



Advanced Cost and Management Accounting

COURSE CODE: M21CM02DE

Master of Commerce

Discipline Specific Elective Course

Self Learning Material



SREENARAYANAGURU
OPEN UNIVERSITY

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The State University for Education, Training and Research in Blended Format, Kerala

SREENARAYANAGURU OPEN UNIVERSITY

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To increase access of potential learners of all categories to higher education, research and training, and ensure equity through delivery of high quality processes and outcomes fostering inclusive educational empowerment for social advancement.

Mission

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Pathway

Access and Quality define Equity.

Advanced Cost and Management Accounting

Course Code: M21CM02DE

Semester - III

Discipline Specific Elective Course Master of Commerce Self Learning Material (With Model Question Paper Sets)



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ADVANCED COST AND MANAGEMENT ACCOUNTING

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Semester- III

Discipline Specific Elective Course

Master of Commerce

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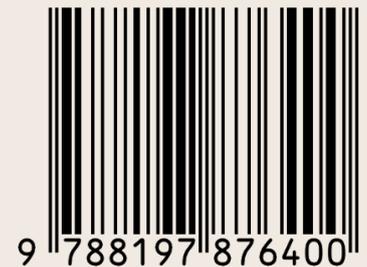


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Dear learner,

I extend my heartfelt greetings and profound enthusiasm as I warmly welcome you to Sreenarayanaguru Open University. Established in September 2020 as a state-led endeavour to promote higher education through open and distance learning modes, our institution was shaped by the guiding principle that access and quality are the cornerstones of equity. We have firmly resolved to uphold the highest standards of education, setting the benchmark and charting the course.

The courses offered by the Sreenarayanaguru Open University aim to strike a quality balance, ensuring students are equipped for both personal growth and professional excellence. The University embraces the widely acclaimed “blended format,” a practical framework that harmoniously integrates Self-Learning Materials, Classroom Counseling, and Virtual modes, fostering a dynamic and enriching experience for both learners and instructors.

The University aims to offer you an engaging and thought-provoking educational journey. This learning material titled Business Policies and Strategic Management offered for MCom programme builds on the knowledge gained in undergraduate studies. It takes the basic understanding of business concepts and expands on them. The course combines theory and real-world practices to give learners a complete picture. We use case studies and examples to help explain complex ideas. Throughout the Blocks, learners will develop their analytical and decision-making skills, which are crucial for managing businesses effectively. The Self-Learning Material has been meticulously crafted, incorporating relevant examples to facilitate better comprehension.

Rest assured, the university’s student support services will be at your disposal throughout your academic journey, readily available to address any concerns or grievances you may encounter. We encourage you to reach out to us freely regarding any matter about your academic programme. It is our sincere wish that you achieve the utmost success.



Warm regards.
Dr. Jagathy Raj V. P.

01-01-2025

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01 BLOCK

Marginal Costing Techniques for Decision- Making

Block Content

- Unit - 1 INTRODUCTION TO MARGINAL COSTING
- Unit - 2 MARGINAL COSTING AND DECISION MAKING

Unit 1

Introduction to Marginal Costing

Learning Outcomes

After completing this unit, the learners will be able to:

- ◆ Understand the meaning of marginal cost
- ◆ Understand the meaning of marginal costing
- ◆ Gain insights on the importance and uses of marginal costing.
- ◆ Understand the concept of CVP Analysis and its techniques.

Background

Marginal cost refers to the additional cost incurred when a business firm produces one more unit of a product. It represents the variable costs directly associated with production, such as raw materials, direct labour, and variable overheads. Since fixed costs remain unchanged in the short run, marginal cost only considers costs that vary with production levels. Marginal costing focuses on variable costs to determine profitability and decision-making. It separates costs into fixed and variable components. This allows businesses to analyse the impact of the changes in production on the total costs and profits. Unlike absorption costing, which includes fixed costs in product valuation, marginal costing charges only variable costs to products, treating fixed costs as period costs. Marginal costing assists businesses in pricing, production planning, and decision-making. It helps in determining the break-even point, which is the level of output where total revenue equals total costs, enabling companies to assess profitability. By emphasising contribution margin (selling price minus variable cost per unit), marginal costing provides a clear picture of how sales impact profits. Thus, this unit deals with the various concepts related to marginal costing.

Keywords

Marginal Cost, Marginal Costing, Cost - Volume - Profit Analysis

Discussion

1.1.1 Marginal Cost

- ◆ Additional costs are incurred for producing an extra unit of a product.

Marginal Cost is the additional or incremental cost incurred for producing an additional or extra unit of a product. Marginal cost shows how the total cost changes when we increase or decrease the output by one unit. Chartered Institute of Management Accountants (CIMA) London has defined marginal cost as “the amount at any given volume of output by which the aggregate costs are changed if the output is increased or decreased by one unit”. Here, “a unit” may be an order, a single product, a batch of products, a process, or even a specific stage involved in a series of production stages.

The per unit marginal cost remains constant irrespective of the volume of production or the level of activity. In order to gain more understanding of the topic of marginal cost let us delve into an example

Let's say ABC Ltd is a firm which manufactures 500 units of a product on a monthly basis. The total fixed cost is ₹25,000 and the per unit variable cost of the product is ₹1,250. The total cost each month would be calculated as follows:

Fixed Cost	₹ 25,000
Variable cost of 500 units	₹ 6,25,000
Total Cost	₹ 6,50,000

Let's assume that ABC Ltd has increased the production by one more unit.

Then, now the total cost would be:

Fixed Cost	₹ 25,000
Variable cost of 501 units	₹ 6,26,250
Total Cost	₹ 6,51,250

This additional cost incurred for producing an extra unit ₹1,250 (i.e., ₹6,51,250 - ₹6,50,000) is the marginal cost of the product. If we take a closer look at the above example, we can see that the additional cost that was incurred is equal to the variable cost of the product. Thus, we can say that marginal cost is



actually the variable cost of the product.

Here, Variable Cost means the sum of Direct Material, Direct Labour, Direct Expenses and Variable Overheads. Variable overheads comprise variable production overheads, variable administration overheads, and variable selling and distribution overheads.

1.1.2 Marginal Costing

◆ Costing technique where only the variable costs are charged to cost units and fixed costs are written off.

Marginal Costing is a costing technique. In marginal costing, only the variable costs are charged to cost units, and fixed costs are written off in full by charging them to the profit and loss account. According to the Institute of Cost and Management Accountants, London, Marginal Costing is defined as “the ascertainment of marginal costs and of the effect on profit of changes in volume or type of output by differentiating between fixed costs and variable costs”.

◆ variable and fixed costs

Variable costs are the costs that change in direct proportion according to the changes in the level of production or volume of output such as the cost of raw materials used in the production process, wages of workers and so on. Fixed costs are those costs which remain the same despite the variations in the level of production or volume of output. It must also be remembered that fixed costs only remain constant up to a certain production level and thereafter, they tend to vary. In other words, fixed costs tend to vary in the long run.

Marginal Costing Versus Absorption Costing

◆ Absorption costing charging all types of costs to processes, products or operations

The concept of marginal costing is often contrasted with the technique of absorption costing. Also referred to as the Traditional or Full cost Method, Absorption costing involves charging all types of costs, both variable and fixed costs, to the processes, products or operations. According to CIMA, London, “Absorption Costing is the practice of charging all costs, both variable and fixed, to operations, processes or products”.

Table 1.1.1

Difference between Absorption Costing and Marginal Costing

Basis	Absorption Costing	Marginal Costing
Costs	Here, both fixed and variable costs are charged to the products, processes, and operations.	Only variable costs are charged to products whereas fixed costs are considered period costs.

Inventory valuation	Here, the total cost, comprising both the fixed cost and variable cost, is used to evaluate finished goods and work in progress.	Here, finished goods and work in progress are valued at marginal cost or variable cost.
Managerial decision-making.	Here, profit (sales minus total cost) forms the foundation for managerial decision-making.	Here, the Contribution margin (Sales minus variable cost) forms the basis for managerial decision-making.
Over or under-absorption of fixed cost	As fixed costs are arbitrarily apportioned over product costs in absorption costing, the possibility of over or under-absorption arises.	As fixed costs are excluded in marginal costing, the possibility of over and under-absorption of fixed costs is eliminated.

1.1.2.1 Characteristics / Features of Marginal Costing

The following are the distinguishing features of the marginal costing technique.

- 1. Technique of Costing:** Marginal Costing is a technique of costing and not a method of costing. Techniques differ from methods of costing. Techniques refer to the diverse ways of analysing and presenting the different costs, which aids the management in decision –whereas methods of costing refer to the various processes and techniques employed by firms in order to ascertain their costs. Different industries use different costing methods depending upon the nature of their business. There are different costing methods such as process costing and job costing.
- 2. Segregation of Cost:** There are different cost elements such as production, administration, selling and distribution. Under marginal costing, each of these cost elements is further bifurcated into fixed and variable cost elements. The semi-variable costs are also further segregated into fixed costs and variable costs.
- 3. Product Costs:** In marginal costing, only variable or marginal costs are considered product costs.
- 4. Period Costs:** Under Marginal costing, the fixed costs are treated as period costs and they are charged to the Cost-

ing Profit and Loss Account for the corresponding period in which they are incurred.

5. **Inventory:** The finished goods or work in progress are also valued at marginal costs
6. **Determination of prices:** Prices under marginal costing are determined based on marginal costs after adding contribution. Contribution is nothing but the excess of sales over variable costs.
7. **Profitability:** A contribution margin is also employed to determine the profitability of products or departments.

1.1.2.2 Assumptions of Marginal Costing

1. There is a segregation of all types of costs into fixed costs and variable costs under the marginal costing technique.
2. Regardless of the level of output, the variable cost per unit remains constant. However, it varies according to the changes or fluctuations in the levels of production. In other words, the changes in variable cost are directly proportional to the changes in the volume of output.
3. Regardless of the level of output, the selling cost per unit also remains constant.
4. Fixed costs do not vary for the entire volume of production and remain constant.
5. The only factor which influences the cost is the level of output or the volume of production.

1.1.2.3 Uses of Marginal Costing

i. Facilitates the fixation of selling prices

Determination of the selling price is a crucial decision as it has the potential to impact the profitability of the business firm. The marginal costing technique comes as a vital aid to management in the situation of fixing product selling prices. We know that the sale of a product at any price below the level of marginal cost will lead to a cash loss for the firm, as marginal cost represents the basic or minimum price that can be fixed for a product. In addition to this, firms should also make a reasonable contribution to cover the fixed costs. Hence, if the marginal cost of the product and the overall profitability of the concern are estimated in advance, then the fixing price would become easier.

◆ Helps in setting selling price by ensuring they cover atleast the marginal cost.

ii. Helps to maintain the desired level of profit

- ◆ Helps to determine sales volume to maintain a desired level of profit

Due to competitive pressures, regulatory requirements, or other unavoidable factors, business firms are often required to reduce product prices periodically. Such price reductions lower the contribution margin per unit, but the business firms will want to sustain a minimum profit level. However, the companies can still maintain this minimum level of desired profit by increasing sales volume if the demand for the company's products is elastic. For this, marginal costing techniques can be applied to estimate the necessary sales volume that will be required to be achieved by the firms in order to maintain a desired level of profit.

iii. Helps to accept a price less than its total cost

- ◆ Firms set selling prices above marginal cost but below total cost to contribute to fixed cost

Many times, there are situations where firms are forced to set the selling price of a product below its total cost during special circumstances like trade depression. The selling price of a product during special scenarios is fixed at a level above its marginal cost but below its total cost. The selling prices are fixed in such a fashion because any price above the marginal cost will positively contribute to covering fixed costs, even if it does not fully cover total costs. This is better than not having any contribution towards fixed costs at all. So, when an organisation receives a specific order, setting a price below total cost but above marginal cost may be justifiable, provided that it does not adversely affect the domestic market.

iv. Facilitates the determination of sales mix

- ◆ Products prioritised based on their per unit contribution

Marginal costing also helps to decide to select the appropriate sales mix or production. For this, the per unit contribution of each product is evaluated. The products are prioritised on the basis of their respective per-unit contribution of each product. The product with the highest contribution is given the highest preference or priority for production, and those with the lowest contribution are given the least preference or priority. However, the calculations are done assuming fixed costs remain constant. Products that generate a negative contribution margin should be discontinued or deprioritised, unless there are compelling reasons to continue their production.

v. Helps to decide whether to make or buy the products

- ◆ Marginal cost compared with purchase price

A make-or-buy decision involves determining whether a company should produce a component of the finished product or finished product in-house (make) or purchase it from an external supplier (buy). In order to take the make or buy decision,



the marginal costs of manufacture internally by the firm will be compared with the price quoted by an external supplier in the market. Suppose the marginal costs are found higher as compared to the purchase price. In that case, decision is taken to procure the product or component from outside rather than opting for in-house manufacture or production and vice-versa.

vi. Helps to fix the optimum level of activity

- ◆ Contribution of different activity levels are determined

Business firms often employ the technique of marginal costing to determine the optimum activity level. For this, the contribution of different activity levels is determined. Finally, the activity level that gives the highest contribution will be chosen as the optimum activity level.

vii. Helps to choose the best method of production

- ◆ Contribution of each method is calculated to select the best method

Marginal costing also aids management in selecting the best method from among the various methods of production. In such situations, the business firms can calculate the contribution of each method of production, and the one that gives the highest contribution can be chosen.

viii. Helps to analyse the impact of changes in sales price

- ◆ Impact on sales price analysed using contribution techniques

Due to several factors such as changes in the levels of competition, changes in government regulations or expansion plans, a business organisation may be confronted with the problem of bringing about alterations in their selling prices. So, it would be imperative to analyse the impact of such variations in selling prices on the profitability of the business firm. This impact can be easily examined without any hassle using the contribution technique.

ix. Performance Evaluation:

- ◆ Performance evaluation of divisions, departments using P/V ratio

Marginal costing is also employed by the firms for evaluating the performance of the different divisions, departments, product lines and markets. Similarly, business firms can also decide on unprofitable ones among each category (i.e., departments, divisions, product lines, markets) so as to discontinue their operations in the future. Using the P/V ratio, the performance of the different divisions, departments, product lines and markets can also be evaluated and compared. The one which gives the lowest P/V ratio in each category may be discontinued.

1.1.2.4 Importance of Marginal Costing

Marginal Costing is a vital technique which aids the management in planning and controlling the operations of the firm. The following point highlights the importance of marginal costing.

- ◆ **Aids in managerial decision-making:** Many times, management is confronted with the problem of making choices that are crucial enough to impact the profitability of the business. Some of such scenarios include whether to make or buy a product, how to select a profitable sales mix, whether to accept or reject an offer, how to deal with the problem of limiting factors or key factors, how to determine the optimum level of activity, whether to continue or shut down business operations and so on. So, Marginal Costing plays an imperative role in managerial decision-making in making precise decisions in the above circumstances.
- ◆ **Helps in Cost Control:** Marginal Costing helps to exercise control over the variable overheads and avoids the need for arbitrary apportionment, allocation and absorption of fixed overheads.
- ◆ **Facilitates Profit planning:** Marginal Costing aids the management in planning the profit by determining the profit at different levels of sales and volume of production.
- ◆ **Aids in Production Planning:** The marginal cost per unit remains constant despite the variations in the level of output or volume of production. The stable nature of marginal cost (per unit), in turn, enables the management to plan their production processes with ease.
- ◆ **Aids the determination of different parameters or factors:** Marginal costing enables the management to determine several parameters like break - even point (the level of production at which total cost becomes equal to the total revenue), the different amounts of profits expected at various activities levels, the sales that have to be achieved in order to achieve a desired or pre-fixed amount of profit, the impact of variations in wages, variations in raw material prices and variations in sales mixture on the profit of the firm and so on.

1.1.2.5 Limitations of Marginal Costing

- ◆ All the assumptions of marginal costing may not hold good under certain circumstances. They are discussed below
 - a. For instance, after a certain level of activity, fixed cost will not remain constant and will start to vary.
 - b. Segregation of cost may not be easy in all cases. It may be difficult to segregate certain costs into fixed and variable



costs in certain cases. For example, semi variable costs.

- c. Similarly in the case of Variable costs, they do not always stay constant or vary directly in proportion to output volume. This happens due to the effects of the law of diminishing or increasing returns.
- d. Due to several factors such as changes in price levels, changes in the competition levels, discounts etc, the selling price may not remain constant indefinitely or across all output levels.
 - ◆ In the long run, setting selling prices requires consideration of fixed costs; therefore, pricing decisions cannot rely solely on marginal costs in long run.
 - ◆ Marginal costing completely overlooks the time factor. If two jobs provide the same contribution but one takes longer to complete, the longer job should be considered more costly. However, this aspect is entirely disregarded under marginal costing.
 - ◆ As mentioned earlier, fixed costs are not considered while valuing finished goods and work-in-progress inventories in marginal costing. In reality, this practice is completely illogical as fixed costs also forms part of manufacturing costs. Stocks valued under marginal costing are undervalued, meaning the profit and loss statement cannot accurately reflect true profits. Likewise, the balance sheet does not provide an accurate picture of the company's financial position since stock values are understated.
 - ◆ Though the scenario under or over absorption of fixed overheads never arises in the application of the marginal costing technique, the problem of under or over absorption may crop up in the case of variable overheads.

1.1.2.6 Determination of Cost and Profit under Marginal Costing

Table 1.1.1

Cost and Profit Statement under Marginal Costing

Particulars	Amount ₹	Amount ₹
Sales/ Revenue (A)		XXX
Costs of Sales / Production		
Direct Material (i)	XXX	
Direct Labour (ii)	XXX	
Direct Expenses (iii)	XXX	
Variable overheads (iv)	XXX	
Total (B) [(i) + (ii) + (iii) + (iv)]		XXX
Contribution (C) [(A) – (B)]		XXX
Less: Fixed Overheads		XXX
Profit		XXX

Here variable overheads include variable production overheads, variable administration overheads and variable selling and distribution overheads. Fixed overheads include fixed production overheads, fixed administration overheads and fixed selling and distribution overheads.

1.1.3 Cost - Volume - Profit Analysis (CVP Analysis)

The Cost – Volume – Profit Analysis, an important tool used in the profit planning, cost control and decision – making of a firm can be considered as the logical extension of the marginal costing technique. CVP analysis explores the relationship between the three crucial factors namely the cost, volume and profit. These factors are interconnected as well as interdependent. Although the profits of a firm are influenced by diverse factors, the cost of production or manufacture, the volume of sales and the selling price are the three predominant factors which has the capability to bring a significant impact on the profit of the business firms. Management uses CVP analysis to find solutions to different business dilemmas such as determining the break –even point, selecting an appropriate sales mix, determining the optimum activity level, fixation of selling prices, make or buy decisions, determine the amount of sales to be achieved to avoid losses, determine the amount of sales to earn a desired amount of profit, study the impact of changes in prices, cost and sales volume on profits and so on. The different techniques or elements or concepts forming part of the CVP analysis are contribution, marginal cost equation, profit –volume ratio, break even analysis and margin of safety. Each of these concepts are further discussed in the subsequent sections.

- ◆ Analyses the relationship between the three factors - cost, volume and profit.

1.1.3.1 Contribution

Contribution shows the amount by which sales revenue exceeds variable costs. It is also referred to as ‘Contribution Margin’ or ‘Gross Margin’. Contribution represents the portion of sales that contributes to covering fixed costs and generating profit. In other words, contribution is equal to fixed cost plus profit. If the contribution is higher than the amount of fixed costs, then there will be profit. On the other hand, if the amount of fixed cost is higher than the amount of contribution, then it will lead to loss. If the fixed cost is nil, then contribution will become equal to profit.

- ◆ Portion of sales that contributes to covering fixed costs and generating profit

Contribution:

$$\text{Contribution} = \text{Sales} - \text{Variable Cost}$$

OR

$$\text{Contribution} = \text{Fixed Cost} \pm \text{Profit / Loss}$$

1.1.3.2 Marginal Cost Equation

We know that $\text{Sales} - \text{Variable Cost} = \text{Contribution}$ and $\text{Contribution} = \text{Fixed Cost} \pm \text{Profit/Loss}$

This implies that

$$\text{Sales} - \text{Variable Cost} = \text{Fixed Cost} \pm \text{Profit / Loss}$$

Thus, the marginal cost equation =

$$S - VC = FC \pm P$$

◆ Marginal Cost Equation

Where S denotes Sales, VC denotes – Variable Cost, FC denotes Fixed Cost, and P denotes Profit.

Let's take a few examples further to understand the application of the marginal cost equation.

Illustration 1.1.1

You are required to determine the variable cost from the following particulars

Sales – ₹ 5,00,000, Fixed Cost - ₹1,30,000 , Profit ₹ 80,000

Solution :

$$\text{Sales} - \text{Variable Cost} = \text{Fixed Cost} + \text{Profit}$$

$$5,00,000 - \text{Variable Cost} = 1,30,000 + 80,000$$

$$\text{Variable Cost} = 5,00,000 - 2,10,000$$

$$= ₹ 2,90,000$$

Illustration 1.1.2

From the following details, calculate the amount of profit earned during the year.

Variable Cost - ₹ 20 per unit, Fixed Cost – ₹4,50,000, Selling Price - ₹50 per unit,

Number of units produced – 50,000 units

Solution:

$$\text{Total Sales Value} = \text{Selling price per unit} \times \text{No: of units}$$

$$= ₹ 50 \times 50,000$$

$$= ₹25,00,000$$

$$\text{Variable cost} = \text{Variable cost per unit} \times \text{No: of units}$$

$$= ₹ 20 \times 50,000$$

$$= ₹10,00,000$$

Marginal Cost Equation :

$$\begin{aligned}\text{Sales} - \text{Variable cost} &= \text{Fixed Cost} + \text{Profit} \\ 25,00,000 - 10,00,000 &= 4,50,000 + \text{Profit} \\ 15,00,000 &= 4,50,000 + \text{Profit} \\ \text{Profit} &= 15,00,000 - 4,50,000 \\ &= ₹10,50,000\end{aligned}$$

Illustration 1.1.3

Calculate the Fixed cost from the following information

Sales - Rs . 10,00,000, Variable cost - 50%, Profit - ₹ 2,00,000

Solution

$$\begin{aligned}\text{Sales} &= ₹10,00,000 \\ \text{Variable cost} &= 50\% \\ &= \frac{50}{100} \times 10,00,000 \\ &= ₹ 5,00,000\end{aligned}$$

Marginal Cost equation

$$\begin{aligned}\text{Sales} - \text{Variable Cost} &= \text{Fixed Cost} + \text{Profit} \\ 10,00,000 - 5,00,000 &= \text{Fixed cost} + 2,00,000 \\ 5,00,000 &= \text{Fixed Cost} + 2,00,000 \\ \text{Fixed Cost} &= 5,00,000 - 2,00,000 \\ &= ₹3,00,000\end{aligned}$$

1.1.3.3 Profit Volume Ratio (P/V ratio)

The **Profit-Volume (PV) Ratio**, also known as the **Contribution Margin Ratio**, Contribution Ratio' or 'Marginal Ratio', is a ratio which expresses the relationship between the contribution (i.e, sales revenue minus variable costs) and sales revenue. The ratio indicates the amount of sales which is available to cover the fixed cost and the profit. The P/V ratio is usually expressed in percentage. It is calculated as follows:

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

◆ Expresses the relationship between the contribution and sales revenue.

A high PV Ratio indicates a strong ability of the firm to cover fixed costs and yield profits from additional sales, while a low PV ratio suggests that the firm needs to increase its sales volume to reach profitability.

However, we know that Contribution = Sales – Variable Cost and Contribution = Fixed + Profit. So substituting these formulas in the above equation, P/V ratio can also be expressed as

$$\text{P/V ratio} = \frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} \times 100$$



$$\text{P/V ratio} = \frac{\text{Fixed Cost} + \text{Profit}}{\text{Sales}} \times 100$$

$$\text{P/V ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$$

Uses of Profit Volume Ratio

- i. The PV ratio is a crucial tool that enables management to estimate the break-even point.
- ii. The P/V ratio helps to estimate the different amounts of profit the firm will be able to earn for different sales levels.
- iii. The sales volume required to earn a stated amount of profit can also be estimated with the help of this ratio.
- iv. The ratio helps to determine the contribution for a stated sales volume.
- v. The ratio helps to determine the sales volume for a variable cost
- vi. The ratio helps to determine the variable cost for a stated sales volume

Let us consider the formula for the P/V ratio once again,

$$\text{P/V ratio} = \frac{\text{Fixed Cost} + \text{Profit}}{\text{Sales}}$$

Using the above formula, the sales required to be achieved for a pre-determined amount of profit can be found using the following formula.

$$\text{Sales} = \frac{\text{Fixed Cost} + \text{Profit}}{\text{P/V ratio}}$$

Illustration 1.1.4

Calculate P/V ratio under each of the following cases

- i. Contribution = ₹75, Sales = ₹300
- ii. Sales = ₹ 90 Variable cost = ₹60
- iii. Fixed Cost = ₹50, 000, Profit = ₹10,000, Sales = ₹1,20,000

Solution:

- i. Given Contribution = ₹75, Sales = ₹300

$$\begin{aligned} \text{P/V ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 \\ &= \frac{75}{300} \times 100 \\ &= 25\% \end{aligned}$$

ii. Given Sales = ₹90, variable Cost = ₹60

$$\begin{aligned} \text{P/V ratio} &= \frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} \times 100 \\ &= \frac{90 - 60}{90} \times 100 \\ &= \frac{30}{90} \times 100 \\ &= 33.33\% \end{aligned}$$

iii. Given, Fixed Cost = ₹50,000, Profit = ₹10,000, Sales = ₹1,20,000

$$\begin{aligned} \text{P/V ratio} &= \frac{\text{Fixed Cost} + \text{Profit}}{\text{Sales}} \times 100 \\ \text{P/V ratio} &= \frac{50,000 + 10,000}{1,20,000} \times 100 \\ \text{P/V ratio} &= \frac{60,000}{1,20,000} \times 100 \\ &= 50\% \end{aligned}$$

Illustration 1.1.5

Determine the P/V ratio under each of the following cases

Case I

	2023	2024
Sales	6,00,000	9,00,000
Profit	45,000	70,000

Case II

	2023	2024
Sales	1,00,000	4,50,000
Total Cost	65,000	2,00,000

Solution:

Case I

$$\begin{aligned} \text{P/V ratio} &= \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100 \\ &= \frac{(70,000 - 45,000)}{(9,00,000 - 6,00,000)} \times 100 \\ &= \frac{25,000}{3,00,000} \times 100 \\ &= 8.33\% \end{aligned}$$

Case II

$$\begin{aligned} \text{Profit} &= \text{Sales} - \text{Total Cost} \\ \text{Profit in 2023} &= 1,00,000 - 65,000 = 35,000 \end{aligned}$$



$$\begin{aligned}
 \text{Profit in 2024} &= 4,50,000 - 2,00,000 \\
 &= ₹ 2,50,000 \\
 \text{P/V ratio} &= \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100 \\
 &= \frac{2,50,000 - 35,000}{4,50,000 - 1,00,000} \times 100 \\
 &= \frac{2,15,000}{3,50,000} \times 100 \\
 &= 61.43 \%
 \end{aligned}$$

Illustration 1.1.6

Sales – ₹ 25,00,000

Variable Cost – 60%

Profit - ₹ 4,50,000

Determine the a) P/V ratio, b) Fixed Cost and c) Sales Volume to earn a profit of ₹ 7,50,000 d) Profit when sales are ₹ 18,00,000

Solution :

$$\begin{aligned}
 \text{a. Contribution} &= \text{Sales} - \text{Variable Cost} \\
 &= ₹ 25,00,000 - ₹ 15,00,000 \\
 &= ₹ 10,00,000 \\
 \text{P/V ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 \\
 &= \frac{10,00,000}{25,00,000} \times 100 \\
 &= 40 \%
 \end{aligned}$$

$$\begin{aligned}
 \text{b. Contribution} &= ₹ 10,00,000 \\
 \text{Profit} &= ₹ 4,50,000 \text{ (given)} \\
 \text{Contribution} &= \text{Fixed Cost} + \text{Profit} \\
 10,00,000 &= \text{Fixed Cost} + 4,50,000 \\
 \text{Fixed Cost} &= 10,00,000 - 4,50,000 \\
 &= ₹ 5,50,000
 \end{aligned}$$

c. Sales to earn a profit of ₹ 7,50,000

Sales to earn a predetermined amount of profit is found by the formula

$$\text{Sales} = \frac{\text{Fixed Cost} + \text{Profit}}{\text{P/V ratio}}$$

$$= \frac{5,50,000 + 7,50,000}{40 / 100}$$

$$= \frac{13,00,000}{40/100}$$

$$= \frac{13,00,000 \times 100}{40}$$

$$= ₹32,50,000$$

d. Profit when Sales ₹18,00,000

We know that P/V ratio = $\frac{\text{Fixed Cost} + \text{Profit}}{\text{Sales}}$

$$\frac{40}{100} = \frac{5,50,000 + \text{Profit}}{18,00,000}$$

$$\frac{40}{100} \times 18,00,000 = 5,50,000 + \text{Profit}$$

$$7,20,000 = 5,50,000 + \text{Profit}$$

$$\text{Profit} = 7,20,000 - 5,50,000$$

$$= ₹ 1,70,000$$

1.1.3.4 Break-Even Analysis

Cost-volume profit analysis, referred to as CVP Analysis, is a predominant measure used in business profit planning. The CVP analysis examines the interrelationship between the cost of production of products, the volume and the profits of the firm. CVP analysis is often referred to as Break-even analysis. This is because Break-even analysis is the most commonly used version of Cost – Volume – Profit analysis. It is a means through which companies can analyse how a change in cost items, such as variable costs and fixed costs, affects the profitability of a business and a change in the volume of sales.

- ◆ Helps to analyse the changes in cost on profitability and volume of sales

Assumptions under Break-Even Analysis

1. All types of costs, such as production, administration, and selling and distribution costs, are further divided into fixed and variable components.
2. Fixed costs remain unchanged regardless of the level of output.
3. The per-unit selling price remains the same at all output levels.



4. Per-unit variable cost also remains the same at all output levels. However, variable cost varies directly in proportion to variations in the levels of output.
5. Cost is only affected by the Volume of Production
6. There are no variations in the general price level.

Break –Even Point

Level of sales or volume of production at which total revenue equals total cost

Also referred to as ‘Critical Point’ or ‘Equilibrium Point’ or ‘Balancing Point’, the break-even point refers to that level of sales or volume of production at which total revenue becomes equal to total cost. It is a point where businesses neither make a profit nor incur losses. In other words, it’s a no-profit –no-loss point. At the break-even point, the contribution becomes equal to fixed costs. If businesses increase their production or sales beyond the break-even point, they will be able to make profits. On the other hand, if the enterprises decrease their production or sales below the break-even point, then they shall incur losses.

The break-even point can be determined using two methods, namely the algebraic method and the graphic or chart method.

i. Algebraic Method

Break-even points can be computed in terms of units, sales value, and percentage. The formula for computing The – Even Point in terms of units, sales value and percentage using the algebraic method is as follows:

$$i. \text{ Break–Even Point (in units)} = \frac{\text{Fixed cost}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

$$= \frac{\text{Fixed cost}}{\text{Contribution per unit}}$$

$$ii. \text{ Break–Even Point (in sales value)}$$

$$= \frac{\text{Fixed cost}}{\text{Contribution per unit}} \times \text{Selling price per unit}$$

OR

$$\text{Break–Even Point (in sales value)} = \frac{\text{Fixed cost}}{\text{P/V ratio}}$$

$$iii. \text{ Break–Even Point} = \frac{\text{Fixed cost}}{\text{Total Contribution}} \times 100$$

(as a percentage of estimated sales or capacity)

$$= \frac{\text{B.E.P (in value)}}{\text{Total Sales (in value)}} \times 100$$

$$= \frac{\text{B.E.P (in units)}}{\text{Total Sales (in units)}} \times 100$$

Illustration 1.1.7

XYZ Ltd. sells a product for ₹50 per unit. The fixed costs for the company amount to ₹1,00,000, and the variable cost per unit is ₹30. Actual sales = ₹ 10,00,000. Calculate the a) break-even point in units, b) break-even point in value, and c) break-even point in percentage.

Solution:

$$\text{Break-Even Point (in units)} = \frac{\text{Fixed cost}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

$$= \frac{₹1,00,000}{₹50 - ₹30}$$

$$= 5000 \text{ units}$$

$$\text{Break-Even Point (in sales value)} = \frac{\text{Fixed cost}}{\text{Contribution per unit}} \times \text{Selling price per unit}$$

$$= \frac{₹1,00,000}{₹50 - ₹30} \times 50$$

$$= ₹ 2,50,000$$

$$\text{Break-Even Point (in \%)} = \frac{\text{B.E.P (in units)}}{\text{Total Sales (in units)}} \times 100$$

$$\frac{\text{B.E.P in units}}{\text{Total sales in units}} = \frac{5000 \text{ units}}{20,000 \text{ units}}$$

Hence,

$$\text{Hence, Break - Even Point in (\%)} = \frac{5,000}{20,000} \times 100$$

$$= 25 \%$$

ii Graphic Method / Chart Method

It is also possible to determine the break-even point graphically. This is done with the help of a break-even chart. A break-even chart is basically the graphical representation of the break-even analysis. The graphic method of break-even analysis is a power-

ful tool for understanding the relationship between costs, sales volume, and profits, enabling businesses to make informed decisions regarding pricing, production levels, and financial planning.

Steps to Create a Break-Even Graph

◆ Determination of break -even point using break even chart

1. **Draw the Axes:** The horizontal axes or the x-axis represent the volume of production or sales, and it may be expressed in terms of units. The vertical axis, or the y-axis, represents the costs and sales revenue (in rupees).
2. **Draw Fixed Costs Line:** Draw a line parallel to the x-axis at the level of total fixed costs. The parallel line to the x-axis indicates the constant nature of the fixed fees regardless of the level of production or sales.
3. **Draw the Total Costs Line:** For each unit of output, the corresponding variable costs are plotted above the fixed cost line and for zero level of activity, the variable costs are joined to the fixed cost. Starting from the total fixed costs line, draw a line that slopes upward, indicating the total costs increase as more units are produced. As the variable expenses are plotted above the fixed costs, they represent the total costs at different activity levels.
4. **Draw the Total Revenue Line:** Sales for different activity levels are plotted and joined by an upward-sloping line that represents total revenue.
5. **Identify the Break-Even Point:** The break-even point is where the total revenue line intersects the total costs line. At this point, the business covers all its costs, and profit is zero.

Let us consider an example to understand how to determine the break-even point graphically.

Illustration 1.1.8

Calculate break-even points in units and sales value with the help of a Break –Chart. The per unit selling price is ₹12, the Variable cost (per unit) is ₹ 6, the Fixed Cost is ₹4,800, and the output levels are 200,400,600,800,1000,1200,1400,1600

Solution:

Output	Variable Cost(₹)	Fixed Cost (₹)	Total Cost (₹)	Sales (₹)
0	0	4800	4800	0
200	1200	4800	6000	2400
400	2400	4800	7200	4800
600	3600	4800	8400	7200
800	4800	4800	9600	9600
1000	6000	4800	10800	12000
1200	7200	4800	12000	14400
1400	8400	4800	13200	16800
1600	9600	4800	14400	19200

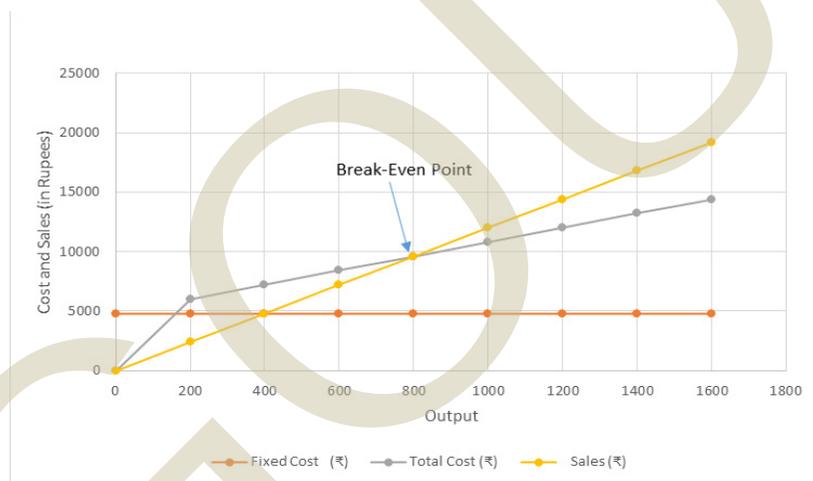


Figure 1.1.1 Break-Even Chart

Here Break - even point (in units) is 800 units, and the - break even point in sales is (₹) 9600

Here, the **blue line** represents **Total Costs**, which includes both fixed and variable costs. It starts at the level of fixed costs and increases as more units are produced. The **green line** represents **Total Revenue**, which starts from the origin and increases linearly with sales. The red dotted line represents the Fixed Cost, which remains constant irrespective of the output level. The **green point** marks the **Break-even Point**, where total revenue equals total costs. At this point, the company has neither profit nor loss.

Interpretation

- ◆ **To the left of the break-even point:** The company incurs a loss because total costs exceed total revenue.

- ◆ **At the break-even point:** Total revenue equals total costs, resulting in no profit or loss.
- ◆ **To the right of the break-even point:** The company makes a profit since total revenue exceeds total costs.

Verification using an algebraic method.’

$$\text{Break-Even Point (in units)} = \frac{\text{Fixed cost}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

$$= \frac{₹4800}{₹12 - ₹6}$$

$$= 800 \text{ units}$$

Break – Even Point

$$\text{(in sales value)} = \frac{\text{Fixed cost}}{\text{P/Vratio}}$$

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$= \frac{12-6}{12} \times 100$$

$$= 50 \%$$

$$\text{Break – Even Point} = \frac{\text{Fixed cost}}{\text{P/Vratio}}$$

$$= \frac{4800}{50} \times 100$$

$$= ₹9600$$

Angle of Incidence

It is the angle formed between the Total Cost Line and Sales line as a result of the intersection of these lines at the break-even point. It is an indicator of the profit-earning capacity of the business firm, and a higher angle indicates a higher profit. In contrast, a lower angle depicts a lower rate of profit. The business firms employ the angle of incidence along with the margin of safety to analyse the soundness of a business. A high margin of safety accompanied by a large angle of incidence indicates that the company is said to be in a favourable position and vice-versa.

- ◆ Angle formed between total cost line and sales line

1.1.3.5 Margin of Safety

The margin of safety shows the difference between actual sales and the break-even sales, or it is the excess of sales over

♦ difference between actual sales and break -even sales

break-even sales. At the margin of safety, contribution will become equal to profit as fixed costs are zero.

The margin of safety can be computed in units, value, and percentage of sales.

