present Value Factor for the year 4 = $\frac{1}{(1+0.10)^4}$ = 0.683



CHECK YOUR PROGRESS

2. Fill in the blanks with appropriate words :

a) While making capital budgeting decisions, you must accept a project with a _____ NPV.

b) NPV method takes into account all the _____ and _____ associated with a project.

c) NPV method is consistent with the _____ objective of financial management.

d) IRR is the rate that makes PV of_____ equal to PV of _____of an investment project.

e) While making capital budgeting decisions, you must accept a project having IRR _____ than cost of capital.

f) IRR method is based on the assumption of reinvestment of cash inflows generated during project life at _____.

g) In case of contradictory results by IRR and NPV for mutually exclusive projects, you must rely on _____.



7.6 LET US SUM UP

In this unit we have discussed the following :

- Project Appraisal is the scientific process of evaluating the profitability of the projects.
- Project appraisal methods can be classified into two –
  a. Traditional method or Non-Discounted Method
  b. Time-adjusted Method or Discounted Method
- Under traditional method, there are two techniques for evaluating the projects namely Pay-Back Period Method, Accounting Rate of Return Method.
- Under Time-adjusted Method, there are basically three techniques for evaluating the projects namely Net Present value Method,Internal rate of Return Method,Profitability Index Method.



7.7 FURTHER READING

Khan, M. Y., & Jain, P. K. (2018). *Financial Management: Text, Problems and Cases, 8e*. McGraw-Hill Education.

Paramasivan, C. (2009). *Financial Management*. New Age International.

Singh, P. (2009). *Fundamentals of Financial Management 2Nd Ed*. Ane Books Pvt Ltd.

7.8 ANSWERS TO CHECK YOUR PROGRESS:

Ans. to Q. No. 1 : a) True, b) True, c) False, d) False, e) True.

Ans. to Q. No. 2 : a) Positive, b) Cash inflows, cash outflows, c) wealth maximization, d) cash inflows, cash outflows, e) more, f) internal rate of return, g) Net Present Value Method.

7.9 MODEL QUESTIONS

1. Explain briefly the following methods for evaluating capital budgeting bringing out the advantages and disadvantages of each:
   a) Pay- Back period Method
   b) Accounting Rate of Return Method
   c) Internal rate of Return Method
2. What is NPV method? Explain the acceptance criteria using NPV Method.
3. Mention merits and demerits of NPV method.
4. What is IRR? Explain acceptance criteria of IRR method.
5. Mention merits and demerits of IRR method.
6. Compare and Contrast between NPV method and IRR method.
7. What is profitability index method? Mention its merits and demerits of profitability index method.
8. Calculate the pay-back periods of the following projects. Each project requires an cash outlay of Rs. 1,00,000. Suggest which projects are acceptable if the standard pay-back period is 5 years.

Year	Cash Inflow		
	Project A	Project B	Project C
1	30,000	30,000	10,000
2	30,000	40,000	20,000
3	30,000	20,000	30,000
4	30,000	10,000	40,000
5	30,000	5,000	—-

(Ans. Project A= 3.333 years, Project B = 4 years, Project C = 4 years; All the three projects are acceptable)

9. A Chemical Company is considering investment in a project that costs Rs. 5,00,000. The life of the project is 5 years and estimated salvage value is zero. Tax rate is 55%. The company uses straight line method for depreciation and proposed project has estimated earnings before depreciation and before tax as follows :

Year	Earnings before depreciation and tax
1	1,00,000
2	1,00,000
3	1,50,000
4	1,50,000
5	2,50,000

Determine the following :

i. Payback period,

ii. Average rate of return

iii. Net Present value at 15%

iv. Gross profitability Index at 15%

The following are the present value factor at 15% p.a.:

Year	1	2	3	4	5
P.V. factor	0.870	0.756	0.658	0.572	0.497

(Ans. i. 4.33 years, ii. 4.5%, iii. Rs. (-) 1,03,477, iv. 0.793)

10. A company proposes to install a machine involving a capital cost of Rs. 1,80,000. The life of the machine is 5 years and its salvage value at the end of the life is nil. The machine will produce the net operating income after depreciation of Rs. 34,000 per annum. The company's tax rate is 45%.

The present value factors for 5 years are as under :

Discounting rate	14	15	16	17	18
Cumulative Factor	3.43	3.35	3.27	3.20	3.13

*** ***** ***

UNIT 8 : DECISION TREE ANALYSIS

UNIT STRUCTURE

8.1 Learning Objectives

8.2 Introduction

8.3 Meaning and Definition of Decision making

8.4 Importance of Decision making

8.5 Principles of Decision making

8.6 Types of Decision-Making

8.7 Decision Making Process

8.8 Decision Making under Different States of Nature

- 8.8.1 Decisions under Certainty
- 8.8.2 Decisions under Risk
- 8.8.3 Decisions under Uncertainty

8.9 Concept of Decision Tree

8.10 Uses of Decision tree

8.11 Benefits of Decision Tree

8.12 Construction of Decision tree

8.13 Limitations of Decision Tree

8.14 Let us Sum Up

8.15 Further Reading

8.16 Answers to Check Your Progress

8.17 Model Questions

8.1 LEARNING OBJECTIVES

After going through this unit you will able to :

- explain the meaning of decision-making
- discuss the different types of decision and decision-making
- interpret decision under risk and uncertainty
- explain the concept of decision tree
- identify the benefits of decision tree
- discuss the major limitations of decision tree

8.2 INTRODUCTION

Decision making plays vital role in everybody's life. Without taking a decision one's everyday life is not possible. In every stage of life, a person or a manager can take their decision to achieve its desired goal. Decision making is a process of selecting the best alternative to achieve that goal. Decision may affect an individual or people in group or an organization or the society as a whole. It depends on taking an effective decision making. Decisions may be major or minor, but some of these decisions might have proved to be effectivedecisions, viz. appropriate, timely and acceptable.This unit will discuss about the meaning and importanceofdecision making. It will also discuss about the principles and types of decision making as well as decision making under different states of nature. The unit also discuss about the concept of decision tree and its benefits and limitations. After completion of this unit, the learners will be able to understandthe managerial decision-making process and construction of a decision tree.

8.3 MEANING AND DEFINITION OF DECISION MAKING

The word decision is derived from the Latin word, 'Deciso' which means cutting away or cutting off or in practicalcontent, 'to come to a conclusion.'Decision making is the vital of panning and also the essence of management.Decision making is a rational process which involves selection of a particular course of action from among the alternatives available to achieve a pre-determined goal. A decision is an act of choice wherein an executive forms a conclusion about what must and must not be done in a given situation.It is a solution selected after examining several alternatives. Different authors have defined decision making in different ways. A few of them are given as below :

a) **J. L. Massive**, "A decision can be defined as a course of action consciously chosen from available alternatives for the purpose of a desired result."

b) **D. E. McFarland**, "A decision is an act of choice wherein executive forms a conclusion about what must be done in a given situation, a

decision represents a course of behaviour chosen from a number of possible alternatives. “

c) **R. A. Killion**, “decision in its simplest form is a selection of alternatives.”

d) George R. Terry, “Decision-making is the selection based on some criteria from two or more possible alternatives.”

e) R. S. Davar, “Decision-making may be defined as the selection based on some criteria of one behavior alternative from two or more possible alternatives. To decide means ‘to cut off or in practical content, ‘to come to a conclusion. “

f) **P. F. Drucker, “What-ever a manager does he does through making decisions.”**

Decision-making thus involves a mental process by selecting the best alternative for attaining the desired objective. It is considered as a mental exercise about what to do or not to do.

8.4 IMPORTANCE OF DECISION MAKING

Management without decisions is like a man without backbone. Thus, decision-making plays a vital role in management. It is the most important component of a manager’s activities. Without taking any decision, nothing can be performed. Every aspects of management function like, planning, organizing, motivation and control is determined by decisions, the result of which is the performance of the enterprise.Decision-making is undoubtedly the heart and core executive activity in the business. The importance of decision making are given below :

a) Performed themanagement process effectively: Decision-making is the core function of entrepreneurs which involves various functions, like planning, organizing, co-ordination, directing, controlling etc.

b) Best alternative selection: Decision-making is of great importance in selecting the best alternatives. A decision is an act of choice wherein an executive forms a conclusion about what must and must not be done in a given situation. A decision represents a course of behaviour chosen from a number of possible alternatives.

c) **Reduction of Risk :** The entrepreneur can collect and analyzed all informations and facts in the process of decision-making which helps in reduction of risk by forecasting the factors related to uncertainty and their affects.

d) **Entrepreneurial Success:** A right decision making helps the organization in order to their success. The decision can be taken on right time.

e) **Help in achievingthegoals:** The decision-making also helps the management in achieving the desired goal.

f) **Complexities and technological changes:** Rapid changes in the technology and complexities of the business environment have increase the importance of decision making.

8.5 PRINCIPLES OF DECISION MAKING

Decision-making is a complex job for every decision maker. There are certain principles which help the decision-maker for adopting quality decisions. These principles arediscuss in brief as below :

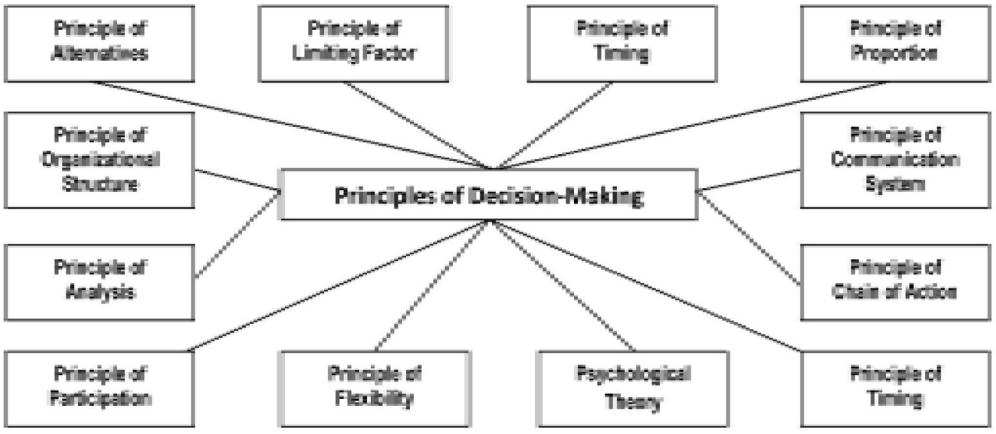


Fig. 8.1: Principles of Decision-Making

a) **Principle of Alternatives:** It involves evolution of all possible alternatives and examinationof a given problem in the order of their usefulness. In conclusion, selection is done to get the best alternative in order to their circumstances and purposes.

b) **Principle of Organizational Structure:**Organizational structure is very crucial for decision making. It should be readily understood. In case of centralizedorganizational structure, decision-making power remain with the top management level which may results in confused decision and thereby createsdoubt among the employees. On the other hand, for decentralizedorganizational structure, decision-making will be flexible and more effective.

c) **Principle of Analysis:**The objectives and policies must be proper analyzedin order of effective decision-making. The clear definition of objectives and policies is needed to guides the direction of decision-making. Without this need, decision-making will be drifting and unproductive.

d) **Principle of Participation:** Under this principle active participation of the employees is needed for productive decision making. Itis based on human behaviour and human relationship. The employees should be given right opportunity for discussing the problem and suggesting the alternative solutions.

e) **Principle of Limiting Factor:** This principle involves some strategic or important factors in decision making process. Time, cost or resources etc. may be the limiting factors. Based on these factors good decisions are supposed to be taken decision making.

f) **Principle of Timing:** Time factor is also considered as one of the principles of decision making. If decisions will not be taken at right time, chances of profit will escape from our hands. Decision after time has gone have no importance. So, managers should follow the principle of timing while decision-making.

g) **Principle of Flexibility: Flexibility in decision making is also considered as one of the important principle of decision making.** The flexible mental disposition of the decision-maker enables him to change the decision and win over the co-operation of all the diverse groups.

h) **Principle of Communication System:** Proper communication of information to all responsibility centreswithin the organization is also

needed for effective decision-making. Unless this structure is built up, ignorance of decision or ill-informed decision will result in misunderstanding and loose co-ordination.

i) **Principle of Chain of Action: In any organization,** allactivities involve a chain relationship. Any decision to change a particular work brings change in other related works also. Similarly, decision-making also proceeds following the chain of action in different activities. Therefore, before taking a decision one should consider the chain relationship among different activities.

j) **Principle of Proportion:** Each firm has limited resources of production, so proportionate combination of resources is required to obtain the maximum production. This principle helps to select the best alternative in the process of decision-making.

k) **Psychological Theory:** Under this principle, different psychological factors may affect the quality of decisions such as personality of decision makers, their education, experience, ambition and level of satisfaction etc.

l) **Principle of Goal-orientation:** Without any goal an organization is unfunctional.For achieving the desired goal, the role of decision making is vital. The value of decision depends upon the quantum of goals achieved which is based on facts. Hence, decision should be sound and result-oriented.