It is computed using the following formulas.

$$\text{Margin of Safety (in units)} = \text{Actual Sales (in units)} - \text{Break-even Sales (in units)}$$

$$= \frac{\text{Profit}}{\text{Contribution per unit}}$$

$$\text{Margin of Safety (in Value)} = \text{Actual Sales (in value)} - \text{Break-even sales (in value)}$$

Or

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

Or

$$= \text{Margin of safety (in units)} \times \text{Selling Price per unit}$$

$$\text{Margin of Safety (as \% of sales)} = \frac{\text{Margin of safety (in units)}}{\text{Actual Sales (in units)}} \times 100$$

Or

$$= \frac{\text{Margin of safety (in value)}}{\text{Actual Sales (in value)}} \times 100$$

$$= 100 - \text{Break Even Sales (in \%)}$$

$$= \frac{\text{Profit}}{\text{Total Contribution}} \times 100$$

Illustration 1.1.9

A company has achieved actual sales of ₹500,000. Its break-even sales are calculated to be ₹350,000. Determine the margin of safety in rupees and as a percentage of actual sales.

Solution:

$$\text{Margin of Safety (in Value)} = \text{Actual Sales (in value)} - \text{Break-even sales (in value)}$$

$$= ₹500,000 - ₹350,000$$

$$= ₹1,50,000$$

$$\text{Margin of Safety (as \% of sales)} = \frac{\text{Margin of safety (in value)}}{\text{Actual Sales (in value)}} \times 100$$

$$= \frac{₹1,50,000}{₹500,000} \times 100$$

$$= 30 \%$$

Illustration 1.1.10

Calculate the Margin of Safety in each of the following cases

- Profit = ₹8,400, P/V ratio = 40 %



- ii. Break-even Sales = 20% , Actual Sales = ₹ 15,00,000
- iii. Profit = ₹5,600, Contribution (per unit) = ₹ 7
- iv. Actual Sales = 5000 units, Break-even sales = 1300 units
- v. Profit = ₹6,300, Contribution = ₹25,200
- vi. Break-even sales = 60%

Solution:

$$\begin{aligned} \text{i. Margin of Safety} &= \frac{\text{Profit}}{\text{P/V ratio}} \\ &= \frac{8,400}{\frac{40}{100}} \\ &= ₹ 21,000 \end{aligned}$$

$$\text{ii. Margin of Safety} = \text{Actual Sales} - \text{Break even sales}$$

$$\begin{aligned} \text{Break-even sales} &= \frac{20}{100} \times ₹15,00,000 \\ &= ₹ 3,00,000 \end{aligned}$$

$$\begin{aligned} \text{Margin of Safety} &= ₹15,00,000 - ₹ 3,00,000 \\ &= ₹ 12,00,000 \end{aligned}$$

$$\begin{aligned} \text{iii. Margin of Safety} &= \frac{\text{Profit}}{\text{Contribution per unit}} \\ &= \frac{₹5,600}{₹7} \\ &= 800 \text{ units} \end{aligned}$$

$$\begin{aligned} \text{iv. Margin of Safety} &= \text{Actual Sales} - \text{Break even Sales} \\ &= 5000 - 1300 \\ &= 3700 \text{ units} \end{aligned}$$

$$\begin{aligned} \text{v. Margin of Safety} &= \frac{\text{Profit}}{\text{Total Contribution}} \times 100 \\ &= \frac{6,300}{25,200} \times 100 \\ &= 25\% \end{aligned}$$

$$\begin{aligned} \text{vi. Margin of Safety} &= 100 - \text{Break-even sales (\%)} \\ &= 100\% - 60\% \\ &= 40\% \end{aligned}$$

Summarised Overview

Marginal costing is a costing technique in which only variable costs are included in the cost of products, processes or operations. Fixed costs are treated as period costs and written off against the profits of the relevant periods in which they arise. The Cost – Volume – Profit Analysis can be considered as the logical extension of the marginal costing technique. The CVP analysis examines the interrelationship between costs, volume and profit. It plays a predominant role in the profit planning, cost control and decision-making of a firm. The different concepts and elements that form part of the CVP analysis are contribution, P/V ratio, marginal cost equation, break-even analysis, and margin of safety. Marginal costing is widely used in managerial decision-making, cost control, profit planning, production planning, and determination of different parameters like a break-even point, the sales that have to be achieved in order to achieve a desired or pre-fixed amount of profit, and so on.

Self-Assessment Questions

1. Define Marginal Costing.
2. What is the formula for calculating Contribution?
3. State the formula for the Break-even Point in units.
4. What does the P/V Ratio stand for in marginal costing?
5. What is the Margin of Safety?
6. How is the Contribution Margin calculated?
7. What is the primary assumption about fixed costs in marginal costing?
8. Which costs are considered when calculating marginal cost: variable or fixed?
9. What is meant by Variable Cost?
10. Which costs are excluded from inventory valuation in marginal costing?
11. Name two main advantages of using marginal costing.
12. In marginal costing, how are the selling price and variable cost per unit assumed to behave with output changes?
13. Define Break-even Point.
14. What is the contribution margin ratio?
15. List one limitation of marginal costing.
16. How does marginal costing treat fixed costs over different levels of production?
17. What effect does an increase in fixed costs have on the break-even point?
18. Why is marginal costing useful in decision-making? Give an example of a variable cost.

Assignments

1. Discuss the uses and limitations of marginal costing
2. Elucidate the key differences between Absorption Costing and Marginal Costing.
3. What are the limitations of marginal costing?
4. What do you mean by Break-even point? How can you determine the break-even point? Discuss its major applications or uses.
5. Calculate the P/V ratio for each of the following cases:

- i. Contribution = ₹120, Sales = ₹600
 - ii. Sales = ₹150, Variable Cost = ₹90
 - iii. Fixed Cost = ₹70,000, Profit = ₹20,000, Sales = ₹1,80,000
- Solutions (i) 20% (ii)40% (iii)50%

6. Calculate the following using the following information:

- i. P/V Ratio
- ii. Fixed Cost
- iii. Sales Volume to earn a profit of ₹6,00,000
- iv. Profit when sales are ₹20,00,000

Information:

- ◆ Sales = ₹30,00,000
- ◆ Variable Cost = 70% of Sales
- ◆ Profit = ₹5,00,000

Solutions (i) 30% (ii) ₹4,00,000 (iii) ₹33,33,333 (iv) 2,00,000

7. ABC Ltd. sells a product for ₹60 per unit. The company's fixed costs are ₹150,000, and the variable cost per unit is ₹35. If actual sales are ₹9,00,000, calculate the following:

- i. Break-even Point in units
- ii. Break-even Point in value
- iii. Break-even Point as a percentage of actual sales

Solutions (i) 6000 units (ii) ₹3,60,000 (iii) 40%

8. Calculate the Margin of Safety for each of the following cases:

- i. Profit = ₹9,500, P/V ratio = 30%
- ii. Break-even Sales = 25% of actual sales, Actual Sales = ₹12,00,000
- iii. Profit = ₹4,800, Contribution (per unit) = ₹8

- iv. Actual Sales = 4,000 units, Break-even Sales = 1,200 units
- v. Profit = ₹5,700, Contribution = ₹19,000
- vi. Break-even Sales = 55% of actual sales

Solutions:

- (i) ₹31,667
- (ii) ₹9,00,000
- (iii) 600 units
- (iv) 2800 units
- (v) 30%
- (vi) 45%

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Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

SGOU

Unit 2

Marginal Costing and Decision-making

Learning Outcomes

After completing this unit, the learners will be able to:

- ◆ Understand how marginal costing is applied to solve various managerial problems faced by business firms

Background

In a competitive business environment, firms must make critical financial and operational decisions to ensure profitability and sustainability. Marginal costing serves as a valuable tool in guiding businesses through various decision-making processes, including fixation of selling price, accepting additional orders, preparing quotations, make-or-buy decisions, key factor analysis, own-or-lease choices, sell-or-further-process evaluations, and decisions related to closing down or suspending activities. Setting the right selling price is crucial for profitability, and marginal costing helps determine the minimum price required to cover variable costs and contribute to fixed costs. Similarly, when firms receive additional orders, they analyse whether accepting them at lower prices still adds to overall profit. In make-or-buy decisions, marginal costing helps firms decide whether to produce components in-house or outsource them based on cost-effectiveness. Key factor analysis identifies resource constraints, guiding businesses to prioritise products or operations that generate the highest contribution margin. In own-or-lease decisions, marginal costing helps to determine whether owning or leasing assets is financially viable. In some cases, businesses must decide whether to sell a product as it is or process it further for additional value. Marginal costing helps compare additional costs against potential revenue gains. Finally, firms facing financial challenges may need to consider closing down or suspending activities, where marginal costing helps to analyse whether operations should continue or be temporarily halted. By applying marginal costing principles, businesses can make informed, cost-effective decisions that enhance profitability and optimise resources in different market conditions.

Keywords

Marginal Costing, Make or Buy decision, Key factor analysis

Discussion

Marginal costing plays a crucial role in various decision-making scenarios within a business. Some of the important managerial problems where marginal costing is applied for decision making is discussed below.

1.2.1 Fixation of selling price

Although the firms consider the conditions prevailing in the market and other diverse economic parameters while setting the selling prices, they primarily rely on the marginal costing technique for fixing prices under different circumstances. Business firms are often required to modify their pricing strategies according to the changes in economic conditions or scenarios. The selling prices fixed during normal business conditions may not be the same as the selling prices fixed during times of depression or during the situation of experiencing extreme competitive pressures. Sometimes, firms may set their selling prices in such a way as to cover the total costs and earn a targeted level of profit. However, in certain situations, the firms may be forced to set the selling prices to the levels of the marginal cost or even below the marginal cost, like when a new product is introduced into the market while exploring new foreign markets or eliminating competitors from the market, to maintain the plant and machinery in running condition, to retain existing customers or to prevent the loss of orders in the future. Marginal costing is a valuable approach for making pricing decisions, especially in competitive and dynamic markets.

- ◆ Setting the selling prices under different economic conditions or scenarios

Let us closely examine how marginal costing enables business firms to fix their selling prices under different conditions.

- ◆ Setting selling prices to cover total costs while also ensuring a targeted profit margin

- Normal Business Condition:** Under normal business conditions, companies may set their selling prices to cover total costs, which include both fixed and variable expenses, while also ensuring a target profit margin. Alternatively, pricing decisions can be based on marginal cost. In this approach, firms add a substantial margin to the marginal or variable cost to account for fixed costs and secure the desired profit.

◆ Pricing is based on marginal cost

◆ Price is fixed on the basis of the marginal cost while also contributing towards fixed costs

◆ Orders will be accepted at a price above the marginal cost.

- b. **Trade Depression:** During economic downturns, demand often declines, and firms may struggle to cover their total costs (fixed and variable). In such situations, pricing based on marginal cost can help businesses stay competitive by focusing on covering variable costs while contributing partially to fixed costs. By doing this, firms can avoid shutting down operations, as any revenue above the marginal cost reduces losses, even if total costs aren't fully covered.
- c. **Intense Competition:** During times of intense competition, the firms may be forced to fix their prices below the total cost, and in those scenarios, the price may be fixed on the basis of the marginal cost of the products while also contributing towards fixed costs. There are also instances where the firms may fix their selling prices below the marginal costs. This is done in order to eliminate their competitors from the market, especially the weaker ones.

1.2.2 Accepting Additional Orders

Sometimes, business firms may receive orders from export markets or bulk orders from large buyers. Normally, in such situations, the business firms are often faced with the problem of deciding whether to accept or reject these orders. This is because these orders will usually be received with the demand to fix selling prices below the prevailing market price of the product. In such a situation, the firms base their decisions on marginal costs. Such orders will be accepted at a price above the marginal cost in order to provide for the fixed costs. It is important to note that special orders from local dealers should be avoided as it would affect the general price level of the product prevailing in the local markets.

Illustration 1.2.1

Dev Ltd. is producing 60,000 units of a product at 60 % capacity. It receives an order from Mr. Smith, a foreign dealer, for 40,000 units for Rs.40, although the local price is Rs.60 per unit. The cost per unit of the product is as follows.

Direct Material	- ₹ 20
Direct Labour	- ₹ 10
Variable expenses	- ₹ 5
Fixed Overheads	- ₹ 15

Should Dev Ltd accept the order from Mr Smith or not?

Solution:

Calculation of Current Profit (before accepting order)



Particulars	Amount (₹)
Sales (60,000 × 60)	36,00,000
Less: Variable Cost (60,000 × 35)	21,00,000
Contribution	15,00,000
Less: Fixed Cost (60,000 × 15)	9,00,000
Profit	6,00,000

Calculation of Profit (if order is accepted)

Particulars	Amount (₹)
Sales ((60,000 × 60) 36,00,000 (40,000 × 40) 16,00,000	52,00,000
Less: Variable Cost (1,00,000 × 35)	35,00,000
Contribution	17,00,000
Less: Fixed Cost(constant)	9,00,000
Profit	8,00,000

So, if Dev Ltd. accepts Mr Smith's order, the profit will be increased by ₹ 2,00,000. Therefore, it is advisable to place the order.

1.2.3 Quotations

◆ quoted prices should be determined based on the contribution of each order

In a jobbing enterprise, orders for similar products are rarely repeated. So to ensure the plant operates at full capacity, the pricing strategy must remain flexible. So Quoted prices should be determined based on the contribution each order generates. The amount of contribution must be adjusted depending on the availability of capacity. When there is considerable unutilised capacity, it may be necessary to accept a low contribution in order to provide work. On the other hand, if the order book is well filled, the selling price charged should be such which provides high contribution.

1.2.4 Make or buy decisions

A make-or-buy decision is a strategic choice a company faces when determining whether to produce a component or finished product internally (make) or buy it from an external supplier (buy). To make this decision, the company compares the marginal costs of producing the item in-house or internally within the firm with the purchase price offered by an external supplier. Marginal cost refers to the additional cost incurred to make one more unit of the component, including direct materials, labour, and other variable costs. In contrast, the purchase price is the cost the company would incur by acquiring the same component from an external supplier.

If the marginal cost of producing the item internally exceeds the price offered by an external supplier, the company is likely

◆ If marginal cost of producing the item internally exceeds the price offered by an external supplier, the company is likely to choose the buy option an vice – versa

to choose the buy option. This is because purchasing the component from an outside supplier would be more cost-effective and it will allow the company to focus more on other core activities. On the other hand, if the marginal cost of internal production is lower than or equal to the external price, the company may decide to make the component in-house, as this would be a more economical choice in the long run.

Illustration 1.2.2

Consider the following information related to the total cost of manufacture of a product by ABC Ltd.

Direct Material	₹ 21
Direct labour	₹ 17
Variable overhead	₹ 15
Fixed overhead	₹ 13
Cost per unit	₹ 66

If the same product is available in the market for ₹ 64, should ABC Ltd manufacture or purchase the product from the market?

Solution

Here, marginal cost of the product is calculated

Direct Material	₹ 21
Direct Labour	₹ 17
Variable Overhead	₹ 15
Marginal Cost	₹ 53

As the marginal cost of the product (₹ 53) is lower than the purchase price (₹ 64), ABC Ltd should manufacture the product rather than purchasing the same from the market.

1.2.5 Key factor analysis

A key factor or a limiting factor can be considered as a factor, resource, or constraint that limits the activities or operations of the business. This key factor prevents restricts the company's ability to produce more output or achieve higher sales or prevents it from making unlimited profits. Common examples of key factors include:

- a. **Raw materials:** Shortage of essential materials required for manufacturing
- b. **Sales volume:** Limited demand or market size for products

◆ Key factors

- c. **Labour:** Availability of skilled labour or workforce hours
- d. **Financial resources:** Limited access to capital or credit to expand operations.
- e. **Production capacity:** Limited machinery or labour available to produce goods.

Firms should identify the key or limiting factors affecting their operations. When a limiting factor is present, profitability should be assessed based on the contribution margin per unit of the limiting factor. Priority should be given to the product that yields the highest contribution margin per unit of the limiting factor, rather than one that generates a lower contribution per unit. If two or more limiting factors are present, it is important to account for each of them in the analysis.

◆ When a limiting factor is present, profitability should be assessed based on the contribution margin per unit of the limiting factor.

If the sales (in units) is the limiting factor, then the basis for deciding the priority of products is the contribution per unit. On the other hand, if the sales in value is the limiting factor, then P/V ratio is the deciding factor. If limiting factor is raw material, then the per unit contribution of raw material to produce a unit of the product is considered for decision making. If labour is the key factor, then the per unit contribution of labour hour that would be required to produce a unit of the product is considered. If machine hour is the key factor, then the per unit contribution of machine hour that would be required to produce a unit of the product is considered.

Illustration 1.2.3

Mohan Ltd manufactures two products using the same raw material and production facilities. Consider the following additional information and evaluate the succeeding questions.

Particulars	Product I	Product II
Selling price per unit	200	160
Material @ ₹ 2 per kg	40	10
Labour @ ₹ 3 per hour)	30	60
Variable Overheads @ ₹ 4 per machine hour	80	60
Total Fixed Overheads: ₹ 12,00,000		

Evaluate the profitability of both the products and give recommendations regarding selection of the best alternative.

- i. When sales value is limited

- ii. When sales quantity is limited
- iii. When raw material is in short supply
- iv. When labour hours are limited
- v. When Production capacity in terms of machine hours is limited

Solution :

Calculation of per unit contribution of key factor

Particulars	Product I	Product II
Selling Price (per unit)	200	160
Less: Variable Cost		
Material	40	10
Labour	30	60
Variable overheads	80	60
Contribution (per unit)	50	30
P/V Ratio	=	=
$\frac{\text{Contribution}}{\text{Sales}} \times 100$	$\frac{50 \times 100}{200}$	$\frac{30 \times 100}{160}$
	= 25 %	= 18.75 %
Contribution per unit raw material	$\frac{50}{20}$ = ₹ 2.5	$\frac{30}{5}$ = ₹ 6
Contribution per labour hour	$\frac{50}{10}$ = ₹ 5	$\frac{30}{20}$ = ₹ 1.5
Contribution per machine hour	$\frac{50}{20}$ = ₹ 2.5	$\frac{30}{15}$ = ₹ 2

- i. When sales value is limited, Product I is more profitable than Product II as its P/V ratio is higher than that of Product II.
- ii. When sales quantity is limited, Product I is more profitable than Product II as its contribution per unit is higher than that of Product II.
- iii. When raw material is in short supply, Product II is more



profitable than Product I as its contribution per kg of raw material is higher than that of Product I.

- iv. When labour hours are limited, Product I is more profitable than Product II as its contribution per labour hour is higher than that of Product II.
- v. When Production capacity in terms of machine hours is limited, Product I is more profitable than Product II as its contribution per machine hour is higher than that of Product I.

1.2.6 Own or Lease

A leasing agreement is a contract where the lessor (owner) allows the lessee (user) to use an asset for a fixed period in exchange for rent. The lessee selects the asset, and the leasing company buys it. The lessee then uses the asset and pays regular rent. Leasing offers 100% financing, meaning the lessee doesn't need to make a down payment or invest upfront. The rent paid is tax-deductible, reducing taxable income. In contrast, buying an asset allows businesses to claim depreciation and interest on loans as tax deductions. Buying is better for assets that increase in value over time. So, the two alternatives will be evaluated to decide whether to purchase or lease a particular asset. The total cost of the two alternatives is compared to calculate the annual savings or extra cost involved. The decision will be made in favour of the alternative, which will give minimum cost or higher profit.

- ◆ Decision will be made in favour of the alternative, which will give minimum cost or higher profit.

1.2.7 Sell or further process

The marginal costing technique helps in determining whether a product should be sold as such or further processed by comparing the additional revenue and additional cost of further processing. For this, the marginal revenue from further processing is calculated. Marginal revenue is the difference between the revenue from selling the product after further processing and the revenue from selling it in its current state. The marginal cost of further processing is calculated after taking into account all the further additional costs required for the further process of the product. Finally, the marginal revenue will be compared with the marginal cost. If the marginal revenue from further processing exceeds the marginal cost, it is advisable to process the product further, as it will increase overall profit. On the contrary, if the marginal cost exceeds the marginal revenue, the product should be sold without further processing to avoid reducing profits.

- ◆ If the marginal revenue from further processing exceeds the marginal cost, it is advisable to process the product further, and if the marginal cost exceeds the marginal revenue, the product should be sold without further processing.

1.2.8 Closing down or suspending activities

- ◆ A firm can continue to operate as long as its sales revenue is enough to cover marginal costs and fixed overheads.

This is a temporary decision which involves deciding whether it is better to continue or suspend the activities of the business firm as a result of a trade recession. This may be associated with a single product, division, or even the factory as a whole. Firm can continue operating as long as its sales revenue is enough to cover marginal costs and fixed overheads. Though some fixed costs like payment of wages to temporary staff are escapable or avoidable fixed costs, some fixed costs incurred even during the temporary shutdown in the form of interest, depreciation, taxes, and insurance are unavoidable. In addition to this, when the factory or the concerned unit is reopened after shut down, certain additional fixed costs will also have to be incurred, like overhauling of plant and machinery. However, the contribution should exceed the difference between the fixed costs that would be incurred during normal conditions and the fixed costs that would be incurred while the plant is closed down.

Difference between the fixed costs incurred while the plant is operating and fixed costs that would be incurred while the plant is closed down.

The shutdown point is said to be reached whenever the contribution from continuing operations is equal to the difference between the fixed costs that would be incurred while the plant is operating and the fixed costs that would be incurred while the plant is closed down.

The shutdown point can be calculated using the following formulas:

$$\text{Shutdown point (in sales value)} = \frac{(\text{Fixed costs} - \text{Shutdown costs})}{P/V \text{ ratio}}$$

$$\text{Shutdown point (in sales units)} = \frac{(\text{Fixed costs} - \text{Shutdown costs})}{\text{Contribution per unit}}$$

Illustration 1.2.4

Raj Ltd. produces 40,000 units of Product A at normal operating capacity. The per unit cost of manufacturing Product A is given below.

Direct Material	-	₹ 15
Direct Labour	-	₹ 5
Variable Overhead	-	₹ 6
Fixed Overhead	-	₹ 8
		<u>₹34</u>

The selling price per unit of Product A is ₹ 38. However, Raj Ltd expects that only 4000 units will be sold in the upcoming year. So, the management of the company is planning to shut down the plant, estimating that fixed overheads can be reduced to ₹ 90,000 in the next year. When the plant is operating, fixed costs are incurred uniformly throughout the year. The additional



costs associated with the shutdown of the plant are estimated to be ₹ 30,000. Should the plant be shut down? Also, estimate the shutdown point.

Solution:

Unavoidable Fixed costs	=	₹ 90,000
(+) Additional Shut down costs	=	₹ <u>30,000</u>
Total Shut down Costs		<u>₹ 1,20,000</u>

If the company is operating, it will incur ₹ 3,20,000 (40,000 × ₹ 8) as fixed costs. On the other hand, if it shuts down its activities, the fixed cost incurred will be ₹ 1,20,000. So, the plant should operate if the contribution is greater or equal to ₹ 2,00,000, which is the difference between these fixed costs (i.e. ₹3,20,000 - ₹1,20,000). On the other hand, if the difference in fixed costs is lower than the contribution, then it should be shut down.

Calculation of Contribution

Sales (4,000 × 38)	=	₹ 1,52,000
(-) Variable Costs (4,000 × 26)	=	<u>₹ 104,000</u>
Contribution	=	₹ 48,000
(-) Fixed Costs	=	<u>₹ 3,20,000</u>
Hence, Loss	=	₹ 2,72,000

So, it is evident that if Raj Ltd continues to operate in the next year, it will have to manage the plant at a loss of ₹ 2,72,000, but if the plant is closed down, the shutdown costs will be ₹ 1,20,000.

So, it is advisable to shut down the plant.

Calculation of shut-down point

$$\begin{aligned} \text{Shut-down point} &= \frac{(\text{Fixed costs} - \text{Shutdown costs})}{\text{Contribution per unit}} \\ &= \frac{(3,20,000 - 1,20,000)}{38 - 26} \\ &= 16,667 \text{ units} \end{aligned}$$

Summarised Overview

Marginal costing remains a predominant technique for setting selling prices under different scenarios. In normal business conditions, prices are set to cover total costs (fixed and variable) while ensuring a target profit margin. During a depression, businesses may price products based on marginal cost to remain competitive, cover variable costs, and contribute partially to fixed costs, reducing overall losses. During intense competition, the price may be fixed on the basis of the marginal cost of the products while also contributing towards fixed costs. The firms may also set prices at or below marginal cost to survive competition. In a make-or-buy decision, the company has to determine whether to produce a component or finished product internally or buy it from an external supplier. For this, the company compares the marginal costs of producing the item in-house or internally within the firm with the purchase price offered by an external supplier. If the marginal cost of making the item internally exceeds the price offered by an external supplier, the company is likely to choose the buy option. If the marginal cost of internal production is lower than or equal to the external price, the company may decide to make the component in-house. When a limiting factor is present, profitability should be assessed based on the contribution margin per unit of the limiting factor. Priority should be given to the product that yields the highest contribution margin per unit of the limiting factor. In the case of own or lease decisions, the two alternatives will be evaluated. The total cost of the two alternatives is compared to calculate the annual savings or extra cost involved. The decision will be made in favour of the alternative, which will give minimum cost or higher profit. If two or more limiting factors are present, it is important to account for each of them in the analysis. In the case of close-down or operating decisions, a firm can continue operating as long as its sales revenue is enough to cover marginal costs and fixed overheads. Though some fixed costs, like payment of wages to temporary staff, are escapable or avoidable fixed costs, some fixed costs are incurred even during the temporary shutdown. In addition to this, when the factory or the concerned unit is reopened after shutdown, certain additional fixed costs will also have to be incurred. However, the contribution should exceed the difference between the fixed costs that would be incurred during normal conditions and the fixed costs that would be incurred while the plant is closed down.

Self-Assessment Questions

1. What do you mean by make or buy decision?
2. What do you mean by key factor analysis? How is the decision taken by a business firm when there is a key factor?
3. How should a firm decide whether to close down or suspend its business activities?
4. How is the selling price determined under different economic conditions?



5. When should a company decide to process a product further instead of selling it as such?
6. What factors should be considered before accepting a special order?
7. How are own or lease decisions taken?
8. What do you mean by shut down point?

Assignments

1. Paramjith Ltd. is currently producing 50,000 units of a product at 50% capacity. The company received a special export order from Mr Stefan for 30,000 units at ₹45 per unit, whereas the domestic price is ₹70 per unit. The cost per unit is as follows:

Direct Material = ₹ 25

Direct Labour = ₹ 15

Variable Expenses = ₹ 10

Fixed Overheads = ₹ 15

Should Paramjith Ltd accept the order from Mr Stefan or not?

Solution: Current Profit - (₹) 2,50,000, Profit if the order is accepted - (₹) 1,50,000. It is advisable not to take the order.

2. Consider the following information related to the total cost of manufacturing a product by Pawan Ltd.

Direct Material	₹ 30
Direct labour	₹ 26
Variable overhead	₹ 24
Fixed overhead	₹ 22
Cost per unit	₹ 102

If the same product is available in the market for ₹ 90, should ABC Ltd manufacture or purchase the product from the market?

Solution: As the marginal cost of the product (₹ 80) is lower than the purchase price (₹ 90), Pawan Ltd should manufacture the product rather than purchase the same from the market.

3. Aman Ltd manufactures two products using the same raw material and production facilities. Consider the following additional information and evaluate the succeeding questions.

Particulars	Product I	Product II
Selling price per unit	400	320
Material @ ₹ 2 per kg	80	20
Labour @ ₹ 3 per hour)	60	120
Variable Overheads @ ₹ 4 per machine hour	160	120
Total Fixed Overheads: ₹ 24,00,000		

Evaluate the profitability of both products and give recommendations regarding the selection of the best alternative.

- When sales value is limited
- When sales quantity is limited
- When raw material is in short supply
- When labour hours are limited
- When Production capacity in terms of machine hours is limited

Solution :

- When sales value is limited, Product I is more profitable than Product II as its P/V ratio (25 %) is higher than that of Product II (18.75%).
- When sales quantity is limited, Product I is more profitable than Product II as its contribution per unit (₹100) is higher than that of Product II (₹60).
- When raw material is in short supply, Product II (₹6) is more profitable than Product I as its contribution per kg of raw material is higher than that of Product I (₹2.5).
- When labour hours are limited, Product I is more profitable than Product II as its contribution per labour hour (₹5) is higher than that of Product II (₹1.5).
- When Production capacity in terms of machine hours is limited, Product I is more profitable than Product II as its contribution per machine hour (₹2.5) is higher than that of Product II (₹ 2).

4. Arnav Ltd. produces 50,000 units of Product A at normal operating capacity. The per unit cost of manufacturing Product A is given below

Direct Material	-	₹ 17
Direct Labour	-	₹ 7
Variable Overhead	-	₹ 8



Fixed Overhead - ₹ 10
₹42

The selling price per unit of Product A is ₹ 46. However, Raj Ltd expects that only 5000 units will be sold in the upcoming year. So, the management of the company is planning to shut down the plant, estimating that fixed overheads can be reduced to ₹ 1,00,000 in the next year. When the plant is operating, fixed costs are incurred uniformly throughout the year. The additional costs associated with the shutdown of the plant are estimated to be ₹ 50,000. Should the plant be shut down? Also, estimate the shutdown point.

Solution : Total Shut down Costs - ₹ 1,50,000

If Raj Ltd continues to operate in the next year, it will have to manage the plant at a loss of ₹ 4,30,000, but if the plant is closed down, the shutdown costs will be ₹1,50,000. So, it is advisable to shut down the plant. Shut-down point = 25,000 units.

5. Explain in detail how the marginal costing assists the business in making decisions under different business scenarios.

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Suggested Reading

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3. Maheshwari SN. Cost and Management Accounting, Sultan Chand and Sons, New Delhi

Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

SGOU

02 BLOCK

Standard Costing and Variance Analysis

Block Content

- Unit - 1 MATERIAL VARIANCE
- Unit - 2 LABOUR COST VARIANCE
- Unit - 3 VARIANCE OVERHEAD COST VARIANCE
- Unit - 4 SALES VALUE VARIANCE

Unit 1

Material Variance

Learning Outcomes

After completing this unit, the learners will be able to:

- ◆ explain standard costing.
- ◆ identify material cost from other cost components.
- ◆ have a clear understanding of the process of setting material cost standards.
- ◆ perform material cost variance analysis.

Background

During the COVID-19 pandemic, the flow of materials and finished goods became slow or temporarily shut down due to the stringent lockdown imposed by the government. As a result, manufacturing was disrupted and the entire economy came to a standstill. In a survey carried out by Ernst & Young, among senior supply chain executives in late 2020 and 22, they found that Covid-19 had magnified the problems that persisted in supply chain systems in the country. Both negative and positive effects were observed in the survey, with a majority of the companies facing severe setbacks during the pandemic. The impact of these disruptions is reflected in the revenue and cost of a company. For instance, supply chain disruptions as a result of travel restrictions during the pandemic led to increased costs of transporting materials. In such a situation actual cost of materials incurred by a company varies from what they had already estimated. In short, the actual cost of materials consumed varies from standard (estimated) cost, depending upon micro and macroeconomic factors. This unit illustrates how such variations in material costs are computed and their underlying concepts.

Keywords

Standard Costing, Material Standards, Variance Analysis, Material Cost Variance, Material Usage Variance.



2.1.1 Standard costing

- ◆ Expected cost or estimated costs are known as **standard cost**, which is used to identify variances for controlling cost.
- ◆ The process of estimating cost and identifying variances is known as **standard costing**

It will be difficult for a manager to identify whether the organisations' performance is at par with the expectations without knowing the expected performance level. To overcome this, every organisation, irrespective of its size, estimates targets that are a benchmark for expected performance. These benchmarks are commonly referred to as standards, which will be used to evaluate performance. It is important to note that separate benchmarks or standards will be set for revenue and cost. This unit and the subsequent units deal with cost standards and illustrate the process of identifying how actual cost varies from standards. The process of estimating costs, and comparing them with the actual costs to identify variance is known as standard costing. Estimates of future costs act as a benchmark in this process which is known as standard cost. Standard cost can be defined as:

“The predetermined cost that is calculated at the management's standards of efficient operations and the relevant necessary expenditure” -ICMAI

2.1.1.1 Need for standard costing

Standard costing is important to an organization as it helps in controlling costs and evaluating performance. The reason for preferring standard cost is listed below:

1. Standard cost is a future cost that is used for decision-making
2. It acts as a target or standard for actual performances.
3. It is useful for budgeting and performance evaluation or exercising control.
4. It is used for calculating the profit and value inventory while preparing interim reports.

2.1.1.2 Process of standard costing

The process of standard costing involves the following steps:

1. Estimating the cost or setting up of standards.
2. Calculation of actual cost.
3. Comparison between actual and standard.
4. Identifying the variances.
5. Disposal of variance, if any, by transferring them to the costing profit and loss account.

2.1.1.3 Development of standard cost

- ◆ The main components of standard cost include:
 - ◆ Material cost
 - ◆ Labour cost
 - ◆ Overhead cost

Though standard costing was originally used by manufacturing firms, it is also used by services and not-for-profit organisations. It specifies the expected cost and quantity required to manufacture a unit of product or to provide a service. The primary objective of any business unit is to minimise the per-unit cost of manufacturing or providing a service while maintaining quality specifications. The standard cost helps an organisation to keep track of whether the per-unit cost is at par with the expectations. The standard cost is determined from the cost estimates of the management. Cost estimation depends on the technical information provided by technical engineers and product managers. Due consideration is given to historical data, current production, and future expectations in the setting up of standards. However, the standards are affected by the selection of alternative inputs available for manufacturing or providing services. Thus, for detailed analysis and control standard cost is set for material, labour, variable overheads, and fixed overheads. In addition, standards are set for quantity and value of sales, which are generally referred to as budgeted sales.

This unit illustrates the process of setting material cost standards and variance analysis. Cost estimation and variance analysis of labour, overheads and sales will be covered in the subsequent units.

2.1.2 Material Cost Standards

Material cost standards define the quantity and price of materials used in manufacturing, impacting factors like material mix, yield and product quality. Product specifications, including material quality and quantity, are documented in bills of materials. Companies consider normal waste when converting these quantities into costs, and purchasing agents play a key role in influencing input prices by understanding purchasing needs, exploring alternative suppliers, and assessing the economic climate. They focus on the total cost of ownership which encompasses more than just the purchase price – factoring in shipping, storage, and disposal costs as well. Finally, to determine the total standard material cost for a product, component quantities are multiplied by unit prices, and these totals are summed.

2.1.2.1 Material Quantity Standards

The process of setting material quantity standards is illustrated below:

1. **Standardization:** The initial step of material quantity stan-

◆ Material quantity standards provide the basis for determining the quantity and quality of materials to be produced, production methods, and evaluate any setbacks encountered in production.

dards is the standardisation of products. At this stage decision on the product, type and quantity to be produced is taken, based on the production plan and customer's order.

2. **Product study:** Once the product, type and quantity are standardised it is important to identify the production methods, prerequisites for production, materials to be used, acceptance in the market etc. of the product to be produced. This is analysed by the engineering department or product consultants for development and production.
3. **Preparation of specification list:** On completion of the product study a material list is prepared, which specifies the quality, quantity and proportion of the material to be used, substitute materials, processes to be followed, prerequisites, conditions required etc. Consideration for the amount of wastage is given at the time of preparing the specification list.
4. **Test runs:** A trial run is carried out and the product is tested for quality and quantity desired. Any variations from what is already specified are noted down during this stage for improvements.

2.1.2.2 Material price standards

The price of materials is not under the control of the manufacturer. However, an organisation must be capable of estimating material prices with reasonable accuracy. The purchase department will be entrusted with the task of estimating material price based on their knowledge about market conditions. Material price standards provide the basis for the estimation of material prices. The following factors have to be considered while estimating the material prices, provided the fluctuations in the price of materials is small:

1. Quantity of materials held in stock and its price.
2. Price at which orders are placed for future delivery of materials.
3. Minimum support price as per the norms of the concerned authority
4. Expected price fluctuations.

However, if the price fluctuations are severe, the manufacturer will find it difficult to determine standard cost. They can overcome the difficulties in determining standard cost in such situations as follows:

◆ *Material price standards* provide the basis for estimating standard costs subjected to small and severe price fluctuations.

◆ *Material cost variance* provides information on the variations arising due to the difference between the actual and the standard cost of materials

1. **Adjusted pricing:** Average price of material for the year can be adjusted for any known fluctuations and expected changes. The resulting value shall be considered as the standard cost.
2. **Weighted average pricing:** In case the fluctuations are seasonal, weighted average of material price will be considered as the standard cost. If purchase is made at once, standard cost will be the weighted average of prices likely to be paid. Whereas if the purchase is spread throughout the year, then standard cost will be the weighted average price of the whole year.
3. **Statistical estimate:** Material prices have to be estimated based on statistical evaluation if the prices is found to be fluctuating annually.

2.1.3 Material Cost Variance

The difference between actual cost and standard cost of materials arises due to the variations in the material price from standard price or actual consumption from standard consumption, or both are known as material cost variance. Mathematically it can be represented as follows:

$$\text{Material cost} = [\text{Standard cost} - \text{Actual cost}]$$

Or

$$[(\text{Std. Quantity} \times \text{Std. Price}) - (\text{Actual quantity} \times \text{Actual price})]$$

It has to be noted that the above calculation does not explain whether the variance is caused by price or quantity factors. For instance, E-Bikes Ltd. which manufactures electric scooters reported actual cost of ₹7125 for purchasing materials during the financial year 2023-24. Whereas, the standard cost for battery units was ₹9355 for the financial year 2023-24. By applying the formula for the calculation of material cost variance we get ₹2230 (₹9355 - ₹7125). This indicates that the material cost variance is favourable as the actual cost does not exceed the estimated cost of production. However, it ignores the price and quantity factors of manufacturing electric scooters by E-Bikes Ltd, provided in

Exhibit.2.1.1 To overcome this, the variance analysis of material cost can be classified into two segments, namely:

1. Material price variance, and
2. Material usage variance

Exhibit.2.1.1			
The following statement provides the actual and standard material cost data of E-Bikes Ltd. which manufactures electric scooters			
Actual			
Materials	Quantity	Price	Total Cost
Battery units	10	500	5000
Frame components	20	50	1000
Electronic components	15	75	1125
			7125
Standard			
Materials	Quantity	Price	Total Cost
Battery units	12	640	7680
Frame components	15	75	1125
Electronic components	10	55	550
			9355

2.1.3.1 Material Price Variance

Material price variance measures the difference between the actual purchase price of the material and the standard material price. In other words, material price variance represents what was paid for the material and what was expected to be paid for the material. The material price variance can be calculated by using the following formula:

$$\text{Material Price variance} = \text{Actual Quantity (AQ)} \times (\text{SP} - \text{AP})$$

Where, SP - Std. Price
AP - Actual Price

Actual quantity (AQ) refers to the actual quantity purchased. Now let us calculate the material price variance for Battery units, frame components and electronic components used in manufacturing electric scooters by E-Bikes Ltd by applying the formula to the material price details provided in Exhibit 2.1.1. Substituting the values of actual quantity, actual price and standard price in the formula we get:

Table 2.1.1
Material price variance calculation

<i>Battery units</i>	Amount
Material price variance = $10 \times \{640 - 500\}$	1400
<i>Frame components</i>	

Material price variance = $20 \times \{75 - 50\}$	500
<i>Electronic components</i>	
Material price variance = $15 \times \{55 - 75\}$	-300
Total	1600

The calculation of *material price variance* presented in Table 2.1.1 indicates that out of the overall *material cost variance* of ₹4682, ₹1600 relates to the variations caused by the difference in standard price and actual price. Thus, *material price variance* helps in identifying the price quotient in material cost variance by considering the actual and standard per unit price of materials consumed. It must be noted that, when details of units actually purchased are unavailable, the actual quantity consumed will be considered as AQ in calculating *material price variance*. However, it is not ideal to consider materials consumed as actual quantity in all situations, because the price variations would result from factors controllable and uncontrollable by the purchase department. The factors that cause material price variance include:

1. The difference in the purchase price of the material.
2. The difference in the quantity purchased.
3. Rush orders to overcome the shortage in supply.
4. Rush orders to purchase in a less favourable or more favourable market.
5. Failure to make purchases when the materials are cheaper.
6. Failure to secure cash and trade discounts.
7. Inefficiency in the organisation of purchases.
8. Payment of excess or less freight.
9. Transit losses and discrepancies, which may arise if purchase price is inflated to include the loss.
10. Change in quality or specification of material purchased.
11. Use of substitute material having a higher or lower unit price.
12. Change in materials purchase, upkeep and store keeping cost.
13. Change in the pattern or amounts of taxes and duties.