8.6 TYPES OF DECISION-MAKING

There are different types of decisions involved in decision making. A few of the important typesof managerial decisions are as given below:

a) **Programmed and Non-programmedDecisions:** Prof, Simon has classified all decisions into two classes: (i) Programmed decisions, and (ii) Non-programmed decisions. These classifications of decisionsis made on the basis of the use of operations research.

Programmed decisions are normally of repetitive nature. These are taken within the broad policy structure. An organization can develop

specific processes for handling these decisions. Programmed decisions have short-run impact and are taken by lower level managers, such as, granting leave to an employee, purchase of materials in normal routine, etc. If a manager spends appreciable time in dealing with programmed decision, he is wasting time which he could more profitably spend in dealing with non-programmed decisions.

Non-programmed decisions are of non-repetitive nature. Their need arises because of some specific circumstances, such as, opening of a new branch, introducing a new product in the market etc. They involve judgement, intuition and creativity. Such decisions are taken by top management. For example, if a large number of employees suddenly started absenting themselves without information, it would constitute a problem involving the non-programmed decision. The management should thoroughly probe into the cause and consequences of such a problem.

b) **Routine and StrategicDecisions:** *Routine decisions*also called as *tactical decisions*. Routine decisions are taken in the context of day-co-day Operations of the organization. They are not very important. Mostly they are of repetitive nature and do not require much analysis and evaluation and can be made quickly. Authority for taking such decisions is generally delegated to middle and first-line managers. They do not involve any high risk or uncertainty. For instance, sending samples of a product to the Government investigation center is a routine decision.

Strategicdecisions are also known as *basic decisions*which relate to policy matters and usually involve large investments or expenditure of funds. These decisions are mostly non-repetitive in nature. These decisions are taken by higher level of management after careful analysis and evaluation of various alternatives. A slight mistake in these decisions is bound to injure the entire organization. Major capital expenditure decisions, all decisions affecting organization, productivity, pricing, location and size of the business etc. are the main examples of strategic decisions.

c) **Major and Minor Decisions:** Decisions may be classified as Major and Minor. For example, if it relates to the purchase of a big machine worth, say a lakhs of rupees, it is a *major decision*. On the other hand, purchase of fountain pen, ink or a few reams of paper are *minor matters* and may be decided by the Office Superintendent.

d) **Policy and Operative Decisions:** *Policy decisions* are taken by top management. They are relating to basic policies. Policy decisions are important decisions having a longer impact which involves a change in the procedure, programme or strategy of the organizations.

*Operative decisions*on the other hand, relates to the day-to-day operation of an organization. Generally, this type of decision is taken by middle and lower level management people. Division of Work, delegation of authorities, time of payment of over-time wage etc. are the examplesof operative decisions.

e) **Organizational and Personal decisions: The executive** makes *organizational decisions*, when he acts formally as a company officer. It reflects the basic policy of the company. They can be delegated to others.

***Personal decisions* are those which relates** to the executive as an individual and not as member of an enterprise. It cannot be delegated.

f) **Individual and Group Decisions:** *Individual decisions* are made by one individual in the context of routine or programmed decisions where the analysis of variables is simple. When size of business unit is small and decisions have to be taken are of great importance and technical knowledge is required, then owner of an enterprise takes all decisions himself.

On the other hand, *group decisions* are the decisions taken by a group or a standing committee constituted for this specific purpose. Such decisions are very important for the organization, because they involve the participation of a large number of persons.

8.7 DECISION-MAKING PROCESS

In making a decision, the manager should observe certain steps and follow them in the proper sequence. The following procedure should be followed in arriving at acorrect decision;

a) **Identification of a Problem:** Identification of a problemmeans recognition of a problem in a clear-cut manner. A clearunderstanding of the real problem is the most important task in theprocess of decision-making, as the right answer can be found only for a right question. C.I. Barnard says that "knowing the right question is winning almost half the battle." The decision-maker should sort out the strategic points underlying the subject-matter of the potential decision.Without knowing the real cause of problem, if management decides to reduce the selling price, there may be loss instead of profit. Hence, scientific method should be used to identify the real aspect of problem.

b) **Analysing the Problem:** After the problem is correctly identified, the next step is to collect the facts and figures essential to analyses the problem. The problem should be divided into many sub-problem and each element of the problem must be investigated thoroughly and systematically. The cost structure, sales potential, financial position, price factors, Labour matters and other administrative matter can be analysed on the basis of the observed facts. Information gathering and data processing are important steps to arrive at logical decisions intended to resolve any issue.

c) **Developing Alternative Solutions:** Next step in decision-making is the 'quest' from alternatives from amongst the analysed facts and figures. Alternate approaches to solve problem are to be thought of on the basis of facts and factors investigated.

d) **Evaluation of Alternative Solutions:** Next, the pros and cons of available alternatives are analysed and an alternative is compared with other alternatives The available alternatives are screened in the order of maximum benefit derived from them. Each alternative is evaluated in terms of risks involved in implementing them. Peter F.

Drucker suggests the following criteria to evaluate the available alternative course of action:

- Risk: Degree of risks involved in each alternative.
- Economy of efforts: Cost, time and efforts involved in each alternative.
- Timing or situation: Whether the problem is urgent.
- Limitation of Resources: Financial, physical and human resources available withinthe organization.

e) **Selection of the Best Solution**: In this process of decision-making, the best alternative is selected out of various available alternatives. In attempting to selection from alternative, several basic approaches to decision-making are open to the manager. Among these, experimentation technique, research and analysis technique are important approaches.

f) **Implementing the Decision:** after selecting the best, the manager has to implement the decision to achieve desired goals. Decision therefore, be communicated in clear terms so that it can be implemented easily and early. Skill in communication is an essential talent for a good decision-maker. The motivation of employees and co-ordination of their efforts are other phases of implementation of decisions.

g) **Feedback and Control**:Lastly, the management should receive continuous information and evaluate them regarding the effect of his implemented decision. As Mervin Kahn says, "The solution may have to be modified to make it palatable to the individual or goa1s."



CHECK YOUR PROGRESS

1. Fill in the blanks :

a) The decisions which are frequent and repetitive in nature are called as_____.

b) Decision tree is a flowchart like_____.

c) _____ guides for decision-making.

8.8 DECISION MAKING UNDER DIFFERENT STATES OF NATURE

A decision-maker may not have complete knowledge about decision alternatives or about the outcome of a selected alternative. These conditions of knowledge are often denoted to as states of nature as mentioned below :

a) Decisions under Certainty

b) Decisions under Risk; and

c) Decisions under Uncertainty

These three conditions in relation to knowledge and predictability of decision states is depicted in Fig. 8.2 as below :

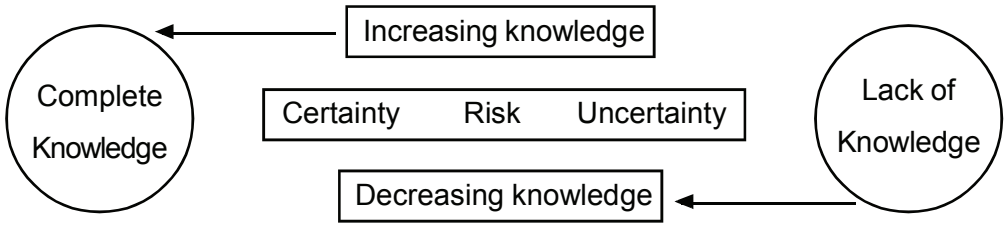


Figure 8.2: Decision Making Conditions Continuum

a) **Decision making under certainty:** A decision is made under conditions of certaintywhen amanager knows the precise outcome associated with each possible alternativeor course of action. In such situations, there is perfect knowledge about alternativesand their consequences. Exactresults are known in advance with complete (100 percent) certainty. The probability of specific outcomes is assumed to be equal to one. Amanager is simply faced with identifying the consequences of available alternativesand selecting the outcome with the highest benefit orpayoff.As you can probably imagine, managers rarely operate under conditions of certainty.The future is only barely known. Indeed, it is difficult to think of examples of all butthe most trivialbusiness decisions that are made under such conditions.

b) Decision making under risk: A decision is made under conditions of risk when asingle action may result in more than one potential outcome, but the relativeprobability of each outcome is known. Decisions under conditions of risk are perhapsthe most common. In such situations, alternatives are recognized, but their resultingconsequences are probabilistic and doubtful. In practice,managers assess the likelihood of various outcomes occurring based on pastexperience, research, and other information.

c) Decision making under uncertainty: A decision is made under conditions ofuncertainty when a single action may result in more than one potential outcome, butthe relative probability of each outcome is unknown. Decisions under. conditions ofuncertainty are unquestionably the most difficult. In such situations a manager has noknowledge whatsoever on which to estimate the likely occurrence of variousalternatives. Decisions under uncertainty generally occur in cases where no historicaldata are available from which to infer probabilities or in instances which are so noveland complex that it is impossible to make comparative judgements.Examples of decisions under complete uncertainty are as difficult to cite as exampleof decisions under absolute certainty. Given even limited experience and the abilityto generalize from pastsituations, most managers should be able to make at leastsome estimate of the probability of occurrence of various outcome. Nevertheless,there are undoubtedly times when managers feel they are dealing with completeuncertainty.Selection of a new advertising programme from among several alternatives might beone such example. The number of factors to be considered and the large number ofuncontrollable variables vital to the success of such a venture can be mind-boggling.On a personal level, the selection of a job from among alternatives is a careerdecision that incorporates a great deal of uncertainty. The number of factors to beweighed andevaluated, often without comparable standards, can be overwhelming.

8.9 CONCEPT OF DECISION TREE

A decision tree is a pictorial representation in tree form which indicates the magnitude, probability and interrelationship of all possible outcomes. It represents a systematic appearance of decisions and their forecasted results. The idea of a decision tree is delightfully simple. Instead of compressing all the information regarding a complex decision into a table, one can draw a schematic representation of the problem that displays the information in a more easily understandable fashion. When the decision maker must make a sequence rather than a single one, the use of the decision tree is simplifying the analysis. Thus, it is graphical representation showing the sequence of decision to be made and the possible events that may occur. Thus, a decision tree is a graphical method, a decision maker can see the alternative solution to him, their respective outcomes as probabilities associated with each of them and evaluate the comparative outcome to find out the optimum one.

Under the decision tree model, an individual has to come to a conclusion about investing in a particular project or not. Decision tree depict future decision points and possible chance events-various uncertain things happening in future. Decision tree can be drawn to meet all sorts of situation. The management often use these models because they lay out the information in a graphical way with possible probabilities attached to the final outcome.



CHECK YOUR PROGRESS

2. A type of decision-making environment is
   a) Certainty
   b) Uncertainty
   c) Risk
   d) All of above (choose the correct one)

8.10 USES OF DECISION TREE

For making decisions, a manager may take the use of decision tree. A basic value of decision tree lies in expressing all outcomes or events in quantitative forms which provide precision in decision making. Since a large number of techniques have been developed to take into account the impact of large number of variables, the use of decision tree is even increased. There are three steps involved in the use of decision tree -

a) To plan out in a diagram form, a number of future chance events which may affect a decision;

b) By considering and evaluating them and then arrive at a set of relative "Values" for the predicted outcome of each possible decision; and

c) To choose among these outcomes, the course with highest "Values" that is likely to produce optimum return for the company.

8.11 BENEFITS OF DECISION TREE

The different benefits of the decision tree are given below :

a) A manager can quickly visualize the alternatives, the possible future events and the outcome.

b) Information available can be used by management to make an informative decision about a project or the investment they have planned.

c) They are helpful in analyzing non-repetitive situations that involve risks and substantial costs or potential rewards.

d) It helps in promoting a healthy discussion regarding the alternatives, the possible events, their probabilities and the outcome.

e) The value of perfect information can be computed directly from the decision tree.

f) The tree structure in the decision model helps in drawing a conclusion for any problem which is more complex in nature.

g) It forces the manager to organize his thoughts and to specify his alternative decisions and the important events that will affect the outcome from choosing each of these.

h) The model is used not just in corporate finance, but in philosophy, economic forecasting as well.

8.12 CONSTRUCTION OF A DECISION TREE

There are three elements of a decision trees. These three elements are depicted in Fig. 8.3 as below :

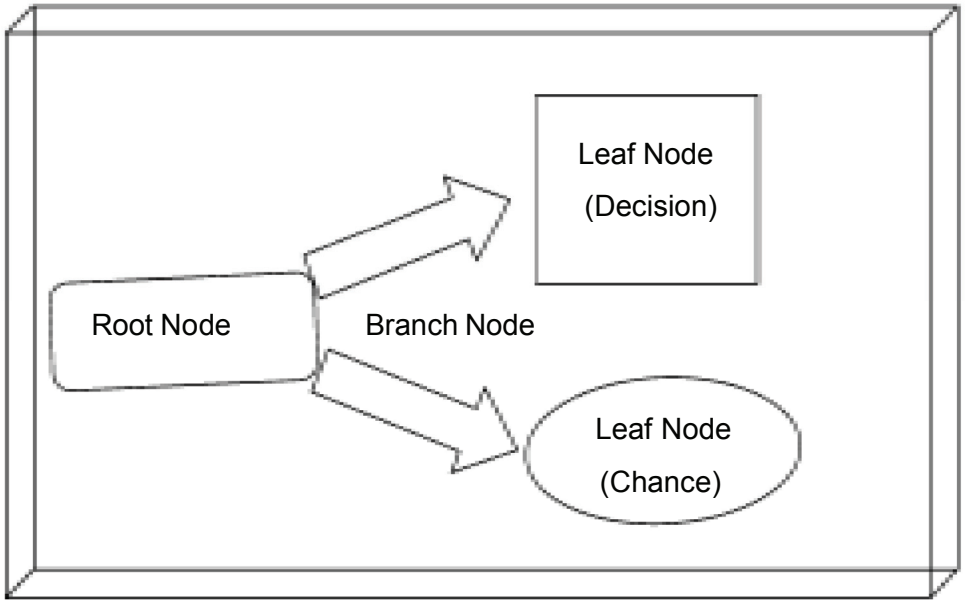


Fig. 8.3: Decision Tree Model

Root Node : Root node is also called the top-level node which signifies the decisive objective or big decision one can try to make.

Branch Node : It is stem from the root. It involvesvarious optionsor courses of actionavailable whileconstructing a particular decision. It is denoted by the arrow line and often include associated costs, as well as the likelihood to occur.

Leaf Node : These nodes are attached at the end of the branches. Here, possible outcomes for each action are arrived at. Leaf nodes are of two types namely square leaf nodes and circle leaf note. Former indicate about making another decision while the later indicatesabout the chance event or unknown outcome.

Construction of a decision tree is very essential for making effective decision. Let us understand the important steps involving in construction of a decision treewhile making capital investment decision by a manager as below.

a) **Definition of the proposal**: There should be a definite investment proposal whether buying a new product or to produce a new product.

b) **Identification of alternatives**: There should be identification of the decision alternatives. The alternatives may be buying a large plant or buying a small plant or buying a medium size plant or not to buy a plant at all.

c) **Graphing the decision tree**: Next step is to graphed the decision tree adopting decision point (Root node), decision branch (Branch node) and ending point or other data (Leaf node).

d) **Forecasting cash flows**: Necessary data should be located on the decision tree branches for the purpose of taking up decisions like projected cash flow, expected present value etc.

e) **Evaluating Results**: Lastly, the results from the expected values for each decision are analyzed. After analyzing, the best possible alternatives should be selected by the management.

8.13 LIMITATIONS OF DECISION TREE

The main limitations of decision tree are :

a) The only objection to the use of decision trees is that problems in the real world are so complex that the tree expands beyond the limits of human comprehension.

b) Another difficulty in analyzing decision tree is that even with simple two or three branch forks, the tree can be quite complex; it may turn into a bush.

c) There is often inconsistency in assigning probabilities for different events.



CHECK YOUR PROGRESS

3. Write true or false :

   a) A decision criterion defines factors that are relevant in a decision.

   b) All criteria are equally important in decision making.



8.14 LET US SUM UP

In this unit we have discussed the following-

- Decision making is a process of selecting the best alternative to achieve that goal.
- A decision is an act of choice wherein an executive forms a conclusion about what must and must not be done in a given situation.
- Decision-making is undoubtedly the heart and core executive activity in the business.
- Decision making may be Programmed & Non-programmed decisions, Routine & Strategic decisions, major & minor matters, Policy & Operative decisions, organizational &**Personal decisions** and Individual & group decisions.
- A decision tree is a pictorial representation in tree form which indicates the magnitude, probability and interrelationship of all possible outcomes.
- Decision tree depict future decision points and possible chance events- various uncertain things happening in future.
- The only objection to the use of decision trees is that problems in the real world are so complex that the tree expands beyond the limits of human comprehension.



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8.16 ANSWERS TO CHECK YOUR PROGRESS

1. (a) Programmed decision (b) Tree structure (c) Policy
2. All of above
3. (a) True (b) False

8.17 MODEL QUESTIONS

1) Discuss the importance of decision making in business and administration.
2) What are the various stages in the process of decision making?
3) What do you mean by decision tree? Discuss the uses and limitations of decision tree.
4) Discuss in brief the different states of nature of decision making. Briefly explain the principles of decision making.

UNIT 9 : MANAGEMENT CONTROL SYSTEM

UNIT STRUCTURE

9.1 Learning Objectives

9.2 Introduction

9.3 Meaning of Management Control System

9.4 Elements of Management Control System

9.5 Nature and Purpose of Management Control System

9.6 Objectives of Management Control System

9.7 MCS vis-à-vis Strategy Formulation and Control

9.8 Management Control Procedure

9.9 Advantages of MCS

9.10 Let us Sum Up

9.11 Further Reading

9.12 Answers to Check Your Progress

9.13 Model Questions

9.1 LEARNING OBJECTIVES :

After going through this unit, you will be able to :

- know the meaning and nature of management control system
- explain the objectives of management control system
- discuss the different types of management control system
- identify the MCS vis-à-vis strategy formulation and control
- discuss the procedure of management control
- explain about the tools and techniques of management control

9.2 INTRODUCTION

Control is one of the most important concept and process in management. Control helps in guiding employees effectually towards achieving the organization's goals. Through an effective control system, management can move towards attaining their desired goals. It is a set of both formal and informal systems. Management control may be concerned with examining, observing, reviewing, measuring and evaluating the performance of the people

according to the operational plan for attainment of their pre-determined goals. Thus, a management control system is both as aformal and an informal frameworkwhich an organization puts in place to compare its strategy and goals against the actual outcome.This unit will discuss about the meaning and definition of management control as well as different elements of management control. It will also discuss about the nature and objectives of management control. After completion of this unit, the learners will be able to understandthe management control system vis-à-vis strategy formulation and control and also the different procedure involved in management control system.

9.3 MEANING OF MANAGEMENT CONTROL SYSTEM

The function of management is to plan, organize, integrate and inter-relate the activities of an organization to achieve its desired goal which is facilitated by management control system. It is a set of formal and informal system to assist the management in moving forward to realize organizational goals. It is a measurement tool that determines whether the business is able to perform its functions effectively and is it able to meet its objectives.Management Control System (MCS) is a set of interrelated communication structures that facilitates the processing of information for the purpose of assisting managers in co-coordinating the parts and attaining the purpose of an organization on a continuous basis. Thus, a MCS may be defined as the structured and integrated system of information and processes that used by management to support the planning and control activities.It influences the behaviour of organizational resources to implement organizational strategies. Strategic planning, budgeting, resource allocation, performance measurement, evaluation and reward responsibility centre allocation and transfer pricing are the important aspects of management control system.

According to Anthony and Govindrajan (1994), "Management Control is the process by which managers influence other members of the organization to implement the organization's strategies".

According to Horngren et al. (2005), "Management control system is an integrated technique for collecting and using information to motivate employee behavior and to evaluate performance".

According to Maciariello et al. (1994), "Management control is concerned with coordination, resource allocation, motivation, and performance measurement".

Management control system also determines the performance level of an organization. It communicatesthe manager about the objectives and goals of the organizationthat helps everyone to works towards attaining these goals as quickly and effectively as possible. Moreover, the organizations that have adopted a management control system use it for both nonfinancial and financial measures as both of them leave a direct impact on the business which needs to be monitored. Thus, the management control systems involve a variety ofactivitiesthat includes:

- Planning the organization's future course of action;
- Coordinating and communicating organization's activities todifferent departments;
- Information evaluation; and
- Influencing people to work in accordance with the goals set for the organization.



CHECK YOUR PROGRESS

1. Fill in the blanks :

   a) Management control is concerned with coordination, resource allocation, _____ _____.

   b) MCS supports to generate _____ at every stage.

9.4 ELEMENTS OF MANAGEMENT CONTROL SYSTEM

In order to determine the effectiveness and success of a management control system, the following essential components/elements are vital.

Setting goals and strategies of a company

Understanding the present strategies, policies, objectives and goals which are the prime need to do before implementation of the management control system. It is essential to align the goals of MCS and operational goals of the organization for effective functioning of the organization. Without changing the core policies and objectives, the MCS ensures maximum effectivenessin organization operations.

Perfection in organizational structure

Organization structure is basically the arrangement of several sub-units, departments and responsibility centers with defined authority and responsibilities. There should be a perfection in the organizational structure for making an effective management control system in the organization which fit with the current framework. The forms of organizational structure consist of functional structure, Divisional structure, Matrix structure and Network structure.

Corporate culture

Corporate culture consists of shared values, common perception and common decision premises applied by organization particularly to the activities and problemof organization (Maciariello & Kerby, 1997). It is a mixed mechanism for integrating vision, mission and action aspects of managerial process. Vision and mission are based on shared values and common perceptions. Actions are based on common decision premises applied to the activities and problems of the organization.

Motivation through rewards

Reward is a system which motivates the employees to work hard for the organization. Rewards could be monetary and non-monetary in nature. Monetary rewards include salary increase and ESOPs (Employee Stock Options Plans). Non-monetary rewards include recognition, enhanced status, increased autonomy, appreciation etc. Through promotional structures an employee can motivated to show the highest levels of creativity, efficiency, and productivity.The reward structure is a part of MCS, and it can be done by tying the rewards with the achievement of goals.

Communication and Integration

Communication is vital foreffective control systems in an organization. It helps in proper coordination of activities across functions, divisions and the networks .It ensures "goal convergence" between the individual's goals and organization goals. Various "management communication vehicles" like formal Conferences, Workshops, Official Newsletter, Monthly Reports, Inter Office Memos, Office Notes, E-mails, Intranet, Internet etc. which takes vital role in effective communication.

Integration of various activities and processes is not only achieved through" communication circles" but also through other formal mechanism such as committees. To address issues at different levels, committees are constituted toachieve integration across the organization. Strategy and operating management committee aims at achieving a synergy between strategy and its implementation.

Informal Management Controls

There is also informal management control which helps the organizational operation. Informal management control occurs through meetings, conversation, site visits, etc.The role of informal management control has been considered so critical that managements like to keep `loyal employees' who are essentially `informers', in key -positions. Informal control is not visible in the formofresponsibilitycenters,programmes, budgets and report syetitexerts strong, pressure. Informal management control is not amenable to systematic description but it doesoperate in every organization whether it has a formal management control system or not.

9.5 NATURE AND PURPOSE OF MANAGEMENT CONTROL SYSTEM

The fundamental definition of management which indicates the role of a manager is "Planning, Organizing, Staffing, Directing, Controlling, Reporting and Budgeting". This fundamental definition also sums up the essence of the nature and purpose of management control, the concept of management control

has advanced from this generic approach to a more specific definition. While defining Management Control, Anthony and Dearden (1981) stated

"Management control is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of organization's goals".