◆ *Material price variance* represents the variations in material cost due to the difference in the purchase price and standard price of materials, for which the purchasing department is held responsible

If the price variance had occurred due to the inefficiency of the purchase department it is advisable to report the variance as early as possible by taking the quantity purchased as the actual quantity. Since the responsibility to make material purchases falls on the purchasing department, they are held responsible for differences arising due to their inefficiencies.



2.1.3.2 Material Usage Variance

The material usage variance measures if the actual quantity of materials consumed is different from the standard quantity that was allowed to be consumed or expected to be consumed in production. Thus, material usage variance provides information on the variance in material cost due to the usage or consumption of materials. It can be calculated using the following formula:

$$\begin{aligned} \text{Material usage variance} \\ &= \text{Std. Price (SP)} \times (\text{SQ} - \text{AQ}) \\ \text{SQ} - \text{Standard Quantity} \\ \text{AQ} - \text{Actual Quantity} \end{aligned}$$

Now, let us employ the formula in calculating the usage variance for E-Bikes Ltd. based on the details of standard quantity and actual quantity consumed provided in Exhibit.2.1.1, and we get:

Table 2.1.2

Material usage variance calculation

<i>Battery units</i>	Amount
Material price variance = $640 \times \{12 - 10\}$	1280
<i>Frame components</i>	
Material price variance = $75 \times \{15 - 20\}$	-375
<i>Electronic components</i>	
Material price variance = $55 \times \{10 - 15\}$	-275
Total	630

Since the material usage variance represents the variance due to the actual usage of materials, the actual quantity represents materials used in the calculation of material usage variance. Here, the production department is responsible for any variation in the materials consumed compared to the standard quantity allocated for consumption. The factors that may cause material usage variance include:

1. Variations in consumption due to inefficiency or carelessness.
2. Alterations in the specification of the product.
3. Lack of proper inspection of raw materials.
4. Purchase of materials that do not meet quality standards.
5. Rigid technical specifications and strict inspection lead to more rejections which require more materials for rectification.

◆ Material usage variance measures the variance in material cost due to the difference in quantity consumed and the standard quantity allotted for consumption. The production department is held responsible for such variations.

6. Inefficiency in production resulting in wastages.
7. Use of substitutes materials.
8. Theft or pilferage of materials.
9. Inefficient labour force leading to excessive utilization of materials.
10. Defective machines, tools and equipments, and bad or improper maintenance leading to breakdowns and more usage of materials.
11. Yield from materials in excess of or less than that provided as the standard yield.
12. Faulty materials processing. Timber, for example, if not properly seasoned may be wasted being used in subsequent processes.
13. Accounting errors e.g. when materials returned from the shop or transferred from one job to another are not properly accounted for.
14. Inaccurate standards.
15. Change in composition of a mixture of materials for a specified output.

In short, the material usage variance might arise due to differences in the proportion of inputs used or the productivity of the materials used for production. Thus, material usage variance is further divided into:

1. Material mix variance
2. Material yield variance

Material mix variance: Material mix variance occurs when more than one inputs are used in the production. It is the difference arising due to the difference in the actual proportion of inputs used from the standard proportion of inputs used. It is calculated using the formula:

$$\text{Material mix variance} = \text{Std. Price (SP)} \times \{\text{Revised Std. Quantity (RSQ)} - \text{Actual Quantity (AQ)}\}$$

Here it has to be noted that the value of the *revised std. quantity* (RSQ) may not be available in the material overhead data. Thus, it becomes necessary to calculate the value of RSQ by using the available material overhead data procedure for calculating RSQ is as follows:

$$\text{Revised Standard Quantity (RSQ)} = \frac{\text{Total quantity of actual mix}}{\text{Total quantity of standard mix}} \times \text{Standard quantity}$$



Let us employ the material mix variance calculation procedure to find out the material mix variance for E-Bikes Ltd to manufacture electric scooters, using the data provided in Exhibit 2.1.1. Unlike earlier calculations, a detailed presentation is required to understand the calculation material mix variance. Hence, a detailed illustration of the procedure for calculating the material mix variance for by E-Bikes Ltd is presented below:

Table 2.1.3

DETAILS OF STANDARD AND ACTUAL MATERIAL MIX EXTRACTED FROM EXHIBIT.1

Materials	Standard quantity	Actual quantity
Battery units	12	10
Frame components	15	20
Electronic components	10	15
Total	37	45

Note: Standard price of Battery units is 640, Frame components is 75 and Electronic components is 55.

First, we will start with the calculation of *revised standard quantity*. The calculated values of the same are presented in Table 2.1.4.

Table 2.1.4

Revised standard quantity

Materials	Revised Standard quantity
Battery units	14.60
Frame components	18.243
Electronic components	12.162
Total	45.01

Calculation of Revised Std. Quantity (RSQ):

Battery units:

$$\begin{aligned} \text{RSQ} &= \frac{45}{37} \times 12 \\ &= 1.216 \times 12 \\ &= 14.60. \end{aligned}$$

Frame components:

$$\begin{aligned} \text{RSQ} &= \frac{45}{37} \times 15 \\ &= 18.243 \end{aligned}$$

Electronic components:

$$\begin{aligned} \text{RSQ} &= \frac{45}{37} \times 10 \\ &= 12.162 \end{aligned}$$

Now that the *revised standard quantity* has been calculated, let us move on to the calculation of *material mix variance*. Table 5 presents the values obtained for the same by applying the formula:

$$\text{Material mix variance} = \text{Std. Price (SP)} \times \{\text{Revised Std. Quantity (RSQ)} - \text{Actual Quantity (AQ)}\}$$

Table 2.1.5

Material mix variance	
Materials	Variance
Battery units	2944
Frame components	-132
Electronic components	-156.09
Total	2655.91

Calculation of material mix variance:

Battery units:

$$\begin{aligned} \text{Material mix variance} &= 640 \times \{14.60 - 10\} \\ &= 640 \times 4.60 \\ &= 2,944 \end{aligned}$$

Frame components:

$$\begin{aligned} \text{Material mix variance} &= 75 \times \{18.243 - 20\} \\ &= 75 \times -1.760 \\ &= -132 \end{aligned}$$

Electronic components:

$$\begin{aligned} \text{Material mix variance} &= 55 \times \{12.162 - 15\} \\ &= 55 \times -2.838 \\ &= -156.09 \end{aligned}$$

Material yield variance (material sub-usage variance): Material yield variance occurs also only in the case of using more

than one input in production. It is the variance in material usage that occurs due to the yield or productivity of inputs. The reasons for yield variance may be the usage of sub-standard materials, the inefficiency of works or wrong processing. It is calculated as follows:

$$\text{Material yield variance} = \text{Std. Price (SP)} \times \{ \text{Std. Quantity (SQ)} - \text{Revised standard quantity (RSQ)} \}$$

Application of the procedure for calculating the material yield variance for E-Bikes Ltd for manufacturing electric scooters based on the information provide in Table 3 is presented below:

Table 2.1.6

Material yield variance

Materials	Variance
Battery units	-1664
Frame components	-243.225
Electronic components	-118.91
Total	-2026.135

Table 2.1.6 presents the value *material yield variance* calculated by applying the formula. Calculations as shown below:

Calculation of material yield variance

Battery units:

$$\begin{aligned} \text{Material yield variance} &= 640 \times \{12 - 14.60\} \\ &= 640 \times -2.6 \\ &= -1,664 \end{aligned}$$

Frame components

$$\begin{aligned} \text{Material yield variance} &= 75 \times \{15 - 18.243\} \\ &= 75 \times -3.243 \\ &= -243.225 \end{aligned}$$

Electronic components

$$\begin{aligned} \text{Material yield variance} &= 55 \times \{10 - 12.162\} \\ &= 55 \times -3.243 \\ &= -118.91 \end{aligned}$$

The calculation of material mix variance and material yield variance reveals that the variance caused by difference in material mix is favourable, whereas the sub usage variance is unfavourable. This indicates that though the proportion of battery units employed in production is within the standard, productivity

of the same is not up to the standards set by E-Bikes Ltd. However, adverse cost incurred due to lower productivity of battery units is balanced by the material mix variance, making the overall material variance favourable (2230).

2.1.4 Conclusion

Standards help an organisation to keep track of performance and maintain control. Standard costing is a tool that assists companies in setting up cost standards and performing variance analysis. The cost standards provide information on the cost expectation of an organisation and the variance analysis provides information on how much their performance meets these expectations, thus providing a basis for controlling future operations. The material variance analysis presented in this unit implies that variations in material cost may arise due to price and quantity factors. By applying the material cost variance procedure, explained in this unit, an organisation will be able to break down the price and quantity factors that contribute to the overall material cost differences. This information will facilitate an organisation to find out which material cost component is causing deviations from their expected performance. Thus, it can be concluded that material variance analysis helps an organisation to gather useful information that helps them take control measures to overcome the inefficiencies caused by specific material cost components.

Summarised Overview

This unit discusses standard costing and variance analysis, focusing on material variance. *Standard costing* is defined as the process of estimating costs and comparing them with actual costs to identify variances. The need for standard costing is emphasized, as it aids in controlling costs and evaluating performance, setting benchmarks for expected outcomes. The standard costing process involves estimating costs, calculating actual costs, comparing the two, and identifying variances, which are then transferred to the profit and loss account for disposal. Furthermore, the text notes that standard costing is applicable not only in manufacturing but also in service and non-profit sectors. It underlines the importance of accurate cost estimation based on technical inputs and historical data. The main components of standard costs include material costs, labour costs, and overhead costs. *Material cost variance* refers to the difference between standard cost and actual cost. *Material price variance* is the variance in materials cost arising due to the difference in purchase price. *Material usage variance* is the variance in materials cost arising due to the difference in purchase price. It comprises *material mix variance* and *material yield variance*. *Material mix variance* is the material usage variance that occurs when more than one inputs are used in production. It is the variance in material



usage due to the difference in the actual proportion of inputs and the standard proportion of inputs. *Material yield variance* refers to the variance in material usage arising due to the difference in productivity of inputs used in production.

Self-Assessment Questions

1. What is standard costing, and how does it differ from actual costing?
2. Explain the objectives of standard costing in cost control and decision-making.
3. Differentiate between basic, ideal, and attainable standards.
4. What are the main components of standard costing?
5. Discuss the importance of setting standard costs for material, labour, and overhead.
6. For producing 10kg of CEMCO, the standard material requirements is:

Material	Quantity	Rate per kg
A	8kg	6.00
B	4kg	4.00

During April, 1000 kg of CEMCO were produced. The actual consumption of materials is as under:

Material	Quantity	Rate per kg
A	7.5	7.00
B	5	5.00

Calculate (a) Material cost variance, (b) Material price variance, and (c) Material usage variance. (ICAI, Intermediate).

7. Product A required 10 kg of material at a rate of ₹4 per kg. The actual consumption of material for manufacturing product A comes to 12 kg of material at rate of ₹4.50 per kg. Calculate (a) Material cost variance, (b) Material price variance, and (c) Material usage variance.
8. Explain the significance of variance analysis in standard costing.

Assignments

1. Explain the importance of standard costing in cost control and performance evaluation. How does standard costing help managers in decision-making? Provide examples to support your answer.
2. Using the data provided in Exhibit 1, calculate the material cost variance, material price variance, and material usage variance for E-Bikes Ltd. Interpret the results and discuss the possible reasons for the variances.
3. Standard costing is widely used in manufacturing but is also applicable to service and non-profit organisations. Discuss the challenges of implementing standard costing in a service-based organisation. How can these challenges be addressed?

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2. The Institute of Cost Accountants of India. (2013). *Cost and Management Accountancy*. ICMAI.
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Suggested Reading

1. The Institute of Cost Accountants of India. (2013). *Cost and Management Accountancy*. ICMAI.
2. Kinney, M.R., & Raiborn, C. A. (2011). *Cost Accounting: Foundations and evolutions* (8th ed.). South Western Learning.
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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

SGOU

Unit 2

Labour Cost Variance

Learning Outcomes

By the end of this unit, the learner will be able to :

- ◆ identify labour costs from other cost components.
- ◆ have a clear understanding of the process of setting labour cost standards.
- ◆ to perform labour cost variance analysis.

Background

Impact of increasing labour costs on apparel supply chains

Labour costs have always been an essential concern for garment companies, brands and retailers because the cost of people is also crucial just like the cost of raw materials like cotton, yarns, or fabrics. In recent years, rising labour costs in major apparel manufacturing centres like China, Bangladesh, Vietnam and India have become a significant challenge for brands and suppliers accustomed to low-cost labour. Such an increase in labour cost leads to a situation where the actual cost exceeds the expected cost, forcing brands to rethink their sourcing strategies, manufacturing locations, and business models. *Labour cost variance* is a measure used to evaluate such labour cost differences, based on which companies can adopt strategic decisions like shifting production to regions with lower labour costs or investing in technology to improve efficiency. For instance, unfavourable labour cost variance due to a steady increase in manufacturing wages in China, a leading global apparel manufacturing hub for decades, has led brands to relocate their production out of China to other lower-cost countries. This unit illustrates the labour standards and measures companies employ for strategic decision-making.

Keywords

Labour cost standards, labour rate variance, labour efficiency variance, idle time variance

Discussion

Labour cost variance refers to variations in labour cost caused by the difference between actual and estimated or standard labour costs. The variance may arise due to a change in prevailing wage rates. This unit provides insights into the procedure for setting labour cost standards and presents the labour cost variance analysis.

2.2.1 Labour cost standards

Labour standards are developed by following procedures similar to material cost standards, such as identifying each production operation performed by workers or machinery. Labour cost standards outline the working hours (labour time standards) and wage rates (labour rate standards) relevant to manufacturing. Effective standards are created by companies by gathering quantitative data from methods like industrial engineering, time and motion studies, or historical data. It has to be noted that, while setting labour time standards unnecessary movement must be excluded. Methods time measurement analyses tasks to establish time standard for trained workers. However, in-house studies may lead to employee slowdowns when monitored, artificially inflating time standards. Alternatively, historical data can be used, but it may contain inefficiencies. Management often adjusts standards to account for these biases. Labour rate standards on the other hand should reflect wages and employee costs, including additional benefits and taxes. In cases where employees performing similar tasks are paid differently, a weighted average wage rate is calculated. The total cost of each operation is determined by multiplying job task time by wage rates, which are then summed to establish the total standard cost of producing one unit of product.

- ◆ Setting the selling prices under different economic conditions or scenarios

2.2.1.1 Procedure of setting labour time standards

The procedure or the steps involved in setting labour time standards are given below:

1. **Standardisation:** Similar to material standards, the labour standard begins with product standardisation. The process of product study and standardisation of products is explained in section 2.1.2.1 of unit 1.
2. **Labour specification:** Once product standards are developed the types of labour and labour time are specified. This is done based on past records and also considers the normal wastage of time.
3. **Standardisation of methods:** After specifying types of labour and labour time, appropriate sequences and methods for operating the machines are selected.
4. **Manufacturing layout:** Manufacturing layout is a plan of operation which is developed for each product list for which operations are to be performed.
5. **Time and notion study:** It is the process of identifying the best methods for completing tasks by workers and determining the standard time a worker requires for each job. In addition, it also considers factors such as learning efficiency and the impact of the learning curve.
6. **Training and trial:** Training is provided to workers in order to do the work and the time spent during the trial run is noted down.

2.2.1.2 Procedure of Setting Wage Rate Standard

The most important factor for determining the wage rate of workers would be the type of labour required for performing a specific job. The following factors will be considered while determining the standard wage rates for skilled and unskilled workers:

1. **Completion time:** It refers to the time taken by the workers to complete a unit of production.
2. **Piece-rate:** Time or piece rate commonly used in the industry, which can be identified through peers.
3. **Wage agreement:** The wage agreement entered between management and workers' union.
4. **Prevailing law:** Laws prevailing in the field of operation. For instance, the Payment of Minimum Wages Act, Payment of Bonus Act etc.

Exhibit 2.2.1

Given below is a statement showing the details of labour cost for E-Bike Ltd which manufactures electric scooters:

Actual			
Labour	Total hours	Rate	Total Cost
Assembly labour	12	₹84	₹1008
Quality control	10	₹33	₹330
			₹1338

Idle assembly hours = 5 and Idle Quality hours = 10

Standard			
Labour	Total hours	Rate	Total Cost
Assembly labour	11	₹60	₹660
Quality control	7.5	₹35	₹262.5
			₹922.5

2.2.2 Labour Cost Variance

◆ Difference between-actual labour cost and standard labour cost

Labour or employee cost refers to the amount paid to employees for the work done. The difference between actual labour cost and standard labour cost is known as the labour (employee) cost variance. It is also termed direct wage variance because it represents the difference between the actual direct wages incurred and the standard direct wages for a specific outcome. Mathematically, labour cost variance can be represented as follows:

$$\text{Labour Cost Variance} = \text{Standard Cost} - \text{Actual Cost}$$

Let us apply the formula to calculate the labour cost variance for manufacturing electric scooters by E-Bikes Ltd, based on the data provided in Exhibit 2.2.1. Here, the standard cost is ₹922.5 and the actual cost is ₹1338. Thus the labour cost variance will be:

$$\begin{aligned} \text{Labour Cost Variance} &= ₹922.5 - ₹1338 \\ &= -₹415.5 \end{aligned}$$

Here, the labour cost variance is negative, indicating that the actual cost incurred on labour exceeded the expected cost by -₹415.5, which is unfavourable for E-Bikes Ltd. This might be due to differences in actual labour rate or number of hours worked. By integrating such differences into the variance analysis, the labour cost variance can be divided into:

5. Direct labour rate variance (LRV) or wage rate variance (WRV)
6. Direct labour efficiency variance.
7. Idle time variance

2.2.2.1 Labour Rate Variance (LRV)

Labour rate variance is the difference between the actual hourly wage paid and the standard hourly wage of labour. It shows how much the actual wage varies from the expected wage for the

hours worked. In other words, it measures the gap between the actual wage rate and the standard wage rate per hour, based on the actual hours worked. Labour rate variance can be calculated as follows:

$$\text{Labour rate variance} = \text{Actual Hours (AH)} \times \{ \text{Std. Rate (SR)} - \text{Actual Rate (AR)} \}$$

Now let us try to find out the labour rate variance of assembly hours for E-Bike Ltd using the formula. By substituting the values given in Exhibit 2.2.1 we get:

Table 2.2.1

Labour Rate Variance	
<i>Assembly hours</i>	Amount
Material price variance = $12 \times \{ ₹60 - ₹84 \}$	-₹288
<i>Quality control</i>	
Material price variance = $10 \times \{ ₹35 - ₹33 \}$	₹20
Total	-₹268

The value of labour rate variance obtained indicates that out of the total labour cost variance of -₹415.5, -₹268 is caused due to the difference in standard and actual wage rates per hour of actual labour. This might be due to factors that are not within the control of an organisation. The factors which influence the direct labour rate variance include:

◆ Factors influence the direct labour rate variance

- 1. Wage structure in the industry:** Change in the wage structure that prevails in the industry, which will increase labour cost variances until standard costs are not revised in accordance to such change.
- 2. Difference in grades and pay:** Difference in grades and pay to workers might be different from what is already specified. This might be due to shortage of labour, or through mistake or due to retention of surplus labour.
- 3. Guaranteed wages:** It refers to the wages for workers unable to earn their normal wages. This might influence direct labour if such wages are also a part of the labour cost.
- 4. Difference in payment methods:** Using a different payment method, such as day rates instead of the standard piece-work remuneration system will affect direct labour.
- 5. Payment to casual and temporary workers:** Direct labour may also be affected by the higher or lower rates paid to casual and temporary workers who are employed to meet seasonal demands or urgent or special tasks.

6. **Arrears to new workers:** New workers are not receiving the full standard wage rates.
7. **Overtime and night shift:** Overtime and night shift work that exceeds the standard, or where no provisions have been included in the standard, will only apply if overtime and shift differential payments are considered part of the direct labour cost.
8. **Composition:** The composition of a gang as regards the skill and rates of wages being different from that laid down in the standard.

Nevertheless, it must be noted that, though labour rates are influenced by external factors beyond an organisation's control, personal managers are held responsible for labour rate negotiations.

2.2.2.2 Direct Labour Efficiency Variance

◆ Difference between-actual working hours and standard working hours

The variance that arises from differences in the actual working hours compared to standard working hours is called labour efficiency variance. This variance measures the difference between the standard hours that should have been worked and the actual hours worked, valued at the standard wage rate. It indicates whether the labour hours are efficient. It can be calculated as follows:

$$\text{Labour Efficiency Variance} = \text{Std. Rate (SR)} \times \{ \text{Std. Hours (SH)} - \text{Actual Hours (AH)} \}$$

To understand it better, let us recall the labour overhead data provided in Exhibit 1. Substituting the actual and standard labour details of assembly hours in the calculation for labour efficiency variance we get:

Table 2.2.2

Labour efficiency variance	
<i>Assembly hours</i>	Amount
Material price variance = $60 \times \{ ₹11 - ₹12 \}$	-₹60
<i>Quality control</i>	
Material price variance = $35 \times \{ ₹7.5 - ₹10 \}$	-₹87.5
Total	-147.5

This indicates that out of the overall labour cost variance of -₹415.50, -₹147.50 is due to the difference in standard hours and actual hours worked. Such variations in efficiency may arise due to the ability of the workers, an inappropriate team of workers, the inefficiency of the production manager or foreman etc. The factors which influence labour efficiency variance include:

◆ Factors Influence Labour Efficiency Variance

1. Lack of proper supervision or strict supervision than specified.
2. Poor working conditions.
3. Delays due to waiting for materials, tools, instructions, etc., if not treated as idle time.
4. Defective machines, tools and other equipments.
5. Machine break-down, if not booked to idle time.
6. Work on new machines requiring less time than provided for, till such time standard is not revised.
7. Basic inefficiency of workers due to low morale, insufficient training, faulty instructions, incorrect scheduling of jobs, etc.
8. Use of non-standard material requiring more or less operation time.
9. Carrying out operations not provided for booking them as direct wages.
10. Incorrect standards.
11. Wrong selection of workers, i.e., not employing the right type of man for doing a job.
12. Increase in labour turnover.
13. Incorrect recording of performances, i.e., time or output.

The production manager or foreman can be held responsible for the adverse variance which otherwise can be controlled.

Labour efficiency variance is further divided into:

1. Labour mix variance or gang variance
2. Labour yield variance or labour revised-efficiency variance.

◆ Changes in the combination of labour force

Direct labour composition or mix or gang variance: This is a sub-variance of labour efficiency variance, which arises due to changes in the composition of a standard gang or, a combination of labour force. For instance, change in the standard proportion of skilled workers, semi-skilled workers and unskilled workers in the total workforce. It can be calculated as follows:

$$\text{Labour Mix Variance} = \text{Std. Rate (SR)} \times \{ \text{Revised Std. Hours (RSH)} - \text{Actual Hours Worked (AH)} \}$$

Similar to material mix variance, wherein we were required to calculate revised standard quantity, labour mix variance requires revised standard hours (RSH), which can be calculated as follows:

Revised standard hours (RSH) =

$$\frac{\text{Total hours of actual labour}}{\text{Total hours of standard labour}} \times \text{Standard hours}$$

A detailed illustration of the application of labour mix variance calculation is presented below for your understanding:

Table 2.2.3

DETAILS OF STANDARD AND ACTUAL LABOUR HOURS EXTRACTED FROM EXHIBIT.1

Labour hours	Actual	Standard
Assembly hours	12	11
Quality control	10	7.5
Total	22	18.5

Note: Standard rate of *assembly hours* is ₹60, and *quality control* is ₹35

Table 2.2.4

Revised Standard Hours

Type of labour	Revised Standard Hours
Assembly hours	13.08
Quality control	8.92
Total	22.00

Calculation of revised standard hours (RSH):

Assembly hours

$$\begin{aligned} \text{RSH} &= \frac{22}{18.5} \times 11 \\ &= 13.08 \text{ hrs.} \end{aligned}$$

Quality control

$$\begin{aligned} \text{RSH} &= \frac{22}{18.5} \times 7.5 \\ &= 8.92 \text{ hrs.} \end{aligned}$$

Table 2.2.5

Labour mix variance

Type of labour	Variance
Assembly hours	₹64.80
Quality control	₹37.80
Total	₹27.00

Calculating Labour mix variance:

Assembly hours

$$\begin{aligned}\text{Labour mix variance} &= ₹60 \times \{13.08 - 12\} \\ &= ₹60 \times 1.08 \\ &= ₹64.80\end{aligned}$$

Quality control

$$\begin{aligned}\text{Labour mix variance} &= ₹35 \times \{8.92 - 10\} \\ &= ₹35 \times -1.08 \\ &= -₹37.80\end{aligned}$$

◆ Related to productivity of workers

Direct labour yield variance: It is the variation in labour cost on account of an increase or decrease in yield or output as compared to the relative standard. Labour efficiency variance arises due to the productivity of workers. It can be calculated as follows:

$$\text{Labour Yield Variance} = \text{Std. Rate (SR)} \times \{\text{Std. Hours (SH)} - \text{Revised Std. Hours (RSH)}\}$$

The labour yield variance of E-Bikes Ltd is presented in Table 5.

Table 2.2.6
Labour yield variance

Type of labour	Variance
Assembly hours	-₹124.80
Quality control	-₹49.70
Total	-₹174.50

Calculating labour yield variance:

Assembly hours

$$\begin{aligned}&= ₹60 \times \{11 - 13.08\} \\ &= ₹60 \times -2.08 \\ &= -₹124.80\end{aligned}$$

Quality control

$$\begin{aligned}&= ₹35 \times \{7.5 - 8.92\} \\ &= ₹35 \times -1.42 \\ &= -₹49.70\end{aligned}$$

The calculation of labour mix variance and labour yield variance reveals that the variance caused by the difference in labour composition is favourable, whereas as the variance caused due to the difference in the productivity of labour mix is unfavourable. This indicates that though the proportion of labour hours involved in the production is within the standard, productivity of

the same is not up to the standards set by E-Bikes Ltd. The degree of variation caused by labour yield variance is higher than the labour mix variance, thus resulting in a negative labour efficiency variance (-₹147.5) (27+ -174.5).

2.2.2.3 Idle Time Variance

◆ Difference between paid and work hours

It has to be noted that the actual labour hours may include the idle time of workers, which we have ignored in all the previous calculations of labour cost variance. The calculation of labour cost variance caused by such idle hours involved is known as idle time variance. It is the difference between paid and worked hours. This variance which forms a portion of wage efficiency variance, is represented by the standard costs of the actual hours for which the workers remain idle due to abnormal circumstances. It can be calculated as:

Idle Time Variance

$$= \text{Std. Rate (SR)} \{ \text{Actual Hours}_{\text{paid}} - \text{Actual Hours}_{\text{worked}} \}$$

Exhibit 1 provides that the idle time for labour hours involved in manufacturing electric scooters by E-Bikes Limited was 15, while the actual hours are given as 32 hours. This means that out of the 32 hours paid, the actual hours worked are only 17 (32-15). Considering the difference in actual hours paid and actual hour worked the labour cost variance be calculated is presented in Table 2.2.7:

Table 2.2.7
Idle time variance

Type of labour	Variance
Assembly hours	₹300
Quality control	₹105
Total	₹405

Assembly hours

$$\begin{aligned} \text{Idle time variance} &= ₹60 (12 - 7) \\ &= ₹60 \times 5 \\ &= ₹300 \end{aligned}$$

Quality control

$$\begin{aligned} \text{Idle time variance} &= ₹35 (10 - 7) \\ &= ₹35 \times 3 \\ &= ₹105 \end{aligned}$$

Idle time variance is always unfavourable.

The results obtained indicate that the presence of 15 idle hours out of paid hours reduces productivity and increases labour cost variance, thus resulting in an additional labour cost of ₹405. This indicates a significant financial impact due to inefficiencies in labour utilization.

Conclusion

Labour cost variance is an essential metric that highlights discrepancies in costs arising from the differences between actual and standard labour expenses. These differences can happen due to several factors, including, changes in the labour mix, and occurrences of idle time. The analysis of this variance helps an organisation in understanding these discrepancies. By closely analysing the various components of labour involved in production, organisations can gain valuable insights into the distinct costs associated with different labour proportions, productivity levels, and hours worked. This enables businesses to effectively monitor and control their labour costs, ultimately enhancing their financial performance.

Summarised Overview

Labour cost variance is a financial concept that highlights the difference between actual labour costs and standard labour costs, which is often influenced by fluctuations in wage rates. Establishing labour cost standards involves identifying various production operations and gathering quantitative data to accurately reflect working hours and wage rates. This process starts with product standardisation and culminated in training personnel and monitoring time during trial runs. Several factors play a role in determining these labour standards, including the time required for task completion, piece rates, wage agreements, and existing regulations. Labour cost variance can be categorized into three main types: *direct labour rate variance*, *direct labour efficiency variance* and *idle time variance*. The direct labour rate variance measures the extent of cost fluctuations caused by changes in wage rates. Conversely, the direct labour efficiency variance arises from differences in worker productivity and the effectiveness of the workforce. Analysing these variances provides organisations with insights into labour cost changes related to workforce inefficiencies. Additionally, calculating idle time variance is crucial, as actual labour hours often include periods where workers are not actively engaged in productive activities. Therefore, when assessing labour cost variance, it is essential to determine the proportion of the variance attributable to worker downtime. Understanding these distinctions helps organisations manage labour costs more effectively and identify areas of improvement.



Self-Assessment Questions

1. Define labour cost variance. How does it help in cost control?
2. Differentiate between labour rate variance and labour efficiency variance. Provide one example for each.
3. Enumerate and explain the steps involved in setting labour time standards.
4. State any three factors that can lead to unfavourable labour efficiency variance.
5. What is idle time variance? How can it be minimised in a manufacturing unit?
6. Explain the significance of using revised standard hour (RSH) in calculating labour mix variance.
7. A company has the following labour data:
 - a. Standard hours 100
 - b. Actual hours 120
 - c. Standard rate ₹50
 - d. Actual rate ₹55

Calculate: (a) Labour rate variance, and (b) Labour efficiency variance.

8. From the data below, calculate the idle time variance for Quality Control workers:
 - a. Actual hours paid 15
 - b. Actual hours worked 10
 - c. Standard rate ₹40

Assignments

1. Using the data from Exhibit 2.2.1, calculate the direct labour efficiency variance for both assembly hours and quality control labour. Provide step-by-step calculations.
2. Create a hypothetical case for a garment manufacturer shifting production from China to Vietnam due to labour cost variance. Explain what labour cost components the company would consider during this transition.
3. Design a brief report evaluating the impact of inaccurate labour standards (time and wage) on production cost control in a manufacturing unit. Use examples from the unit to support your analysis.

Reference

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Suggested Reading

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SGOU

Unit 3

Variance Overhead Cost Variance

Learning Outcomes

By the end of this unit, the learner will be able to:

- ◆ identify overhead costs from other cost components.
- ◆ have a clear understanding of the process of setting overhead cost standards.
- ◆ to perform fixed overhead cost variance analysis.
- ◆ analyse variable overhead cost variance analysis

Background

The rising electricity charges force mini steel plants in Chhattisgarh to shut down

On the eve of 29th July 2024 nearly 200 mini steel plants in Chhattisgarh have halted operations indefinitely, because of a steep increase in electricity charges. Chhattisgarh which had a favourable power rate, increased their electricity charges from Rs.6 to Rs.7 per unit. This increase resulted in an approximately 26.67% rise in costs, which made operations financially unviable for these small-scale manufacturers. This overhead cost variance negatively impacts the profitability and competitiveness of these plants, placing them at a disadvantage against steelmakers in other regions where electricity is cheaper. This situation highlights how rising overhead costs, especially from utilities, can drastically affect industries reliant on stable, predictable costs to remain competitive in challenging markets. The decision by mini steel plants in Chhattisgarh to shut down their operations is a direct consequence of an analysis of the overhead costs associated with utility costs i.e., electricity costs. Other utility costs include rent, water, gas etc. which support the revenue-generating activities of an organisation. Collectively, these costs are known as overhead costs. The case of mini steel plants in Chhattisgarh highlights the importance of understanding cost variances of such overheads. This unit illustrates the procedures involved in setting overhead standards and variance analysis related to these expenses.



Keywords

Overhead standards, variable overhead variance, fixed overhead variance, expenditure variance, volume variance

Discussion

◆ Indirect costs

2.3.1 Overhead standards

Overheads are business expenses that are essential for day-to-day operations but are not directly attributable to specific products or services. Contrary to other direct operating costs, overheads broadly support a business's revenue-generating activities rather than a particular activity. Overhead (OH) standards reflect the company's predetermined manufacturing overhead rates assigned to inventories. The best costing information comes from assigning overhead to different cost categories based on cost drivers using various activity drivers for overhead actions. After creating bills of materials, the operations flow document, and the predetermined OH rates for each activity, a standard cost card is prepared. This card summarises the standard quantities and costs needed to produce one unit.

2.3.1.1 Procedure of setting Overhead Time/quantity standards

Variable overhead time/quantity is estimated based on the specifications from the engineering department. Usually, variable overheads are determined by the amount of labour hours worked. However, they can also be based on the quantity of direct materials used. For instance, fixed overhead time is calculated based on the planned production volume

2.3.1.2 Procedure for Setting Overhead Expense Standards

When calculating overhead expense standards, it is important to consider both the level of output and the budgeted expenses. The budgeted output is fixed based on practical manufacturing capacity and anticipated sales demand. Expenditures can be categorized under various headings corresponding to the chosen level of output. These expenditures are classified as either fixed or variable. Therefore, the overhead expense standards are determined by computing the optimal level of output for production departments, followed by creating budgets for both fixed and variable overheads. If production is seasonal or fluctuates throughout the year, a flexible budget can be prepared to facili-

tate a comparison between the set targets and the actual expenditures for the period.

Exhibit 2.3.1

Actual			
Overheads	Quantity	Price	Total cost
<i>Variable:</i>			
Utilities	10	12.60	126
Maintenance	10	8.40	84
<i>Fixed:</i>			
Depreciations			252
Rent			336
			98
Production hours			60
Units of electric scooters produced			45
Standard			
Overheads	Quantity	Price	Total cost
<i>Variable:</i>			
Utilities	12	12	144
Maintenance	5	7.50	37.5
<i>Fixed:</i>			
Depreciations			250
Rent			300
			731.5
Production hours			70
Units of electric scooters			50

2.3.2 Overhead variance

Because total variable overhead costs change directly with the level of activity, and fixed overhead costs per unit change inversely with activity, you need to select a specific capacity level. This selection helps you compute budgeted overhead

◆ Difference between actual overhead incurred and overhead charged

costs and develop a predetermined overhead rate. The analysis of variations in overhead cost is the most difficult because overhead is the aggregate of indirect materials, labour and expenses. In simple terms, overhead variance is nothing but the under or over-absorption of overhead. This fourth variance approach offers managers the greatest detail and flexibility for control. In short, overhead cost variance or overall overhead variance can be explained as the difference between the actual overhead incurred and the overhead charged or applied to the job or process at the standard rate. The overhead variances comprise *fixed overhead variance* and *variable overhead variance*.

2.3.2.1 Fixed overhead cost variance

Fixed overhead cost variance provides information on the difference between the standard cost of fixed overhead allowed for the actual output and the fixed overhead cost incurred. The recovery of fixed overheads depends on capacity utilization. If a company produces less than projected output, it cannot recover all budgeted fixed overheads. This will result in a production volume variance. another variance arises from differences between actual spending and estimated fixed variable overheads, known as overhead expenses variance. The following discussion will clarify these two variances:

◆ Difference between budgeted fixed overhead and actual fixed overhead.

1. **Volume variance:** Fixed overhead costs do not change based on how much is produced within a certain range of activity. This means that while total fixed overhead remains the same, the cost per unit will decrease as production increases. Conversely, if production decreases, the cost per unit goes up. This creates a challenge for management, as they need a consistent way to allocate fixed overhead costs, regardless of how much is produced.
2. **Expenditure variance:** As discussed above, the production volume variance analyses the unrecovered fixed overheads. Apart from this, there can be variations in the actual spending of both fixed and variable overheads when compared to what was established as a standard. Such variations can be accounted for by analysing an overhead expense.