Later on, this definition was modified and refined by Anthony and Govindrajan (1994). According to them "Management control is the process by which managers influence other members of the organization to implement the organization's strategies". It also identified the following activities of Management Control-

- planning what organization should do,
- coordinating the activities of several parts of organization
- communicating information
- evaluating information
- deciding what, if any, action should be taken
- influencing people to change behaviour"

Merchant (1998) argues that the reare many definitions of management, "all of which relate to process of organizing resources and directing activities for the purpose of achieving organization's objectives". Heuses the framework of Functions, Resources and Processes as elements of management. He developed his Management Control Systems framework in terms ofthree types of controls viz. Action Controls, Results Controls and Personnel andCulturalControls.

Action controls "involve ensuring that employees perform (or do not perform) certain actions known to be beneficial (or harmful) to theorganization".

Results controls focus on results and involve "rewarding individuals (and sometimes groups of individuals) for generating good results or punishing for poor results".

Personnel and Cultural controls on taking steps that ensure "that employees control their own behaviour or control each other's 'behaviours". Such controls aim a thelping employees do a good job and are based on employees' natural tendencies to control themselves. These controls imply self-monitoring that could include self-control, intrinsic motivation, ethics, trust, transparency etc.

Thus, in sum up the purpose of management control system involves :

- To clearly communicate the organisation's goals;
- To ensure that managers and employees understand the specific actions required of them to achieve organizational goals;
- To communicate results of actions across the organisation; and
- To ensure that managers can adjust to changes in the environment.



CHECK YOUR PROGRESS

2. Management control system includes-

a) Financial performance

b) Non-financial performance

c) Both financial and non-financial performance

d) None of the above (choose the correct one)

9.6 OBJECTIVES OF MANAGEMENT CONTROL SYSTEM

The management control system aiming to make all the related information associated with the planning and control functions available, so as to enable the development of these activities. As a technique, MCS assist the organization in process of decision making. It supports and motivates individuals

so that they can overcome their limitations and work together in order to achieve the common organizational goals. Generally, MCS involves the following objectives-

a. Measuring Progress

Measuring the progress of a company is one of the objectives of MCS. It examines about the smooth functioning of the plan adopted and the instructions given by the organization. The navigator takes reading to determine that the organization is walking on the planned and predetermined path. The received feedback helps to compare the performances with expectations.

b. Uncovering Deviations

The objective of a management control system is to detect deviations from the charted course. Both the internal and external forces can move the company from its selected path.

c. Change

Changeis an integral part of an organization. New government policies, new raw materials, market shifts, or a dispute in the labor resources can be a cause for the change. Therefore, the key objective of the management control system is to help the manager in identifying and detecting the change to take proper action against any threat in the organization.

d. Delegation

Another objective of MCS is the delegation. Delegation helps infaster working culture efficiently. Itcauses deviations from the normal course of action. Thus, the management control system helps the manager in determining whether the individuals to whom he has delegated work are making improvements or not.

e. Mistake

Mistakes is a term which occurs at any point of time. Such as, the accounting software might become faulty, or the wrong parts of equipment might have been ordered. The objective of implementing a management control system is to detect and rectify the deviation in the form of a mistake to avoid another one.

f. Complexity

Monitor the diversified product or service line and ensure the quality and profitability of a business is vital in MCS. It is to be reiterated that, having a complex framework due to scattered geographical locations are generally involves in a large organization. The objective of a management control system is multidimensional as it indicates any deviations and can record and analyze the sales figures at different locations.

g. Indicating corrective actions

Suggestion for corrective actions to the management in order to overcome the mistakes and deficiencies in the organizationis also the another important objective of a management control system.

9.7 MCS VIS-À-VIS STRATEGY FORMULATION AND CONTROL

A conceptual framework of control system was provided by Anthony and Dearden in terms of three leave, processes viz. Strategic Planning, Management Control and Operational Control.This terminology has now been refined through the idea of an "interactive hierarchy" of control represented by strategy, management control and the task control.The new framework (depicted in Table 1.1) has now been developed by Anthony & Govindrajan.

Table 1.1

The Old and New Framework of Management Control Systems

Old **Framework (Anthony & Dearden)**	**New** **Framework (Anthony & Govindrajan)**
Strategic Planning	Strategy Formulation
Management Control	Management Control
Operation Control	Task Control

While discussing on the MCS vis-a vis strategy formulation and control the following key points of distinction between them are remembered :

a) Strategic planning focuses on a single aspect of the corporate life at a time where as management control focuses on all the operations of different sub-divisions or units of an organization. The acquisition and deposition of majorfacilities, creation of division or subsidiaries, research and development of new products, and sources of new permanent capital belong to the domain of strategic planning. The focus of management control extends to the total operations ofdivisions, plants, etc.

b) The domain of strategic planning comprises unstructure do run programmed decisions where as management control is predominantly rhythmic and regular.

c) The nature of information required for strategic planning tends to be tailor-made for the problem, largely external, futuristic and less accurate where as management control requires integrated, largely internal, historical and accurate in formation.

d) Strategic planning of ten uses techniques like SWO Tanalysis (Strength, Weaknesses, Opportunities and Threats analysis) whereas management control relies on budgeting.

e) Strategic planningis a creative and analytical activity where as management control is largely administrative and persuasive in nature.

f) The time frame of strategic plans tends to belong, say beyond one year, where as the management control operates by an year, quarter or even smaller time frames.

g) The appraisal of strategic plain is extremely difficult compared to management control which is relatively easy to evaluate.

9.8 MANAGEMENT CONTROL PROCEDURE

Control process enables management to focuses on key works where such work carried out deviates from the standards laid down. Control is the final role of management. Management is required to execute a series of steps to ensure that the plans are carried out accordingly. Management control procedure is the continuous and ongoing dynamic process of monitoring performance and taking action to ensure desiredresults.It ensures the management about non-deviation of performance rate from its standards set.

Key Features :

a) ***Management Function :*** It confirms the management about carrying the work done inconformity with the established plan.

b) ***Dynamic Process :*** After implementing the plan, the control process becomes imperative to check if there is any deviation.

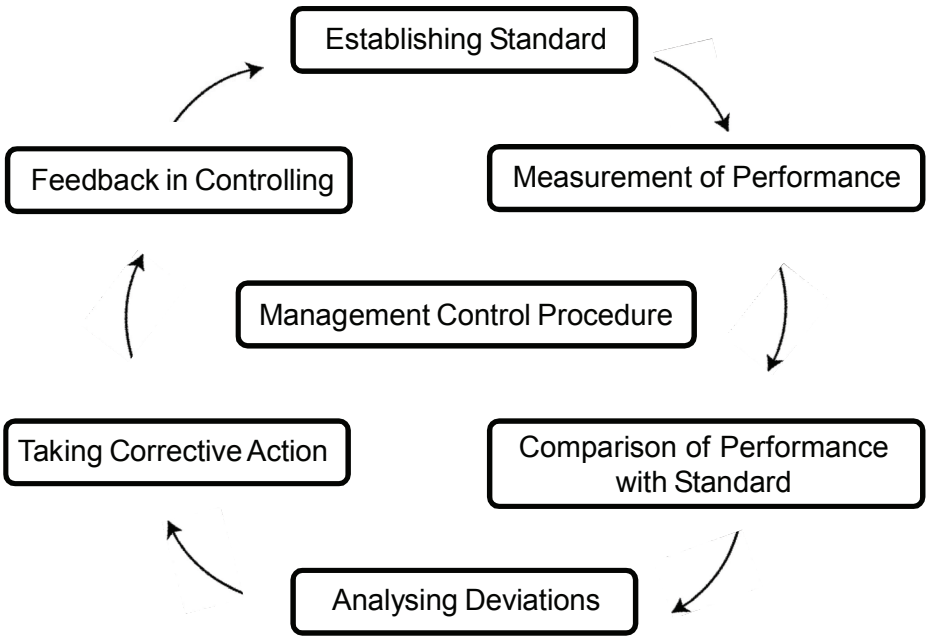
c) ***Continuous Activity :*** It is a continuous process where the management continuously analyses its actions so as to confirm their performance is in the right track.

d) ***Forward looking :*** It is a futuristic approach. It keeps check on the performance which iscarried out presently or going to be carried out in near future.

e) ***Close relation with planning :*** It can be said that "There can be a planning without controlling but there cannot be a controlling without planning". therefore, it is the plan or the budget against which the actual performance can be compared to arrive at deviations if any.

Steps in Management Control Procedure (MCP)

The management control procedure contains several steps. It starts with establishing the standards which can be used as a yard stick to measure and compare the actual with the standards. The end result of comparison is the spotting out deviations. The different steps involved in the management control procedure are given below :



a) Establishing Standard

Setting average is the first requirement of control. Standards arise out of plans and give the foundation of comparison.Standards mean target or the yardstick against which the actual performance is measured. The standards must be achievable, high or very high standards which cannot be achieved are of no use. The standards are the expected out comes. The set standards should be simple and easily understood by the workers so that they have a clear idea of what is expected from them in terms performance. The standards set should be precise, attainable, accurate, flexible and realistic.

b) Measurement of Performance

There are three methods of measuring performances. i) Prior approval, ii) Personal observations and iii) Checking the unexpected.

Prior approval of the executive is necessary to allow the work to proceed as planned. When something does not work out as planned, there arises a need for reports and corrective action. Personal observations gives an opportunity to the executives to see for themselves their real state of action. While measuring the performance the quantitative as well as qualitative aspect of performance is kept in mind. Sometimes employees achieve the quantitative standards by ignoring qualitative standards. That is why while measuring the performance quality standards are also measured.

c) Comparison of Performance with Standard

The actual performance is compared with the planned performance and standard. This is said to be the heart of control procedure. Because, this step brings to light whether the performance is taking place in accordance to the plan or not. If there is match in both then the controlling function ends there only. But if there is mismatch or deviation then the manager tries to find out the extent of deviation. If the deviation is minor, then it should be ignored. But if the deviation is more than timely action must be taken.

d) Analysing Deviations

Managers should make an effort to find the reasons for theoccurrence of deviations. Deviation means difference between the standard and the actual. The fault may be that standards fixed were unattainable rather than

thesubordinate's inefficiency. Again, the deviations might have been caused through the nature ofinstructions issued through the manager rather than due to the subordinate's mistake. Hence, it isessential that the reasons, which caused the deviation, be ascertained to determine the appropriatecorrective action.

e) Taking Corrective Action

After determining the causes for deviations, the manager should go in for a corrective action which may involve revision of standards, changing the methods of selection and training of workers or providing better motivation. If the deviation is found to be insignificant then immediate correction may not be required only, its reoccurrence can be checked. While if the deviation is significant, management must take corrective action immediately and gives suggestions for controlling its reoccurrence. The rectification of deviations from the standards should be undertaken promptly so that further losses are avoided.

f) Feedback in Controlling

The management is responsible for to see whether all the suggested recommendations are properly implemented and followed.After incorporating the corrective measure a feedback report is prepared. Feedback refers to list of reasons for deviations of plans or for inefficiency in overall working of organization; along with reasons the corrective measures.Feedback acts as a base to establish the standard for next year and controlling process again starts from first step.

9.9 ADVANTAGES OF A MANAGEMENT CONTROL SYSTEM

The advantages of adaptation of MCS by all size of entities are mentioned below :

a) It facilitates the gathering of relevant data and offering the information to management so that operations can continue seamlessly.

b) It communicates the goals of an organization in a detailed and clear manner.

c) It ensures the manager, as well as other employees to understand the particular course of action plan to reach the goals.

d) Itsupports to generate feedback at every stage.

e) It becomes possible to restore and make adjustments accordingly

f) It executes in helpingforecasting and budgeting both.

g) It helps in aligning the objectives of a company.

h) The management control system acts as a middleman between the employee and the manager as it feeds necessary information of the former to the latter.



CHECK YOUR PROGRESS

3. Write true or false :

a) Output is measured and compared against a plan.

b) Management controlisacreativeandanalyticalactivity.



9.10 LET US SUM UP

In this unit we have to discussed the following -

- Management control system is both as a formal and an informal framework which an organization puts in place to compare its strategy and goals against the actual outcome.
- MCS may be defined as the structured and integrated system of information and processes that used by management to support the planning and control activities.
- Setting goals and strategies of a company, perfection in organizational structure, corporate culture, motivation through rewards, communicationandIntegration and informalManagementControls are the essential components of management control system.

- Management Control Systems framework hasthree types of controls- Action Controls, Results Controls and Personnel and Cultural Controls.
- Management control system aiming to make all the related information associated with the planning and control functions available, so as to enable the development of these activities.
- Strategic planning is a creative and analytical activity whereas management control is largely administrative and persuasive in nature.
- Management control procedure is the continuous and on going dynamic process of monitoring performance and taking action to ensure desired results.



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9.12 ANSWERS TO CHECK YOUR PROGRESS

1. (a) motivation, and performance measurement; (b) feedback
2. Both financial and non-financial performance
3. (a) True (b) False

9.13 MODEL QUESTION

1) Define management control system. Discuss the nature and purpose of management control system. Distinguishing it from strategic Formulation.
2) Identify various critical components of management control and indicate how they influence the behaviour in organizations.
3) What is Management Control Procedure? Discuss the steps involved in Management Control Procedure.
4) "The ultimate purpose of management control is to achieve goal congruence" Comment?

** *** **

UNIT 10 : RESPONSIBILITY ACCOUNTING

UNIT STRUCTURE

10.1 Learning Objectives

10.2 Introduction

10.3 Concept of Responsibility Accounting

10.4 Objectives of Responsibility Accounting

10.5 Types of Responsibility Centre

10.6 Transfer Pricing

10.7 Let Us Sum Up

10.8 Further Reading

10.9 Answers to Check Your Progress

10.10 Model Questions

10.1 LEARNING OBJECTIVES

After going through this unit you will be able to-

- discuss the meaning of responsibility accounting.
- discuss he objectives of responsibility accounting
- explain the different types of responsibility centres.
- explain the concept of transfer pricing.

10.2 INTRODUCTION

In this unit we will discuss about responsibility accounting. In simple terms, it indicates to a system where the responsibility entrusted and responsibility discharged is measured. You are aware that organisation s take different decisions based on accounting records. Likewise, responsibility accounting also facilitates the different managerial decision- making.

10.3 CONCEPT OF RESPONSIBILITY ACCOUTING

You are aware that in today's context, business decision- making is a complex matter. The success or failure of business, to a great extent, depends on the decisions taken by an organisation. The decision- making is complex because of the frequent changes in market competition, customer tastes and preferences, socio-political, economic and technological factors etc.

This complexity, when considered in terms of business conglomerate having business interest in different geographical areas and having different products in their portfolios, become more complex. For example, TATA group, Reliance Industries etc. have wide spread business interest. Think about their decisions!

In this context, we can discuss the concept of responsibility accounting. Firstly, let us discuss the meaning of responsibility centre. A responsibility centre is a unit, department or division created within the broad organisational structure. This unit having the identifiable objectives, business policies, human resource etc. is responsible for the activities entrusted to it and is responsible to attain its business goals. This unit of the parent organisation functions under the unit head, generally identified as the area manager, branch head, regional manager and the like, who is responsible for the functioning of that unit. The unit generate its own financial statements indicating the revenue, expense, investment, profit/ loss, return on investment and so on.

Responsibility Accounting

Let us now discuss the concept of responsibility accounting. In its simplest form, it is the accounting process which reports the functioning of the managers who are in charge of certain responsibility centres. This also serve as a performance management system. The responsibility centre is under the control of the centre head who have the authority over the centre and is also responsible for the functioning and profitability of the responsibility centre.

A large organisation may create different responsibility centres depending on their business strategies and policies. These centres put under the supervisors and the responsibility accounting draws the framework to evaluate

and control the functioning of these centres within the broad organisational vision, mission and objectives. The main advantage of the responsibility accounting is that it can evaluate the financial performance of the entire organisation by focusing on the different areas or segments or responsibility centres. Accordingly, the organisation is in a position to identify what, where, when and how to take corrective measures, if the need arises.



CHECK YOUR PROGRESS

Q. 1: What is responsibility accounting?

10.4 OBJECTIVES OF RESPONSIBILITY ACCOUNTING

The objectives of responsibility accounting may be discussed as under-

- **Measuring the contribution of a division :** Responsibility accounting helps in measuring the contribution of each division of the organisation towards the attainment of the organisational goals. It helps in identifying the profitable and loss making divisions. Therefore, the top management can plan the required interventional measures.
- **Performance evaluation of managers:** The performance of the managers who are in charge of the responsibility centres can be evaluated by responsibility accounting. The responsibility centres are created to expand the business and to decentralise the management of the organisation to facilitate quick decision- making. The responsibility of these centres are given to the senior managers whose performance can be evaluated on the basis of the reports generated from responsibility accounting.
- **Motivation to managers:** Responsibility accounting motivates the divisional managers in managing the divisions under their authority. Efficient performance of the responsibility centres, to a great extent, depends on the divisional heads. The divisional heads can be motivated

based on the performance indicators of the individual and the division as a whole.

- **Delegating authority:** In case of big organisations, decentralisation of management becomes important with the expansion of business. The decentralisation will be effective when there is proper delegation of authority. Responsibility accounting facilitates the delegation of authority and at the same time the top management can install a control system over the managers to whom the authority has been delegated.



CHECK YOUR PROGRESS

Q. 2: State two objectives of responsibility accounting.

10.5 TYPES OF RESPONSIBILITY CENTRE

In this section, we will discuss the different type of responsibility centres. The different type of responsibility centres are –

- **Cost Centre:**Cost means the expenses incurred. The managers of cost centres are responsible for managing the cost for that centre. For example, in case of an industry, the production and service departments are considered as the cost centres. The managers of these centres are responsible for controlling the cost which are under their control.

  The performance evaluation of the cost centres are done on the basis of cost variance i.e. difference between budgeted cost and actual cost incurred.

- Revenue Centre: A revenue centre of an organisation is responsible for generating revenues. The centre looks after the activities which can create more revenue for the organisation. In order to achieve the target of revenue generation, the managers of revenue centres may design the training programmes of the employees of the centre to enhance

their skill. The performance of revenue centre's manager is evaluated on the basis of actual revenue and budgeted revenue. The marketing manager or an individual sales person is the example of revenue centre.

- Profit Centre: A profit centre is the combination of revenue and cost centre. The primary objective of profit centre is to earn profit. The performance of a profit centre is evaluated on the basis of profit that it earned against the budgeted amount of profit. For example, a divisional manager may be assigned as a manager of profit centre. The manager is responsible to control cost, generate revenue and ensure profit for the organisation.

10.6 TRANSFER PRICING

In the earlier section, we have discussed some of the responsibility centres which an organisation may create. When an organisation decentralises its activities and decision- making authority, it needs to create different divisions. In that case, some transactions may take place between the divisions, which are within the broad organisational framework. This is termed as interdivisional transfer of goods and services. These inter divisional transfer need some pricing technique, which is known as transfer pricing.

Transfer price refers to the value of goods and services that are transferred between two divisions. These goods are intermediate goods which are required by a particular division.



CHECK YOUR PROGRESS

Q. 3: What is transfer pricing?



10.7 LET US SUM UP

In this u it we have discussed the following aspects-

- The decision- making is complex because of the frequent changes in market competition, customer tastes and preferences, socio-political, economic and technological factors etc.
- A responsibility centre is a unit, department or division created within the broad organisational structure.
- This unit of the parent organisation functions under the unit head, generally identified as the area manager, branch head, regional manager etc.
- Responsibility accounting process which reports the functioning of the managers who are in charge of certain responsibility centres.
- Responsibility accounting serve as a performance management system.
- The objectives of responsibility accounting are-
    - Measuring the contribution of a division
    - Performance evaluation of managers
    - Motivation to managers
    - Delegating authority
- The different types of responsibility centre are –
    - Cost Centre
    - Revenue Centre
    - Profit Centre
- Transfer price refers to the value of goods and services that are transferred between two divisions within an organisation.
- The goods which are transferred are intermediate goods.



10.8 FURTHER READING

Book : Lal J. (2002). Cost accounting (3rd Edition). McGRAW

OER: Describe the Types of Responsibility Centers - Principles of Accounting, Volume 2: Managerial Accounting | OpenStax

Responsibility Accounting | Accounting for Managers (lumenlearning.com)

Responsibility center - Wikipedia

Responsibility Accounting in Management - Business LibreTexts



10.9 ANSWERS TO CHECK YOUR PROGRESS

CHECK YOUR PROGRESS 1 :

A large organisation may create different responsibility centres depending on their business strategies and policies. These centres put under the supervisors and the responsibility accounting draws the framework to evaluate and control the functioning of these centres within the broad organisational vision, mission and objectives

CHECK YOUR PROGRESS 2 :

Two objectives of responsibility accounting are :

- **Measuring the contribution of a division:** Responsibility accounting helps in measuring the contribution of each division of the organisation towards the attainment of the organisational goals.
- **Motivation to managers:** Responsibility accounting motivates the divisional managers in managing the divisions under their authority. The divisional heads can be motivated based on the performance indicators of the individual and the division as a whole.

CHECK YOUR PROGRESS 3 :

Transfer price refers to the value of goods and services that are transferred between two divisions. These goods are intermediate goods which are required by a particular division.



10.10 MODEL QUESTIONS

Q.1: What is responsibility accounting?

Q.2: What is responsibility centre?

Q.3: What is profit centre?

Q.4: What is transfer pricing?

Q.5: Discuss the objectives of responsibility accounting.

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UNIT 11 : BUDGETARY CONTROL

UNIT STRUCTURE

11.1 Learning Objectives

11.2 Introduction

11.3 Meaning of Budget

11.4 Meaning of Budgetary Control

11.5 Advantages of Budgetary Control

11.6 Limitations of Budgetary Control

11.7 Type of Budgets

11.8 Zero Base Budgeting

11.9 Performance Budgeting

11.10 Requisites for Successful Budgetary Control

11.11 Organisation for Budgetary Control

11.12 Illustration

11.13 Behavioural Implications of Budget

11.14 Let Us Sum Up

11.15 Further Reading

11.16 Answers to Check Your Progress

11.17 Model Questions

11.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- discuss the meaning of budget and budgetary control
- explain the advantages and disadvantages of budgetary control
- explain the different types of budget
- discuss the requisites for successful budgetary control
- discuss the organisation for budgetary control
- discuss the behavioural impact of budget

11.2 INTRODUCTION

In this unit we will discuss about budget and how budget is used as a controlling technique. Budget is an expression of the future plan of action in

monetary terms. In an organisational context, preparation of budget is a regular activity and it is generally prepared by considering all the major and supporting activities of the organisation. This budget exercises control over the use of resources- physical, financial, human and the like. Therefore, it is important to study the behavioural implication of budget in an organisation. This unit will cover all these aspects giving you all the necessary inputs related with budget and budgetary control. Let us first discuss the meaning of budget.

11.3 MEANING OF BUDGET

You are aware that for the individuals as well as the business entities, money earned and money spent is important. One must have an idea about the sources and amount of earning as well as the heads under which money will be spent within a particular period of time.When the plan of earning and spending money is expressed in terms of money, it is called budget. Budget is a plan expressed in monetary terms. It shows the expected income and expenditure for a particular time period. Budget preparation is an important and regular activity that every organisation whether public or private, large or small, with or without profit motive, need to prepare the budget. The Central and State Governments also prepare the budgets.

Budget is used as a tool for planning, coordinating and controlling the affairs of an organisation. The budget -

- Facilitates the management to prepare the plan for foreseeable period;
- Express the management's plan in quantitative form;
- Coordinate the different functional areas in the organisation, like sales, marketing, production, purchase, human resource, finance and so on;
- Binds all the levels of management to think ahead, anticipate the likely outcomes and prepare for proactive action;
- Motivate the individual employees to focus on the stated goals.

Though preparation of budget is important, it may not prove to be fully effective owing to the future uncertainty. A budget is prepared on the basis of past accounting data. To make it future oriented, it needs to be adjusted for the future changes. The efficient management always keep checking the budget and the actual expenditure to control any deviations from the planned course of action.