Calculation: As stated earlier fixed overhead cost variance refers to the difference between actual fixed overhead cost incurred and the absorbed fixed overhead costs. In other words, it measures the disparity between the standard cost of fixed overhead allocated for the actual output produced and the actual fixed overhead expenses incurred. It can be calculated as follows:

$$\text{Fixed overhead variance} = \{(SH \times SR) - (AH \times AR)\}$$

Where SH = standard hours, SR = standard rate, AH = actual hours, and AR = actual rate. Standard hour refers to the standard hours of actual production and standard rate refers to standard overhead rate per hour, which can be calculated as follows:

Standard hours of actual production =

$$\frac{\text{Budgeted hours}}{\text{Budgeted output}} \times \text{Actual output}$$

$$\text{Standard overhead rate per hour} = \frac{\text{Budgeted overheads}}{\text{Budgeted hours}}$$

Now let us apply the procedure to calculate the variance of fixed overhead rent paid by E-Bikes Ltd to manufacture electric scooters based on the details provided in Exhibit 1. First the standard hours of actual production and standard overhead of E-Bikes Ltd is calculated as follows:

$$\begin{aligned} \text{Standard hours of actual production} &= \frac{70}{50} \times 45 \\ &= 63 \text{ hours} \end{aligned}$$

Standard overhead rate per hour is shown in Table 2.3.1

Table 2.3.1

Standard overhead rate per hour

Fixed overhead	Rate
Depreciation	₹3.57
Rent	₹4.29
Total	₹7.86

Calculations:

Depreciations

$$\begin{aligned} \text{Standard overhead rate per hour} &= \frac{250}{70} \\ &= 3.57 \end{aligned}$$

Rent

$$\begin{aligned} \text{Standard overhead rate per hour} &= \frac{300}{70} \\ &= 4.29 \end{aligned}$$

Now let us apply the fixed overhead variance formula based on the values obtained to calculate the variance in fixed overhead rent:

$$\text{Fixed overhead variance} = \{(63 \times 7.86) - (588)\}$$



$$= 495.18 - 588$$

$$= -₹92.82$$

The value obtained reflects that the fixed overheads incurred by E-Bikes Ltd were significantly lower than expected, which is favourable. However, the overall variance is less informative as it is silent about whether the adverse cost arose due to expenditure variance or volume variance. Thus, fixed overhead variance is further divided into

1. Fixed overhead expenditure variance
2. Fixed overhead volume variance

2.3.2.2 Variable overhead cost variance

Variable overheads include expenses that vary with production levels, such as indirect materials or labour hours. If not specified, labour hours are typically used as the basis. The calculation of variable overhead cost variance is similar to that of labour cost variance. Variable overhead variance provides information on the variation in the actual overheads incurred from the overhead applied to actual production at the standard rate. It can be calculated as follows:

Variable overhead cost variance

$$= (\text{Standard variable overheads for actual production} - \text{Actual variable overheads})$$

Calculation: Based on the information provided in Exhibit 1 let's try to find out the variable cost variance for E-Bikes Ltd. Here, we cannot apply the formula directly to the cost details provided, as the standard overheads for actual production are not provided. For this first, we need to find out the standard cost per unit before applying the formula. The per unit standard cost is calculated as follows:

$$\text{Standard cost per unit} = \frac{144}{50}$$

$$= 2.88 \text{ per unit}$$

Now the standard overheads for actual production can be calculated as follows:

$$\text{Standard overheads for actual production} = (2.88 \times 45)$$

$$= 129.6$$

Now by substituting the value obtained for standard overheads for actual production, the variable overhead variance of utilities can be calculated as follows:

$$\begin{aligned}\text{Variable overhead variance} &= 129.6 - 210 \\ &= -80.4\end{aligned}$$

The value obtained represents the variance in variable overheads of E-Bikes Ltd in the production of electric scooters. Since the value is negative, the variance is unfavourable for the company. However, it does not provide information as to whether the variance is caused due to a change in actual spending or hours. Thus, variable overhead cost variance is divided into two:

- i. Variable Overhead expenditure variance and
- ii. Variable overhead efficiency variance

2.3.3 Volume variance

◆ A rise due to changes in volume of production

Volume variance is applicable only in the case of fixed overhead. It is a type of fixed overhead variance, which arises due to the changes in the volume of production. It is the difference between fixed overhead allowed for actual output at a standard rate and the budgeted fixed overheads. It represents the over and under-absorption of fixed overheads. Whereas, if the actual output is more than the estimated output, it leads to over recovery of fixed overheads and volume variance will be favourable and vice-versa. This is because fixed overheads are not expected to change with the change in output. The reasons for volume variance include:

1. Inefficiency of workers.
2. Inefficiency of machinery
3. Shortage of orders.
4. Shortage of power.
5. Ineffective supervision.
6. More or less working days.

$$\text{Volume variance} = (\text{SH} \times \text{SR}) - (\text{BH} \times \text{SR})$$

Here, SH = standard hours of actual production, SR = standard overhead rate per hour, and BH = budgeted hours. Budgeted hours refer to the standard time taken for producing estimated output. Now let us apply the formula to find out the volume variance of E-Bikes Ltd substituting the values provided in Exhibit 2.3.1:

$$\begin{aligned}\text{Volume variance} &= (63 \times \frac{550}{70}) - (588) \\ &= (63 \times 7.86) - 588\end{aligned}$$



$$= 495.18 - 588$$

$$= -92.82$$

- ◆ Types of fixed overhead volume variance

The value obtained is unfavourable, indicating that the actual production is below the estimate. The analysis highlights the importance of accurate production forecasting, as favourable variances support better resource allocation and may contribute to cost savings. The fixed overhead volume variance can be broken down to find out the variance caused due to efficiency, capacity and number of working days. Thus, fixed overhead volume variance can be subdivided as follows:

- a. Efficiency Variance
- b. Capacity variance and
- c. Calendar variance

Fixed overhead efficiency variance: Efficiency variance represents that portion of volume variance which arises due to the difference in actual efficiency achieved from the budgeted efficiency of production. It can be calculated as follows:

$$\begin{aligned} \text{Fixed overhead efficiency variance} \\ &= (\text{Standard hour} \times \text{Standard rate}) - (\text{Actual hours} \times \text{Standard rate}) \end{aligned}$$

Applying the formula on the fixed overhead rent paid by E-Bikes Ltd for manufacturing electric scooters, we get:

$$\begin{aligned} \text{Fixed overhead efficiency variance} &= (63 \times \frac{550}{70}) - (60 \times \frac{550}{70}) \\ &= (63 \times 7.86) - (60 \times 7.86) \\ &= 495.18 - 471.6 \\ &= 23.58 \end{aligned}$$

The result indicates a favourable fixed overhead efficiency variance, suggesting that rent have been utilized efficiently.

Fixed overhead capacity variance: Capacity variance shows how much the actual working capacity differs from the expected capacity. This variance occurs when a plant or equipment is underused or overused. It can result from factors like idle time, strikes, machinery breakdowns, power failures, material or labour shortages, absenteeism, overtime, and changes in the number of shifts. In summary, this variance happens because the actual working hours differ from the planned working hours.

$$\begin{aligned} \text{Fixed overhead capacity variance} \\ &= (\text{Actual Hours} \times \text{Standard Rate}) - (\text{Budgeted Hours} \times \text{SR}) \end{aligned}$$

Let us apply the formula to find out the capacity variance of rent paid by E-Bikes Ltd while producing electric scooters. Substituting the values provided in Exhibit 1 we get:

$$\begin{aligned}\text{Fixed overhead capacity variance} &= (60 \times \frac{550}{70}) - (70 \times \frac{550}{70}) \\ &= (60 \times 7.86) - (70 \times 7.86) \\ &= 471.6 - 550.2 \\ &= -78.6\end{aligned}$$

The value obtained reflects an unfavourable capacity variance, indicating that E-Bikes Ltd had not fully used the capacity for which it paid rent. This analysis emphasizes the need for effective capacity planning to ensure fixed costs like rent are optimally utilized.

Fixed calendar variance: Calendar variance occurs because of the difference in actual number of working days from the standard number of working days. If the actual working days exceed the budgeted working days, the variance will be favourable. Conversely, if the actual working days are fewer than the budgeted days, the variance will be unfavourable.

Fixed calendar variance

$$= \text{Std. Fixed Overhead Rate per day (Actual no. of working days - Budgeted working days)}$$

Here, we need the fixed overhead rate per day, the actual number of working days and the budgeted number of working days. Based on the data provided in Exhibit 2.3.1, let us assume that the actual working days, budgeted working days and fixed overhead rate per day are as follows, for E-Bikes Ltd:

$$\begin{aligned}\text{Actual number of working days} &= 2.5 \text{ days (60 hours)} \\ \text{Budgeted working days} &= 2.92 \text{ days (70 hours)} \\ \text{Standard rate per day} &= 188.36 (550 \div 2.92)\end{aligned}$$

Substituting the values on the calendar variance formula we get:

$$\begin{aligned}\text{Fixed calendar variance} &= 188.36 (2.5 - 2.92) \\ &= 188.36 \times -0.42 \\ &= -79.111\end{aligned}$$

The unfavourable calendar variance obtained indicates that fixed overhead was inefficient because of fewer working days, implying that E-Bikes Ltd had paid for more days than were used in production.

2.3.4 Expenditure variance

Expenditure variance is simply the difference between standard and actual overheads. Expenditure variance is part of both fixed and variable overhead variance. Hence it can be divided into:

1. Fixed overhead expenditure variance
2. Variable overhead expenditure variance

2.3.4.1 Fixed Overhead Expenditure Variance

◆ Reflects the efficiency of spending management

The fixed overhead expenditure variance indicates the difference between the actual fixed overhead spend and the estimated fixed overhead. This variance arises when there is a gap between the planned fixed overheads and the actual fixed overhead expenses that occurred during a period. It reflects how effectively spending has been managed. Such variances may result from the following reasons:

1. Rise in general price level.
2. Changes in production methods.
3. Ineffective control

Fixed overhead expenditure variance can be calculated as follows:

$$\begin{aligned} \text{Fixed overhead expenditure variance} \\ = \text{Budgeted fixed overhead} - \text{Actual fixed overhead} \end{aligned}$$

Let us apply the formula for calculating the expenditure variance on rent paid by E-Bikes Ltd for manufacturing electric scooters, based on the data provided in Exhibit 1. Substituting the value we get:

$$\text{Fixed overhead expenditure variance} = 550 - 588 = -38$$

The variance obtained indicates that E-Bikes Ltd. incurred an unfavourable variance in rent expenditure, implying excess spending against the estimated rent. This necessitates a review and manage fixed overhead costs more effectively to avoid budget overruns in the future.

2.3.4.2 Variable Overhead Expenditure Variance

The variable overhead expenditure variance indicates the discrepancy between our actual spending on variable overhead and the budgeted amounts based on the hours worked. This variance may arise from fluctuations in both the costs of components and the amount of work performed. It happens due to the divergence

between the standard variable overhead rate and the actual variable overhead rate corresponding to the hours worked. The calculation can be outlined as follows:

Variable overhead expenditure variance

$$= [(Standard\ rate \times Actual\ hours) - (Actual\ rate \times Actual\ Hours)]$$

Here, the actual rate represents the actual rate per hour. Based on the data provided in Exhibit 2.3.1 let us calculate the variance between actual and standard variable overhead spending. Substituting the values we get:

Variable overhead expenditure variance

$$\begin{aligned} &= \left[\left(\frac{181.5}{70} \times 1 \times 60 \right) - (210) \right] \\ &= (2.60 \times 60) - (210) \\ &= 156 - 210 \\ &= -54 \end{aligned}$$

The value obtained indicates that the variance of money spent on variable overheads by E-Bike Ltd is unfavourable. This can be due to higher costs or increased use of indirect materials. Price variances may occur when changes in variable overhead prices are not captured in the standard rate, such as shifts in indirect labour wages or utility costs. Managers typically have limited control over these external price changes and should not be held accountable; the standard rate should instead be adjusted. However, quantity variances from waste or shrinkage, like material deterioration due to poor handling, can be managed, so managers should be responsible for improving controls.

2.3.5 Efficiency variance

Efficiency variance represents the variation in actual and standard overheads due to the difference in standard and actual hours of output. It is a sub-classification of variable overhead variance. It is a measure of the extra overhead or savings incurred as a result of excess or lower usage of labour hours than standard labour hours allowed. This variance measures how to use more or less of the activity or resource. that serves as the basis for variable overhead application and affects cost. When the actual input exceeds the standard input allowed, it indicates that production operations are inefficient. Additionally, the excess input suggests that a larger variable overhead budget is necessary to

accommodate the increased activity level being utilized. Variable overhead efficiency variance can be calculated as follows:

$$\begin{aligned} &\text{Variable overhead efficiency variance} \\ &= [(\text{Standard hours} - \text{Actual hours}) \times \text{Standard rate}] \end{aligned}$$

Applying the formula of variable overhead efficiency variance on variable overheads used by E-Bikes Ltd, we get:

$$\begin{aligned} &[(63 - 60) \times 2.60] \\ &= 3 \times 2.60 \\ &= 7.8 \end{aligned}$$

The positive variance obtained here indicates that E-Bikes Ltd. used fewer actual hours than the standard hours for production, suggesting that the company managed its resources more efficiently. Thus, emphasizing the importance of effectively controlling variable overheads like utilities that can contribute to overall cost savings and enhance profitability.

Problems faced while setting physical standards

The discussion so far had covered the material cost, labour cost, and overhead cost standard and variance analysis. However, some problems persist while setting these standards which vary from industry to industry. They are illustrated below:

1. When a company introduces a new product line, it may need to hire inexperienced workers, complicating the process of setting standard time due to their lack of experience.
2. Changes in technology often require the installation of complex machines. Initially, accurately estimating output and efficiency can be challenging until the working conditions stabilize. Therefore, establishing standards and estimating costs for these machines will require significant effort.
3. Manufacturers often choose product diversification to enhance profitability. A key challenge with this change is re-setting production facilities. For instance, switching from copper to bronze parts requires new tools, which complicates establishing standard production times for the updated equipment.
4. Material specifications are established, and if the materials do not meet these specifications, achieving the standards may be impossible.
5. Cost accountants frequently face the challenge of selecting the appropriate type of standard to adopt. For instance, the industrial engineer has provided the standard time for all direct labour operations as follows:
 - a. The standard time achievable by the most efficient operations is 2 hours for each unit of product,

which includes provisions for personal fatigue and delays.

- b. The average trained operator can achieve a good performance of 2.10 hours per unit of product.
- c. The typical past performance is 2.60 hours for each unit.

The question arises whether direct labour standard hours should be based on maximum efficiency, attainable good performance, or average past performance. Using maximum efficiency can lead to lower unit costs in selling prices, but may result in a high debit variance if not achieved. Conversely, basing standards on attainable performance may minimise variances. Maximum efficiency standards can help departmental heads control performance. Similar considerations apply to waste standards, as deciding between accounting for only unavoidable wastage or past average wastage will impact production cost standards differently.

Understanding fixed and variable overhead cost standards is essential for any business striving to enhance efficiency and maintain control over overhead expenses. Just like in the case of material, labour and overheads, a variance analysis is what helps organisations to efficiently maintain control over the expenses. This unit presented the fixed and variable overhead variance analysis. First, we illustrated fixed overhead variance, by comparing the budgeted and actual rent incurred by E-Bikes Ltd. The variations observed may be due to shifts in production volume and various cost control measures. The volume variance presented in this unit captures the impact of production changes on rent and the expenditure variance shows how much actual rent differs from what was planned. Secondly, the variable overhead variance analyses the costs that change with production levels, such as utilities. The variance analysis mainly represents the spending variances and efficiency variances. The spending or expenditure variance presented in this unit evaluates the cost control efficiency by comparing the actual rate per unit to the budgeted rate of utilities. Efficiency variance examined how well utilities were used against the standard hours set for production. This analysis pinpoints the cost drivers and identifies areas that need improvement for E-Bikes Ltd. This will lead the company to better resource management and tighter cost control, ensuring alignment with production standards. Furthermore, an analysis of sales variance is required to complete the variance analysis, presented in the next unit.

Summarised Overview

Fixed and variable cost standards play a vital role in standard costing, serving as a benchmark for assessing the efficiency and control of overhead expenses. *Fixed overhead variance* specifically analyses the discrepancies between budgeted fixed overhead costs and the actual costs incurred. This variance primarily stems from changes in production volume and effectiveness in cost control. The main components of fixed overhead variance are expenditure variance and volume variance. On the other hand, *variable overhead variance* examines the fluctuations in costs that vary with production levels, such as utilities and indirect materials. This analysis is based on two key variances: spending variance, which gauges cost control efficiency by comparing the actual cost per unit to the budgeted rate, and efficiency variance, which assesses resource utilization against standard hours. By conducting variance analysis, businesses will be able to identify cost components and identify gaps in efficiency which facilitates improved resource management and cost control in alignment with established production standards. For instance, overhead cost standards offer insights into an organisation's expectations regarding expenditures on fixed and variable overheads, providing a framework for evaluating actual costs incurred. This process underscores the importance of variance analysis in understanding the importance of variance analysis in understanding how effectively a company manages its variable overheads, including utilities and indirect labour.

Self-Assessment Questions

1. Define overhead costs. How are they different from direct costs?
2. What are the main components of fixed overheads and variable overheads?
3. Why is it important to set overhead cost standards in manufacturing?
4. What is the difference between standard overhead and actual overhead?
5. Define fixed overhead cost variance and list its two major components.
6. E-Bikes Ltd has budgeted 80 hours to produce 60 electric scooters. The standard overhead rate is 8. The actual hours used were 72, and actual variable overhead incurred was 576. Calculate (i) Standard hours for actual production, (ii) Variable overhead cost variance, (iii) Variable overhead expenditure variance.
7. Given the following data
 - a. Budgeted fixed overhead 500
 - b. Actual fixed overhead 550
 - c. Budgeted hours 100

- d. Actual hours 90
- e. Output achieved 45 units
- f. Budgeted output 50 units

Calculate (i) Fixed overhead expenditure variance, (ii) Fixed overhead volume variance, and (iii) Fixed overhead efficiency variance.

8. A company incurred 950 as actual fixed overhead. Standard overhead rate is 10 per hour. Standard hours allowed for actual production is 80 hours. Calculate (i) Total fixed overhead cost variance, (ii) Determine whether the variance is due to under-absorption or over-absorption.

Assignments

1. Analyse the impact of rising utility costs on the financial viability of manufacturing firms with a focus on fixed vs. variable overhead components.
2. Develop a cost control strategy for a mini steel plant in Chattisgarh facing adverse overhead variances. Focus on utility and maintenance costs.
3. Critically evaluate the role of flexible budgeting in overhead variance analysis with relevant examples from the E-Bikes Ltd case.

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Unit 4

Sales Value Variance

Learning Outcomes

By the end of this unit, the learner will be able to :

- ◆ comprehend the need for sales variance analysis
- ◆ to perform sales variance analysis.
- ◆ evaluate profit variance analysis.

Background

Volkswagen hit by 60% fall in profits as sales in China slump

Volkswagen recently announced its financial results for third quarter. The company has seen a significant 64% drop in net profit compared to last year. This decline is mainly due to high operational costs and lower sales in the important Chinese market, which has been key to Volkswagen's growth. Several factors contribute to this decline. The company faces increased competition from both traditional car manufacturers and new electric vehicle (EV) startups. This makes it harder for Volkswagen to keep its market share. Additionally, the electric vehicle sector is not performing well, showing that the company needs to innovate and adapt quickly to changing consumer preferences and regulations. In response to these issues, Volkswagen is considering a restructuring strategy. This could include closing factories and cutting jobs as the company seeks to reduce costs and streamline operations. Executives stress that it is crucial to make significant cost reductions to stay competitive in a fast-changing market. This situation highlights how sales can vary from the expectations of an organisation. In such a situation an organisation can focus on analysing sales performance to address the challenges posed by such variations. This process helps a company to identify gaps between expected and actual sales, revealing factors that contribute to underperformance. By understanding these differences, a company can adjust its strategy, reallocate resources, or implement targeted cost-cutting measures. These proactive steps are essential for a company's long-term success in a competitive industry. This unit, illustrates the procedure of variance analysis that can be undertaken by companies for performance evaluation.



Keywords

Sales variance, sales value variance, profit variance, volume variance, mix variance

Discussion

The analysis of variance will only be considered complete when the discrepancies between actual profit and standard profit are thoroughly examined. It is essential to conduct a sales variance analysis to achieve a comprehensive understanding of profit variance, as profit is calculated by subtracting costs from sales. Therefore, alongside the evaluation of cost variances, it is important to also perform an analysis of sales variance.

2.4.1 Sales variance

Sales variance can be classified into revenue or value variance and margin or profit variance. sales value variance reflects the difference between budgeted and actual sales values, which may result from variations in actual selling price, actual quantity sold and actual sales mix from the expectations of an organisation. On the other hand, sales margin variance measures the difference between budgeted actual profit, representing the combined effect of all variances. This variance can arise due to factors such as general price increases, unexpected competition, or ineffective sales promotions.

Exhibit.2.4.1

Standard and actual sales figures of E-Bikes Ltd.:

Particulars	Standard	Actual
Sales value	1,200,000	1,050,000
Selling price per unit	1,500	1,400
Quantity of units to be sold/ actually sold	800	750
Budgeted profit	4,000,000	330,000

Additional information:

- ◆ Standard sales mix: 70% standard model, 30% premium model

- ◆ Actual sales mix: 60% standard model, 40% premium model

2.4.1.1 Sales Value Variance/Revenue Variance

Sales value variance is caused due to the difference in actual sales from budgeted sales. If the actual sales exceed budgeted sales, a favourable variance would be shown and vice-versa. It can be calculated as follows:

$$\text{Sales value variance} = \text{Budgeted sales} - \text{Actual sales}$$

By substituting the sales figures of E-Bikes Ltd provided in Exhibit1 we get:

$$\begin{aligned} \text{Sales value variance} &= 1,200,000 - 1,050,000 \\ &= 1,50,000 \end{aligned}$$

It reflects an unfavourable situation for E-Bikes Ltd as the actual sales are below budgeted sales. This suggests that E-Bike Ltd failed to achieve its sales target. This may be due to factors like pricing, demand fluctuation or competitive market conditions. These results highlight the need for investigating specific causes behind the poor sales performance. Thus, sales variance can be further divided into:

Price variance: Price variance may result due to the differences in actual and standard selling price of products sold. It can be determined in the same way as the material price variance. It represents the difference between the actual selling price and the standard selling price for the quantity of sales that occurred. The formula for this is:

$$\begin{aligned} \text{Price variance} \\ &= \text{Actual quantity sold} \times (\text{Standard price} - \text{Actual price}) \end{aligned}$$

Now let us apply the formula using the sales data of E-Bikes Ltd to calculate price variance and we get:

$$\begin{aligned} \text{Price variance} &= 750 (1,500 - 1,400) \\ &= 750 \times 100 \\ &= 75,000 \end{aligned}$$

The value obtained represents unfavourable variance of ₹75,000 due to reduction in the selling price per unit compared to the standard price. This suggests that E-Bikes Ltd earned less revenue per unit than planned, potentially due to competitive pricing pressure or a need to adjust prices to stimulate sales. This insight is important for the organisation as it highlights the impact of pricing decisions on profitability and may prompt a review of pricing strategies or cost structures to maintain target margins.

Volume variance: Volume variance may occur due to the difference in standard and actual quantity sold. It can be determined as material usage variance. Budgeted sales may be different from the actual sales. In other words, the budgeted quantity of sales at standard prices may vary from the actual quantity of sales at standard prices. Thus, the variance is as a result of difference in budgeted and actual quantities of goods sold. The formula is:

Volume variance

$$= \text{Standard price} \times (\text{Budgeted quantity} - \text{Actual quantity})$$

Applying the formula for volume variance on the data provided in Exhibit 1 we get the volume variance of E-Bikes Ltd as shown below:

$$\begin{aligned} \text{Volume variance} &= 1500 \times (800 - 750) \\ &= 1500 \times 50 \\ &= 75,000 \end{aligned}$$

The volume variance indicates a ₹75000 loss in revenue due to selling fewer units than originally budgeted. Specifically, this unfavourable variance is due to selling 50 units less than the planned quantity. This implies that the company failed to meet its expected sales volume. Information on this variance is important for management, as it signals the need to examine sales strategies, market conditions, and production efficiencies to align closer with sales targets and maintain projected revenue levels.

Mix variance: When more than one product is manufactured and sold, the budgeted sales of different products are in a given ratio. If the actual quantities sold are not in the same proportion as budgeted, it would cause a mix variance. It can be calculated according to two methods:

- i. *Based on quantity:* This method is followed on those cases where products are homogenous. Here the formula for calculating *sales mix variance* is same as used in case of *material mix variance*.

$$\text{a. Mix variance} = \text{Standard price} \times (\text{Revised standard quantity} - \text{Actual quantity})$$

If the actual quantity is more than the revised standard quantity, it will result in favourable variance and vice versa. The revised standard quantity can be calculated as shown below:

Revised standard quantity

$$= \text{Total quantity of actual mix} \times \frac{\text{Standard quantity}}{\text{Total quantity of standard mix}}$$

$$\text{Quantity variance} = \text{Standard sales} - \text{Revised standard sales}$$

Let us consider an example, where a company budgeted to sell 100 units in the ratio (i) Product A 60 units and (ii) Product B 40 units. But they actually sold 50 units of A and 70 units of B. The standard price is 10 and 8 for product A and B respectively.

$$\begin{aligned} \text{Total quantity of actual mix} &= 50 + 70 \\ &= 120 \end{aligned}$$

Revised standard quantities:

$$\begin{aligned} \text{A} &= 120 \times (60 \div 100) = 72 \text{ units} \\ \text{B} &= 120 \times (40 \div 100) = 48 \text{ units} \end{aligned}$$

Mix variance for each product:

$$\begin{aligned} \text{A} &= 10 \times (72 - 50) = 220 \\ \text{B} &= 8 \times (48 - 70) = -176 \end{aligned}$$

$$\begin{aligned} \text{Total Mix variance} &= 220 - 176 \\ &= 44 \end{aligned}$$

Here it can be observed that the mix variance for product A is favourable, whereas the product mix variance for product B is unfavourable. However, the Total mix variance is observed to be favourable. This implies that more of the higher-margin product (A) could have been sold to maximise profit.

ii. Based on value: This method is followed in those cases where products are not homogenous. In such a case, the actual sales at standard prices, i.e., standard sales are to be expressed in budgeted ratios to calculate 'revised standard sales' and then are compared with the actual sales at standard prices. The formula is:

$$\text{Mix variance} = \text{Revised standard sales} - \text{Standard sales}$$

Here,

$$\text{Revised standard sales} = \text{Budgeted ratio of sales} \times \text{Standard sales}$$

Where,

Budgeted ratio of sales

$$= \text{Budgeted sales of a product} / \text{Total budgeted sales}$$

Let us consider an example. As per the budgeted sales of a Tech. Ltd, a computer hardware company, the value of total sales is 100000, wherein laptop sales amounts to 60000 and smartphone sales is 40000. The value of actual total sales is 120000. Similarly, the actual sales of laptops and smartphone is 50000 and 70000 respectively.

Solutions.

Calculation of Budgeted ratio:

Laptop

$$\begin{aligned} \text{Budgeted ratio of sales} &= 60000 \div 100000 \\ &= .6 \end{aligned}$$



Smartphone

$$\begin{aligned}\text{Budgeted ratio of sales} &= 40000 \div 100000 \\ &= .4\end{aligned}$$

Calculation of revised standard sales:

Laptop

$$\begin{aligned}\text{Revised standard sales} &= .6 \times 120000 \\ &= 72000\end{aligned}$$

Smartphone

$$\begin{aligned}\text{Revised standard sales} &= .4 \times 120000 \\ &= 48000\end{aligned}$$

Calculation of mix variance

Laptop

$$\begin{aligned}\text{Mix variance} &= 72000 - 50000 \\ &= 22000\end{aligned}$$

Smartphone

$$\begin{aligned}\text{Mix variance} &= 48000 - 70000 \\ &= -20000\end{aligned}$$

Total Mix variance

$$\begin{aligned}&= 22000 - 20000 \\ &= 2000\end{aligned}$$

It can be observed that the mix variance for laptops is favourable, whereas the variance is unfavourable for smartphones—however, the total variance of Tech. Ltd is 0. This implies that the company sold more smartphones than planned, but fewer laptops, and thus the total effect has been balanced out.

Quantity variance: This is the difference between budgeted sales and the revised standard sales. The formula is:

$$\text{Quantity variance} = \text{Budgeted sales (Standard sales)} - \text{Revised standard sales}$$

Let consider an example, where Company A had budgeted 60000, and 40000 as sales for Product A and B. The total budgeted sales thus amounts to 100000. Now let us assume that the actual quantity sold is 120000, at standard prices maintaining the budgeted sales mix ratio.

Solution

Calculation of revised standard sales

Product A

$$\begin{aligned}\text{Revised standard sales} &= 60\% \text{ of } 120000 \\ &= 72000\end{aligned}$$

Product B

$$\begin{aligned}\text{Revised standard sales} &= 40 \% \text{ of } 120000 \\ &= 48000\end{aligned}$$

$$\text{Total Revised Standard Sales} = 120000$$

Calculation of Quantity Variance

$$\begin{aligned}\text{Quantity Variance} &= 100000 - 120000 \\ &= 20000\end{aligned}$$

It can be observed that the quantity variance is favourable for Company A as the actual quantity sold was more than budgeted, leading to a higher total revenue, even though the product mix remained the same.

2.4.1.2 Sales margin variance/Profit variance

This represents the difference between budgeted profit and actual profit. The formula is:

$$\text{Profit variance} = \text{Budgeted profit} - \text{Actual profit}$$

Suppose XYZ Ltd. budgeted a profit of 50000, but actually earned a profit of 45000. The profit variance will be:

$$\begin{aligned}\text{Profit variance} &= 50000 - 45000 \\ &= 5000\end{aligned}$$

This implies that the company earned less profit than what was expected.

Price variance: It shall be equal to the price variance calculated with reference to turnover. It represents the difference between standard and actual profit on the actual volume of sales. The formula is:

$$\text{Price variance} = \text{Actual quantity} (\text{Standard profit} - \text{Actual profit})$$

Let us take an example. ABC Ltd sold 1000 units. The budgeted profit per unit was 10 and the actual profit per unit is 8.

Solution

$$\begin{aligned}\text{Price variance} &= 1000 \times (10 - 8) \\ &= 1000 \times 2 \\ &= 2000\end{aligned}$$

This implies that the company earned 2 per unit lower than what was expected, resulting in lower overall profit.

Volume variance: The profit at the standard rate on the difference between the standard and the actual volume of sales would be the amount of volume variance. This can be calculated as follows:



$$\text{Volume variance} = \text{Budgeted profit} - \text{Standard profit}$$

Volume variance

$$= \text{Standard profit} (\text{Standard quantity} - \text{Actual quantity})$$

Suppose that the standard profit per unit of XYZ Ltd. is 10, budgeted sales quantity is 6000 units, and actual sales was 5000 units. The volume variance will be:

$$\begin{aligned} \text{Volume variance} &= 10 \times (6000 - 5000) \\ &= 10 \times 1000 \\ &= 10000 \end{aligned}$$

This imply that the company sold lesser units that that was budgeted, reducing the total profit.

The volume variance can be divided into:

Mix variance: When more than one product is manufactured and sold, the difference in profit can result because of the variation of the actual mix and budgeted mix of sales. The difference between revised standard profit and standard profit, therefore is the mix variance. The formula is:

$$\text{Mix variance} = \text{Revised standard profit} - \text{Standard profit}$$

The actual quantities are to be revised in the ratio of the standard mixture.

Suppose that the budgeted sales mix of ABC Ltd is 60 units, and 40 units resepectively for product A and B. The per unit price is 5 for A and 10 for B. The budgeted profit amounts to 300 and 400 for A and B respectively. The actual sales is (i) A = 50 units, (ii) B = 70 units, and (iii) Total = 120 units.

Solution

Revised standard profit:

Product A

$$\begin{aligned} \text{Revised standard profit} &= 120 \times (60 \div 100) \times 5 \\ &= 72 \times 5 \\ &= 360 \end{aligned}$$

Product B

$$\begin{aligned} \text{Revised standard profit} &= 120 \times (40 \div 100) \times 10 \\ &= 48 \times 10 \\ &= 480 \end{aligned}$$

$$\text{Total revised standard profit} = 840$$

Calculation of actual standard profit

Product A

$$\begin{aligned}\text{Actual standard profit} &= 50 \times 5 \\ &= 250\end{aligned}$$

Product B

$$\begin{aligned}\text{Actual standard profit} &= 70 \times 10 \\ &= 700\end{aligned}$$

$$\text{Total actual standard profit} = 850$$

$$\begin{aligned}\text{Mix variance} &= \text{Revised Standard Profit} - \text{Actual Standard Profit} \\ &= 840 - 950 \\ &= 110\end{aligned}$$

Quantity variance: It results from the variation in profit because of the difference in actual quantities sold and the budgeted quantities both taken in the same ratio. The formula is:

$$\text{Quantity variance} = \text{Budgeted profit} - \text{Revised standard profit}$$

Let us consider the previous example, where the budgeted profit was 700 (400 + 300). And the revised standard profit calculated was 840 (480 + 360). Hence:

$$\begin{aligned}\text{Quantity variance} &= 700 - 840 \\ &= -140\end{aligned}$$

This imply that selling more units overall increased the profit eventhough the mix remained the same.

Summarised Overview

Sales variance analysis is a crucial financial tool used by organisations to evaluate the differences between their actual sales figures and their budgeted sales projections. This detailed examination allows businesses to pinpoint specific deviations that may arise from a variety of factors, including quantity sold, pricing strategies, or external market influences. By understanding these variations, companies can make informed adjustments in areas such as pricing structures, product offerings, or target market strategies, ultimately aligning their operations with financial goals. In contrast, profit variance analysis delves deeper into the discrepancies between actual profits and anticipated profits. This process involves dissecting the elements that impact profitability, including fluctuations in costs, changes in sales volume, and variations in operational efficiency. By isolating these factors, organisations can implement targeted corrective measures to address areas of concern and optimize future planning efforts. Together, sales and profit variance analysis serve as indispensable components of effective financial control and strategic decision-making, empowering businesses to respond proactively to market conditions and enhance their overall performance.



Self-Assessment Questions

1. Explain the importance of sales variance analysis in organizational performance evaluation.
2. Differentiate between sales value variance and sales margin variance with suitable examples.
3. How can price and volume variances impact the overall sales performance of a company?
4. Discuss how sales mix variance is calculated and interpret its significance when the actual sales mix differs from the standard mix.
5. Analyse the reasons why Volkswagen might experience an unfavourable sales variance. link your answer to real world factors and variance types.
6. Describe how profit variance is derived and why it is necessary to examine both cost and sales variances.
7. Evaluate the impact of unfavourable price variance on profit margins. Under what circumstances can a company still maintain profitability despite such variance?
8. In what ways can variance analysis support strategic decision making in a competitive market environment, such as the electric vehicle industry?

Assignments

1. Volkswagen reported a 64% fall in net profit due to slumping sales in China. Design a variance analysis framework that could help Volkswagen identify key problem areas and develop corrective strategies.
2. Develop a detailed mix and quantity variance analysis using a two-product company scenario of your choice. Interpret the business implications of your results.
3. Create a comparative variance analysis report for a company with both actual and budgeted sales data for three products. include sales value variance, mix variance, and profit variance. present your findings in a tabular format with comments.

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Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

SGOU

03 BLOCK

Activity-Based Costing (ABC) and Transfer Pricing Applications

Block Content

- Unit - 1 ACTIVITY-BASED COSTING (ABC)
- Unit - 2 TRANSFER PRICING MODELS

Unit 1

Activity-Based Costing (ABC)

Learning Outcomes

After completing this unit, the learners will be able to:

- ◆ familiarize the concept of Activity Based Costing
- ◆ understand the product costing under ABC
- ◆ differentiate between Activity Based Costing Method and Traditional Absorption Costing Method

Background

We know that overheads refer to the costs of all materials, labour, and expenses that cannot be readily identified with a particular job, product, or process. In other words, Overhead refers to the sum of indirect material, indirect labour and indirect expenses. There are different types of overheads, such as production overheads, administration overheads, and selling and distribution overheads. Traditional costing methods, such as job-order costing and process costing, often allocate overhead costs based on a single volume-based measure, such as direct labour hours or machine hours. While these methods were effective in the early 20th century when direct labour and material costs constituted the bulk of total costs, they became less relevant as businesses evolved. With advancements in technology and increased automation, overhead costs, such as utilities, maintenance, and administrative support, began to play a more significant role in total production costs. The reliance on unsophisticated allocation bases often led to cost distortions, particularly in the case of products or services that consumed resources unevenly. Activity-Based Costing was developed to address this challenge. ABC traces overhead costs more accurately by focusing on activities as the primary cost drivers. Instead of spreading the overheads broadly across all products or services, it identifies specific activities involved in production or service delivery. It assigns costs based on the extent to which each product or service utilises those activities. This approach provides more precise cost information, enabling organisations to understand the true profitability of their products better.

Keywords

Activity Based Costing, Cost Driver, Activity Based Cost Management, Activity Based Budgeting

Discussion

In traditional costing systems, overhead costs are grouped under cost centres and allocated to products based on factors such as direct labour hours, machine hours, or production volume. While this method works for some organisations, it can lead to inaccurate cost information in certain cases, especially when overhead rates are calculated using simplified bases like labour or machine hours. These rates assume that products requiring more time to produce inherently generate more overhead, which may not always reflect reality. This doesn't mean that all traditional costing systems are inaccurate. Some do provide detailed overhead allocation by first distributing service centre costs to production cost centres before calculating absorption rates. For organisations that do not require highly precise cost information, traditional costing may be sufficient. However, conventional methods may fall short for businesses that rely on accurate cost data to set prices or make long-term decisions. Such organisations benefit from **Activity-Based Costing (ABC)**, a modern approach designed to provide more accurate product cost information by linking overheads to specific activities.

- ◆ Limitations of traditional costing systems.

The concept of Activity-Based Costing (ABC) emerged in the late 1980s due to the limitations of Traditional Costing Methods. Initially developed in manufacturing industries, where overhead costs were rapidly increasing, ABC has since been adopted across various sectors, including healthcare, banking, and retail, to improve cost allocation accuracy. The concept of ABC was first defined by Robert S. Kaplan and Robin Cooper in 1987. Their research highlighted the strategic benefits of ABC, including improved decision-making, better resource allocation, and enhanced competitiveness. Today, ABC is widely recognised and used as a powerful management tool.

- ◆ Emergence of Activity Based Costing



3.1.1 Meaning of Activity-Based Costing

3.1.1.1 Activity-Based Costing – Meaning and Definition

Activity-based costing (ABC) is a costing system that assigns costs to specific activities or processes that drive those costs rather than spreading them uniformly across all products or services. In this system, overheads are initially calculated separately for each activity. These overhead costs are then allocated to various cost objects based on the extent to which each cost object utilises the activities. It allows resources and overhead costs to be assigned more accurately to the products and services that use them, compared to traditional methods that rely on labour or machine hours as the basis for cost absorption over cost centres. The **Activity-Based Costing (ABC) system** is particularly suitable for businesses where overhead costs are significantly higher than direct costs. It is highly effective in organisations with a diverse product range or multiple products, especially when different products consume varying amounts of overhead resources. ABC is also useful when the firm is facing stiff competition and when resource consumption is not directly linked to production volume. ABC primarily aims to reduce distortion in product costs, which normally happens in the case of traditional overhead accounting. ABC helps to provide more accurate costs, identify high-cost and value-adding activities and eliminate non-value-adding activities.

- ◆ A costing system that allocates overhead costs to products or services based on the activities and resources consumed by them

According to CIMA London, Activity Costing is defined as the “ Cost attribution to cost units on the basis of benefits received from indirect activities, i.e., ordering, setting up, assuring quality, etc.”.

Before proceeding further, let us take a look at some of the key terms used in activity-based costing.

- Activity:** In Activity-based Costing, activities are used as the basis for calculating the cost of goods or services. It is because of the assumption that activities are responsible for the incurrence of cost. An activity is nothing but a specific task or unit of work performed with a particular purpose, such as placing a purchase order, setting up a machine, providing after-sales service, and so on. Activities may be unit-level activities, batch-level activities, product-level activities or facility-level activities. Unit-level activities deal with the number of units produced, such as the inspection or testing of every item produced. Those activities relating to the number of batches, such as machine set-up costs and material ordering costs, are known as batch-level activities. Those activities associated with a particular product, such as product design, advertisement costs, etc, come under

- ◆ Specific task or unit of work performed with a particular purpose

product-level activities. Finally, facility-level activities pertain to those activities related to the organisation as a whole, such as the maintenance of buildings and promotional advertisements for the organisation as a whole. The categorisation of activities enables the organisation to determine the type of cost driver to be employed. Cooper introduced the categorisation of activities in 1990.