An organisation may prepare different types of budget, like sales budget, cash budget, operational budget, capital expenditure budget, revenue budget, master budget etc. The budget period of these different types of budgets are different. Some are short- term; some are medium- term while some are long-term budgets. For example, cash budget may be for a week, sales budget may be for a period of three months, revenue budget may cover a period of one year, capital expenditure budget may be for a period of three to five years.



CHECK YOUR PROGRESS

Q. 1: What is budget?

11.4 MEANING OF BUDGETARY CONTROL

In this section, we will discuss budget as a control technique. You are aware that budget expressed the managerial plans quantitatively. Budget is the estimation of future income and expenditure, while it is prepared on the basis of accounting data of past periods. Let us have a simple illustration to discuss the budgetary control -

Table 1: A Budget

Particulars	**Actual (Rs.)**	**Budget (Rs.)**	**Variance (Rs.)**
Sales	17, 000	15, 000	2, 000
Cost of goods sold	2, 000	1, 500	500
Gross Profit	15, 000	13, 500	1, 500
Office expenses	1, 500	1, 700	-200
Advertising Expenses	2, 500	2, 000	500
Total Expenses	**4, 000**	**3, 700**	**300**

The above budget shows some imaginary actual figures against the budgeted figures along with the variances. Budget as a controlling tool, as used by the management, compare the budgeted figures and the actual expenditure/ revenue. If there is any variance, the management have to find out the reasons

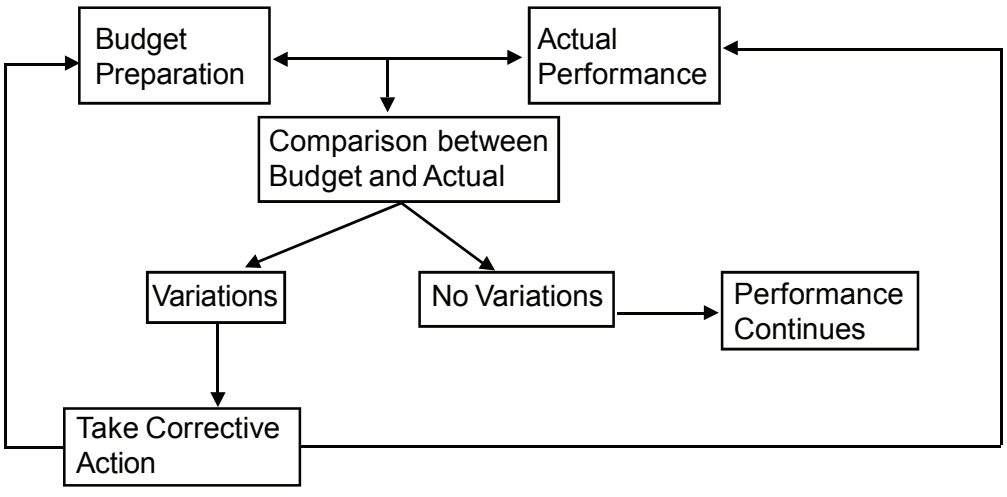
for such variances and may initiate the corrective action, if needed. In the absence of budget, the management is clueless what to control, how to control when corrective action is to be taken or the reasons for variances are beyond the control of the organisation.

As a controlling tool, budget facilitates a check on the expenses to be incurred under a particular head of expense. It serves dual purposes-

- Keep expenses under control; and
- Facilitates optimum allocation of funds among different organisational activities.

As a result, no organisational activity suffers because of lack of fund and avoids non- essential expenses. It ensures financial discipline across the organisation and scarce resources are used optimally. Going back to the illustration given above in Table 1, the advertising expenses have crossed the budget figure. Now, the management need to be cautious and search for the probable reasons for such over- expenditure. It also facilitates the fixing of responsibility over the personnel responsible for incurring advertising expenses and preparing the advertising budget. Then management can also relook whether there is any lack in coordination of activities.

Budgetary control is a continuous process. The different steps involved in the budgetary control may be shown as under-



Any organisation implementing budgetary control, first need to prepare the budget. The budget acts as standard against which the actual performance of the organisation is compared. The result of such comparison reveals-

Is the organisation able to implementing the plan as per estimate?

Is there any deviation from the planned course of action?

If the answer to these questions is "YES", the organisation is moving towards the achievement of stated goals within the budget.

If the answer to these questions is "NO", the organisation need to take corrective action immediately. This need to be done by reviewing the budget preparation stages or by evaluating the actual performance or analysing the business circumstances and so on. The entire process of reviewing the performance, comparing budget and actual performance, taking corrective action as and when needed etc. will be done on continuous basis.



CHECK YOUR PROGRESS 2

Q. 2: What is budgetary control?

11.5 ADVANTAGES OF BUDGETARY CONTROL

As you are now well versed with the concept of budgetary control, it is important here to discuss the objectives of budgetary control. The objectives of budgetary control may be stated as under-

- Encourage all the employees to coordinate their activities in the light of organisational objectives and the master budget of the organisation.
- The organisation can plan and control the income and expenditure for a particular period of time.
- Budget helps in planning the capital expenditure.
- Wastage of resources can be eliminated.
- Arrange the fund for working capital for smooth running of the organisation.

- Maximise profits by optimum utilisation of the scare resources.
- When the budgets and actual results are compared, the management can identify the reasons for deviations and the principle of "Management by Exception" can be applied to eliminate such deviations in the future.

11.6 LIMITATIONS OF BUDGETARY CONTROL

Budgets helps an organisation to coordinate the activities and to optimally use its resources. However, budget as a tool of control suffers from certain limitations. These limitations may be discussed as under-

- **Future uncertainties:** Future is always uncertain. It is difficult to predict the future without errors. As budget is prepared on the basis of assumptions about future, any change in circumstances reduces the utility of budget.
- **Budget revision:** The budgetary process requires constant monitoring of the events. Any change in the future events necessitates the revision of the budget. Frequent revision of the budget reduces its applicability and increases the cost.
- **Over-budgeting:** As the budget is prepared by taking into account the departmental requirements, there may be a tendency to overestimate the departmental requirements. Such practices may make the budget unrealistic.
- **Inflexibility:** Budgets are prepared for a particular period of time. The different heads and amount of expenses are fixed. Budget acts as a rigid controlling tool. The organisation may face difficulties to capitalise any opportunities that may arise in the said period.
- **Lack of Cooperation:** The preparation and implementation of budget requires active cooperation from all departments and individuals. Any problem in cooperation make the budget redundant.
- **Cost:** The budget process involves cost. The budget process may need efficient personnel to forecast the future trends and to coordinate all the activities of the organisation. For small organisations, the budget process may prove to be a costly affair.

- **Support of top management:** To run the budget process smoothly, the support of the top management is essential. If the top management fails to support the process, it is difficult to prepare an effective budget.



CHECK YOUR PROGRESS 3

Q. 3: State two advantages and two disadvantages of budgetary control.

11.7 TYPE OF BUDGETS

Budgets are of different types. The budgets can broadly be classified on the basis of functions and flexibility.

Let us first discuss some of the budgets on the basis of functions-

- **Sales budget:**It shows the estimated sales during the budget period in terms of quantity and value of sales. This budget also acts as guidance for other budgets. The sales manager is responsible for preparing g the sales budget. The sales manager need to take into account the information available from different sources, like past sales data, reports of salesmen, availability of raw materials, production capacity, market trends etc.
- **Production budget:** This is another functional budget which forecast the production during the budget period. It is prepared in relation to sales budget. This budget takes into account

  what to be produced

  when to be produced

  what cost to be incurred for production

  when men, money, material to made available, etc.

  The production manager prepare this budget based on the production planning, plant capacity etc.

- **Purchase Budget:** Purchase budget is prepared for estimating the purchases to be made for the organisation during the budget period. This include purchase of materials for production process, stationery for office use, requirements of research and development department etc. The purchase manager is responsible for preparing this budget and need to take into account the opening and closing stock, orders received, the levels of stocks to be maintained etc.
- **Cash Budget:** Cash budget is prepared to estimate the cash receipts and cash payment and the balance of cash during budget period. It shows the cash available for different activities. The aim of this budget is to make the cash available at the right time and to avoid the excess cash lying idle in the organisation. Cash budget depends on other budgets like, sales budget, purchase budget, production budget tec.
- **Master Budget:** Master budget set out the plan for the entire organisation. It coordinates all other budgets and encompasses all the activities of the organisation. It is generally prepared in the form of projected profit and loss account and projected balance sheet. Ge required information for these are provided by other budgets like cash budget, sales budget, production budget etc. It guides the top management in running the organisation.

Budgets based on flexibility are as follows-

- **Fixed Budget:** Fixed budget is prepared for a particular level of activity. There is no scope for incorporating the changes that may cause by change in business environment. This budget is prepared if the demand can be accurately forecasted or where budget period is very short. This budget can be prepared for those expenses which do not vary with the change in the level of activity. However, this budget fails to serve as an effective tool of cost control.
- **Flexible budget:** This budget is prepared for different levels of operation. The budget is flexible in terms of meeting the changes in the levels of operation. It estimates the cost, profit or loss at the various levels of operations.

11.8 ZERO BASE BUDGETING

The budgets, in general, are prepared by taking into account the budgets of previous years and an estimate is made about the changes that may take place in the future. Here, it is important to mention about **Zero Base Budget**. The zero base budget is prepared without referring the budget of previous years. The departmental heads of an organisation are required to prepare the budget by considering the current situations and an expectation of future. The budget helps in proper allocation of resources among the different activities and identify wasteful items of expenses. However, this requires high degree of managerial skill. The applicability of zero base budgeting is limited as it is difficult to apply in case of materials, labour, production overheads etc.

11.9 PERFORMANCE BUDGETING

The budgets are prepared in terms of monetary value. It takes into account the estimated amount of expenditure under different heads. In performance budget, both financial and physical activities are considered. These two are correlated by creating relationship of input and output. The budget is prepared in terms of activities, programmes, projects etc. The budget fixes the targets for each of the activity and measures the actual performance in terms of physical and financial terms.



CHECK YOU RPROGRESS

Q. 4: What is sales budget?

11.10 REQUISITES FOR SUCCESSFUL BUDGETARY CONTROL

We have come across the different types of budgets in the previous section. An organisation resorting to budgetary control will enjoy certain advantages. At the same time, the organisation must take into account that the

success of the budgetary control system depends on certain essential conditions. These may be stated as under-

- The budgetary control must get the support of the top management of the organisation.
- The budget should be based on realistic assumptions and goals set must be attainable.
- All the employees must be communicated about the importance of budget and how they need to contribute for its preparation.
- There must be proper delegation of authority.
- The budgetary control system should be flexible to incorporate unforeseen circumstances.



CHECK YOUR PROGRESS

Q. 5: State any two requisites for successful budgetary control.

11.11 ORGANISATION FOR BUDGEATRY CONTROL

In order to meet the conditions for the success of the budgetary control, there must be a proper organisational structure in relation to budget. This may not be visible in small organisations. So far as large organisations are concerned, the elements of the organisation for budgetary control may be discussed as under-

- **Budget centre:**A budget centre is a section within the organisation created for the purpose of budget preparation. The budget centre takes into account all the parts of the organisation.
- **Budget Officer:** The budget officer is responsible for coordinating all the activities for preparing and implementing the budget. The budget officer scrutinize all the budgets submitted by different departments of the organisation.
- **Budget Committee:** A budget committee is formed with all the departmental heads headed by the budget officer. The departmental heads

provide the budgets of the respective departments and help the committee to take collective decisions.

- **Budget period:** It refers to the time period for which the budget is prepared, which may be short- term, like cash budget, sales budget etc. On the other hand, it may be for a longer period like, capital expenditure budget. The period of the budget depends on a number of factors, like type of budget, nature of demand, the economic situation, the length of the trade cycle etc.

11.12 ILLUSTRATION

Let us discuss some illustration on the preparation of budget-

Illustration 1:

From the following information, prepare a flexible budget.