◆ Item for which a separate measurement unit is needed

◆ A factor in which influences cost of a particular activity

◆ Grouping of individual cost related to specific activity or function

- b. **Cost object:** It is an item, such as a product, service, or job, for which a separate measurement unit is needed. For example, product, activity, service, process and so on.
- c. **Cost driver:** It refers to a factor that can influence or bring about a change in the cost of a particular activity. Examples include the number of machine-hours, the number of inspections, and the volume of materials used.
- d. **Cost pool:** A cost pool is a grouping of individual costs that are related to a specific activity or function, such as production setup, quality control, or customer service. Costs in the pool are distributed to products or services based on relevant cost drivers, such as machine hours, number of inspections, or labour hours.

3.1.1.2 Features of Activity-Based Costing

Activity-based costing (ABC) is a costing method that assigns costs to products or services based on the resources consumed by the activities they require, rather than relying on traditional volume-based measures like direct labour hours, units produced, or material costs. In this approach, ABC recognises that resources are not directly consumed by products, services, or jobs but by the activities performed to produce them. The following are the features of Activity Based Costing:

- a. **Focus on Activities:** ABC identifies activities as the primary cost objects. Costs are first assigned to activities and then allocated to products or services based on their use of these activities. Examples of activities include ordering, receiving, inspection, quality control, etc.
- b. **Use of Cost Drivers:** Costs are allocated using cost drivers, which are factors that cause the cost of an activity. Examples of cost drivers include the number of machine setups, inspection hours, and purchase orders.
- c. **Accurate Overhead Allocation:** Compared to traditional costing methods, ABC allocates overheads based on the actual consumption of resources, hence providing a more precise cost per product or service.

4. Better Product and Service Pricing

ABC enables companies to assign costs more accurately to individual products or services, which supports more effective pricing strategies. Organisations can avoid underpricing or overpricing by understanding the true cost structure.

5. Customer Profitability Analysis

In addition to product costing, ABC can analyse the profitability of individual customers or customer segments. This helps businesses to focus on the most valuable customers and develop strategies to improve the profitability of less profitable ones.

6. Encourages Cost Transparency

ABC helps to provide a detailed breakdown of how resources are consumed, promoting greater cost transparency within the organisation. This can foster accountability and a better understanding of cost behaviour at all organisational levels.

7. Improved Resource Allocation

ABC helps in better allocating resources by differentiating between resource-intensive and non-resource-intensive activities. Companies can prioritise high-value activities and minimise investment in low-value ones.

3.1.1.4 Disadvantages of Activity-based Costing

Following are some of the disadvantages of the ABC system.

1. High Implementation Costs

Setting up an ABC system is very expensive. It requires significant investment in data collection, software, and training. So, organisations will have to hire specialised personnel to design and implement the system effectively.

2. Complexity and Time-Consuming

ABC involves identifying numerous activities, assigning cost drivers, and tracking resource usage, which can be a time-consuming process. Managers may find it difficult to interpret and use the extensive cost data effectively, particularly if the system tracks too many activities and cost drivers. This highlights the complex nature of the ABC system.

3. Data Collection Challenges

ABC requires detailed and accurate data on activities and resource usage, which may not always be readily available. Collecting this data can be a difficult task, especially in large organisations with complex operations.

4. Resistance to Change

Implementing ABC often involves significant changes to existing accounting and reporting systems. Employees and managers may resist these changes, especially if they perceive the system as highly complicated or if it challenges the established practices.

5. Limited Applicability for Small Businesses

For smaller organisations with simpler operations, ABC's benefits may not compensate for its costs and complexity. Traditional costing methods may be sufficient and more cost-effective in such cases.

6. Difficulty in Identifying Cost Drivers

Selecting appropriate cost drivers is critical to the success of ABC, but it can be challenging. If cost drivers are poorly chosen, the accuracy and reliability of the cost information may be compromised.

7. Periodic Updating Required

Business operations and processes evolve, requiring the ABC system to be regularly updated. Failing to do so can render the system outdated, reducing its accuracy and relevance.

8. Limited Use for External Reporting

ABC is primarily an internal management tool and may not align with external financial reporting standards like Generally Accepted Accounting Principles (GAAP) or International Financial Reporting Standards (IFRS). This can result in the need to maintain dual systems for internal and external reporting purposes.

3.1.1.5 Differences between Activity Based Costing Method and Traditional Absorption Costing Method

Table 3.1.1

Difference between the Activity Based Costing Method and the Traditional Costing Method

Basis	Activity-Based Costing Method	Traditional Absorption Costing Method
Meaning	Here, overheads are charged to cost objects like products, services, or jobs where the overhead of each activity is ascertained separately and then charged to the cost objects based on the activity consumption of the cost objects.	Here, following the allocation and apportionment of overheads to the production and service departments, the overheads of the service departments are then re-apportioned to the production departments, and the production overheads are charged to the final products based on appropriate basis such as labour and machine hours.
Basis of Absorption	Here, activities form the basis for the absorption of overhead	Here, arbitrary bases like labour hours and machine hours form the basis for the absorption of overheads
Ascertainment of Overhead	Here, overheads are ascertained for each activity, such as the purchase of materials, setting up of machines, etc.	Here, overheads are ascertained for each functional cost centre, such as production or service.
Level of Accuracy	It is a more accurate system of costing compared to the traditional costing method.	It is not an accurate system of costing.

Types of Activities	It considers all types of activities, such as unit-level activities, batch-level activities, product-level activities, and facility-level activities.	Here, only two types of activities, namely Unit-level activities and facility-level activities, are considered.
Identification of Unnecessary Activities	It helps to identify unnecessary activities.	It does not help to identify unnecessary activities.
Control over Activities	It helps to exercise control over activities that cause fixed overheads.	It does not help exercise control over activities that cause fixed overheads.

3.1.2 Purposes of Activity-Based Costing.

Activity-based costing (ABC) serves several key purposes, primarily aimed at improving cost accuracy and supporting better decision-making within an organisation. Below are the main purposes of Activity-Based Costing

1. Supporting Strategic Decision-Making

ABC serves as a valuable decision-making tool in the following ways:

- ◆ **Performance and Profitability Improvement:** ABC can enhance organisational performance and profitability by providing more accurate cost information and identifying inefficiencies.
- ◆ **Cost-Plus Pricing:** For companies using a cost-plus pricing strategy, ABC provides precise cost data, allowing them to set competitive and profitable prices for their products. This method ensures that pricing reflects the true cost of production, including overheads.
- ◆ **Enhanced Decision-Making for Wholesale Distributors:** Wholesale distributors can gain significant decision-making by implementing ABC by linking costs to various activities. ABC also enables them to make decisions relating to the introduction of new products or choosing vendors.
- ◆ **Facility and Resource Expansion:** ABC supports decisions related to expanding or relocating facilities. Businesses often use cost associations whenever a decision is made to invest in new facilities, staff, or equipment. By analysing

various cost elements such as freight and logistics, organisations can assess whether the reduction in these costs justifies the new investment decisions. The ABC model offers a detailed breakdown of costs, providing a clearer basis for such decisions.

- ◆ **Improved Human Resource Decision Support:** ABC enables cost tracking at the individual level, offering insights into financial performance tied to specific roles, such as branch management or sales. This helps in evaluating productivity and making informed decisions about staffing and resource allocation.

2. Accurate Cost Allocation

In ABC, the overhead and indirect costs are more precisely allocated to products, services, or other cost objects. This helps to provide a more accurate picture of the true cost of production or service delivery by linking costs to activities.

3. Identifying Cost Drivers

ABC helps to determine the activities that drive costs and analyse how resources are consumed. This helps in understanding the relationship between activities and costs, making it easier to manage and reduce unnecessary expenses.

4. Profitability Analysis

ABC helps to evaluate the profitability of individual products, services, or customers. It helps management to focus on the most profitable ones and identify unprofitable products or services for improvement or discontinuation.

5. Improving Process Efficiency

Activity-based Cost management helps identify value-adding and/or non-value-adding activities. This, in turn, helps streamline operations, reduce waste, and improve overall productivity.

6. Budgeting and Forecasting

ABC helps to align budgets with actual operational needs, providing a clearer view of future cost behaviour. This will help to enhance the accuracy of budgeting by focusing on activity-based resource consumption.



7. Cost Control and Performance Evaluation

Activity Based Costing is used to monitor and control costs by analysing variances between actual and budgeted activity costs. This helps to encourage accountability and support performance evaluation at both activity and departmental levels.

8. Enhancing Customer Profitability Analysis

ABC helps to analyse the cost of serving individual customers or customer groups. It helps to identify high-cost or low-margin customers and allows the organisation to focus on more profitable customers.

3.1.3 Cost Drivers

ABC identifies cost drivers, which are factors that bring about changes in activity costs. In ABC, activities are the processes or tasks that consume resources, and cost drivers are the factors that affect the cost of those activities. Identifying the right activities and cost drivers allows businesses to allocate costs to products or services more accurately, enabling better decision-making and cost control.

◆ Factors that bring changes in activity costs

Take the case of an activity, such as purchasing materials. Here, the various cost drivers involved are the number of orders placed, the number of inspections conducted, and the number or frequency of receipt of raw materials. If setting up machines is an activity, then the various cost drivers are the number of machine hours, number of machine set-ups, etc.

◆ Cost drivers- Resource Cost - Drive and Activity Cost Drivers

Cost drivers are two kinds, namely Resource Cost Driver and Activity Cost Driver. While resource cost drivers measure the quantity of resources consumed by a particular activity, the activity cost driver measures the frequency and intensity of demand the cost objects place on activities. The following table shows some activities and their cost drivers.

Table 3.1.2
Activities and Cost Drivers

Activity	Cost Driver
Machine setup	Number of setups, Number of machine hours
Ordering	Number of purchase orders processed
Quality inspection	Number of hours spent on inspection
Material Handling	Number of orders

Product design	Number of design changes
Research and Development	Number of research projects, Number of personnel hours spent on a project
Packaging	Number of units packaged
Sales and marketing	Number of sales visits or marketing campaigns
Training employees	Number of training sessions or trainees

3.1.4 Stages in Activity-Based Costing (ABC)

Activity-Based Costing (ABC) is implemented in several stages to ensure accurate allocation of costs to products, services, or cost objects based on activities and their corresponding cost drivers. The main stages in the ABC process are as follows:

1. Identify Organisational Activities

Identifying and defining the organisational activities that consume resources within the organisation is the first stage in activity-based costing. Activities may be related to machines, labour, or other support activities like ordering, receiving, handling materials, or despatching. All activities relating to a particular functional area must be identified, and a complete list of them must be prepared. This is referred to as activity inventory. However, caution must be exercised to exclude the non-value-adding activities from the activity inventory as it may lead to further escalation in costs. The primary goal of this step is to gain an understanding of the various organisational processes that drive costs within an organisation.

- ◆ Identification of activities that consume resources within the organisation

2. Assign Costs to Activities (Creation of Cost Pool or Cost Bucket)

Once the activities have been identified, overhead costs are assigned to these activities based on their resource consumption. These are called cost pools or cost buckets. It basically refers to all costs associated with a particular activity. Cost pools are similar to cost centres. Just like the cost centre, the costs are accumulated for each activity. For instance, the entire cost of machine setups may represent a single cost pool for all expenses associated with setup. This step helps to gain insight into how much each activity is costing and also helps to allocate costs more accurately.

- ◆ Assignment of overhead costs to activities



3. Identify Cost Drivers for Each Activity

- ◆ Identification of factors that influence or determine cost of activities

The next step is to identify the factors that influence or determine the cost of an activity. These factors are referred to as cost drivers. Identifying cost drivers is crucial because it connects activities to the costs they generate. The activities related to each functional area must be identified, and the most suitable cost drivers must be selected for each activity. For example, in the functional area of material management, the issue of purchase orders is one of the major activities. So, the cost driver relating to this activity would be the number of purchase orders. Take the case of another functional area, such as quality control. Here, the major activity would be the testing of samples. The cost driver related to this activity is the number of batches produced.

4. Calculation of Cost of Cost Driver Rate

The next step is the calculation of the cost–driver rate. It can be calculated using the following formula.

$$\text{Cost Driver Rate} = \frac{\text{Total Cost of Activity}}{\text{Cost Drivers}}$$

- ◆ Cost Driver Rate Calculation

Examples: Take the case of the activity of ordering; here, the cost driver is the number of purchase orders placed. Here, the cost driver rate is calculated using the following formula.

$$\text{Cost Driver Rate} = \frac{\text{Total Ordering Costs for Purchases}}{\text{Number of Purchase Orders placed}}$$

Take the case of the inspection activity; here, the cost driver is the number of materials inspections. Here, the cost driver rate is calculated using the following formula.

$$\text{Cost Driver Rate} = \frac{\text{Total Inspection Costs}}{\text{Number of Inspection of materials}}$$

5. Charging Activity Costs to Products/ Jobs/Processes

- ◆ Tracing the cost of activities to products / jobs / processes

The final stage is to trace the cost of activities to products/ jobs/processes. It is done on the basis of each product's or job's or process's demand of these activities. Cost drivers are used to measure the product's demand for these activities.

3.1.5 Preparation of Cost and Profit Statement under Traditional and ABC

Illustration 3.1.1. Tara Ltd manufactures two products – Product X and Product Y. The annual data of the company is given below :

Products	Annual Output (Units)	Total Machine Hours	Total No: of Purchase Orders	Total No: of Machine Setups
X	10,000	30,000	200	25
Y	70,000	1,50,000	400	50

The annual overhead costs are as follows:

Particulars	₹
Volume-related activity costs	6,00,000
Set-up related costs	10,00,000
Purchase-related costs	7,50,000

You are required to calculate the cost per unit for each product (X and Y) using the Traditional method and Activity-Based Costing (ABC) method

Solution:

i. Traditional Method

Calculation of Machine Hour Rate

$$\text{Total Overheads} = ₹ 6,00,000 + ₹ 10,00,000 + ₹ 7,50,000 = ₹ 23,50,000$$

$$\text{Total Machine Hours: } 30,000 + 1,50,000 = 1,80,000$$

$$\text{Machine Hour Rate} = \frac{\text{Total Overheads}}{\text{Total Machine Hours}} = \frac{23,50,000}{1,80,000} = ₹ 13.05$$

Statement Showing Cost Per Unit

Particulars	Product A	Product B
I. Output (units)	10,000	70,000
II. Machine Hours	30,000	1,50,000
III. Overhead Cost @ 13.05 per machine hour	3,91,500	19,57,500
IV. Overhead Cost per unit (III/I)	39.15	27.96

ii. ABC Method (III/I)

Calculation of Cost Driver Rates

Machine Hour Rate

$$= \frac{\text{Total Overhead Costs for Volume related activities}}{\text{Total Machine Hours}}$$

$$= \frac{6,00,000}{1,80,000}$$

$$= ₹ 3.33$$



$$\begin{aligned} \text{Cost of one Set – up} &= \frac{\text{Total Costs related to set-ups}}{\text{Total number of set-ups}} \\ &= \frac{10,00,000}{75} \\ &= ₹13,333.33 \end{aligned}$$

$$\begin{aligned} \text{Cost of one purchase order} &= \frac{\text{Total Costs related to purchases}}{\text{Total number of purchase orders}} \\ &= \frac{7,50,000}{600} \\ &= ₹ 1,250 \end{aligned}$$

Statement showing the cost per unit.

Particulars	Products	
	A	B
Machine Hours	30,000	1,50,000
No: of Purchase Orders	200	400
No: of Setups	25	50
Cost related to Volume related activities @₹3.33	99,900	4,99,500
Cost related to Purchase Orders @ ₹1250	2,50,000	5,00,000
Cost related to Setups @₹ 13,333.33	₹3,33,333.25	₹6,66,666.5
Total Cost (IV+V+VI)	₹6,83,233.25	₹16,66,166.5

Illustration 3.1.2

Pawan Ltd produces three products, X, Y, and Z, for which the standard cost and quantities per unit are given below :

Particulars	Products		
	X	Y	Z
Output (units)	20,000	30,000	40,000
Direct Labour (per unit)	₹ 40	₹ 50	₹ 58
Direct Material (per unit)	₹ 60	₹ 50	₹ 42
Machine Hours per unit	5	5	8
Labour Hours per unit	4	5	6
No: of Purchase requisitions	700	1000	1,100
No: of Machine setups	130	140	160

Production Overhead Split by Departments:

- ◆ Department P (Labour-intensive): ₹18,00,000
- ◆ Department Q (Machine-intensive): ₹21,00,000
- ◆ Department P requires 3,00,000 Labour Hours.
- ◆ Department Q requires 7,00,000 Machine Hours.

Overhead Cost Split by Activity:

Receiving and Inspection : ₹22,00,000
 Production Scheduling : ₹17,00,000
 Total ₹39,00,000

Prepare cost statements using the traditional absorption costing method and Activity-based Costing method.

Solution :

i. Traditional Method

$$\text{Overhead Absorption Rate} = \frac{\text{Overhead of the Department}}{\text{Hours}}$$

$$\text{Department P} = \frac{18,00,000}{3,00,000} = ₹ 6 \text{ per labour hour}$$

$$\text{Department Q} = \frac{21,00,000}{7,00,000} = ₹ 3 \text{ per machine hour}$$

Statement of Cost using Traditional Absorption Costing Method

Particulars	Cost per Unit		
	Product X ₹	Product Y ₹	Product Z ₹
Direct Material	60	50	42
Direct Wages	40	50	58
Overhead – Department P			
X – 4 hrs @ ₹ 6	24		
Y – 5hrs @ ₹ 6		30	
Z – 6hrs @ ₹ 6			36
Overhead - Department Q			
X – 5 hrs @ ₹ 3	15		
Y -5hrs @ ₹ 3		15	
Z – 8 hrs @ ₹ 3			24
Product Cost per unit	139	145	160

ii ABC Method

Calculation of Cost Driver Rates

$$\text{Cost Driver Rate} = \frac{\text{Total Cost of Activity}}{\text{Cost Drivers}}$$



$$\text{Receiving and Inspection} = \frac{\text{₹}22,00,000}{2800} = \text{₹ } 786 \text{ per batch}$$

$$\text{Scheduling and set-up} = \frac{\text{₹}17,00,000}{430} = \text{₹ } 3953 \text{ per set-up}$$

Calculation of Overhead

Particulars	Product X		Product Y		Product Z	
	Receiving	Set-Up	Receiving	Set-Up	Receiving	Set-Up
i. Activity Cost Driver Rate	786	3953	786	3953	786	3953
ii. Activity Consumed	700	130	1000	140	1100	160
iii. Activity Cost Assigned (I × II)	5,50,200	5,13,890	786000	553420	864600	632480
iv. No: of units	20,000	20,000	30,000	30,000	40,000	40000
v. Per Unit (III/ IV)	27.51	25.69	26.2	18.45	21.62	15.81

Statement of Cost using the ABC Method

Particulars	Cost Per Unit		
	Product X(₹)	Product Y (₹)	Product Z(₹)
Direct Materials Cost per unit	60	50	42
Direct Wages per unit	40	50	58
Overhead (per unit)-Receiving	27.51	26.2	21.62
Overhead (per unit) – Set-up	25.69	18.45	15.81
Total Cost Per unit	153.2	144.65	137.43

Comments

It can be seen that under the traditional method, Product Z shows a higher cost, whereas, under the ABC method, product X shows a higher cost. If the company fixes selling prices based on cost, according to the traditional costing method, then product Z will be priced higher, and product X will be priced lower. This will result in a loss of sales of Product Z and a loss per unit of

X, leading to a loss to the company. The results shown under the ABC method are presumed to be accurate as it is a more logical method than the traditional costing method.

Illustration 3.1.3

ABC Supermarket sells three major product lines: Beverages, Dairy Products, and Snacks. The management wants to evaluate the profitability of each product line using both traditional and activity-based costing. The following data is provided for the current year:

Product Line Information

Particulars	Beverages	Dairy Products	Snacks
Selling price per unit	₹8	₹10	₹12
Cost of goods sold per unit	₹5	₹6	₹8
Number of purchase orders placed	400	600	500
Number of deliveries received	350	1000	750
Hours of shelf-stocking time	700	1800	1200
No. of units sold	2,00,000	3,00,000	1,50,000

Support Costs and Cost Allocation Bases

Activity	Description	Total Cost	Cost Allocation Base
Returns Processing	Processing returned products	₹15,000	Direct tracing to Beverages
Ordering	Placing orders for inventory	₹1,80,000	1,500 purchase orders
Delivery	Receiving deliveries	₹2,85,000	2,100 deliveries
Shelf Stocking	Stocking and restocking shelves	₹1,90,000	7,000 shelf-stocking hours
Customer Support	Assistance to customers	₹3,50,000	6,50,000 items sold

Required :

(i) If ABC Supermarket currently allocates support costs (all costs other than cost of goods sold) to product lines on the basis of cost of goods sold of each product line. Calculate the operat-

ing income and operating income as a percentage of revenues for each product line.

(ii) If ABC Supermarket allocates support costs (all costs other than cost of goods sold) to product lines using an activity-based costing system, calculate the operating income and operating income as a% of revenues for each product line.

(iii) Give Comments

Solution :

(i) Traditional Costing Method

Calculation of Total Support Cost

$$\begin{aligned} \text{Total Support Cost} &= ₹15,000 + ₹1,80,000 + ₹2,85,000 + \\ &\quad ₹1,90,000 + ₹3,50,000 \\ &= ₹10,20,000 \end{aligned}$$

Total Cost of Goods Sold (COGS)

$$\begin{aligned} \text{Total COGS} &= (2,00,000 \times ₹5) + (3,00,000 \times ₹6) + \\ &\quad (1,50,000 \times ₹8) \\ &= ₹10,00,000 + ₹18,00,000 + ₹12,00,000 \\ &= ₹40,00,000 \end{aligned}$$

Support Cost Allocation (%)

$$\begin{aligned} &= 10,20,000 / 40,00,000 \times 100 \\ &= 25.5\% \end{aligned}$$

Statement of Operating Income (Traditional Costing)

Particulars	Beverages	Dairy Products	Snacks	Total
A. No. of units sold	2,00,000	3,00,000	1,50,000	
B. Selling price per unit	₹8	₹10	₹12	
C. Revenues ₹ (A × B)	₹16,00,000	₹30,00,000	₹18,00,000	₹64,00,000
D. Cost of goods sold per unit (₹)	₹5	₹6	₹8	
E. Less: Cost of Goods Sold per unit COGS (Units × Cost per Unit) or (i.e, A × D)	₹10,00,000	₹18,00,000	₹12,00,000	₹40,00,000
F. Gross Margin(C-E)	₹6,00,000	₹12,00,000	₹6,00,000	₹24,00,000

G. Less: Support Cost (25.5% of COGS)	₹2,55,000	₹4,59,000	₹3,06,000	₹10,20,000
H. Operating Income (F-G)	₹3,45,000	₹7,41,000	₹2,94,000	₹13,80,000
I. Operating Income as % of Revenue H/C × 100	21.56%	24.70%	16.33%	21.56%

(ii) Activity-Based Costing (ABC) Method

Calculation of Cost Driver Rates

Activity	Total Cost	Cost Drivers	Cost Driver Rate
Ordering	₹1,80,000	1,500 purchase orders	₹120 per order
Delivery	₹2,85,000	2,100 deliveries	₹135 per delivery
Shelf Stocking	₹1,90,000	7,000 hours	₹27 per stocking hour
Customer Support	₹3,50,000	6,50,000 items sold	₹0.54 per item

Statement of Operating Income (ABC Costing)

Particulars	Beverages	Dairy Products	Snacks	Total
A. No. of units sold	2,00,000	3,00,000	1,50,000	
B. Selling price per unit	₹8	₹10	₹12	
C. Revenues ₹ (A × B)	₹16,00,000	₹30,00,000	₹18,00,000	₹64,00,000
D. Cost of goods sold per unit (₹)	₹5	₹6	₹8	
E. Less : Cost of Goods Sold COGS (₹) (Units × Cost per Unit) (i.e.A × D)	₹10,00,000	₹18,00,000	₹12,00,000	₹40,00,000
F. Gross Margin (C- E)	₹6,00,000	₹12,00,000	₹6,00,000	₹24,00,000
Less: Support Cost				

(i) Returns Processing	₹15,000	₹0	₹0	₹15,000
(ii) Ordering Cost (400:600:500)	₹48,000	₹72,000	₹60,000	₹1,80,000
(iii) Delivery Cost (350:1000:750)	₹47,250	₹1,35,000	₹1,01,250	₹2,85,000
(iv) Shelf Stocking (700:1800:1200)	₹18,900	₹48,600	₹32,400	₹1,90,000
(v) Customer Support (2,00,000:3,00,000:1,50,000)	₹1,08,000	₹1,62,000	₹81,000	₹3,50,000
G. Total Support Cost	₹2,37,150	₹4,17,600	₹2,74,650	₹10,20,000
H. Operating Income (F- G)	₹3,62,850	₹7,82,400	₹3,25,350	₹14,70,600
I. Operating Income as % of Revenue	22.68 %	26.08 %	18.07 %	22.97 %

Comments: It can be seen that statements prepared under traditional approach and activity based costing show different results in the form of operating income as a % of revenue. It can be generally felt that allocation of support costs under activity based costing is more reliable and accurate than under traditional method.

3.1.6 Activity-Based Variance Analysis

◆ Analyses differences between expected and actual costs in ABC System

Activity-Based Variance Analysis (ABVA) is a technique used to evaluate and analyse the differences between expected and actual costs in an **Activity-Based Costing (ABC)** system. It helps organisations to identify inefficiencies and areas where resource usage or cost control needs improvement. **Key Components of ABVA are Planned or Budgeted Costs, Actual Costs and Variance.**

1. **Planned Costs (Budgeted Costs):** These are the costs expected for an activity based on predefined standards and scheduled resource usage.
2. **Actual Costs:** These are the actual costs incurred during the activity.
3. **Variance:** Variance refers to the difference between planned (budgeted) and actual costs.

$$\text{Variance} = \text{Actual Cost} - \text{Budgeted Cost}$$

ABVA helps to identify the areas where the underutilisation of resources happens. It helps to provide detailed insights into cost behaviour for better cost control. It also helps to measure

efficiency in resource consumption across different activities. Furthermore, it helps to pinpoint the activities that deviate from cost expectations.

3.1.7 Activity-Based Budgeting

◆ The process of planning and managing anticipated activities for the organisation to produce a cost-effective budget that satisfies the expected workload and establishes strategic goals

A firm's anticipated activities are expressed quantitatively in an activity-based budget. An Activity Budget presents the management's prediction of workload and financial and non-financial requirements to accomplish the strategic goals of the firm and the alterations planned to enhance its performance in the future. The process of designing and managing anticipated activities for the organisation to produce a cost-effective budget that satisfies the expected workload and strategic goals established is known as activity-based budgeting. ABB offers an approach for calculating the resources necessary depending on the activity level budgeted. The type of work/activity to be done, the quantity of work/activity, and the cost of work/activity constitute the three key elements of activity-based budgeting. The anticipated workload and activities define the resources needed. The goal is to make the system more efficient. Therefore, a lot of important concerns must be addressed and appropriately answered during the budget development process.

3.1.8 Activity-Based Cost Management

◆ Cost management strategy that improves operational efficiency and decision making

Activity-Based Cost Management (ABM) is a cost management strategy that improves operational efficiency and decision-making by applying the concepts of Activity-Based Costing (ABC). In order to manage and cut expenses, optimise resource allocation, and boost profitability, ABM focuses on determining and evaluating the costs associated with the business. Cost driver analysis, activity analysis, and performance analysis are the three major aspects of the Activity-based Cost management system.

◆ Three major aspects of activity based cost management system

- i. Cost Driver Analysis involves identifying factors causing inefficiencies in an activity, such as delays in processing customer invoices.
- ii. Activity Analysis involves identifying various activities of an organisation, such as activity centres, value-added activities, and non-value-added activities. Under ABM, each activity is categorised as either value-added or non-value-added activity. Value-added activity means an activity that aids in augmenting the value of products or services in the minds of the customers. In contrast, a non-



value-added activity does not increase the value of products or services in the minds of the customers.

- iii. Performance Analysis focuses on determining the most effective methods to evaluate key factors critical to an organisation, aiming to drive continuous improvement.

◆ Optimise costs, improve resource allocation and enhance profitability

ABM basically aims to address the needs of customers for higher quality and lower costs. Quicker response time and greater innovation by using fewer resources. ABM is used in a wide variety of areas of business, such as activity-based budgeting, benchmarking, performance measurement, and cost reduction.

3.1.9 Direct Product Profitability

Direct Product Profitability (DPP) is a financial tool that is mostly used in retail and distribution companies to assess the profitability of particular products by taking into account both their direct costs and direct revenues. By simply allocating the actual costs of selling and distributing a product, DPP concentrates on determining the underlying profitability of each one, in contrast to traditional techniques that distribute overheads uniformly. Direct Product Profitability (DPP) is a powerful tool for analysing product-specific costs and revenues, enabling businesses to focus on maximising profit through strategic decisions. It guides resource allocation to maximise overall profitability.

◆ Powerful tool for analysing product specific costs and resources.

Direct Product Profitability has widespread applications in retail, manufacturing and logistics. It is used in the retail sector to evaluate shelf-space profitability. It helps to prioritise products in the manufacturing sector. It helps to optimise distribution and logistics warehousing costs. Direct Product Profitability includes costs directly tied to a product, such as procurement, warehousing, distribution, and shelf space utilisation. It focuses on analysing each product's financial contribution rather than overall business profitability. It helps to highlight products that generate the highest returns, helping in efficient resource allocation.

◆ Widespread applications in retail, manufacturing and logistics

DPP provides a clear picture of each product's profitability by allocating direct costs and revenues, ensuring more accurate financial insights. It helps businesses make informed decisions regarding product pricing, assortment, and discontinuation of underperforming products. By identifying high-margin products, DPP enables better utilisation of resources, such as shelf space, labour, and inventory. DPP highlights cost-heavy products and uncovers inefficiencies in distribution, warehousing, or production, leading to better cost control. It assists in setting competitive pricing by understanding the true

◆ The financial metric used to analyse product-specific profitability

cost structure and profitability of individual products. Businesses can focus on products that contribute the most to profitability while re-evaluating or phasing out low-performing items. DPP aligns business operations with profitability goals, ensuring that strategies are focused on maximising returns. When combined with customer data, DPP can reveal which customers or segments prefer highly profitable products, enhancing targeted marketing efforts.

3.1.10 Customer Profitability Analysis

◆ Examination of multiple activities and expenses incurred in servicing a specific customer

While Activity Costing examines the various cost drivers to isolate costs and determine a product's profitability precisely, Customer Profitability Analysis examines the multiple activities and expenses incurred in servicing a specific customer. Customer Profitability Analysis focuses on analysing profit per customer rather than profit per product. In other words, Customer Profitability Analysis shifts the focus from product line profitability to individual customer profitability.

◆ Helps in identification of high-value customers

Customer Profitability Analysis helps to identify high-value customers who contribute the most to profitability, and this, in turn, enables organisations to divert resources and efforts to such customers. It further allows organisations to identify customer segments that need to be expanded or reduced. Customer profitability Analysis helps to improve decision-making by acting as a guide in pricing and resource allocation. It allows for framing personalised strategies for profitable and less-profitable customers.

◆ Key aspects
- Revenue Assessment
- Cost Allocation and Profitability Measurement

The key aspects of Customer Profitability Analysis are Revenue Assessment, Cost Allocation and Profitability Measurement. For assessing the revenue, the total income earned from each customer is assessed, including the product pricing and the service fees. All costs involved in serving each customer, such as sales and marketing expenses, costs related to order processing, delivery and logistics costs, costs related to customer service or support, and so on, are allocated. The profitability is measured by subtracting the customer-specific costs from the revenue.

Steps in Customer Profitability Analysis

- ◆ **Identify Revenues and Costs for Each Customer:** The first step is to track revenues from sales and services for individual customers or segments. It helps to allocate both direct and indirect costs to specific customers using Activity-Based Costing (ABC).
- ◆ **Calculate Customer Profitability:** The next step is to de-



termine profitability by subtracting costs from revenues.

- ◆ **Segment Customers:** The next step involves categorising customers into different categories, such as high-profit, low-profit, or loss-making.
- ◆ **Analyse and Act:** The final step in customer profitability analysis is to develop strategies to enhance profitability, such as improving service efficiency or renegotiating terms with less profitable customers.

Summarised Overview

Activity-Based Costing (ABC) is a costing approach that allocates costs to products or services based on activities and resources consumed by them. ABC method provides a more accurate representation of the expenses than traditional methods. Its key features include identifying cost drivers, linking costs to activities, and enabling precise product costing, which aids in pricing and profitability decisions. ABC supports performance improvement through Activity-Based Variance Analysis (ABVA) and Budgeting (ABB), focusing on resource optimisation and cost control. Activity-Based Cost Management (ABM) extends ABC principles to reduce costs, enhance efficiency, and meet customer demands. Tools like Direct Product Profitability (DPP) and Customer Profitability Analysis (CPA) allow businesses to prioritise products and customers by evaluating their contributions to profitability. Through the preparation of accurate cost statements, ABC comes as a vital aid in strategic decision-making and overall cost management and, thus, contributes to long-term success.

Self-Assessment Questions

1. What is Activity-Based Costing (ABC)?
2. What do you mean by activity?
3. What do you mean by cost pool?
4. What is a cost driver in ABC?
5. Give an example of an activity and its cost driver.
6. What type of organisations benefit mostly from ABC?
7. How are overhead costs allocated in ABC?
8. What is the purpose of identifying activities in ABC?
9. What do you mean by Activity based budget?
10. If the total inspection costs are ₹2,40,000, and there are 600 inspections, what is the cost per inspection?

Assignments

1. How does ABC differ from the traditional costing approach?
2. State the advantages and disadvantages of Activity Based Costing?
3. Elucidate the concepts of Activity Based Budgeting and Activity Based Cost Management.
4. What do you mean by Customer Profitability Analysis?
5. Explain Direct Product Profitability.
6. ABC Ltd. produces three products—A, B, and C. The following information is provided regarding their production:

Particulars	Product A	Product B	Product C
Output (units)	10,000	15,000	25,000
Direct Labour (₹ per unit)	30	40	50
Direct Material (₹ per unit)	50	60	40
Machine Hours (per unit)	6	6	8
Labour Hours (per unit)	5	6	7
Purchase Requisitions	500	800	1,200
Machine Setups	100	150	250

Production Overhead Split by Departments:

Department X (Labour-intensive): ₹12,00,000

Department Y (Machine-intensive): ₹15,00,000

Department X requires 2,00,000 labour hours.

Department Y requires 4,00,000 machine hours.

Overhead Cost Split by Activity:

Receiving and Inspection: ₹9,00,000

Production Scheduling: ₹18,00,000

Total: ₹27,00,000

Prepare cost statements using the traditional absorption costing method and Activity-based Costing method.

Solution :

Traditional Absorption Costing Method :

Product A ₹132.5, Product B ₹158.5 , Product C = ₹162



Activity-Based Costing :

Product A ₹134, Product B ₹155.2, Product C = ₹128.88

7. Riya Ltd manufactures two products – Product A and Product B. The annual data of the company is given below:

Products	Annual Output (Units)	Total Machine Hours	Total Number of Purchase Orders	Total Number of Machine Setups
Product A	8,000	25,000	150	20
Product B	50,000	1,10,000	300	40

The annual overhead costs are as follows:

Particulars	₹
Volume-related activity costs	5,50,000
Set-up related costs	8,50,000
Purchase-related costs	6,20,000

Calculate the cost per unit for Product A and Product B using:

- ◆ The Traditional method of charging overheads.
- ◆ The Activity-Based Costing (ABC) method.

Solution: Traditional Costing Method : Product A ₹46.75, Product B ₹32.92

Activity-Based Costing : Product A ₹73.97, Product B ₹28.55

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Suggested Reading

1. Jain, S.P, Narang. K.L, & Simi. A., Advanced Cost and Management Accounting Kalyani Publishers, New Delhi
2. Khan. M.Y. and Jain P.K. Advanced Cost Accounting, Tata Mc Graw Hill Publishing Co. Ltd. New Delhi.
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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.



Unit 2

Transfer Pricing Models

Learning Outcomes

After completing this unit, the learners will be able to:

- ◆ comprehend the concept of transfer pricing.
- ◆ identify different transfer pricing methods.
- ◆ apply transfer pricing models.
- ◆ analyse the transfer pricing methods in an international context.

Background

HUL's inter - company transactions

Transfer pricing models are essential for multinational corporations like Hindustan Unilever (HUL) to ensure fairness and compliance in inter-company transactions. HUL centralises parts of its operations to improve efficiency, encourage innovation, and create economies of scale. These centralised activities result in numerous transactions between the Unilever Group of Companies. To maintain fairness and comply with international and local regulations, HUL employs transfer pricing mechanisms that reflect an arm's-strength or market-based price. This approach ensures that the pricing of inter-company transactions is consistent with the value created and activities performed by each activity. The significance of transfer pricing lies in its role in aligning business practices with the OECD guidelines and country-specific regulations. It not only ensured regulatory compliance but also enhanced operational transparency and allocative efficiency. By leveraging appropriate transfer pricing models, HUL maximises value creation for both consumers and shareholders while adhering to legal and ethical standards globally. This unit illustrates the various transfer pricing models that are employed by companies to fix transfer prices.

Keywords

Transfer price, Full product cost, Market price pricing, Cost plus pricing, Negotiated pricing, International scenario

Discussion

3.2.1 Transfer Pricing

- ◆ Helps to measure performance of each division

To become profitable, an organisation must earn enough money to cover all its costs, including those from support departments. Instead of spreading these costs out, support services can be “sold” to user departments through transfer prices. Transfer pricing plays a crucial role in companies with multiple divisions, helping to measure the performance of each unit. A transfer price is the estimated value of goods and services exchanged between divisions, usually set for intermediate products. Each division acts as a profit centre, and its profitability is evaluated based on these transfer prices. This approach gives management clearer insights.

3.2.1.1 Meaning and Scope

- ◆ Price charged by one segment to another segment of an organisation

Transfer price is the price charged by one unit or segment to another unit or segment of an organisation in case of transactions between them. The term inter-unit transfer (intra-company transfer) is used to refer to any movement of products between divisions, plants, or organisational units. The concept of transfer pricing is extended to inter-company transfer when they are related in any way, i.e., they are separately incorporated and are under the common control. The normal transaction between companies when they are not related in any way is termed as a sale. But when they are related or under common control, these transactions are known as transfers in the accounting concept and the price so charged is termed as transfer price.

3.2.1.2 Important terms

Segment: Segment means unit, division, department, sales territory or branch. A segment is formed by grouping activities on the basis of the functions, products, customers or geographical territories.

Related party: The term related party means a party that di-



rectly or indirectly through one or more intermediaries controls or is controlled by or is under common control with an enterprise.

Control: The term control is defined in IAS 24 “Related Party Disclosure” as:

1. Either enjoyment of more than one-half of the voting power or substantial voting power directly or through subsidiaries indirectly.
2. Power to direct the operating and financial policies of the management by statute or agreement.

Transfer price under related party relationships is a normal feature of commerce and business. Many enterprises frequently carry on their activities through subsidiary or associated enterprises and acquire interests in other enterprises through investment or trading. The parties are considered to be related if one party can control the other party or exercise significant influence over the other party in making financial or operating decisions. Related party transactions have relevance in the era of globalisation, and due to the increasing concentration of international economic activities in the hands of multinational enterprises.

◆ Related party transactions

3.2.1.3 Factors Influencing Transfer Pricing

The transfer price can impact the performance of a division. Thus, a lot of care is to be taken while fixing the same, and the following factors should be taken into consideration:

◆ Factors to be considered while fixing transfer price

1. The transfer price should facilitate the precise assessment of divisional performance.
2. It should encourage divisional managers to enhance the probability of their respective divisions.
3. The independence and power of a division must be guaranteed.
4. The transfer price should promote ‘goal congruence,’ meaning that the goals of divisional managers align with those of the organisation.

3.2.1.4 General rules of Transfer Pricing

There are various methods to calculate transfer prices for goods or services, but the following general guidelines are appropriate:

◆ General guidelines

1. The maximum price should not exceed the lowest external market price at which the buying segment can obtain the goods or services.

2. The minimum price should be at least equal to the selling segment's incremental cost for producing the goods or services, plus the opportunity cost of utilising the facilities.

If the goods from the external supplier are cheaper than the minimum price of the internal supplier, Here, the short-term decision for the internal division might be to stop production and buy externally, as internal production is not cost-efficient. In the long term, the selling division could improve efficiency to reduce internal costs while still considering some external purchases. The difference between the upper and lower transfer price limits reflects the profit from producing internally rather than buying externally. Transfer prices divide corporate profits between buying and selling divisions. While transfer prices are eliminated in external reporting, they are crucial for internal performance evaluation, where managers of both divisions aim to maximise their financial outcomes. The selling division wants the highest transfer price, and the buying division seeks the lowest. Therefore, transfer prices should be mutually agreed upon by the divisions.

3.2.2 Objectives

The following are the main objectives of the intercompany transfer pricing scheme:

1. **To evaluate the current performance and profitability of each unit:** This is necessary in order to determine whether a particular unit is competitive and can stand on its own. When the goods are transferred from one department to another, the revenue of one department becomes the cost of another, and such an inter-transfer price affects the reported profits.
2. **To improve the profit position:** Intercompany transfer price will make the costs of both the units realistic in order to take decisions relating to such problems as make or buy, sell or process further, and the choice between alternative methods of production.
3. **For accurate estimation of earnings on proposed investment decisions:** When finance is scarce, and it is required to determine the allocation of scarce resources between various divisions of the concern, taking into consideration claims, then this technique is useful.

Monetary amount for international exchanges

3.2.3 Types of transfer pricing

Transfer price is the notional value of goods and services transferred from one division to another division. In other words, when internal exchange of goods and services takes place between the different divisions of a firm, they have to be expressed in monetary terms. The monetary amount for those interdivisional exchanges is called the transfer price. The determination of transfer price is an extremely difficult and delicate task, as a lot of complicated issues are involved. Interdivision conflicts are also possible. There are several methods of fixation of transfer price, such as:

1. Market-based transfer pricing
2. Marginal cost transfer pricing
3. Full product cost
4. Cost plus markup transfer pricing
5. Negotiable transfer pricing
6. Marginal cost and opportunity cost transfer pricing

3.2.3.1 Market-based transfer pricing

The market-based method of transfer pricing determines transfer prices based on the prevailing market price of goods or services. This approach aligns internal pricing with external market conditions and offers various benefits and considerations.

◆ Determines transfer prices based on prevailing market price

Key features: The key features of the market-based transfer pricing method are explained below:

1. **Market price as a benchmark:** Here, the transfer price reflects the price the buying division would pay if purchasing from an independent external supplier. This ensured an objective, arm's-length measure of value.
2. **Variation for internal sales:** Selling and distribution overheads may be excluded from the market price since internal transactions do not require external selling efforts. These adjustments ensured fairness and reduced unnecessary costs for the buying division.
3. **Applicability:** Most effective for standardised, high-cost or high-volume services (eg storage, transportation) where market prices are readily available.

Market based transfer price has the following advantages:

1. **Easily ascertained:** Actual costs are fluctuating and hence difficult to determine. On the other hand, the market price can be easily ascertained.

- ◆ Advantages of market-based transfer pricing

2. **Good parameters for performance evaluation:** Profits resulting from market price-based transfer prices are good parameters for performance evaluation of selling and buying decisions.
3. **Avoid the arbitration system:** It avoids an extensive arbitration system in fixing the transfer prices between the divisions.

However, several problems can exist with the use of market prices for intracompany transfer:

- ◆ Disadvantages of market-based transfer pricing

1. **No established market price:** Transferred products may not have a counterpart in the external market, which means there may be no established market price.
2. **No appropriate market price:** Internal sales reduce packaging, advertising, or delivery expenditures and eliminate bad debts; thus, the market price is generally not entirely relevant.
3. **Inappropriate performance evaluations:** In instances of temporary downturn in market demand, the transfer price might be set at the artificially depressed price, which could cause inappropriate performance evaluations or decisions to be made.
4. **Right market price:** Different prices, discounts, and credit terms are allowed to different buyers, so there is a question of which is the right market price to use.

Application of market-based transfer pricing: The market-based transfer price is widely used. For its use, well-developed outside markets should exist, i.e., the price charged is usually identical to that charged to outside customers. However, the serious drawback to this method is the requirement for the existence of a well-developed outside competitive market. Market prices are not always readily available. In some cases, no outside market exists for the intermediate product.

Finer aspect of the market price method

- a. Market price for a product or service is strictly comparable only when credit term, grade/quality, delivery terms, and auxiliary considerations are precisely the same.
- b. Market price is not always determinable, especially for intermediate products and in imperfect competition.
- c. It includes many elements like selling and distribution expenses, commission, discount, etc, which are not of much relevance in the case of a related party transaction.

3.2.3.2 Marginal cost transfer pricing

- ◆ Setting transfer prices based on marginal cost of production

The marginal cost method of transfer pricing sets the transfer price based solely on the marginal (or variable) cost of production, excluding fixed costs. This method is typically applied in specific situations where the buying division cannot bear the burden of fixed costs, and its profitability is prioritised.

Key features: Key features of the marginal cost transfer pricing method are enumerated below:

- ◆ Key features

1. **Focus on marginal cost:** The transfer price is based on variable costs, excluding fixed overheads, since these costs are unavoidable and do not change with the volume of production.
2. **Lowest transfer price:** This method represents the minimum price at which a transfer can occur without the selling division incurring additional variable costs.
3. **Use in special circumstances:** Applied when the buying division is weak or unable to absorb fixed cost allocations, such as during early-stage operations or financial difficulty.

The benefits of marginal cost-based transfer pricing are enumerated below:

- ◆ Benefits of marginal cost based transfer pricing

1. **Relief for the buying division:** By excluding fixed costs, the price reduces the financial burden on the buying division, enabling it to remain competitive or operational.
2. **Simple and transparent:** Calculating the transfer price based on variable cost is straightforward to implement.
3. **Encourages internal collaboration:** The method can facilitate transactions in situations where cost sharing would otherwise impede internal trade

However, the marginal cost-based transfer pricing is subject to the following challenges:

- ◆ Challenges associated with marginal cost based transfer pricing

1. **Understated profitability for the selling division:** By ignoring fixed costs, the selling division's profitability and performance may appear lower than they actually are.
2. **Limited applicability:** Suitable primarily for short-term or exceptional circumstances, such as when the selling division has excess capacity or the buying division faces financial constraints.
3. **Risk of suboptimal decisions:** Overlooking fixed costs in pricing may distort managerial decision-making, such as assessing divisional efficiency or resource allocation.

Application of marginal costing method: The application of the marginal costing method is stated below:

- a. This approach is adopted only to support the transferee in facing the competition in the market during a difficult phase of business.
- b. Companies and multinational enterprises also use marginal costing for internal management control purposes.
- c. It is also applied in a situation when a business aims to obtain a price that will contribute the greatest amount to its net profits.

In short, the marginal cost method provides a viable solution for internal pricing in cases where the buying division requires financial relief. However, it should be applied judiciously, as it shifts the burden of fixed costs entirely to the selling division, potentially affecting its reported performance.

3.2.3.3 Full Product Cost Method

The full product cost method of transfer pricing sets the transfer price based on the total cost of production, which includes both fixed and variable costs, along with overhead allocations. This method is used primarily for internal transactions and provides a comprehensive measure of the product's price, but it comes with specific advantages and limitations.

Key features: The full product cost transfer price method has the following features:

1. **Comprehensive cost basis:** The transfer price includes all components, such as prime costs, manufacturing and administrative overhead, R&D expenses, selling and distribution costs, depreciation, and interest on working capital.
2. **Variations in cost inclusion:** Actual costs used as the base may sometimes include only variable costs or the full cost.
3. **No profit element:** This method does not include a profit margin for the transferring division, benefiting the buying division by keeping costs lower than market prices.

The benefits of full product cost-based transfer pricing include:

1. **Transparency in costing:** This method provides a clear and detailed understanding of the total cost of the product or service.
2. **Fair pricing for internal transactions:** The full product-based cost pricing ensures that the buying division does not pay more than the actual cost incurred by the selling division.

◆ Setting transfer prices based on the total cost of production

Key features

◆ Benefits of full product cost-based transfer pricing



- 3. Support collaboration:** This method encourages internal transactions by reducing the financial burden on the buying division.

However, the full product cost-based transfer pricing is challenged by the following factors:

◆ Challenges associated with full product cost-based transfer pricing

- 1. Lack of profit incentive:** The selling division may be reluctant to transfer goods or services at full cost since it does not earn a profit, particularly in organisations where profit centres are emphasised.
- 2. Overhead allocation issues:** The allocation of fixed costs and overheads can be arbitrary and may lead to disputes over the fairness of the transfer price.
- 3. Market price comparisons:** The absence of a profit margin means the buying division benefits from a lower price compared to market rates, which might not align with market-based profitability goals.
- 4. Potential inefficiencies:** Including full fixed costs can discourage efficiency in the selling division, as inefficiencies may be passed on to the buying division.

Application of full cost method: The aggregation of direct costs and indirect costs is known as full cost method. The advantages cited for including unit fixed costs for pricing decisions (including that in the long run) are relevant costs because if a company charges prices that cannot generate sufficient revenues to meet all of its costs, then it causes a loss to the company. All costs, whether fixed costs or variable costs, are relevant. The disadvantages of the full cost method are:

- The common cost, including unavoidable costs, gets allocated, and hence, the pricing strategy becomes inefficient.
- The allocation of common costs may sometimes become arbitrary.
- Identifying common costs will be difficult; hence, relevance costing, which is important in pricing the product, loses its importance.

In short, the full cost method provides a detailed and fair basis for internal pricing but requires careful consideration of divisional incentives and organisational goals. While it benefits the buying division by excluding profit, the selling division may feel disadvantaged unless adjustments are made for profit-sharing.

3.2.3.4 Cost plus markup transfer pricing

The cost-plus method of transfer pricing involves setting the transfer price by adding a reasonable profit margin to the total cost of production. This method simplifies profit measurement and provides a straightforward approach to determining prices for internal transactions.

Key features: The key features of cost-plus markup transfer pricing are:

Key features

1. **Profit markup:** The transfer price includes the total production cost plus a percentage of profit, which is predetermined based on mutual agreement or aligned with standard industry practices for unrelated parties.
2. **Capacity utilisation impact:** If capacity utilisation is low, fixed costs may lead to inflated prices. Alternatively, undercharging fixed costs can result in losses or reduced profits for the transferring unit. Adjustments for unused capacity may be required, particularly when capacity is reserved for the buying division.
3. **Balancing objectives:** The method seeks to strike a balance by ensuring fair returns for the supplying division while promoting internal transactions at reasonable costs.

The cost-plus markup transfer pricing method is beneficial for an organisation in the following manner:

Benefits of cost plus mark up transfer pricing

1. **Ease of profit measurement:** Straightforward calculation simplifies assessing divisional performance.
2. **Customisable markup:** Profit percentages can be adjusted to reflect specific transaction conditions or align with market norms.
3. **Supports internal collaboration:** Encourages cooperation by ensuring the supplying unit earns a reasonable return.

However, the following challenges persist in using cost-plus transfer pricing:

◆ Challenges associated with cost – plus mark up transfer pricing

1. **Computation of cost:** The critical factors are:
 - a. **Allocation of overhead:** The problem arises when the allocation of fixed overhead is limited. Normal capacity should be the base for allocation. Capacity variance or efficiency variance may be adjusted to determine the price.
 - b. **Administrative overhead:** Administrative overhead may cover a number of products or services in the organisation. The question of the transfer of products or services may be

limited to a few. Apportionment of overhead on the basis of volume of business may seem to be a rational one.

c. **Business risk and efficiency/inefficiency:** Factors like business risk and efficiency/inefficiency in different products are ignored, which may lead to differences in price fixing.

1. Identification of the comparable.
2. Identification of appropriate margin.
3. Comparing the markup

Application of the cost plus method: The application of the cost plus method is explained below:

- a. This method is applied for products where no outside market exists and there is no way to approximate a reliable competitive price.
- b. The cost plus method may generally be applicable where there is value addition in the goods, property or services by the transferor involved in the related party transactions by way of the manufacturing process or other services.

The steps involved in this method are:

Step 1: The direct and indirect costs incurred by the transferor for making the goods, property or services effective for the transaction are determined.

Step 2: The amount of a normal gross profit mark-up to such costs arising from the transaction of similar material, goods or services by the party or by an unrelated party, in a comparable uncontrolled transaction or a number of such transactions, is determined.

Step 3: The normal gross profit mark-up referred to in step 2 is adjusted to take into account the functional and other differences, if any, between the transaction in question and the comparable uncontrolled transactions, or between the parties entering into such transactions, which could materially affect such profit mark-up in the open market.

Step 4: The sum of the cost as referred to in step 1 and adjusted profit mark-up arrived at under step 3 is taken to be an arm's length price in relation to the transaction between related parties.

In short, the cost-plus transfer pricing method facilitates internal pricing by adding a profit margin to production costs. While effective for simplifying profit assessment, careful adjustments are needed to manage inefficiencies and ensure fair and competitive pricing.

◆ Steps in cost plus mark up transfer pricing method

3.2.3.5 Negotiable Transfer Pricing

- ◆ Setting transfer prices through discussions between selling and buying divisions

Negotiated transfer pricing involves setting transfer prices through discussion and agreements between the selling and buying divisions within an organisation. This approach addresses the challenges of cost-based and market-based transfer pricing by establishing a mutually acceptable price that balances divisional and organisational interests. Negotiated transfer pricing is arrived at after negotiation between the transferor and the transferee when the two are in a position to make the best of the bargain. The transferee obtains a quotation from the transferor as well as from external suppliers. Information about cost and market may be used in these negotiations.

Key Features of Negotiated Transfer Pricing

The key features of the negotiable transfer pricing method are enumerated below:

Key features

1. **Negotiation process:** Prices are determined through bargaining, often falling between the market price and the seller's incremental and opportunity costs. Internal selling costs and external market conditions influence the pricing structure.
2. **Flexibility and autonomy:** Divisions are allowed to explore external market alternatives if internal negotiations fail, fostering autonomy. Both divisions benefit from transparency in available options and cost data.
3. **Conflict management:** Negotiations help resolve potential conflicts when a) the market price is lower than the internal price, prompting the buyer to consider external sources, and b) the market price is higher than the buyer's willingness to pay, discouraging the seller from internal sales. Arbitration mechanisms or dual pricing can help resolve disagreements and maintain cooperation.
4. **Applicability to services:** Particularly suited for services where value is qualitative (e.g., expertise and reliability). Commonly used for high-cost, high-volume, or customised services, such as risk management or executive training.
5. **Overall profitability focus:** encourages collaboration between divisions by using joint profitability as a performance metric. Ensured that the negotiated price supports the organisation's overall financial objectives.

Challenges

The challenges involved in adopting a negotiable transfer pricing method are:

- a. Excessive autonomy may lead to suboptimal decisions or divisional self-interest.
- b. Effective negotiation requires open access to relevant data and a clear focus on the organisation's broader goals.
- c. If divisions cannot agree, the process can delay operations or require arbitration.

Application of negotiated price: The negotiated transfer price is generally used if a competitive outside market exists. This method is a time-consuming one and may require frequent re-examination and revision of prices. The decision is taken whether to purchase from outside or obtain internally on the basis of the quality and reliability of supply.

In short, the negotiable transfer pricing balances internal and external factors to achieve a fair and functional price, ensuring that divisional autonomy supports, rather than hinders, the organisation's overall success.

3.2.3.6 Marginal and opportunity cost-based transfer pricing

This pricing recognises the minimum price that the selling division is ready to accept and the maximum price that the buying division is ready to pay. The final transfer price may be based on these minimum expectations of both divisions. The ideal situation will be when the minimum price expected by the selling division is less than the maximum price accepted by the buying division. However, in practice, it may happen very rarely, and there is a possibility of conflicts over the opportunity cost. Fixation of transfer prices is a very delicate decision. There might be a clash of interests between the selling and buying divisions. Hence, while fixing the transfer price, overall, it should be given utmost importance rather than the interests of the selling or buying divisions.

- ◆ Recognises the minimum price of selling division and maximum price of buying division

Illustration on the calculation of transfer pricing

Wild Quest Adventures Ltd. has two operating divisions. The Air Sports Division makes parasailing and paragliding equipment, and the Binding Division makes rubber boots for parasailing. The Binding Division estimates that 8,00,000 pairs of boots will be produced in 2024; of those, 6,00,000 pairs will be sold to the Parasailing Division and 2,00,000 pairs will be sold externally. Managers of the two divisions are in the process of determining a transfer price for a pair of boots. The following information for the Binding Division is available:

Table 1
Details of the cost of producing a pair of boots

Direct material	₹2268
Direct labour	₹1008
Variable overhead	₹588
Variable S&A (both for external and internal sales)	₹336
Total variable cost	₹4200
Fixed overhead (rate based on estimated annual production)	₹840
Fixed selling and administrative (rate based on estimated annual sales)	₹420
Total fixed cost	₹1260
Total cost per pair of boots	₹5460
Markup on total variable cost (40%)	₹1680
List price to external customers (Market Price)	₹7140
Markup (30%)	
Profit for the year	₹6000

Solution

Market price-based transfer price

The transfer price based on the market price equals the price at which the product will be sold in the market. However, the transfer price will be calculated by reducing the selling and distribution overhead from the market price. Thus,

Market price-based transfer price

$$= \text{Market price} - \text{Selling and distribution overhead}$$

Selling and distribution overhead

$$= \text{Variable S\&A} + \text{Fixed selling and administrative overhead}$$

$$= ₹336 + ₹420$$

$$= ₹756$$

Market price based transfer price

$$= ₹7140 - ₹756$$

$$= ₹6384$$

tiny from tax authorities in both home and host nations. Key considerations include:

Key features

- 1. Tax and regulatory compliance:** Tax authorities monitor transfer prices to ensure fairness and prevent tax evasion. Companies must comply with varying transfer pricing laws in different countries, avoiding practices that unfairly profit from low-tax jurisdictions.
- 2. Arm's length standard:** Transfer prices should reflect an objective, arm's length value, as if the transaction occurred between independent parties. Policies should be consistent and equitable across subsidiaries.
- 3. Advance pricing agreements (APAS):** APAS are binding agreements with tax authorities (eg the IRS) that define how transfer prices will be set, preventing disputes and ensuring compliance. APAS mitigate the risks of double taxation but requires lengthy approval times.
- 4. Global trends and compliance:** Increased adoption of transfer pricing legislation worldwide requires companies to adapt to local tax regulations. Organisations like the OECD and EU promote standardised guidelines to reduce disputes and administrative burdens, especially within multinational operations.
- 5. Audit and risks:** Transfer pricing audits are increasingly common, with many multinationals facing scrutiny in multiple countries. Non-compliance risk significant penalties, including potential conflicts with Sarbanes-Oxley Act requirements in the U.S.
- 6. Domestic transfer pricing:** Similar to international practices, multistate firms may use transfer pricing strategies to allocate between states with varying tax rates.

In short, multinational transfer pricing requires careful alignment with global tax laws, fair valuation, and proactive agreements like APAS to avoid disputes and ensure compliance. As audits become more frequent, companies must implement robust, consistent policies to manage risks effectively.

3.2.4.1 Comparable uncontrolled price (CUP) method

- ◆ Price determined by price of comparable goods

This is a price determined by the price of comparable goods sold in an economically comparable market to a buyer unrelated to the seller. The price so arrived is taken to be the arm's length price. The comparable uncontrolled price (CUP) focuses directly on the price of the property or services transferred between par-

ties to a transaction. The price charged between independent parties forms the basis for determining the arm's length price under the CUP method. Similarity of products is the precondition of applying CUP. As the product difference increases, the reliability of CUP decreases. Moreover, many intermediate products are not traded in the open market, thereby restricting their application. CUP may be applicable for the following situation:

1. No difference between controlled and uncontrolled transactions.
2. There is a minor difference in which adjustment is possible in price determination.

3.2.4.2 Resale price method

The resale price method may generally be applied in the case of the resale of goods, property, or services without any value addition by the transferee in the related party transaction to an unrelated party. The resale price is generally applied in the case where the reseller does not add any substantial value to the tangible property, and no physical alteration to the product is made. The RPM cannot be applied in the following cases:

- ◆ Applied in case of resale of goods, property or services

1. Where the reseller alters the physical attributes of the product, causing value addition.
2. Where the reseller enhances the value of the product by adding intangible property.

3.2.4.3 Profit split method

This method is applied in cases of multiple transactions amongst associated enterprises, and the transactions are so inter-related that they cannot be evaluated separately for the purpose of determining the arm's length price of any interlinked parties. The relative contribution made by each such associated enterprise is assessed on the basis of the functions performed, assets used, and risk assumed. The combined profits are then split amongst the enterprises in proportion to their relative contribution. The profit thus apportioned gives the arm's length price in relation to each transaction. Consideration for the profit split method:

- Applied in case of multiple transactions amongst associated enterprises

1. The relative contribution among the associated enterprises must be computed on the basis of the external market data.
2. The consistent approach in the apportionment of contributions.
3. Risk involved in the business.

- ◆ Applied for goods / property / services with special characteristics

3.2.4.4 Transactional Net Margin Method (TNM method)

The transactional net margin method may generally be applicable where the goods, property or service involved in the transaction is of special characteristics or specification or quality standard that the market price of the same is not readily available, still, the normal net profit margin in similar transactions is available. Net margin can be computed by the use of various ratios such as:

1. Net profit before tax
2. Net profit before interest and tax
3. Gross profit as a percentage of operating expenses.

Summarised Overview

Transfer pricing is the method employed by corporations to determine the price for the transfer of goods or services among associated companies, such as the transfer of goods or services between parent and subsidiary companies. The transfer price can be calculated based on market price, full cost of production, marginal cost, cost plus markup, negotiation, and opportunity cost. In market price-based transfer pricing, the market price of the product is used as a benchmark to fix the transfer price. In the absence of a reliable market price, the full product method can be adopted wherein the total cost, including variable and fixed cost of production, is considered as the transfer price. In order to avoid fixed costs from the calculation of transfer price, the company can use the marginal cost method, wherein the transfer price is calculated based on the variable cost. Sometimes the firm will add a percentage of the profit to the cost to calculate the transfer price. This is known as the cost-plus markup method. The company can also rely on negotiation to calculate the transfer price or use the opportunity cost method. In the opportunity cost method, the price foregone by not selling the product to an external customer will be considered as the transfer price. Transfer pricing is highly significant in the case of multinational corporations, which utilise the transfer pricing option in transferring tax liabilities. The popular methods adopted by multinational corporations in fixing transfer price are the Comparable Uncontrolled Price (CUP) method, the Resale Price method, the Profit Split method and the Transactional Net Margin Method (TNMM).

Self-Assessment Questions

1. Define transfer pricing.
2. What is the importance of transfer pricing in multinational companies?
3. What is meant by “related party” in the context of transfer pricing?
4. Explain the role of transfer pricing in performance evaluation.
5. Name any four methods used for setting transfer prices.
6. Explain opportunity cost in the context of transfer pricing.
7. Explain the use of the Profit Split Method in transfer pricing.

Assignments

1. A division manufactures 5000 units of a product, having a market price of 10000 per unit. The selling and distribution cost per unit amounts to ₹1200. Calculate the transfer price per unit and total transfer value, using the market-based method. Compare how transfer pricing would affect:
 - a. Performance evaluation of the division
 - b. Inter-divisional conflicts
 - c. Recommend the situations under which this method can be applied.
2. Compare and contrast marginal cost and full cost methods, and compute transfer price using both methods based on the following information:
 - a. Direct material – ₹3000
 - b. Direct labour – ₹1200
 - c. Variable overhead – ₹600
 - d. Variable S&A – ₹400
 - e. Fixed overhead – ₹1000
 - f. Fixed S&A – ₹500

Discuss the implications of each method on (i) division profitability, (ii) long-term resource planning, and (iii) internal pricing fairness. Present your findings using a table.

3. Calculate transfer price by applying the cost-plus method, based on the following information:

- a. Total cost - ₹5500
- b. Profit margin 25% on cost
- c. Units transferred - 6000

Identify at least two real-world industries where cost-plus pricing is commonly used and justify. Also discuss how capacity utilisation affects transfer pricing and the risks associated with overpricing due to high fixed costs. Provide a recommendation on when to apply this model effectively in a multinational firm (MNC).

Reference

1. Kenney, Michael R., Raiborn, Cecily A. (2011). *Cost Accounting Foundations and Evolutions*. South-Western CENGAGE Learning.
2. Hindustan Unilever Limited. *A responsible taxpayer*. <https://www.hul.co.in/sustainability/responsible-business/business-integrity/responsible-taxpayer/>. Accessed November 15, 2024.
3. The Institute of Cost Accountants of India (2014). *Cost and Management Accountancy* (pp. 2.83 – 2.93). CMA Bhawan.

Suggested Reading

1. Kenney, Michael R., Raiborn, Cecily A. (2011). *Cost Accounting Foundations and Evolutions*. South-Western CENGAGE Learning.
2. The Institute of Cost Accountants of India (2014). *Cost and Management Accountancy* (pp. 2.83 – 2.93). CMA Bhawan.



Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

SGOU

04 BLOCK

Strategic Cost Management Techniques

Block Content

- Unit - 1 COST ACCOUNTING STANDARDS
- Unit - 2 ENTERPRISE PERFORMANCE MANAGEMENT (EPM)
- Unit - 3 STRATEGIC CONCEPTS AND APPLICATIONS IN COST AND MANAGEMENT ACCOUNTING
- Unit - 4 BEHAVIOURAL COST MANAGEMENT

Unit 1

Cost Accounting Standards

Learning Outcomes

After completing this unit, the learners will be able to:

- ◆ An understanding on the different elements of retail marketing environment
- ◆ Get an idea on the concept of segmentation
- ◆ Know different types of pricing methods

Background

The Industrial Revolution marked the rise of large businesses and organisations, which became increasingly complex and dynamic. The roots of cost accounting can be traced back to this period, as it was developed to help business owners record and monitor their costs and expenses. Traditional financial accounting alone proved inadequate for the effective management of medium and large organisations, leading to the emergence of cost accounting as a specialised branch of financial accounting. Over the past few decades, cost accounting has evolved significantly, with new procedures and techniques refining the process further. Its development addressed the limitations of traditional accounting by providing tools for better cost control and operational efficiency, something financial accounting could not achieve. As these scientific methods advanced, cost accounting standards were established to ensure uniformity across industries and economies. Over time, the concept of cost audit also emerged, aimed at reviewing and examining the accuracy of cost accounting records.

Keywords

Cost accounting standards, Revenue management concepts

Discussion

4.1.1 Cost Accounting Standards (CAS)

Cost Accounting Standards (CAS) are a set of guidelines and principles established to ensure consistency, accuracy, and transparency in the cost accounting practices of businesses. These standards provide a framework for measuring, assigning, and allocating costs to products, services, or other cost objectives, ensuring that organisations maintain uniformity in their cost accounting processes. The Cost Accounting Standards Board (CASB) issues standards aimed at improving the quality and consistency of cost accounting methods. These standards apply to industries where cost data is essential for pricing, budgeting, and performance evaluation.

◆ Framework for cost accounting practices

The main objectives of CAS are:

1. **Uniformity:** Standardize the costing methods across industries.
2. **Transparency:** Provide clarity on cost data and make it comparable.
3. **Accuracy:** Ensure precise allocation of costs to products/services.
4. Enhance comparability by ensuring consistency in cost measurement.
5. Facilitate better decision-making by providing more reliable cost information.

4.1.1.1 Cost Accounting Standards Board (CASB)

The Institute of Cost Accountants of India, recognising the need for a structured approach to measuring costs in the manufacturing and service sectors, has established the Cost Accounting Standards Board (CASB) to guide user organisations, government bodies, regulators, research agencies, and academic institutions. The goal is to achieve uniformity and consistency in classifying, measuring, and assigning costs to products and services. The CASB is responsible for developing Cost Accounting Standards. Additionally, to clarify the requirements of these standards and provide practical guidance with examples of technical issues, the CASB issues Guidance Notes. So far, the Institute/Board has issued 24 Cost Accounting Standards, Generally Accepted Cost Accounting Principles, 9 Guidance Notes on Cost Accounting Standards, and two specific Guidance Notes

◆ The CASB is responsible for developing Cost Accounting Standards.



on “Treatment of Costs Relating to Corporate Social Responsibility (CSR) Activities” and “Maintenance of Cost Accounting Records for the Construction Industry, Including Real Estate and Property Development.”

The structure of a Cost Accounting Standard includes an Introduction, the Objectives of issuing the standard, the Scope of the standard, Definitions and explanations of terms, Principles of Measurement, Cost Assignment, and Presentation and Disclosure. While formulating these standards, the CASB takes into account applicable laws, prevailing business environments, and usage in India. It also considers Cost Accounting Standards, principles, and practices followed in other countries. In cases where a standard or part of it becomes inconsistent with subsequent changes in law, the provisions of the law will take precedence.

Table 4.1.1 : List of Cost Accounting Standards

1. Classification of Cost
2. Capacity Determination
3. Production and Operation Overheads
4. Cost of Production for Captive Consumption
5. Determination of Average (Equalized) Cost of Transportation
6. Material Cost
7. Employee Cost
8. Cost of Utilities
9. Packing Material Cost
10. Direct Expenses
11. Administrative Overheads
12. Repairs and Maintenance Cost
13. Cost of Service Cost Centre
14. Pollution Control Cost
15. Selling and Distribution Overheads
16. Depreciation and Amortisation
17. Interest and Financing Charges
18. Research and Development Costs
19. Joint Costs
20. Royalty and Technical Know-How Fee
21. Quality Control
22. Manufacturing Cost
23. Overburden Removal Cost
24. Treatment of Revenue in Cost Statements

4.1.1.2 Key Cost Accounting Standards (CAS)

1. CAS-1: Classification of Costs

Cost Accounting Standard (CAS) 1 deals with the classification of costs, providing guidelines on how different types

- ◆ CAS 1 primarily classifies costs into direct and indirect.

of expenses should be categorised and treated in financial statements. CAS 1 primarily classifies costs into direct and indirect categories. Direct costs are those that can be directly attributed to a specific product, service, or project, such as raw materials or direct labour. Indirect costs, on the other hand, are those that cannot be directly linked to a single output but are necessary for overall operations, such as utilities or administrative expenses.

2. CAS-2: Capacity Determination

- ◆ Determine a company's production capacity, which is the maximum output it can achieve under normal conditions.

Cost Accounting Standard (CAS) 2 focuses on how to determine a company's production capacity, which is the maximum output it can achieve under normal conditions. It helps classify capacity into three main types. 1. installed capacity (theoretical maximum output), 2. practical capacity (realistic output considering normal interruptions like maintenance), and 3. actual capacity (the output actually achieved during a period). CAS 2 guides how companies should account for these capacities to allocate costs properly. This helps businesses manage resources efficiently, identify if they are underusing or overusing their capacity, and make better decisions about production and pricing.

3. CAS-3: Overheads

- ◆ Provides guidelines on how to allocate overhead costs fairly across different products or services

Cost Accounting Standard (CAS) 3 deals with overheads, which are indirect costs incurred during production or service delivery that cannot be directly traced to a specific product or service. Overheads include expenses like rent, utilities, administrative salaries, and equipment depreciation. CAS 3 provides guidelines on how to allocate these overhead costs fairly across different products or services. It suggests using methods such as machine hours, labour hours, or other appropriate bases to distribute overheads. The goal is to ensure accurate cost reporting so that companies can price their products correctly, control expenses, and manage resources efficiently. By following CAS 3, businesses improve transparency and consistency in financial statements.

4. CAS-4: Cost of Production for Captive Consumption

- ◆ Standardize the method for valuing goods used for internal consumption.

Cost Accounting Standard (CAS) 4 deals with the treatment of cost of production for goods and services that are meant for captive consumption, meaning they are produced for internal use rather than for sale to external customers. For example, if a company produces raw materials or components that are used within the company for further manufacturing, CAS 4 provides guidance on how to calculate and report these costs. In simple terms, CAS 4 ensures that all relevant expenses, including ma-



materials, labour, and overheads, are properly considered when determining the value of goods produced for internal use. This helps organisations track the true cost of internal production and ensure proper financial reporting. The objective is to standardise the method for valuing goods used for internal consumption.

5. CAS-5: Average Cost of Transportation

This standard provides the method for calculating average transportation costs to ensure uniformity. These are the expenses incurred for moving goods from one place to another, such as shipping, freight, and handling charges. AS 5 provides guidelines for calculating the average cost of transportation, which means taking the total transportation expenses and dividing them by the quantity of goods transported. This standard ensures that transportation costs are properly allocated to the products or services involved, whether for external sales or internal use. Helps companies track and allocate transportation costs accurately, ensuring that these expenses are reflected in the overall cost of production, which supports correct pricing and financial reporting. The objective is to provide the proper allocation of transportation costs.

- ◆ Guidelines on calculating the average cost of transportation

6. CAS-6: Material Cost

Cost Accounting Standard (CAS) 6 deals with material costs, which refer to the expenses incurred for purchasing raw materials, components, or parts used in producing goods or services. These costs include the purchase price, freight, taxes, and any other charges directly related to acquiring the materials. This provides guidelines on how to account for these material costs, ensuring that they are accurately measured and allocated to the products or services being produced. It also advises on how to value materials—whether at their purchase price, market value, or other valuation methods—based on the situation. Helps businesses track and allocate the costs of materials properly, ensuring accurate financial reporting, effective cost management, and correct product pricing.

- ◆ Expenses incurred for purchasing raw materials, components, or parts used in producing goods or services

7. CAS-7: Employee Cost

Cost Accounting Standard (CAS) 7 covers **employee costs**, which include all expenses related to employees, such as salaries, wages, bonuses, benefits, and any other compensation paid to staff. This also includes costs related to employee welfare, insurance, and other perks. AS 7 provides guidelines on how to account for these employee-related costs and allocate them to

- ◆ Covers employee costs, which include all expenses related to employees

different activities or products. The aim is to ensure that employee costs are accurately tracked and assigned based on the work done, whether for production, administration, or other areas. CAS 7 ensures that all expenses related to employees are properly recorded and distributed in the financial statements. This helps businesses understand their labour expenses, manage their workforce costs, and ensure transparency in their financial reporting.

8. CAS-8: Cost of Utilities

Cost Accounting Standard (CAS) 8 deals with the cost of utilities, which refers to the expenses related to services like electricity, water, gas, steam, and other similar utilities used in production or operations. These costs are essential for running machines, lighting facilities, and maintaining an operational environment. CAS 8 provides guidelines on how to identify, measure, and allocate utility costs to different departments, products, or services. It recommends methods such as metering or using predetermined rates based on consumption to distribute the costs fairly. In simple terms, CAS 8 ensures that utility costs are accurately recorded and allocated to the appropriate activities, helping businesses control energy expenses, improve cost management, and reflect the true cost of production in financial statements.

- ◆ Expenses related to services like electricity, water, gas, steam, and other similar utilities used in production or operations

9. CAS-9: Packing Material Cost

This standard establishes the principles for accounting for the costs associated with packing materials. The objective is to ensure a uniform approach to the treatment of packing material costs. This includes costs for boxes, wrappers, pallets, and any other materials needed to protect and present products effectively. CAS 9 provides guidelines on how to account for these packing material costs, ensuring they are accurately measured and allocated to the products they are associated with. This involves determining the total cost of packing materials and then distributing these costs based on the number of units produced or shipped.

- ◆ Guidelines on how to account for these packing material costs

10. CAS-10: Direct Expenses

CAS 10, issued by the Institute of Cost Accountants of India, relates to **Direct Expenses**. It provides a framework for determining and accounting for direct expenses in an organisation, promoting consistency and transparency in cost statements. The main goal of CAS-10 is to establish uniformity and transparency

- ◆ Framework for determining and accounting for direct expenses



in determining and reporting **direct expenses** associated with production or services, making cost statements more reliable for internal and external stakeholders.

11. CAS-11: Administrative Overheads

It deals with the accounting treatment of overhead costs related to production. It provides guidelines for measuring and allocating these costs, which include expenses like rent, utilities, and salaries that are necessary for manufacturing but are not directly tied to specific products. The standard aims to ensure that overhead costs are consistently classified and assigned, helping businesses accurately determine the total cost of production. By promoting transparency in how these costs are reported, CAS 11 assists companies in better understanding their expenses and making informed financial decisions.

- ◆ Treatment of overhead costs related to production

12. CAS-12: Repairs and Maintenance Cost

Cost Accounting Standard 12 (CAS 12) focuses on the accounting treatment of repairs and maintenance costs related to fixed assets. Its objective is to provide guidelines for accurately measuring, classifying, and allocating these costs to ensure reliable financial reporting. It distinguishes between routine maintenance expenses, which are generally expensed in the period incurred, and significant repairs that enhance an asset's value or extend its useful life, which should be capitalised. Promoting consistency in how these costs are treated and encouraging clear disclosure of accounting policies helps organizations effectively manage their asset-related expenses. Ultimately, it aids in informed decision-making regarding asset investments and enhances the overall quality of financial statements across various industries.

- ◆ Treatment of repairs and maintenance costs related to fixed assets.