Unit sold

1st Quarter: Estimated Sales 100 units; Sale Price: Rs. 50;

2nd Quarter: Estimated Sales 125 units; Sale Price: Rs. 50

3rd Quarter: Estimated Sales 150 units; Sale Price: Rs. 75

4th Quarter: Estimated Sales 250 units; Sale Price: Rs. 75

Direct Material (per unit): Rs. 5

Direct Labour (per unit): Rs. 10

Variable Manufacturing Overhead (per unit):

1st Quarter: Rs. 3

2nd Quarter: Rs. 3

3rd Quarter: Rs. 4

4th Quarter: Rs. 4.20

Fixed Manufacturing Overhead: Rs.500

Variable Selling and Administrative Expenses (per unit):

1st Quarter: Rs. 2

2nd Quarter: Rs. 2

3rd Quarter: Rs. 2.10

4th Quarter: Rs. 2.10

Fixed Selling and Administrative Expenses: Rs. 250

Estimate the Net Profit or Loss

Solution :

Particulars Units sold (estimated)	**Unit Cost**	**Quarter 1** 100	**Quarter 2** 125	**Quarter 3** 150	**Quarter 4** 250
Sale Price (Rs.)		50	50	75	75
Sales (Rs.)		5000	6250	11250	18750
Cost of Goods Sold					
Direct Material	5	500	625	750	1250
Direct labour	10	1000	1250	1500	2500
Variable Manufacturing Overhead		300	375	600	1050
Fixed Manufacturing Overhead (Rs.)		500	500	500	500
Total Cost of Goods Sold		**2300**	**2750**	**3350**	**5300**
Gross Profit		2700	3500	7900	13450
Variable Selling and Administrative Expenses Fixed		200	250	315	525
Selling and Administrative Expenses		250	250	250	250
Total Other Expenses		**450**	**500**	**565**	**775**
Net Profit		2250	3000	7335	12675

11.13 BEHAVIOURAL IMPLICATIONS OF BUDGET

We are aware that budget is prepared by taking into consideration the entire activities of an organisation. The budget officer and the budget committee are concerned with inclusion of each and every activity of the organisation in

the budget preparation process. The success of the budgeting process requires full cooperation from all the employees of the organisation as well as the top management must support the budgetary process. Fulfilling these conditions will make the budget an effective controlling tool in the organisation. At the same time, managers must also be aware about the behavioural implications of budget. The behavioural implications of budget may be discussed as under-

Balancing organisational and individual goals: The budget process need to be carried out keeping in mind the organisation objectives. When setting the budgetary goals for a particular period of time, these goals must be realistic and attainable. When the employees can balance their individual goals with the organisational goals, they tend to show a positive behaviour. They extend their full cooperation to the budget process.

On the other hand, when they perceive the budget targets as unrealistic or find it difficult to make a balance between their personal and organisational goals, a negative behaviour may develop and the budget process may not be acceptable to them. The lack of cooperation and motivation on the part of the employees may make the hinder the implementation of the budget.

In order to avoid such behavioural implications, certain factors must be taken into consideration, like-

- **Budget education:** The employees of the organisation must be properly communicated about the importance of budget. Awareness about the budget, the role that they have to play in the budget process etc. will create a general understanding about the budget and it will facilitate in the development of a positive attitude towards budget.
- **Participatory process:** The budget preparation needs active cooperation form the top to lower levels management. All the employees need to be encouraged to contribute towards this process. Employees must be motivated to set their own goals in the light of the overall organisational goals.
- **Pressure on subordinates:** Budget is used as a controlling tool and it creates a sort of pressure on the subordinate employees. There must

be proper communication about the budget targets and these targets should not be set too high or too low.

- **Balancing inter- departmental conflict:**Budget allocates the resources among different departments in the organisation. As resources are scare, there is every possibility of conflict of interest among the different departments on the matter of resource allocation. Such conflict need to be avoided by balancing the resource allocation.



11. 14 LET US SUM UP

In this unit we have discussed the following aspects-

- When the plan of earning and spending money is expressed in terms of money, it is called budget.
- Budget shows the expected income and expenditure for a particular time period.
- Budget preparation is an important and regular activity that every organisation whether public or private, large or small, with or without profit motive, need to prepare the budget.
- Budget as a controlling tool, as used by the management, compare the budgeted figures and the actual expenditure/ revenue. If there is any variance, the management have to find out the reasons for such variances and may initiate the corrective action, if needed.
- Budgetary control is a continuous process.
- Some of the advantages of budget are-

✓ Budget helps in planning the capital expenditure.

✓ Wastage of resources can be eliminated.

✓ Arrange the fund for working capital for smooth running of the organisation.

- Some of the disadvantages of budget are-

- ✓ **Future uncertainties:** As future is uncertain, it is difficult to predict the future without errors. As budget is prepared on the basis of assumptions about future, any change in circumstances reduces the utility of budget.
- ✓ **Budget revision:** The budgetary process requires constant monitoring of the events. Any change in the future events necessitates the revision of the budget. Frequent revision of the budget reduces its applicability and increases the cost.
- ✓ **Over-budgeting:** As the budget is prepared by taking into account the departmental requirements, there may be a tendency to overestimate the departmental requirements. Such practices may make the budget unrealistic.

- Different types of budget, like sales budget, production budget, flexible budget, master budget, zero base budget, performance budget etc.
- Some of the essentials for the success of the budgetary control process are-
- ✓ The budgetary control must get the support of the top management of the organisation.
- ✓ The budget should be based on realistic assumptions and goals set must be attainable.
- The importance of organisation for effective budgetary control.
- The behavioural implications of budget.



11.15 FURTHER READING

Books : Murthy A. & Gurusamy S. (2009). *Management accounting* (2nd ed.). Tata McGraw Hill.

Gupta K.S. & Sharma R.K. (2007). *Management and cost accounting* (7th ed.). Kalyani Publishers.

Rao S. P. & Kumar T. V. (2010). *Management: Theory and practice (Text and cases)*. Himalaya Publishing House.

Web resource

7.1 Introduction to Budgeting and Budgeting Processes | Managerial Accounting (lumenlearning.com)

Financial and Nonfinancial Controls | Principles of Management (lumenlearning.com)

View of Behavioral Implications of Budget Preparation: A Review and Future Research Context (cribfb.com)

Budget constraint - Wikipedia



11.16 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No. 1: When the plan of earning and spending money is expressed in terms of money, it is called budget. It shows the expected income and expenditure for a particular time period. Budget is used as a tool for planning, coordinating and controlling the affairs of an organisation.

Ans. to Q. No. 2: Budgetary control is a continuous process.As a controlling tool, budget facilitates a check on the expenses to be incurred under the different heads of expense. It serves the following purposes-

- Keep expenses under control; and
- Facilitates optimum allocation of funds among different organisational activities.

Ans. to Q. No. 3: Two advantages of budgetary control are-

- It encourages all the employees to coordinate their activities in the light of organisational objectives and the master budget of the organisation.
- The organisation can plan and control the income and expenditure for a particular period of time.

Two limitations of budgetary control are-

- Future is always uncertain and hence, difficult to predict the future. Budget is prepared on the basis of assumptions about future, any change in circumstances reduces the utility of budget.

- The budgetary process requires constant monitoring of the events. Frequent revision of the budget reduces its applicability and increases the cost.

Ans. to Q. No. 4: Sales budget shows the estimated sales during the budget period in terms of quantity and value of sales. This budget acts as guidance for other budgets. The sales manager is responsible for preparing g the sales budget.

Ans. to Q. No. 5: Requisites for successful budgetary control are-

- The budgetary control must get the support of the top management of the organisation.
- The budget should be based on realistic assumptions and goals set must be attainable.

11.17 MODEL QUESTIONS

Q. 1: What is budget?

Q. 2: What is budgetary control?

Q. 3: Discuss the behavioural impact of budget.

Q. 4: Discuss the advantages and limitations of budgetary control.

Q. 5: Discuss the requisites for successful budgetary control.

** *** **

Unit 12 : SOCIAL COST BENEFIT ANALYSIS

UNIT STRUCTURE

12.1 Learning Objectives

12.2 Introduction

12.3 Social Cost Benefit Analysis

12.4 Social Costs

12.5 Social Benefits

12.6 Features of Social Cost Benefit Analysis

12.7 Objectives of Social Cost Benefit Analysis

12.8 Approaches of Social Cost Benefit Analysis

- 12.8.1 UNIDO Approach
- 12.8.2 Little Mirrlees Approach (L-M)
- 12.8.3 Similarities between UNIDO Approach and Little Mirrlees Approach (L-M)
- 12.8.4 Differences between UNIDO Approach and Little Mirrlees Approach (L-M)

12.9 Limitations of Social Cost Benefit Analysis

12.10 Project Planning

12.11 Project Planning Approach

12.12 Let Us Sum Up

12.13 Further Reading

12.14 Answers to Check Your Progress

12.15 Model Questions

12.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

- explain the concept of Social Cost Benefit Analysis is, its features and objectives.
- discuss about the various approaches of Social Cost Benefit Analysis.
- explain the limitations of Social Cost Benefit Analysis.
- explain about project planning and its approaches.

12.2 INTRODUCTION

In this modern era, the viability and aptness of a project is not only judge by the financial and economic profits derives from the project but also from societal point of views, how much benefits provided by the projects to society and its cost. Social Cost Benefit Analysis is a tool to judge the viability of a project from societal pinot of view. This is a holistic approach for appraisal of a project.

12.3 SOCIAL COST BENEFIT ANALYSIS

Appraisal of a project only from financial and economic aspect is not always appropriate. In most of the developed and developing countries, Governments are interested in bringing equity in every aspect. They not only consider the economic and financial aspect of a project, but also consider the welfare from the project. In that point, a new concept known as Social Cost Benefit Analysis (SCBA) has evolved. Social Cost Benefit Analysis is a tool to evaluate the viability of a project to the public by identifying various costs associated with and various benefits provided by the particular project. It is a comparative analysis of relative costs and outcomes of two or more alternative courses of action, where both the costs of an intervention and its resulting outcomes are expressed in monetary terms. These costs and benefits may be tangible and intangible one. Here, not only the level of costs and benefits associated with a project are determined but also who receives the benefits and paysthe costs are identified. In Social Cost Benefit Analysis (SCBA), a project is worth undertaking if it contributes the welfare of the society as a whole. Monetary aspects are ignored in this process of appraisal.

12.4 SOCIAL COSTS

The cost of goods when transported from one place to other, private firm is set to incur transportation costs. Besides this transportation cost, there are certain costs which ignored by a firm that has serious impact on the society. These costs are related to wear and tear of roads and pollution etc. These costs which have to borne by the society come under the head social costs.

Some examples of social costs for which business are responsible are – air pollution, water pollution, depletion and destruction of animal resource, soil erosion, deforestation, impairment of human resources, deterioration in the law and order condition etc.

Social costs can be classified into two broad categories namely social costs of staff and social costs of community and general public.

Social costs of staff include lay off and voluntary termination, extra hours worked by the officers voluntarily, work related injuries, undesired attitude formation etc.

Social costs of community and general public include increase in cost of living in the vicinity, consumption of power, central services and facilities consumed, state service and facility consumed, expenditure in foreign exchange, environmental damage, product short comings.

12.5 SOCIAL BENEFITS

The term social benefit refers to the increase in the overall welfare of community or society which is being derived from a particular course of action by a business firm or Government other than the person who is receiving the benefits. Social benefit is the total benefit received by the society. The benefits may be private benefits and public benefits.

Social benefits can be classified into two broad categories namely-social benefits of staff and social benefits of community and general public.

Social benefits of staff include medical and hospital benefits to the staff and his family, educational facilities, provident fund facilities, housing and township facilities, holiday, leave encashment, leave travel benefits, recreational and cultural facilities etc.

Social benefits of community and general public include taxes paid to the different authority, environmental improvements, generation of job potential, welfare activity for the community, business generation etc.

12.6 FEATURES OF SOCIAL COST BENEFIT ANALYSIS

The main features of Social-Cost Benefit Analysis are-

1. It is a systematic project evaluation technique.
2. It is both quantitative and qualitative in nature.

3. It is used for long term decision making in capital project appraisal.
4. It enables comparison between social cost and social benefit.
5. It mainly focuses on social impact of a project.
6. It requires unlimited efforts as it is quite difficult to measure social impact precisely.