13. CAS-13: Cost of Service Cost Centers

This standard deals with the principles and methods of classification, measurement and assignment of Cost-of-Service Cost Centre for the determination of the Cost of a product or service and the presentation and disclosure in cost statements. The objective of this standard is to bring uniformity and consistency to the principles and methods of determining the cost-of-service cost centre with reasonable accuracy. Aimed at the allocation of costs for service centres within government contracts, defining service centres as units that provide support services to other organisational units. It outlines methods for equitably distributing both direct and indirect costs among benefiting departments,

- ◆ Consistency in the principles and methods of determining the Cost-of-Service Cost Centre with reasonable accuracy

emphasizing the importance of maintaining documentation for transparency and compliance. CAS 13 requires periodic reviews and adjustments to allocation methods to ensure they accurately reflect the costs of services provided.

14. CAS-14: Pollution Control Costs

Cost Accounting Standard (CAS) 14 addresses the costs associated with pollution control and environmental compliance in government contracts. It defines pollution control costs as those incurred to prevent, reduce, or eliminate environmental pollution and emphasizes that these costs should be allocated consistently and fairly. The standard requires contractors to identify, measure, and report pollution control costs separately from other expenses, ensuring that they are accounted for accurately in the pricing of government contracts while also promoting responsible environmental practices.

- ◆ Defines pollution control costs as those incurred to prevent, reduce, or eliminate environmental pollution

15. CAS-15: Selling and Distribution Overheads

Cost Accounting Standard (CAS) 15 deals with the accounting and allocation of selling and distribution overhead costs in government contracts. It defines these costs as expenses related to marketing, selling, and distributing products or services. CAS 15 emphasizes that these costs should be identified and allocated consistently to ensure that they are fairly reflected in contract pricing. The standard requires contractors to develop and document appropriate methods for allocating selling and distribution costs, ensuring transparency and compliance with federal regulations. Additionally, it stresses the need for regular reviews to maintain accuracy in cost allocations and promote efficient management of selling and distribution activities.

- ◆ Expenses related to marketing, selling, and distributing products or services.

16. CAS-16: Depreciation and Amortization

Cost Accounting Standard (CAS) 16 focuses on the accounting and allocation of depreciation costs associated with facilities capital in government contracts. It provides guidelines for measuring and reporting these costs, emphasizing that contractors must systematically allocate depreciation based on the usage of the facilities for various contracts. The standard distinguishes between costs that should be capitalized (added to the asset's value) and those that should be expensed in the current period. Proper documentation of the depreciation methods used is required to ensure compliance and transparency, and contractors must regularly review their allocation methods to accurately reflect any changes in asset usage.

- ◆ The accounting and allocation of depreciation costs



17. CAS-17: Interest and Financing Charges

Cost Accounting Standard (CAS) 17 addresses the treatment of interest and financing charges in government contracts. It emphasizes that these costs should be incurred and allocated in a consistent and equitable manner. The standard specifies that interest costs associated with capital expenditures can be capitalized only if they meet certain criteria, such as being directly attributable to the acquisition or construction of assets. CAS 17 requires contractors to document their methods for allocating interest and financing charges, ensuring transparency and compliance with federal regulations. Additionally, the standard highlights the importance of regular reviews to ensure that the allocated costs accurately reflect the financing activities related to government contracts.

- ◆ The accounting and allocation of depreciation costs

18. CAS 18 Research and development cost

Cost Accounting Standard (CAS) 18 focuses on the treatment of research and development (R&D) costs in the context of government contracts and accounting practices. It defines R&D costs as expenses related to the creation and development of new products or processes, and it distinguishes between research and development phases. Generally, research costs are expensed as incurred because they involve exploratory activities aimed at gaining new knowledge. Development costs can be capitalized if they meet specific criteria, such as the demonstration of technical feasibility and the intention to complete the product for commercial use. This standard aims to provide clarity on the accounting treatment of R&D expenses, ensuring transparency and consistency in financial reporting for entities engaged in innovative activities.

- ◆ Defines R&D costs as expenses related to the creation and development of new products.

19. CAS 19: Joint costs

Cost Accounting Standard (CAS) 19 addresses the concept of joint costs, which arise when multiple products are produced simultaneously from a single input or process. Joint costs are incurred before the products can be separately identified, making it necessary to allocate these costs to each product based on a systematic and rational method. CAS 19 outlines the treatment of joint costs by suggesting allocation methods such as physical units, relative sales value, or other appropriate bases that reflect the economic reality of the products. This standard aims to ensure that financial statements accurately reflect the cost distribution among joint products, facilitating fair pricing, cost management, and compliance with accounting standards.

- ◆ Treatment of multiple products are produced simultaneously from a single input or process

20. CAS 20: Royalty and Technical know-how fee

- ◆ Treatment of costs related to intangible assets.

Royalties are payments made for the use of intellectual property, such as patents or trademarks, while technical know-how fees are paid for specialized knowledge or expertise. CAS 20 outlines how to recognize and allocate these costs accurately in financial statements. Typically, royalties are expensed as they are incurred, reflecting the ongoing cost of using the intellectual property. Technical know-how fees may also be treated similarly, depending on their nature and the agreement terms. This standard ensures that organizations properly account for these costs, helping them manage expenses and comply with accounting regulations.

21. CAS 21: Quality Control

- ◆ To incorporate quality control costs into their overall cost accounting practices

Cost Accounting Standard (CAS) 21 addresses quality control in the context of production and service delivery. Quality control refers to the processes and measures taken to ensure that products or services meet specific standards and requirements. CAS 21 emphasises the need for organisations to incorporate quality control costs into their overall cost accounting practices. The impact of implementing CAS 21 includes improved product reliability and customer satisfaction, as consistent quality control helps identify defects and reduce waste. By accurately tracking quality control costs, organisations can better allocate resources, manage expenses, and make informed decisions regarding product improvements. Ultimately, adhering to CAS 21 can enhance operational efficiency, strengthen competitive advantage, and support compliance with industry standards.

22. CAS 22: Manufacturing cost

- ◆ Treatment of manufacturing costs incurred during the production of goods.

Focuses on the treatment of manufacturing costs incurred during the production of goods. Manufacturing costs typically include direct materials, direct labour, and manufacturing overhead. CAS 22 provides guidelines on how to identify, measure, and allocate these costs to ensure accurate financial reporting. The standard emphasises that all costs directly associated with the production process should be accounted for, which helps organisations determine the total cost of producing their products. By clearly defining manufacturing costs, CAS 22 aids companies in pricing their products effectively, managing resources efficiently, and improving overall financial performance. Implementing this standard ensures transparency in cost allocation and supports compliance with accounting regulations.

23. CAS 23: Overburden Removal Cost

- ◆ Deals with Overburden Removal Costs in Mining

Cost Accounting Standard 23 (CAS-23) deals with Overburden Removal Costs in mining. Overburden is the layer of soil or rock covering a mineral deposit, and CAS-23 guides how to measure, allocate, and report the costs associated with removing this material. According to CAS-23, overburden removal costs should be assigned to production over the relevant period, usually based on the volume of mineral extracted or the benefit derived. This ensures that these costs are accounted for accurately and consistently, giving a clear picture of the true cost of mining operations.

24. CAS 24: Treatment of revenue in cost statements

- ◆ Focuses on ensuring that revenue is properly recognised and reported in cost statements

Cost Accounting Standard (CAS) 24 provides guidelines on the treatment of revenue in cost statements. Revenue refers to the income earned by an organisation from its core activities, such as sales of goods or services. CAS 24 focuses on ensuring that revenue is properly recognised and reported in cost statements, which are used to track and analyse an organization's costs. According to CAS 24, revenue should be recognised when it is earned and realisable, meaning when the goods or services are delivered, and the payment is either received or assured. It also emphasises the need to match revenue with related costs for accurate financial reporting. By following CAS 24, organisations can provide a clear and transparent view of their revenue streams, ensuring consistency in financial statements and supporting effective cost management and pricing strategies.

4.1.1.3 Importance of Cost Accounting Standards

Cost Accounting Standards (CAS) are essential for businesses and organisations to ensure consistency, transparency, and accuracy in their financial and operational reporting. Here's why they are important:

1. Uniformity and Consistency

- ◆ Ensures cost records are reported uniformly.

CAS provide a consistent framework for cost accounting practices, which ensures that costs are recorded and reported uniformly across organisations and industries. This uniformity facilitates comparison and benchmarking, enabling businesses to assess performance against industry standards.

2. Improved Decision Making

- ◆ Providing Data For Decision Making

CAS helps in generating reliable cost data, which is crucial for informed decision-making. Managers rely on cost informa-

tion to evaluate efficiency, control expenses, and make strategic choices like pricing, budgeting, and resource allocation

3. Compliance and Regulatory Requirements

- ◆ Adherence to rule

In sectors like government contracting, adherence to CAS is mandatory. These standards ensure that organisations comply with government requirements, reducing the risk of legal issues, penalties, and audits. CAS promote ethical practices by enforcing transparency and preventing manipulation or misrepresentation of costs.

4. Cost Control and Efficiency

- ◆ Defining allowable and unallowable costs

By clearly defining allowable and unallowable costs, CAS helps organizations control costs effectively. They encourage cost-efficient operations by guiding allocating indirect costs and measuring cost behavior. With standardized methods, businesses can better track and forecast costs, avoiding cost overruns and inefficiencies.

5. Facilitates Audits and Reviews

- ◆ Ensuring audit accuracy

CAS ensure a well-documented and standardized approach to costing, which simplifies the auditing process. Auditors can easily trace costs, reducing disputes and improving audit accuracy.

6. Enhances Financial Transparency and accountability

- ◆ Ensuring transparency and responsibility

Adherence to CAS increases the transparency of an organization's financial dealings. Investors, regulators, and other stakeholders gain confidence in the reported financials, knowing that costs are being reported according to accepted standards. Cost standards enhance accountability, making it easier for stakeholders to review financial records and hold managers responsible for cost management.

7. Supports Fair Pricing and Competition

- ◆ Establishing fair and justifiable pricing

CAS assist in establishing fair and justifiable pricing for products and services, particularly in government contracts where prices must reflect the actual costs incurred. This prevents price manipulation and ensures competitiveness in the market.

8. Benchmarking and Performance Evaluation

- ◆ Basis for performance evaluation

CAS provide a reliable basis for performance evaluation. Organizations can compare their cost structures and efficiency

levels with industry benchmarks, facilitating improvements and highlighting areas needing attention.

In conclusion, Cost Accounting Standards are essential for promoting accuracy, transparency, and accountability in cost reporting. They assist businesses in effectively managing costs, adhering to regulatory requirements, and making well-informed strategic decisions, ultimately contributing to better financial management and overall organizational performance.

4.1.2 Revenue Management

- ◆ Aimed to maximise revenue

Revenue management, a strategic approach within cost accounting, aims to maximize a company's revenue by aligning pricing, cost structures, and capacity management. Often employed in industries such as hospitality, airlines, and retail, its principles can be applied across various sectors. Here's how revenue management interacts with cost accounting:

1. Pricing strategy

Revenue management's pricing strategy involves using both dynamic and cost-based pricing to maximize profitability. **Dynamic pricing** sets prices based on demand, capacity, and customer segmentation, allowing businesses to adjust prices in real time to optimize revenue. Cost accounting plays a crucial role in this by providing accurate data on the costs of products or services, ensuring that the prices set not only cover these costs but also generate desired profits. Similarly, **cost-based pricing** helps determine the minimum price required by analyzing fixed and variable costs, ensuring that prices do not fall below cost levels. It also helps businesses establish the necessary profit margins to meet their revenue goals.

- ◆ Using dynamic and cost-based pricing to maximise profitability.

2. Cost–Volume Profit Analysis

Break-even analysis, an essential part of cost-volume-profit (CVP) analysis, plays a crucial role in revenue management. It helps organizations grasp the connection between costs, revenues, and profits across different sales volumes. By identifying the break-even point, businesses can develop pricing and sales strategies designed to boost revenue and achieve profitability beyond this threshold. CVP analysis is primarily concerned with how changes in selling prices, costs, and sales volume affect a company's profitability. The point at which total revenue equals total costs, meaning no profit or loss is made. It helps businesses

- ◆ Concerned with how changes in selling prices, costs, and sales volume affect a company's profitability

determine the minimum sales needed to cover costs.

3. Capacity utilization

- ◆ Optimising the use of capacity

Effective cost management involves optimizing the use of capacity, especially in industries with significant fixed costs, such as hotels and airlines. Cost accounting helps allocate both fixed and variable costs to different services or units, giving businesses a clear understanding of how costs behave at various levels of capacity. Additionally, cost accounting provides insights into marginal costs, which are the extra costs incurred when increasing production or service capacity. This data is crucial for revenue management, helping businesses determine whether expanding sales or offering discounts will lead to greater profitability.

4. Product and Service Mix Optimisation

- ◆ Prioritize the sale of higher-margin items

Cost accounting allows businesses to analyze the profitability of different products or services by considering both direct and indirect costs. This enables revenue management to prioritize the sale of higher-margin items or services and adjust the product mix to maximize revenue.

5. Forecasting and Budgeting

- ◆ Helps to forecasting

Accurate demand forecasting is essential for effective revenue management, and it closely aligns with budgeting processes in cost accounting. Cost accounting supplies historical data on both costs and revenues, which can be used to create revenue projections. This information also supports adjustments in pricing and capacity strategies to better align with future expectations.

6. Cost control for profit maximisation

- ◆ Translates into greater profits

Revenue management goes beyond just boosting revenue; it also prioritizes managing costs to guarantee that increased revenue translates into greater profits. Cost accounting monitors both direct and indirect expenses, enabling management to make changes that enhance profitability.

4.1.2.1 Role of Revenue Management in Production Channel

Production channel refers to the series of processes and steps involved in transforming raw materials into finished

goods. It encompasses all activities and costs associated with the production of goods, from the initial acquisition of materials to the final delivery of products to customers. The significance of Revenue management in the production channel can be outlined as follows:

- i. **Optimised Resource Allocation:** Revenue management helps businesses effectively allocate resources by analyzing demand patterns and adjusting production levels accordingly. This ensures that production meets market needs without overproducing or underproducing.
- ii. **Maximised Profitability:** By strategically setting prices based on demand forecasts and market conditions, companies can maximise revenue from their products. This allows businesses to capitalize on peak demand periods while managing costs effectively.
- iii. **Improved Inventory Management:** Effective revenue management provides insights into sales trends and customer preferences, enabling better inventory control. This reduces holding costs and minimizes the risk of excess or obsolete inventory.
- iv. **Enhanced Customer Satisfaction:** By understanding customer demand and pricing sensitivity, companies can offer tailored promotions or pricing strategies that enhance customer satisfaction, leading to repeat business and brand loyalty.
- v. **Market Segmentation:** Revenue management allows businesses to segment their markets and target different customer groups with tailored pricing and production strategies. This approach can lead to increased market share and improved competitiveness.
- vi. **Risk Mitigation:** By understanding market dynamics and demand fluctuations, businesses can mitigate risks associated with production and pricing, allowing for more resilient operations in uncertain economic conditions.
- vii. **Strategic Decision-Making:** Data-driven insights from revenue management inform strategic decisions in production, pricing, and marketing. This helps companies adapt to changing market conditions and seize new opportunities.
- viii. **Financial Forecasting:** Revenue management techniques contribute to more accurate financial forecasts by analyzing historical data and trends. This supports better budgeting and financial planning within the production channel.

The role of revenue management in the production channel is vital for optimizing operational efficiency and profitability. By analyzing demand patterns and market trends, revenue management enables businesses to make informed decisions regarding production levels, inventory management, and pricing strategies. This ensures that resources are allocated effectively, minimizing costs associated with overproduction or stockouts. Additionally, by implementing dynamic pricing based on consumer demand, companies can maximize revenue during peak periods while ensuring customer satisfaction. Ultimately, revenue management aligns production processes with market conditions, fostering a more responsive and profitable production channel.

4.1.2.2 Role of Revenue Management in Customer Profitability Analysis

Customer Profitability Analysis (CPA) is a financial assessment tool used by businesses to evaluate the profitability of individual customers or customer segments. This analysis focuses on understanding how different consumers contribute to the company's overall profits by examining both revenues generated from each customer and the costs associated with serving them. Here are the key components and steps involved in consumer profitability analysis. Assessing the profitability of products and services is crucial for any business. A comprehensive set of management accounts offers this vital information, enabling the identification of which products and services are driving the most revenue and which ones are unprofitable. The role of revenue management in consumer profitability analysis within cost accounting is essential for maximizing profitability and strategic decision-making. By analyzing consumer purchasing behaviours, preferences, and price sensitivity, revenue management helps businesses identify the most profitable customer segments and optimize pricing strategies accordingly. This analysis enables companies to allocate resources effectively, tailoring marketing efforts and promotions to enhance customer value. Additionally, it allows for the assessment of customer lifetime value, enabling businesses to make informed decisions about investments in customer acquisition and retention. Overall, integrating revenue management into consumer profitability analysis facilitates a deeper understanding of revenue drivers, leading to improved profitability and competitive advantage.

Summarised Overview

In order to guarantee effective financial decision-making and the best possible pricing strategies, cost accounting standards and revenue management concepts centre on the methodical collection, analysis, and distribution of expenses. To provide openness and uniformity, cost accounting standards include recommendations on cost allocation techniques, valuation concepts, and reporting accuracy. Important components that aid in figuring out the actual cost of manufacturing or service delivery are overhead allocation, fixed and variable costs, and direct and indirect costs. By carefully managing price, inventory, and distribution, revenue management, on the other side, seeks to maximize profits. Demand forecasting, dynamic pricing, and market segmentation are all used to optimize profitability, particularly in sectors like hotels and aviation that have varying demand and constrained capacity.

Self-Assessment Questions

1. What are cost accounting standards, and why are they essential for maintaining accuracy and transparency in financial reporting?
2. Explain the concept of revenue management and its significance in optimizing profitability. How does it impact production channels and customer profitability analysis?
3. Describe how cost accounting standards can enhance decision-making for production and service-related costs.

Assignments

1. Define cost accounting standards. Explain their importance in ensuring accuracy and transparency in financial reporting. Provide examples to illustrate their role.
2. Discuss the concept of revenue management and its role in optimizing profitability. Analyze how revenue management impacts production channels and contributes to customer profitability analysis. Support your answer with examples.
3. Explain how cost accounting standards can aid in making effective decisions related to production and service costs. Provide examples of scenarios where these standards can be applied to improve operational efficiency.

Reference

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SGOU

Unit 2

Enterprise Performance Management

Learning Outcomes

After completing this unit, the learners will be able to:

- ◆ comprehend the concept of Enterprise Performance Management
- ◆ identify the applications of enterprise performance management in cost accounting and challenges of implementation.

Background

Enterprise Performance Management (EPM) is a strategic framework that helps organisations monitor, manage, and improve their overall performance. EPM integrates critical processes like budgeting, forecasting, and financial reporting to provide a clear picture of how well a business is achieving its objectives. By combining financial and operational data, EPM enables organisations to align their strategic goals with everyday execution, making it easier to adjust plans based on real-time insights. This approach helps businesses make data-driven decisions, optimise resources, and stay adaptive in a changing environment. In today's competitive landscape, EPM is essential for companies aiming to enhance efficiency, drive growth, and improve profitability. Enterprise Performance Management (EPM) and cost accounting work together to help organisations reduce costs, make strategic choices, and increase profits. Traditionally, cost accounting has involved tracking, recording, and analysing the costs of producing goods or providing services. This focus on controlling costs, setting budgets, and allocating resources gives important insights into a company's financial health. With the growth of EPM, cost accounting has expanded to include more strategic aspects, where cost data is now used not only for internal reports but also as a foundation for planning, forecasting, and improving performance over the long term.

Keywords



4.2.1 Enterprise Performance Management

- ◆ Helps companies stay on track with their plans, make better decisions, and respond quickly to changes.

Enterprise Performance Management (EPM) is a framework and set of tools that organisations use to monitor, manage, and improve their performance. It integrates processes like budgeting, forecasting, financial reporting, and analytics to give a full view of a company's financial and operational health. EPM helps companies stay on track with their plans, make better decisions, and respond quickly to changes. It's like a roadmap that aligns what a company wants to achieve with the steps it takes every day. The term Enterprise Performance Management (EPM) does not have a specific origin or a single individual credited with coining it; rather, it evolved gradually within the fields of financial and business management. The concept gained significant progress in the early 2000s when business software companies such as Oracle, SAP, and IBM began introducing integrated performance management solutions under the EPM label. The foundations of EPM were shaped by earlier work on performance measurement, particularly the Balanced Scorecard created by Robert Kaplan and David Norton in the 1990s. Their framework emphasised the need to align organisational activities with strategic objectives, a principle that EPM systems later adopted and expanded upon. Following is the definition of enterprise management:

David Axson (Author of *The Management Mythbuster*) defines EPM as " A set of integrated management processes that link strategy, planning, performance measurement, and execution with the aim of achieving superior business outcomes."

Tom Davenport (Author and Expert in Analytics) define EPM "Enterprise Performance Management involves the integration of strategy, budgeting, and forecasting into a single, coherent process that aligns people and resources to meet strategic goals."

4.2.1.1 Significance of Enterprise Performance Management

Enterprise Performance Management (EPM) plays a crucial role in helping organizations enhance their overall effectiveness and achieve their strategic goals. Here are some key reasons why EPM is important:

1. **Alignment of Strategy and Execution:** EPM ensures that all departments and teams are working toward the same organizational objectives. By aligning day-to-day operations

with strategic goals, companies can create a more cohesive and focused effort toward success.

2. **Data-Driven Decision Making:** EPM systems provide valuable insights through data analytics and performance metrics, enabling leaders to make informed decisions. This reliance on data helps organizations respond swiftly to changes in the market and adapt their strategies accordingly.
3. **Improved Financial Performance:** By integrating financial and operational data, EPM allows organizations to identify cost-saving opportunities, optimize resource allocation, and enhance profitability. Better financial management leads to improved bottom-line results.
4. **Enhanced Agility and Responsiveness:** In today's fast-paced business environment, the ability to quickly adapt to changes is vital. EPM enables organizations to adjust their plans and forecasts in real time, ensuring they can respond effectively to unexpected challenges and opportunities.
5. **Performance Measurement and Accountability:** EPM provides a framework for setting clear performance metrics and key performance indicators (KPIs). This fosters accountability within teams and allows for regular monitoring of progress against targets, facilitating continuous improvement.
6. **Long-Term Planning and Forecasting:** EPM supports strategic planning by providing insights that help organizations anticipate future trends and outcomes. This foresight aids in setting realistic goals and preparing for potential challenges.
7. **Collaboration and Communication:** EPM tools promote better collaboration across different departments by providing a shared view of performance metrics and objectives. Enhanced communication leads to more coordinated efforts and a stronger organizational culture.
8. **Risk Management:** EPM systems help organizations identify and assess potential risks by analyzing performance data and trends. This proactive approach to risk management allows companies to mitigate issues before they escalate.
9. **Regulatory Compliance:** EPM can assist organizations in meeting regulatory requirements by providing accurate and timely reporting. This ensures that businesses remain compliant with financial regulations and standards.

◆ Optimise performance

EPM is essential for organizations seeking to optimize performance, enhance decision-making, and achieve long-term success. Its comprehensive approach helps align strategy with execution, improve financial health, and build a culture of accountability and continuous improvement.



4.2.1.2 Application of EPM in Cost Accounting

Enterprise Performance Management (EPM) encompasses various processes and tools that enable organizations to manage and enhance their overall performance through the integration of financial and operational data. In contrast, Cost Accounting is primarily concerned with tracking, analyzing, and controlling costs related to production and service delivery. By integrating EPM into cost accounting, organizations can significantly improve decision-making, strategic planning, and performance optimization. Key applications of enterprise performance management in cost accounting.

a. Budgeting and Forecasting

EPM systems enable flexible budgeting processes that can adjust to evolving business conditions. By incorporating cost data into forecasts, these systems allow for more precise predictions of expenses and revenues. This capability aids organizations in allocating resources efficiently and establishing achievable financial objectives.

b. Cost Control and Management

EPM allows organisations to implement effective cost-control measures by enabling them to monitor actual costs in relation to their budgets. This comparison helps companies identify variances and take appropriate corrective actions. Additionally, EPM supports the implementation of Activity-Based Costing (ABC), which offers a more precise understanding of the costs linked to specific activities, products, or services. This combination of monitoring and detailed cost analysis enhances overall cost control and financial management and decision-making.

c. Performance Measurement

EPM systems facilitate the development of Key Performance Indicators (KPIs) that are closely aligned with cost metrics. These KPIs serve as essential tools for evaluating cost efficiency and profitability across various departments or product lines within the organization. By establishing clear performance metrics, companies can gain insights into their financial health and operational effectiveness. Regular performance reviews, enabled by EPM systems, allow organizations to assess their effectiveness in managing costs and meeting financial targets. These reviews provide an opportunity to identify areas for improvement, ensure accountability, and make informed decisions that drive better financial outcomes. Overall, the integration of KPIs into

the EPM framework enhances an organization's ability to monitor performance and achieve its financial objectives.

d. **Data Analytics and Reporting**

EPM improves the analytical capabilities of cost accounting by offering tools for in-depth data analysis. Its advanced reporting features enable the visualization of cost trends, making it easier for stakeholders to quickly grasp financial performance. Additionally, real-time reporting facilitates prompt decision-making based on the most current cost information.

e. **Strategic Decision-Making**

EPM provides cost accountants with critical insights that are essential for effective strategic planning. By analysing cost structures and profitability, organizations can make well-informed decisions regarding pricing, product development, and resource allocation. Furthermore, EPM facilitates scenario planning, enabling businesses to assess potential outcomes based on various cost strategies. This comprehensive approach empowers organisations to navigate complex financial landscapes and optimize their overall performance.

f. **Resource Optimisation**

EPM systems play a vital role in identifying underutilized resources and cost inefficiencies within an organization. By analyzing cost data in conjunction with operational metrics, companies can pinpoint areas for process optimization and waste reduction. This analytical approach not only enhances resource allocation but also significantly increases overall operational efficiency, enabling organizations to operate more effectively and profitably.

4.2.1.3 **Benefits of Integrating EPM into Cost Accounting**

- i. **Enhanced Accuracy:** Improved accuracy in cost reporting and forecasting due to real-time data integration.
- ii. **Better Decision-Making:** Informed decisions based on comprehensive performance insights and analytics.
- iii. **Increased Accountability:** Establishing clear performance metrics fosters accountability among departments and teams.
- iv. **Agility and Adaptability:** The ability to quickly adjust plans and budgets in response to changing market conditions.

4.2.1.4 Challenges in Implementing EPM in Cost Accounting

- i. **Data Integration:** One of the primary challenges is the seamless integration of data from various sources. Organizations often use multiple systems for financial and operational data, making it difficult to consolidate and analyze information effectively.
- ii. **Change Management:** Resistance to change among employees can hinder EPM implementation. Staff may be accustomed to existing processes and hesitant to adopt new systems or methodologies, which can disrupt operations.
- iii. **Training Needs:** Implementing EPM requires specific skills and knowledge. Organizations may face difficulties in training employees to effectively use EPM tools and interpret the data generated, leading to underutilization of the system's capabilities.
- iv. **Cost of Implementation:** The initial costs associated with EPM software, training, and ongoing maintenance can be significant. Smaller organizations, in particular, may struggle to allocate the necessary resources for a successful implementation.
- v. **Complexity of Systems:** EPM systems can be complex, and understanding how to navigate and leverage them effectively can be a steep learning curve for users. This complexity may lead to errors in data entry or analysis if not managed properly.
- vi. **Maintaining Data Quality:** Ensuring data accuracy and consistency is crucial for effective EPM. Poor data quality can lead to incorrect insights and decisions, undermining the purpose of implementing an EPM system.
- vii. **Aligning Organisational Culture:** For EPM to be successful, there must be a cultural shift within the organization toward data-driven decision-making. This alignment can be challenging, particularly in organizations with a long-standing emphasis on traditional decision-making processes.
- viii. **Performance Measurement Challenges:** Defining appropriate Key Performance Indicators (KPIs) that truly reflect cost efficiency and operational performance can be difficult. Organizations may struggle to establish meaningful metrics that align with their strategic objectives.
- ix. **Regulatory Compliance:** Navigating regulatory requirements can pose a challenge during EPM implementation,

particularly in industries with stringent financial reporting standards. Ensuring compliance while integrating new systems can complicate the process.

- x. **Scalability Issues:** As organizations grow and evolve, their EPM systems must also scale accordingly. Ensuring that the chosen EPM solution can adapt to changing needs and requirements is essential but can also be challenging.

Addressing these challenges requires careful planning, stakeholder engagement, and a commitment to fostering a data-driven culture within the organization. By overcoming these obstacles, businesses can successfully implement EPM in cost accounting and realize its full potential.

Summarised Overview

The application of Enterprise Performance Management in cost accounting significantly enhances an organization's ability to manage costs, make strategic decisions, and improve overall performance. By integrating EPM with cost accounting practices, businesses can achieve greater financial transparency, accountability, and operational efficiency. Understanding these applications will prepare postgraduate students to leverage EPM tools in their future careers effectively.

Self-Assessment Questions

1. What is Enterprise Performance Management (EPM), and how is it defined?
2. Why is EPM important in modern organizations?
3. What are the key components and processes involved in EPM?
4. How can EPM be applied in cost and management accounting?
5. Explain the role of EPM in enhancing decision-making in an organization.
6. What are challenges in implementing EPM in cost accounting?
7. What are benefits of Integratives EPM into cost accounting?

Assignments

1. Identify and describe the key components and processes involved in EPM. How do these components work together to achieve organizational goals?
2. Discuss how EPM can be applied in cost and management accounting practices. Provide examples of its implementation in these areas.
3. Explain the role of EPM in enhancing decision-making within an organisation. How can it support strategic planning and performance evaluation?

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SGOU

Unit 3

Strategic Concepts and Applications in Cost and Management Accounting

Learning Outcomes

After completing this unit, the learners will be able to:

- ◆ develop a foundational knowledge of key Cost Management Tools and Strategies.
- ◆ utilise Cost Accounting Strategies in Cost Accounting decision making
- ◆ use strategic management tools to analyze data, improve forecasting accuracy, and make informed, real-time adjustments

Background

Strategy refers to a comprehensive plan or series of actions aimed at achieving a particular objective over an extended period. In cost accounting, strategy focuses on methods for controlling and reducing costs through effective decision-making. It encompasses the broad approach or set of actions that an organization undertakes to accomplish its long-term goals and secure a competitive edge. This approach serves as a roadmap, guiding decisions across the organization to align with desired results. Effective strategy involves making thoughtful choices to leverage strengths, address weaknesses, seize opportunities, and minimize threats—a process often called SWOT analysis. In cost and management accounting, strategic concepts are crucial for supporting the organization's long-term objectives, gaining competitive advantage, and enhancing decision-making processes. In this unit we discuss a summary of key strategic concepts within cost and management accounting.

Keywords

Strategic concepts, cost management, cost accounting, cost accounting strategies, Management accounting

Discussion

4.3.1 Cost Accounting Strategies for Decision Making

Cost management teams transform cost accounting and other data into information's for decision that support strategies, improve products and services and the use of resources and that systematically reduce costs. An organizations strategy can be described its overall plan or policies to achieve its goals.to develop a strategy, managers answer two questions:1) Where do we want to go? 2) How do we want to get there? One cost management role is to provide financial reality to the answers to these questions and the development of a successful strategy by focusing the organisation on providing more value at lower costs. Concepts for better decision include the following.

- ◆ Business Intelligence
- ◆ Strategic map
- ◆ Driver caused budgeting
- ◆ Activity- Based costing
- ◆ Target costing
- ◆ Value chain analysis
- ◆ Balance score card
- ◆ Bench marking
- ◆ Lifecycle costing
- ◆ Strategic cost management
- ◆ Economic value added
- ◆ Kaizen costing
- ◆ Throughput accounting

- ◆ Provide Data for Decision Making

4.3.2 Business Intelligence

Business intelligence refers to the process of collecting, processing, analyzing, and visualising data to support decision-making. It often involves using tools and techniques to convert raw data into actionable information. The steps included in business intelligence are



1. Gathering data from multiple sources (e.g., ERP systems, sales records, accounting software) and integrating it (Data collecting and integration).
2. Storing collected data in a centralized repository, ensuring consistency and easy accessibility (Data Warehousing).
3. Using analytical tools to uncover patterns, trends, and insights (Data Analysing and reporting).
4. Presenting data through dashboards, charts, and graphs for easy interpretation (visualisation).

4.3.2.1 Application of Business Intelligence in Cost accounting

Business Intelligence (BI) tools play a critical role in managing costs by enabling the analysis of cost patterns over time. This allows managers to pinpoint areas where expenses can be reduced without sacrificing quality. Additionally, BI tools facilitate a deeper understanding of profitability across products, departments, and customer segments by integrating cost data with revenue information. Leveraging historical cost data, BI tools can also create predictive models that enhance forecasting accuracy and improve resource allocation. Furthermore, BI tools provide real-time tracking of cost-related data, allowing organizations to make quick, informed adjustments to strategies based on current financial conditions. The integration of business intelligence in cost accounting are as follows:

- ◆ **Enhanced Cost Analysis:** BI tools can analyze cost patterns over time, helping managers identify areas where expenses can be minimized without compromising quality.
- ◆ **Profitability Analysis:** BI can help in understanding the profitability of products, departments, and customer segments by combining cost data with revenue insights.
- ◆ **Forecasting and Budgeting:** BI can use historical cost data to build predictive models, aiding in accurate forecasting and resource allocation.
- ◆ **Real-Time Decision-Making:** BI tools enable real-time tracking of cost-related data, making it possible to adjust strategies swiftly based on current conditions.

4.3.2.2 Tools and Software for BI

Business Intelligence (BI) and Cost Accounting benefit significantly from specialized tools and software that streamline data management, analysis, and reporting. BI tools like Tableau, Power BI, and Qlik offer robust features for data visualization,

predictive analysis, and reporting, helping businesses transform raw data into actionable insights. In the realm of cost accounting, software such as SAP, Oracle, QuickBooks, and FreshBooks provides essential functions for tracking costs, analyzing expenses, and generating reports that support financial decision-making. Additionally, comprehensive ERP systems like Microsoft Dynamics and SAP ERP integrate both BI and cost accounting capabilities, allowing businesses to manage and analyze data seamlessly within a single platform. This integration enables organizations to make data-driven decisions more efficiently, as it centralizes key data and analysis functions.

◆ Visualised Tool Support Decision Making

4.3.3 Strategic Map

A **strategy map** is a visual tool used in business to outline the key goals and actions that lead to achieving an organization's strategic objectives. It aligns various departments and activities to ensure everyone is working towards common goals and provides a structured approach to reaching long-term success.

4.3.3.1 Creating a Strategy Map:

1. **Define Strategic Goals:** Start by defining high-level strategic goals for each perspective.
2. **Identify Key Objectives:** Break down each goal into specific, measurable objectives for each area.
3. **Create Cause-and-Effect Linkages:** Map out how each objective supports others across perspectives. For instance, better employee training (Learning & Growth) can improve operational efficiency (Internal Process), leading to higher customer satisfaction and, ultimately, increased revenue (Financial).
4. **Visualize the Strategy Map:** Use arrows or lines to show the connections and dependencies between objectives. This visual roadmap clarifies how achieving one objective contributes to others, keeping everyone aligned

4.3.3.2 Application of strategic map in Cost Accounting

Integrating a **strategy map** into **cost accounting** aligns financial practices with the broader strategic goals of an organization, allowing for a more targeted and impactful approach to cost management. By linking cost accounting activities to specific strategic objectives, an organization can ensure that resource allocation, budgeting, and performance measurement directly support its mission and vision.

1. Aligning Cost Objectives with Strategic Goals

Cost accounting often focuses on minimizing or optimizing costs. By using a strategic map, organizations can prioritize cost reductions that align with larger objectives, such as increasing product quality or improving customer satisfaction. For example, a strategic map might highlight "cost efficiency" as essential to achieving competitive pricing. This ensures cost-cutting doesn't compromise core values like customer satisfaction or innovation.

2. Connecting Financial and Non-Financial Metrics

Cost accounting traditionally emphasizes financial metrics. However, strategic maps allow integration of non-financial metrics (like customer satisfaction or employee training) into decision-making. A decision to invest in technology might increase short-term costs but improve internal processes. With a strategic map, decision-makers can see how this contributes to efficiency, indirectly impacting financial goals.

3. Optimizing Resource Allocation

Strategic maps make clear where to focus resources based on priority objectives. Cost accounting can then allocate resources to high-impact areas, reducing unnecessary spending in lower-priority areas. For example, if the strategic map emphasizes "customer experience," investments in customer service or quality control can be prioritized over areas that don't directly enhance this goal.

4. Enhancing Process Improvement and Cost Efficiency

Strategic maps identify key internal processes linked to the organization's strategy. Cost accountants can then focus on measuring and controlling costs within these processes, fostering improvements that support strategic goals. For instance, if "rapid product delivery" is part of the strategic map, cost accounting can focus on optimizing supply chain costs without compromising speed.

5. Facilitating Performance Measurement and Feedback Loops

A strategic map helps establish metrics that monitor progress towards objectives. Cost accounting then tracks and reports costs relative to strategic initiatives, facilitating informed deci-

sion-making. Continuous feedback from the strategic map can lead to adjusting cost structures, ensuring ongoing alignment with evolving strategies.

6. Enabling Strategic Investment Decisions

Strategic maps reveal long-term objectives that guide investment decisions. Cost accounting data, combined with the strategic map, can support choices about capital expenditures, R&D, and employee training aligned with future goals. For example, if innovation is a strategic goal, a strategic map helps justify R&D investments that might initially seem costly but align with long-term growth.

4.3.4 Driver caused budgeting

- ◆ Budgeting method where financial plans are linked to key business drivers

Driver-caused budgeting is a budgeting method that focuses on the main factors that directly influence costs, income, or overall financial performance. In both business and personal finance, these factors, known as "drivers," are the key variables that shape financial outcomes. By identifying and understanding these drivers, you can create a more precise and useful budget.

4.3.4.1 Steps involved in Driver Caused Budgeting

1. Identifying Key Drivers

Start by identifying the primary factors that influence your budget. For a company, these might include sales volume, production costs, labor hours, or customer demand. For personal finances, drivers might include income, recurring expenses, or debt payments.

2. Setting Benchmarks

Set specific benchmarks or performance indicators for each key driver. These benchmarks serve as reference points to compare actual outcomes with forecasts, allowing you to monitor progress accurately and make timely adjustments whenever necessary.

3. Linking Drivers to Budget Line Items

After identifying the key drivers, connect them to the relevant budget categories. For example, if you anticipate higher sales, it may require additional spending on inventory to meet demand or increased investment in marketing to support the growth. Based

on this, adjust your budget allocations to ensure the necessary resources are available to support these changes.

4. Scenario Planning

Driver-based budgeting is especially effective for scenario planning because it allows for quick adjustments when key factors, such as sales volume or material costs, fluctuate. When one of these critical drivers' changes, the budget can be rapidly updated to account for the new situation, ensuring that the financial plan remains relevant and responsive. This flexibility helps businesses stay adaptable to changing conditions, enabling them to make informed decisions and maintain control over their financial outlook.