12.7 OBJECTIVES OF SOCIAL COST BENEFIT ANALYSIS

The main objectives of conducting Social Cost Benefit Analysis are-

1. To identify and quantify the various costs and benefits associated with a project.
2. To find out a strategy with the help of which maximum benefits can be achieved at minimum costs.
3. To determine the feasibility of a project by discounting the various costs and benefits accrue over a period of time.
4. To determine the economic benefit of a project in terms of shadow prices.
5. To measure the impact of the project on the levels of savings and investment in the society.
6. To analyze the impact of the project on the distribution of income in the society.



CHECK YOUR PROGRESS

1. Fill up the blanks with appropriate word

   a. Social Cost Benefit Analysis is ……. approach.

   b. Social Cost Benefit Analysis identifies and compares the various …... and various …….. associated with the projects.

   c. Social costs can be classified into two categories namely... and ….

   d. Social benefits are of two types namely ……. and ……

   e. Social Cost Benefit Analysis is both ….. and …… in nature.

12.8 APPROACHES OF SOCIAL COST BENEFIT ANALYSIS

Approaches of social cost benefit analysis are basically criteria based on which Social Cost benefit Analysis of a project is done. There are basically two approaches on Social Cost Benefit Analysis. These two approaches are – 1. UNIDO Approach, 2. Little Mirrlees Approach (L-M).

12.8.1 UNIDO Approach

UNIDO stands for United Nation Industrial Development Organization. This approach was first articulated I the guidelines for Project Evaluation which provides a comprehensive framework for SCBA in Developing countries in the year 1978. In this approach, a project is evaluated from societal point of view not from individual point of view. It focuses on aggregate consumption. The followings things are done in UNIDO approach-

1. It measures the Cost and Benefit in terms of Domestic rupees.
2. It measures the Cost and Benefit in terms of consumption.
3. It focuses on efficiency, savings and redistribution aspect in different stages.

Stages of UNIDO Approach

The UNIDO approach of Social Cost Benefit Analysis involves the following five stages

1. **Calculation of financial profitability of a project:**
   The first stage of UNIDO approach is to measures at the financial profitability at market prices. A good technical and financial analysis must be done to measure the financial profitability of the project. Financial profitability is indicated by the Net Present value of the project measured by taking into account the total inputs (costs) and total outputs (benefits) of market price.

2. **Obtaining the net benefit of the project at shadow prices:**
   Measuring the financial profitability of a project would be sufficient only if the project is operated in perfect market as only in perfect market, market prices reflect the social value. So if the project is not operated

in perfect market, then the net benefit of the project can be determined by developing the shadow price of the project. Shadow prices may be defined as the value of the contribution to the country's basic socio-economic objectives made by any marginal change in the availability of commodities or factor of production. For example: a project of constructing a bridge may provide a transport facility which contributes the socio-economic objectives of the country.

3. **Adjustment for the impact of the project on Savings & Investments:**

   The third stage of UNIDO approach is the adjustment for the impact of the project on savings and investments. In this stage, amount gained or lost due to the project by different income groups like workers, business, customer etc. are determined and evaluate the net impact of this gain or loss in savings and investment at present value.

4. **Adjustment for the impact of the project on income distribution:**

   In this stage, impact of the project on income distribution on different income groups. Government considers a project as an investment for the redistribution of income in favour of economically weaker section or economically backward region. This stage measure the impact of a project on income distribution on different income groups or different region.

5. **Adjustment for the impact of the project on merit and demerit goods whose social values differ from their economic value:**

   This is the last stage of UNIDO approach for project evaluation. In this stage, various merit goods and demerit goods of a project are indentified. In some projects, there are some merit goods (e.g., oil, creation of employment etc.), the social value of which exceeds the economic value and there are some demerit goods (e.g., alcohol, cigarette etc.), the social value of which are less than the economic value.

12.8.2 Little Mirrlees Approach (L-M Approach)

I.M.D. Little and James A. Mirrlees developed a comprehensive model or approach for Social Cost Benefit Analysis of a project in 1968 for the projects of developing countries. It assumes that a country can buy and sell any quantity

of a particular goods at a given world price and hence, all traded inputs and outputs are valued at their international prices which is the shadow price/ opportunity of the particular good to the country. All non-tradable goods are valued at accounting prices.

In this approach, all inputs and outputs of a project are classified into two categories namely traded goods and services and non-traded goods and services.

Traded goods and services :

Traded goods and services are those goods and services which can be imported and exported from a country. The shadow price of traded goods and services are border price/international price.If the goods are imported, shadow price includes CIF value, domestic cost of transportation, handling insurance etc. If the goods are exported, shadow price is the FOB and excludes taxes and subsidies.

Non-traded goods and services :

Non-traded goods and services are those goods and services like building, land, infrastructure that are not available for foreign trade. For non-traded goods and services, there is no border price available for them. Shadow price for non-traded goods excluding labour arrived at marginal social cost and marginal social benefit. Marginal social cost is the value of resources required to produce an extra unit of goods and marginal social benefit is the value of extra unit from marginal social cost. All non-traded inputs are valued at accounting prices. To determine the accounting price of non-traded inputs, first we have to estimate the proportion in which demand for that input will be met from increased production and decreased consumption. If the proportion of increase in production to decrease in consumption is 2:1, then the shadow price of the non-traded input will be $2/3^{rd}$ marginal social cost + $1/3^{rd}$ marginal social benefit. The calculation of marginal social benefit and marginal social cost is very difficult in practice. Therefore, L-M suggests that the monetary cost of non-traded items is to be broken down into tradeable, labour and residual components. The tradable and residual components can be converted into marginal social cost

with the help of suitable conversion factor and labour costs can be converted into marginal social cost by applying shadow wage rate. The formula suggested by L-M for calculation of shadow wage rate is:

$$SWR = C' - \frac{1}{s} (c-m)$$

Where,

SWT = Shadow Wage rate

C' = Additional resources devoted to consumption

1/s = social value of unit so committed

c = Consumption of wage earner

m = marginal product of wage earner

In L-M approach, social profit is calculated by considering the following:

1. The future social profit for all the projects must be discounted in the same way.
2. There should be a balance between investment and investible resources.
3. L-M said that experience is the best guide for calculating future social benefit at present value.

12.8.3 Similarities between UNIDO Approach and Little Mirrlees Approach

There are certain similarities between UNIDO approach and L-M Approach. These similarities are-

1. Both approaches are for Social Cost Benefit Analysis of project.
2. Both approaches calculate the accounting prices (shadow prices) for foreign exchange savings and unskilled labour.
3. Both approaches consider the factor of equity.
4. Both the approaches take cash flows at their present value after applying discount factor.

12.8.4 Difference between UNIDO Approach and Little Mirrlees Approach

SL No	UNIDO Approach	L-M Approach
1.	It measures shadow prices in terms of domestic prices.	It measures shadow prices in terms of international prices.
2.	UNIDO approach measures costs and benefits in terms of domestic prices.	L-M Approach measures costs and benefits in terms of international prices.
3.	UNIDO approach measures costs and benefits in terms of consumption.	L-M Approach measures costs and benefits in terms of uncommitted social income.
4.	UNIDO approach recommends stage by stage analysis of efficiency, savings and redistribution consideration.	L-M Approach views the efficiency, savings and redistribution consideration together.

12.9 LIMITATION OF SOCIAL COST BENEFIT ANALYSIS

1. The advantage of Social Cost Benefit Analysis depends upon the accuracy of the data input.
2. The social cost benefit analysis is not required in those investments where the benefits are quite visible and tangible from the point view of society.
3. It is very difficult to measure the social costs and benefits in an accurate manner.

12.10 PROJECT PLANNING

A project plan is a series of formal documents that define the execution and control stages of a project. It is one of the stages of project life cycle. It involves creating planning documents to guide the team throughout the project delivery. In this stage, most of the organization deal with the followings and take necessary action for execution of the same.

1. Project infrastructure and enabling services
2. System design and basic engineering package.
3. Operation and manpower
4. Schedules and budgets
5. Licensing and Governmental clearance
6. Finance
7. System and procedures
8. Identification of project manager
9. Design basis, general condition for purchase and contract
10. Site preparation and investigation
11. Construction resource and materials
12. Work packaging

Thus this stage of a project involves preparation for smooth operation and successful completion of the project. This phase often taken as a part of implementation phase as it does not limit itself to paper work and thinking but many activities like field work, site preparation etc. are undertaken in this phase.

12.11PROJECT PLANNING APPROACH

There are two project planning approaches in project management. They are -1. Product Based Approach and 2.Work or activity Based Approach.

Product Based Approach

In product based approach, a detailed planning done on the identification of the project deliverables i.e., the product created from the project and delivered to the customers. The product may be a software, document, piece of equipment, even a person (trained person), and modified version of some existing products. The planning under this approach includes –

1. The identity of the product
2. A description of the product

3. The product or products that have to exist before this one can be created;
4. The components that make up the product
5. The format of the product
6. The quality criteria that explain how the product will be judged as satisfactory

Work or Activity Based Approach

Under this approach, a detailed planning is done on the works or activities that have been performed in the project. It identifies the required work activities or task that have to be done to achieve the project goal. This includes-

1. List of works and activities arranged in logical manner,
2. Persons on whom the works or activities are assigned,
3. Their duties, power and responsibility,
4. Time duration for each work and activity,
5. Cost estimation of each work or activity,
6. Feasibility of each work etc.
7. Analyzing, merging and redesigning business processes,
8. Reporting progress etc.



CHECK YOUR PROGRESS

2. Mention whether the following statements are true or false.

a. UNIDO stands for United Nation Industrial Development Organization.

b. UNIDO focuses on aggregate consumption.

c. UNIDO approach measures costs and benefits in terms of international prices.

d. I.M.D. Little and James A. Mirrlees developed Little Mirrlees Approach.

e. L-M Approach measures costs and benefits in terms of international prices.

f. L-M Approach divides the goods into two categories



12.12 LET US SUM UP

In this unit, we have discussed the following :

- Social Cost Benefit Analysis is a tool to evaluate the viability of a project to the public by identifying and comparing the various costs associated with and various benefits provided by the particular project.
- Social costs of a project are those costs which have to borne by the society because of undertaking that project. Social costs can be classified into two broad categories namely social costs of staff and social costs of community and general public.
- Social benefit of a project is the total benefit enjoyed by the society derived from that project. Social benefits are of two types namely- social benefits of staff and social benefits of community and general public.
- There are two types of approach of Social Cost Benefit Analysis. They are- UNIDO Approach and Little Mirrlees Approach.
- A project plan, a stage of project life cycle, is a series of formal documents that define the execution and control stages of a project.
- There are two project planning approaches in project management namely Product Based Approach and Work or activity Based Approach.



12.13 FURTHER READING

Vidya-mitra. (2016, April 14). *Social cost benefit analysis: meaning and rationale (BSE)*. https://www.youtube.com/watch?v=AY4qUzr5Q84

Vidya-mitra. (2016, April 14). *Little Mirrlees Analysis (BSE)*. https://www.youtube.com/watch?v= Ej2EtCiono

Aditi Takiar , DAVCG , YNR. (2020, March 30). *Social Cost Benefit Analysis , Part 2 (UNIDO Approach)*. https://www.youtube.com/watch?v=XBzYroiX6wI

Aggarwal, S. (n.d.). *LITTLE-MIRRLESS MODEL (L-M APPROACH OF SCBA)/SCBA PART 3*. Retrieved July 16, 2022, from https://www.gargshashi.com/2020/10/LITTLE-MIRRLESS-APPROACH.html

12.14 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q. No. 1: a) systematic approach, b) social benefits, social costs, c) social costs of staff, social costs of community and general public, d) social benefits of staff, social benefits of community and general public, e) quantitative, qualitative.

Ans. to Q. No. 2: a) True, b) True, c) False, d) True, e) True, f) True.

12.15 MODEL QUESTIONS

1. What is Social Cost Benefit Analysis? What are the features of Social Cost Benefit Analysis?
2. Mention five objectives of Social Costs Benefit Analysis?
3. Write short notes on:

   a) Social Costs, b) Social Benefits.
4. Write a detail notes on the various approaches of Social Costs Benefits Analysis?
5. What are the various stages of UNIDO approach?
6. How does UNIDO approach similar to L-M approach?
7. Compare and contrast between the UNIDO approach and L-M approach.
8. What are the limitations of Social Cost Benefits Analysis?
9. What is project planning? Write a detail notes on the various approaches of project planning?

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