5. Monitoring and Adjusting

Consistently track the key drivers that influence your budget to make adjustments when necessary. This ongoing monitoring helps ensure that the budget stays in sync with the current business environment, rather than relying on outdated projections or assumptions. By staying updated on changes in critical factors, you can make real-time adjustments that keep your financial plan accurate and reflective of actual performance.

Driver-caused budgeting offers several key benefits that make it a highly effective approach for managing finances. One of the primary advantages is flexibility. Since this method is focused on monitoring the key drivers that influence a business's financial performance, it allows for quick adjustments whenever these factors change. Whether it's a shift in sales volume, material costs, or labor expenses, driver-caused budgeting enables businesses to adapt their budget quickly in response to these fluctuations. Another major benefit is accuracy. By aligning the budget closely with the actual drivers of the business, forecasts are more likely to reflect real-world conditions, reducing the risk of over- or underestimating financial needs. Lastly, driver-caused budgeting enhances efficiency by streamlining the process of updating the budget. As changes in key drivers are detected, the budget can be modified promptly, saving time and effort compared to traditional methods that may require a complete overhaul. Together, these benefits make driver-based budgeting a powerful tool for businesses looking to stay adaptive and accurate in their financial planning.

4.3.4.2 Application of Driver caused budgeting in cost accounting

In cost accounting, driver-based budgeting plays a crucial role in decision-making by directly linking costs to the key factors or "drivers" that cause them. This approach helps managers understand the underlying reasons for cost fluctuations and make informed decisions that can lead to more accurate financial planning and efficient resource allocation. Below are several key applications of driver-based budgeting in cost accounting decision-making:

1. Cost Allocation and Cost Behavior Analysis

Driver-caused budgeting enables cost accountants to allocate costs more accurately by identifying and linking them to specific activities or resources. For example, in a manufacturing setting, direct labor costs can be tied to the number of hours worked or units produced, while overhead costs can be allocated based on machine usage or the amount of floor space occupied. This ensures that costs are distributed more fairly and accurately across products, departments, or cost centers, allowing for a clearer understanding of cost behavior. Understanding how costs change in response to key drivers helps businesses make decisions on pricing, cost control, and product mix.

2. Budget Adjustments Based on Activity Levels

Cost accounting often involves monitoring cost fluctuations based on activity levels (e.g., production volume, sales, or service delivery). Driver-caused budgeting helps businesses adjust their budgets in real time by identifying the drivers that influence these activities. For example, if a company faces an increase in demand, driver-caused budgeting allows for the adjustment of costs related to raw materials, labor, or production capacity. This dynamic approach ensures that the budget reflects actual operational changes rather than relying on static or outdated assumptions, helping to prevent cost overruns and inefficiencies.

3. Forecasting and Scenario Analysis

Driver-caused budgeting allows for more accurate forecasting by linking future cost projections to expected changes in key drivers. For instance, if a business anticipates higher fuel costs, it can adjust its transportation and logistics budget accordingly. In cost accounting, this helps businesses prepare for potential fluctuations in material prices, labor costs, or energy prices. By modeling different scenarios based on changes in key drivers,



cost accountants can help management evaluate the financial impact of various strategic decisions, such as entering new markets or increasing production capacity.

4. Cost Control and Efficiency Improvements

Driver-caused budgeting provides insights into areas where costs can be controlled or reduced by focusing on the factors that drive those costs. For example, if energy consumption is a major cost driver in a factory, cost accountants can identify opportunities to reduce energy costs through process improvements, equipment upgrades, or more efficient scheduling. This approach allows businesses to focus on high-impact drivers, ensuring that cost-cutting measures are targeted at areas with the most potential for savings, rather than applying blanket cuts that may hurt overall performance.

5. Product Costing and Profitability Analysis

In cost accounting, determining the true cost of a product is essential for pricing, profitability analysis, and decision-making. Driver-based budgeting helps allocate indirect costs (such as overhead) more accurately by linking them to the activities or resources that drive those costs. For instance, if a particular product requires more machine time or labor hours than others, driver-based budgeting ensures that the associated costs are appropriately assigned to that product. This improves the accuracy of product costings and helps in making decisions regarding pricing, product mix, and profitability analysis.

6. Strategic Decision-Making for Cost Optimization

Driver-caused budgeting also plays a critical role in long-term strategic decision-making. For example, when deciding whether to outsource a production process or keep it in-house, cost accountants can use driver-caused budgeting to assess the cost implications of each option. By analyzing the key drivers of production costs—such as labor, materials, and overhead—businesses can determine which option will be more cost-effective and efficient in the long run.

7. Break-even Analysis

In cost accounting, break-even analysis is a key tool for understanding the relationship between fixed and variable costs and determining the sales volume needed to cover costs. Driver-caused budgeting helps refine break-even analysis by linking

fixed and variable costs to specific operational drivers. For instance, if a company's fixed costs include rent and equipment depreciation, and variable costs are linked to production hours or raw material usage, driver-caused budgeting allows cost accountants to calculate more accurate break-even points by considering how changes in key drivers affect overall costs.

8. Improved Budget Flexibility in Response to Changes

Cost accounting often requires adjustments based on external factors like market conditions, government regulations, or economic shifts. With driver-based budgeting, cost accountants can quickly update budgets based on changes in the underlying drivers, making the budgeting process more responsive to external changes. This flexibility is particularly important when making decisions about expanding or reducing operations, launching new products, or adjusting marketing spend, as it allows businesses to align their cost structure with the latest market conditions.

In cost accounting decision-making, driver-based budgeting provides a more accurate, flexible, and data-driven approach to managing costs. By identifying and analyzing the key drivers of costs, businesses can make more informed decisions about resource allocation, cost control, pricing, and profitability. This approach enhances the ability of cost accountants and managers to adapt to changing conditions, optimize cost efficiency, and improve overall financial performance.

Summarised Overview

This unit outlines essential cost accounting strategies designed to enhance decision-making and align financial planning with an organization's strategic goals. By integrating methods like driver-caused budgeting, business intelligence, and strategic mapping, cost management teams can transform raw data into actionable insights, optimize resources, and systematically reduce costs. Each approach offers distinct benefits. Business intelligence (BI) gathers and processes data for decision-making, enabling organizations to track costs, analyze profitability, and improve forecasting accuracy. With tools like Tableau and Power BI, BI facilitates real-time data tracking and supports profitability and budgeting insights. The strategic map, a visual tool, aligns high-level organizational goals with actionable steps, guiding cost accountants in prioritizing spending to maximise impact and aligning financial and non-financial metrics for better performance. Driver-caused budgeting focuses on primary factors



driving costs and revenue, making it adaptable to real-time changes. It's particularly useful for cost control, accurate forecasting, scenario planning, and break-even analysis. In cost accounting, driver-caused budgeting helps managers allocate costs accurately, adjust budgets based on activity levels, and control expenses by focusing on high-impact drivers. Together, these tools enable organizations to improve financial accuracy, adjust strategies dynamically, and achieve long-term objectives, fostering an agile, efficient approach to managing costs and achieving sustainable growth.

Self-Assessment Questions

1. What do you mean by business intelligence?
2. What do you mean by strategy map?
3. Explain the key strategic concept in cost accounting which helps in decision making?
4. Explain the concept of business intelligence?
5. Briefly explain the application of strategic map in cost accounting?
6. Short note on driver caused budgeting?
7. Explain the steps in noticed in driver-caused budgeting.
8. Write a note on the application of driver-caused budgeting

Assignments

1. What is the key strategic concept in cost accounting that aids decision-making? Discuss its significance in organizational strategies.
2. Define the concept of business intelligence. Explain its role in enhancing decision-making and operational efficiency.
3. Briefly explain the application of a strategic map in cost accounting. How does it assist in aligning organizational goals with cost management?
4. Write a short note on driver-based budgeting. Discuss how it can be used to improve budgeting accuracy and resource allocation.

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

SGOU

Unit 4

Behavioural Cost Management

Learning Outcomes

After completing this unit, the learners will be able to:

- ◆ acquire knowledge on how decision-making, management techniques, and employee motivation affect cost behaviours.
- ◆ The learners will investigate how modern technologies (such as automation, artificial intelligence, and data analytics) may save expenses and increase production efficiency.
- ◆ To understand how to measure performance to industry leaders, learners will get a thorough understanding of benchmarking techniques, such as data analytics and predictive modeling.

Background

Today's fast-moving industries require companies to work smarter by combining behavioral insights, technology skills, and benchmarking methods. Behavioral Cost Management focuses on understanding how people's actions influence company spending and resource use. This approach goes beyond traditional cost control by using insights from behavioral economics to help companies reduce costs through better understanding of human behavior. Meanwhile, Industry 4.0 the era of advanced technologies like Internet of Things, AI, and automation has changed how production works. This shift means that employees need training in Tech-Production skills to operate new systems that improve productivity and reduce waste. Benchmarking allows companies to measure their performance against industry standards. Advanced benchmarking uses data analysis to spot areas needing improvement and helps companies align with best practices to support growth. Together, these three areas need behavioral insights, tech skills, and benchmarking offer a comprehensive approach to modern management, helping companies compete and succeed in today's challenging business environment.



Keywords

Behavioural Cost, Cost Accounting, Skill Development, Technological Production, Benchmarking

Discussion

4.4.1 Behavioral Cost Management

Traditional cost controls rely on predetermined standards and budgets. Behavioral Cost Management recognizes that employees' actions, often shaped by biases and social influences, can either support or disrupt these controls. For example, if employees feel overly restricted by tight budgets, they may unintentionally waste resources or work less efficiently. Behavioral insights can help managers design cost controls that are both effective and motivating. **Behavioral Cost Management** emerged as a response to the limitations of traditional cost accounting methods, which focused solely on numerical and quantitative aspects of cost control, without considering the human factors that influence decisions and behaviors within organizations. The evolution of this concept can be traced through key developments in cost accounting, psychology, and behavioral economics. In the early 20th century (pre--1960), cost accounting primarily focused on measuring, recording, and controlling costs to improve profitability. Methods like **standard costing**, **budgeting**, and **variance analysis** became the foundation of cost control practices. These techniques were largely based on the assumption that if cost drivers and production processes were well-defined, costs could be effectively controlled. However, this approach overlooked the psychological and social factors that could lead to inefficient cost behavior or resistance to cost-control measures. The emergence of behavioral economics in the 1960s, led by scholars like Herbert Simon, Daniel Kahneman, and Amos Tversky, began to challenge the assumption that humans always make rational decisions. Behavioral economics posited that people's decision-making is influenced by biases, emotions, and cognitive limitations. This shift in thinking highlighted those managers and employee may not always act in ways that are optimal for cost control, as traditional cost accounting assumed.

- ◆ Considering the Human Factors that Influence Decisions

Herbert Simon's concept of bounded rationality emphasized that people make decisions based on the limited information they have and are often influenced by factors beyond pure financial reasoning, such as emotions or social influences. This perspec-

tive laid the groundwork for the development of Behavioral Cost Management, which would consider these psychological and social aspects of decision-making.

By the 1970s and 1980s, scholars and practitioners began to recognize the importance of incorporating human behavior into cost management systems. **Behavioral Cost Management** emerged as a formal field of study, blending insights from **management accounting** and **behavioral economics**. Researchers began to examine how individuals and groups within organizations make cost-related decisions and how those decisions impact overall financial outcomes. Key studies during this period focused on the **psychological aspects** of budgeting and cost control. For instance, researchers explored how employees' **motivation, incentives, and attitudes toward cost-cutting** initiatives could affect organizational behavior. This era also saw the introduction of **participative budgeting** and **team-based cost management**, which acknowledged that involving employees in the decision-making process could lead to more effective cost control.

In the 1990s, the study of Behavioral Cost Management gained momentum, with a greater emphasis on understanding the interactions between individual behaviors and organizational cost management systems. Scholars began to explore how organizational culture, communication, and leadership styles influence cost management outcomes. This period also saw the growing influence of lean management and Total Quality Management (TQM), which emphasized employee involvement in reducing waste and improving efficiency—ideas that aligned well with behavioral cost management principles. Additionally, the Development of organizational psychology and human resource management brought new insights into the role of emotions and psychological factors in managing costs. It was recognized that fostering a culture of trust, recognition, and alignment between employees' goals and organizational goals could lead to better cost management practices.

In the 21st century, the concept of Behavioral Cost Management became more integrated into broader business management practices, especially with the rise of strategic management accounting and sustainability concerns. Companies began to look beyond cost-cutting to consider employee well-being, sustainable resource use, and long-term profitability. Technological advancements and data analytics also allowed for a more detailed understanding of human behavior and its impact on costs. Tools like predictive analytics, gamification, and behavioral incentives have been integrated into cost management systems, making it easier for organizations to create environments where employees are motivated to optimize costs while maintaining produc-



tivity and satisfaction. Behavioral Cost Management is now seen as a comprehensive approach that goes beyond traditional cost accounting. It incorporates human behavior, psychology, and organizational dynamics into cost management, ensuring that organizations not only manage costs effectively but also create positive environments that encourage continuous improvement and collaboration.

4.4.1.1 Behavioural Cost Management Key Milestone

◆ Visualised Tool Support Decision Making

- ◆ **1930s-1940s:** Traditional cost accounting methods (standard costing, variance analysis) dominated.
- ◆ **1960s-1970s:** Behavioral economics begins to shape thinking in management and cost accounting.
- ◆ **1980s:** Behavioral Cost Management begins to formalize, incorporating psychological and social aspects.
- ◆ **1990s-2000s:** The integration of lean management, TQM, and organizational psychology further refines Behavioral Cost Management principles.
- ◆ **Today:** Behavioral Cost Management is a key component of modern cost accounting, leveraging data analytics and organizational behavior insights to optimize costs in more holistic ways.

The history of Behavioral Cost Management reflects the growing recognition that human behavior is a crucial factor in cost management decisions. By integrating behavioral insights, organizations can develop more effective, sustainable cost management practices that align with both financial goals and employee motivations.

4.4.1.2 Behavioural Cost Management in Cost Accounting

In cost accounting, Behavioral Cost Management (BCM) incorporates behavioral science ideas to improve an organization's comprehension and control of expenses. It focuses on how cost structures, financial performance, and cost management procedures are affected by human behavior and decision-making. Applying BCM to cost analysis and management entails taking organizational, social, and psychological aspects into account.

1. Understanding Cost Behaviour in Decision-Making

BCM assists managers in comprehending how teams, departments, or employees view and respond to cost-related data. For example, depending on how cost control goals are conveyed, employees may react to them. Their actions will be in line with

those objectives if they believe that decreasing costs will help them obtain rewards or stay out of trouble. Risk-Taking and Over-Conservatism: Managers may underestimate expenses to reach budgetary goals (optimism bias) or exaggerate costs out of concern that they won't reach cost targets (over-conservatism).

2. Cost Control and Incentive Systems

Incentives are important for controlling cost behavior. Cost accountants can create incentive programs that encourage cost-cutting behaviors by using behavioral principles. Positive Reinforcement: If employees receive rewards for identifying and putting cost-cutting initiatives into place, they are more motivated to do so. Another example, Managing Negative Reinforcement: Employees may engage in undesired behaviors such as underreporting expenses or misreporting resource usage in settings where penalties are associated with cost overruns.

3. Forecasting and Budgeting

By taking into account how human behavior influences estimations, BCM can assist in enhancing the budgeting process: Anchoring Bias: When forecasting costs, managers may distort their estimates by relying too much on historical data, or anchoring another thing. Over-Optimism : Overly optimistic behavior can result in unrealistically high budgets that are difficult to reach, which might stress out or dissatisfy staff members. By accounting for human psychological variables, budgeting becomes more feasible and realistic when these inclinations are recognized.

4. Cost-Effectiveness of Communication and Training

The function of training and efficient communication in controlling cost behavior is a crucial component of BCM. Helping staff members to understand cost behavior and the significance of cost-cutting actions, cost accountants can enhance their decision-making and cost consciousness. Misunderstandings and opposition to cost-cutting measures can be decreased by having open and honest communication regarding cost targets, possible benefits, and penalties.

5. ABC (Activity-Based Costing) with Behavioral Understanding

Activity-Based Costing (ABC) divides expenses according to activities instead of goods. Applying BCM principles involves realizing how employee time and behavior affect cost behavior. Behavioral Drivers like Employee conduct can have an impact



on activity drivers, such as the quantity of client contacts or machine setups. By studying behavioral characteristics like multitasking or inefficiency, managers can better understand how much time or resources are spent on each activity.

6. Overcoming Slack in the Budget

When managers purposefully overestimate expenses or underestimate earnings to make sure their goals are easily attainable, this is known as budgetary slack. BCM methods can assist in recognizing and reducing these kinds of behaviors such as Establishing Realistic Goals by including staff in target-setting, behavioral strategies like holding participatory budgeting sessions or providing feedback can help cut down on slack and result in more attainable and realistic objectives. Cost accountants can improve accuracy by identifying cognitive biases such as anchoring or the optimism bias this help to monitor and correct biases.

Analysis of Cost Behaviour in Relation to Organisational Culture

The way that people and groups approach cost management is influenced by the company culture. For instance: Comparing Top-Down and Bottom-Up Methods: Employee resistance could result from a top-down strategy, while more buy-in and better cost control could come from a bottom-up one. Groupthink: Decisions or cost estimates may be influenced by group dynamics. Employees may follow a collective decision that ignores cost-saving options when groupthink is present.

7. Variance Analysis Behavioural Factors

In cost accounting, variance analysis aids in determining discrepancies between planned and actual expenses. By examining the following, BCM can explain some of the reasons for variations such as Behavioral Factors Behind Variance that emphasis a discrepancy between anticipated and actual costs may arise if an employee is not completely aware of the cost drivers or does not communicate in a timely manner. Finding these human elements that contribute to cost performance variations is the main goal of BCM.

8. Controlling the Distribution of Resources

Understanding how decisions about resource allocation are made at various levels is made easier with the aid of behavioral cost management. Due to biases like overconfidence in their capacity to control expenses or a miscalculation of the impact of particular decisions on the budget, managers may allocate resources inefficiently. Depending on the incentives or surrounding circumstances, decision-makers' perceptions of cost drivers and their attempts to mitigate them may have an impact on how resources are allocated.

9. Utilizing Psychological Tools

To gain a better understanding of employees' cost-related behavior, cost accountants may apply psychological methods. Employee perceptions of cost targets, incentive programs, and their personal participation in cost-cutting initiatives can all be evaluated through behavioral surveys and feedback. More efficient cost management techniques can be developed by taking into account the biases and heuristics humans employ while making decisions.

- ◆ Create systems that better reflect the realities of organizational behaviour by knowing how human behaviour, psychological factors, and incentives affect cost-related decisions.

In order to maximize decision-making, enhance cost control, and minimize inefficiencies, behavioral cost management incorporates behavioral science with conventional cost accounting procedures. Managers may create systems that better reflect the realities of organizational behavior by knowing how human behavior, psychological factors, and incentives affect cost-related decisions. This will ultimately result in more sustainable and successful cost management techniques.

4.4.2 Skill Development

Professionals who want to efficiently manage, evaluate, and control costs within a business must strengthen their cost accounting skills. Cost accountants need to develop a wide range of technical, analytical, and people skills since companies are requiring more complex cost management strategies in order to stay competitive. The following are some crucial areas for cost accounting skill development:

- i. **ERP Systems:** Understanding how to track expenses across many departments and functions using Enterprise Resource Planning (ERP) systems, such as SAP, Oracle, or Microsoft Dynamics.
- ii. **Accounting Software:** Knowledge of accounting software that aids in managing and reporting cost structures, such as Sage, QuickBooks, or more specialist cost accounting tools.
- iii. **Data Visualization Tools:** Proficiency in using Tableau, Power BI, and other data visualization tools to clearly and actionably display cost data and trends.

4. Problem-Solving and Critical Thinking

Critical thinking skills and a multifaceted approach to cost management issues are essential for cost accountants.

- i. **Analytical Problem-Solving:** The capacity to examine intricate cost-related issues and offer workable answers to cut down on waste or boost revenue.
- ii. **Making Decisions:** In order to balance immediate financial concerns with long-term strategic objectives, competent cost accountants must be able to make data-driven judgments.

5. Communication skills

Strong communication abilities are essential for cost accountants in order to convey financial information and suggestions to stakeholders who are not in the financial industry:

- i. **Report writing:** The capacity to create reports on cost performance, variations, and projections that are understandable and insightful.
- ii. **Presentation Skills:** The ability to clearly and concisely communicate cost-related information to board members, senior management, and other important stakeholders.
- iii. **interpersonal communication:** Working together with other departments (such as manufacturing, sales, and marketing) to comprehend their cost drivers and make sure cost accounting reports are relevant to their requirements is known as interpersonal communication.

6. Awareness of Compliance and Financial Regulations

The legislative framework governing cost management and financial reporting must be thoroughly understood by a cost accountant.

- i. **Compliance with rules:** Knowledge of International Financial Reporting Standards (IFRS), Generally Accepted Accounting Principles (GAAP), or industry-specific accounting rules that govern expense reporting.
- ii. **Taxation:** Recognizing how taxes effect cost structures and keeping up of tax laws that could influence cost accounting tactics.

7. Proficiency in Project Management

Projects involving cost analysis, budgeting, or efforts to optimize processes are frequently managed by cost accountants. Project management abilities are becoming more and more crucial:

- i. Time management is setting priorities and planning activities to complete them by the due date, particularly while overseeing several cost accounting jobs concurrently.
- ii. Leadership and Team Management: The capacity to guide multidisciplinary groups or work well with other departments to carry out cost-cutting projects.
- iii. Process Improvement: Finding inefficiencies in cost processes and proposing fixes by utilizing concepts like Lean or Six Sigma.

8. Psychological and Behavioral Perspectives

It is becoming more and more crucial to comprehend how human variables affect cost management. This comprises:

- i. **Motivation and Incentives:** Understanding how to create incentive programs that promote cost-cutting practices and match worker activities with company objectives.
- ii. Behavioral cost management Understanding how biases like overconfidence or budgetary slack can skew cost projections and management choices is known as behavioral cost management.
- iii. Negotiation Skills: The capacity to reach favourable financial results by negotiating cost terms with internal departments, clients, or suppliers.

9. Ongoing Professional Advancement

To remain updated in their area, cost accountants need to pursue further education:

- i. **Qualifications:** A cost accountant's credibility and employment opportunities might be improved by obtaining credentials such as Certified Public Accountant (CPA), Certified Management Accountant (CMA), or Chartered Accountant (CA).
- ii. **Industry Knowledge:** Using webinars, workshops, and professional networks to stay current on new technology, changing corporate strategies, and cost accounting trends.
- iii. **Soft Skills:** Gaining soft skills that are useful in negotiating the challenges of cost management in various corporate contexts, such as flexibility, emotional intelligence, and dispute resolution.

In summary, the effectiveness and financial stability of a business depend on the work of a cost accountant. To provide precise and useful financial insights, one must be proficient in areas like cost analysis, budgeting, financial reporting, and accounting software. Effective problem-solving and communication skills also guarantee that cost accountants can work with other departments to promote strategic decision-making. A cost accountant's capacity to make a significant contribution to the performance of the company is further enhanced by ongoing education and adaptation to changing financial laws and technological advancements. Cost accountants play a crucial role in preserving profitability and financial stability by fusing technical expertise with a keen understanding of company.

- ◆ Cost accountants play a crucial role in preserving profitability and financial stability by fusing technical expertise with a keen understanding of company.

4.4.3 Technological Production in Cost Accounting

The way production costs are managed has changed dramatically as a result of the use of technology into cost accounting. Cost accountants may now access more accurate, real-time information due to the developments in digital tools, software, and data analytics. This allows them to streamline production processes, cut down on inefficiencies, and make better financial decisions. In addition to enhancing conventional approaches, technological advancements in cost accounting are bringing in fresh strategies that improve precision, speed, and strategic in-



sights. The main technological advancements in cost accounting are examined in this essay, along with their applications in managing and controlling production costs.

1. Cost Accounting Automation

Automation is among the most important technological developments in cost accounting. Automated systems are gradually replacing traditional human accounting procedures including data entry and expense tracking. Data can be gathered, examined, and processed by automated methods without requiring human involvement. This involves keeping tabs on labor, raw material, overhead, and other production-related expenses. Real-time data updates from automated cost accounting systems minimize errors and guarantee that cost information is always correct. For instance, businesses can combine their financial data with other operational systems like supply chain, inventory management, and human resources by using ERP (Enterprise Resource Planning) systems like SAP, Oracle NetSuite, or Microsoft Dynamics 365. These systems offer automated features for cost calculation, inventory tracking, and production planning, enabling cost accountants to quickly access accurate cost data and streamline their workflow.

2. ABC -Activity-Based Costing

In cost accounting, activity-based costing, or ABC, is a technique that more precisely assigns overhead expenses to particular goods or services according to the activities that produce them. Overhead expenses were traditionally distributed using general averages, which may have resulted in errors. These days, cost accountants can utilize software tools to monitor and allocate costs to the particular tasks that drive production costs, like material handling, machine setup, and quality checks. To help accountants find places where manufacturing processes can be improved or where costs can be decreased, ABC software programs have been developed to automate the allocation of expenses. Programs like ABC/XL and **Cost Perform** offers features to implement ABC models, helping businesses improve cost visibility and profitability.

3. Technology-Based Cost-Volume-Profit (CVP) Analysis

A financial tool for examining the link between costs, volume, and profit is cost-volume-profit (CVP) analysis. This method assists companies in figuring out their breakeven point, analyzing the effects of pricing plans, and figuring out how profitable various production levels are. By offering increasingly complex

methods for modeling and visualizing cost and profit data, technological tools have improved CVP analysis. Cost accountants may see how changes in production volumes or costs will impact profits by using interactive CVP analysis dashboards, which can be included into software programs like Tableau, Microsoft Power BI, and Excel. Additionally, these tools facilitate scenario analysis, which helps companies assess various cost structures and instantly identify the most profitable course of action.

4. Systems for Cloud-Based Cost Accounting

The deployment and accessibility of cost accounting systems have been completely transformed by cloud computing. Compared to conventional on-premises accounting solutions, cloud-based platforms have a number of benefits. They make it possible to enter and analyze data in real time from any place, which is very helpful in production environments that are remote or multinational. Cost accountants are able to track expenses as they arise, work with other departments more effectively, and produce financial reports whenever needed. Numerous features offered by well-known cloud accounting programs, including Xero, Sage Business Cloud, and QuickBooks Online, enable businesses to monitor production expenses in real time. To give a comprehensive picture of expenses, these platforms also make it simple to integrate with other cloud-based software, including as payroll, inventory, and CRM programs.

5. Artificial Intelligence (AI) and Predictive Analytics

Cost accounting has been significantly impacted by AI and predictive analytics, especially in the field of manufacturing cost forecasting. Large volumes of historical data can be analyzed by AI systems to forecast future expenses, changes in demand, and supply chain interruptions. This capacity enables businesses to improve their resource allocation, reduce potential risks, and better plan for changes in production costs. Specifically, machine learning algorithms can be used to identify trends in production costs and suggest ways to reduce them. AI, for instance, can recommend ideal inventory levels or assist in locating inefficient production cycle activities. Large datasets can be processed by tools like Google Cloud AI and IBM Watson to provide actionable insights that enhance production cost management and decision-making.

6. Cost Monitoring and Data Visualization in Real Time

Real-time cost tracking and visualization are now possible, thanks to technological improvements, which empower businesses to make data-driven decisions immediately. Cost accountants can keep an eye on continuous production costs and spot inefficiencies as soon as they arise with the use of real-time cost tracking systems. Dashboards and reporting capabilities that display data in an understandable manner and offer instant insights into the state of production expenses are frequently included with these technologies. Cost accountants can use data visualization software, such as Tableau or Power BI, to present complex financial data in an understandable manner using heatmaps, graphs, and charts. As a result, they are more equipped to detect patterns in production costs, identify inefficiencies, and convey results to management teams. Businesses may quickly modify their manufacturing processes to maximize cost management using real-time analytics.

7. Systems for Integrated Financial Management

In contemporary cost accounting, integrated financial management systems are crucial instruments that link many facets of corporate operations. Cost accountants can access the most recent production cost data. This system facilitates the smooth transfer of financial data between departments. Better teamwork is also made possible by integrated systems, which let other departments participate in the gathering and analysis of cost data. Systems like SAP S/4HANA and Infor Cloud Suite are made to combine supply chain, procurement, and production modules with financial management. This enhances financial reporting, cost control, and forecasting by allowing cost accountants to monitor production costs within the framework of overall business operations.

Cost accounting procedures have been greatly improved by technological developments, especially when it comes to controlling production costs. The accuracy, speed, and efficiency of cost accounting have all increased in large part to automation, cloud-based systems, predictive analytics, and real-time data tracking. Cost accountants are better able to support strategic decision-making and guarantee optimal resource use because they can visualize costs, integrate data from several business areas, and forecast future financial scenarios. Cost accountants will play an increasingly important role in promoting profitability, operational effectiveness, and financial success for companies in a cutthroat industry as technology develops further.

4.4.4 Benchmarking

- ◆ Process of comparing an organization's performance, processes, or practices against industry bests

Comparing an organization's performance, procedures, and practices to those of industry leaders or standards is a methodical process known as benchmarking. Finding best practices, identifying areas for improvement, and improving performance are the goals. Businesses can create plans to enhance their own operations and get a competitive edge by analyzing how other organizations succeed in particular fields. Essentially, benchmarking aids businesses in adopting methods that encourage ongoing progress and evaluating their performance in a relative perspective. It can also include innovation, technological adoption, and operational procedures. Businesses can benchmark across sectors or within their own sector to obtain a variety of insights about best practices.

Although benchmarking has been around since antiquity, it wasn't until the late 20th century that it was formally recognized as a commercial strategy. In ancient times, individuals would compare the quality of goods and services, which is where the idea of benchmarking originated. against decide on quality and pricing, traders, artisans, and farmers would specifically compare their goods against those of others. The basis for upcoming company benchmarking procedures was established by this unofficial comparison. The demand for more standardized procedures and increased efficiency increased with the Industrial Revolution in the 18th and 19th centuries. Companies started setting certain production and quality benchmarks around this time, but benchmarking was still mostly an unofficial, ad hoc procedure. Although there were no established techniques for doing so, the necessity of using comparison to enhance operating procedures and productivity became more apparent as industry expanded. In the 1950s, the United States saw the emergence of the first formal benchmarking concepts. At first, the focus was on analyzing production processes in order to find and apply best practices. In order to enhance their own procedures, businesses started to examine how others were functioning and modified their plans accordingly. For the first time during this time, benchmarking evolved into a more structured procedure that went beyond straightforward comparisons. Because of Xerox Corporation's efforts, benchmarking as we know it today became more structured in the 1970s. Benchmarking was a crucial tactic used by Xerox to boost its company performance during this decade as it dealt with growing competition from foreign firms. The strategy used by Xerox entailed methodically contrasting its overall performance, customer service, and production procedures with those of rivals and industry leaders. With

this, "competitive benchmarking," in which businesses proactively aimed to meet or above the highest industry standards, was formally introduced.

In the 1980s, the technique spread throughout the world as many firms began using benchmarking to compare their performance to that of global leaders. During this time, "internal benchmarking," which compared performance within an organization (e.g., different divisions or branches), was also introduced. Benchmarking became a standard approach in business planning in the 1990s. The improvement of the benchmarking process was the subject of numerous books, seminars, and consulting firms. Frameworks, tools, and detailed methods for benchmarking were created to assist businesses in putting the idea into practice. The idea of "best practices" gained popularity, and benchmarking began to cover topics like customer happiness, innovation, and technology adoption in addition to performance comparisons. A key development in this era was the introduction of benchmarking standards, including the European Foundation for Quality Management (EFQM) framework and the Malcolm Baldrige National Quality Award in the United States, both of which promoted benchmarking as part of quality management systems. Benchmarking techniques kept changing as the 21st century's digital era took shape. More accurate and dynamic benchmarking became possible with the introduction of big data, cloud computing, and data analytics. Now that businesses had access to real-time data, it was simpler to continuously track and evaluate performance.

4.4.4.1 Benchmarking Techniques in Cost Accounting

Benchmarking is a powerful tool in cost accounting, allowing organizations to compare their performance and cost structures with those of other leading companies or industry standards. It enables businesses to identify best practices, optimize processes, and enhance cost efficiency. There are several techniques used in benchmarking within the field of cost accounting, each of which offers a different approach to analyzing costs and improving financial performance.

1. Competitive Benchmarking

Competitive benchmarking involves comparing a company's cost structure, performance, and practices with direct competitors in the same industry. The focus is on identifying the strengths and weaknesses in comparison to similar organizations to gain a competitive advantage. In cost accounting, this technique al-

lows businesses to assess their costs for raw materials, labor, overhead, and production efficiency against the best-performing competitors.

Application: A company might compare its unit cost of production to that of its main competitors. By identifying areas where competitors have lower production costs or higher productivity, the business can work on strategies to reduce its own cost base, improve efficiency, or innovate in its processes.

2. Process Benchmarking

Process benchmarking focuses on comparing specific business processes or activities against those of leading companies, regardless of the industry. In cost accounting, this technique involves evaluating processes such as procurement, production, distribution, and inventory management to identify areas for cost savings.

Application: For example, if a company wants to reduce the cost of its supply chain, it may benchmark its procurement process against industry leaders to identify cost-effective sourcing strategies, more efficient supplier negotiations, or improved logistics practices.

3. Performance Benchmarking

Performance benchmarking compares key financial and operational metrics, such as cost per unit, return on investment (ROI), or profit margins, with those of top performers in the industry. The goal is to understand how well an organization is performing financially and where improvements can be made to reduce costs and increase profitability.

Application: A cost accountant might compare metrics such as cost per unit of production, labor cost as a percentage of revenue, or overhead costs relative to total production. By comparing these performance indicators to industry averages or leaders, a company can assess whether its cost structure is competitive and identify areas to streamline operations.

4. Internal Benchmarking

Internal benchmarking involves comparing the cost and performance metrics within an organization across different departments, branches, or units. This technique is particularly useful for businesses with multiple locations or divisions. By comparing the cost structures within different parts of the organization, businesses can identify best practices and areas for improvement that can be replicated across the company.



Application: For instance, if a company has multiple production plants, internal benchmarking can be used to compare the cost efficiency of each plant. A particular plant might have a more cost-effective process or better resource utilization, and these practices can be adopted by other plants to drive overall cost reductions.

5. Strategic Benchmarking

Strategic benchmarking focuses on comparing the overall business strategies of top-performing companies. This technique examines high-level goals, practices, and approaches that lead to competitive advantage and superior financial performance. In cost accounting, strategic benchmarking involves analyzing how other companies have achieved cost leadership, pricing strategies, and cost control measures through their strategic decisions.

Application: A company may analyze the cost strategies of firms that have successfully managed cost leadership or differentiation. By identifying strategies related to cost control, automation, outsourcing, or vertical integration, companies can adapt similar tactics to strengthen their own position in the market.

6. Functional Benchmarking

Functional benchmarking compares specific functions or departments—such as finance, human resources, or IT—against similar functions in other organizations. In cost accounting, functional benchmarking helps companies evaluate how effectively specific business functions contribute to cost management and overall efficiency.

Application: A cost accountant may benchmark the finance department's cost tracking and reporting functions against best-in-class practices. This could involve comparing the processes for cost allocation, budgeting, or variance analysis to improve accuracy and reduce administrative overhead.

7. Best-in-Class Benchmarking

Best-in-class benchmarking involves comparing a company's practices and processes against the leading companies in any industry, regardless of the competitive field. This technique allows businesses to look beyond their industry and learn from organizations that excel in areas like cost reduction, operational efficiency, and innovation.

Application: A cost accountant might look to a company in a completely different industry that is renowned for its ability

to cut costs and optimize production processes. Insights from industries such as technology, automotive, or healthcare could inspire cost-saving measures that can be applied to manufacturing, retail, or other sectors.

8. Balanced Scorecard Benchmarking

A balanced scorecard approach combines financial metrics with non-financial performance measures, such as customer satisfaction, employee performance, and internal process efficiency. In cost accounting, this technique helps organizations evaluate their cost structures while also considering other factors that contribute to long-term profitability and sustainable cost management.

Application: Using a balanced scorecard, a business may benchmark cost accounting against key performance indicators (KPIs) like customer retention rates or operational excellence. This technique helps companies look beyond just financial costs and consider how customer satisfaction, employee engagement, and process improvements can contribute to lower overall costs.

9. Time-Series Benchmarking

Time-series benchmarking involves comparing the performance of an organization's cost structure over time with its past performance or industry trends. This technique allows businesses to track improvements or declines in cost efficiency and to identify seasonal or cyclical trends in costs that may require adjustments in strategy.

Application: A company might compare its production cost trends over the last five years to industry averages or the performance of top competitors. Time-series benchmarking allows cost accountants to assess whether the organization's costs are rising or falling over time and helps identify when corrective actions are needed.

Benchmarking in cost accounting is a crucial practice for organizations seeking to improve their cost structures, enhance efficiency, and maintain competitiveness. Each technique, from competitive benchmarking to time-series analysis, offers a unique perspective on how costs can be measured and optimized. By adopting a variety of benchmarking methods, companies can develop a more holistic approach to cost management, uncover new opportunities for improvement, and ensure they remain financially competitive in an ever-evolving market landscape.

Summarised Overview

Three fundamental ideas in cost accounting contribute to better cost control and more effective operations: such as Behavioral Cost Management examines how decisions and behaviors (such as management styles and employee motivation) impact expenses. Businesses may promote more efficient use of resources, improve the accuracy of cost projections, and cut waste by being aware of these issues. The goal of Skill Development in Tech-Productions to enhance workers' technical abilities, including data analysis and automation. These abilities lower production costs and boost productivity, which facilitates better cost tracking and management. Comparing a company's expenses and performance to those of other businesses in the same industry in order to identify areas for improvement is known as benchmarking. Businesses may stay competitive, set reasonable cost targets, and implement improved processes by doing this. When combined, these ideas are beneficial.

Self-Assessment Questions

1. What is behavioral cost management, and how does it impact decision-making?
2. How can organizations develop skills to implement effective cost management strategies?
3. What is the role of technology in enhancing production processes and cost management?
4. In what ways can benchmarking help a company maintain competitive advantage.
5. Write a note on the key milestones of behavioural cost management.
6. What are the areas in which accountants require competency?
7. Explain the different techniques of benchmarking
8. A note on the application of :
 - a. Competitions benchmarking
 - b. Process benchmarking
 - c. Interval benchmarking

Assignments

1. Define behavioural Cost Management. Explain its impact on decision-making within an organization.
2. How can organizations develop the skills necessary to implement effective cost management strategies? Provide examples of training or practices that support this development.
3. Discuss the role of technology in enhancing production processes. How can technology contribute to more efficient cost management practices?
4. Explain the concept of benchmarking. Analyze how benchmarking can help a company maintain a competitive advantage in the market.

Reference

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Suggested Reading

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2. Hansen, D. R., Mowen, M. M., & Heitger, D. L. (2021). *Cost management: Accounting and control* (9th ed.). Cengage Learning.
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5. Mason-Jones, R., & Towill, D. R. (2018). *The essentials of supply chain management: Strategic cost management* (3rd ed.). Pearson Education.

Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

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Advanced Cost and Management Accounting

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