M. Com. Semester IV (Session: 2018-2020)

Advance Cost Accounting (Paper Code: COMEC 2)

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Unit III - Marginal Costing

Marginal Costing – Basic Concepts

Structure of the Lesson:

The lesson is structured as follows:

Introduction

Definition

Features of Marginal Costing

Assumptions in Marginal Costing

Characteristics of Marginal Costing

Advantages of Marginal Costing

Limitations of Marginal Costing

Marginal Costing and Absorption Costing

Distinction between Absorption Costing and Marginal Costing

Differential Costing

Marginal Cost

Features of Marginal Cost

Marginal Cost Statement

Marginal Cost Equation

Contribution:

Profit / Volume Ratio

Angle of incidence:

Profit goal:

Operating leverage

Objectives of the Lesson:

On completion of this lesson, you should be able to define and explain the following concepts:

- Marginal Costing
- Absorption Costing or Full Cost Costing
- Differential Costing
- Marginal Cost
- Fixed Cost
- Variable Cost
- Contribution
- P / V ratio
- Margin of Safety
- Angle of Incidence

Introduction

By analyzing the behaviour of costs in relation to changes in volume of output it becomes evident that there are some items of costs which tend to vary directly with the volume of output, whereas there are others which tend to vary with volume of output, are called variable cost and those remain unaffected by change in volume of output are fixed cost or period costs.

Marginal costing is a study where the effect on profit of changes in the volume and type of output is analysed. It is not a method of cost ascertainment like job costing or contract costing. It is a technique of costing oriented towards managerial decision making and control.

Marginal costing, being a technique can be used in combination with other technique such as budgeting and standard costing. It is helpful in determining the profitability of products, departments, processes, and cost centres. While analyzing the profitability, marginal costing interprets the cost on the basis of nature of cost. The emphasis is on behaviour of costs and their impact on profitability.

Definition

Marginal costing is defined by the ICWA, India 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"*

Batty defined Marginal Costing as, *"a technique of cost accounting which pays special attention to the behaviour of costs with changes in the volume of output"*

Kohler‟s Dictionary for Accounting defines Marginal Costing *"as the ascertainment of marginal or variable costs to an activity department or products as compared with absorption costing or direct costing"*

The method of charging all the costs to production is called absorption costing.

Kohler‟s dictionary for Accountants defines it as *"the* process of allocating all or a portion of fixed and variable production costs to work – in – process, cost of sales and inventory". The net profits ascertained under this system will be different from that under marginal costing because of

- Difference in stock valuation
- Over and under – absorbed overheads

Direct costing is defined as *the process of assigning costs as they are incurred to products and services*

Features of Marginal Costing

The following are the special features of Marginal Costing:

- Marginal costing is a technique of working of costing which is used in conjunction with other methods of costing (Process or job)
- Fixed and variable costs are kept separate at every stage. Semi – Variable costs are also separated into fixed and variable.

- As fixed costs are period costs, they are excluded from product cost or cost of production or cost of sales. Only variable costs are considered as the cost of the product.
- As fixed cost is period cost, they are charged to profit and loss account during the period in which they incurred. They are not carried forward to the next year‟s income.
- Marginal income or marginal contribution is known as the income or profit.
- The difference between the contribution and fixed costs is the net profit or loss.
- Fixed costs remains constant irrespective of the level of activity.
- Sales price and variable cost per unit remains the same.
- Cost volume profit relationship is fully employed to reveal the state of profitability at various levels of activity.

Assumptions in Marginal Costing

The technique of marginal costing is based on the following assumptions:

1. All elements of costs can be divided into fixed and variable.
2. The selling price per unit remains unchanged at all levels of activity.
3. Variable cost per unit remains constant irrespective of level of output and fluctuates directly in proportion to changes in the volume of output.
4. Fixed costs remain unchanged or constant for the entire volume of production.
5. Volume of product is the only factor which influences the costs.

Characteristics of Marginal Costing

The essential characteristics and mechanism of marginal costing technique may be summed up as follows:

1. **Segregation of cost into fixed and variable elements:** In marginal costing, all costs are segregated into fixed and variable elements.
2. **Marginal cost as product cost:** Only marginal (variable) costs are charged to products.

3. **Fixed costs are period costs:**Fixed cost are treated as period costs and are charged to costing profit and loss account of the period in which they are incurred.

4. **Valuation of inventory:** The work – in – progress and finished stocks are valued at marginal cost only.

5. **Contribution is the difference between sales and marginal cost:** The relative profitability of the products or departments is based on a study of "contribution" made by each of the products or departments.

Advantages of Marginal Costing

Marginal costing is an important technique of managerial decision making. It is a tool for cost control and profit planning. The following are the advantages of marginal costing technique:

1. Simplicity

The statement propounded under marginal costing can be easily followed as it breaks up the cost as variable and fixed.

2. Stock Valuation

Stock valuation cab be easily done and understood as it includes only the variable cost.

3. Meaningful Reporting

Marginal costing serves as a good basis for reporting to management. The profits are analyzed from the point of view of sales rather than production.

4. Effect on Fixed Cost

The fixed costs are treated as period costs and are charged to Profit and Loss Account directly. Thus, they have practically no effect on decision making.

5. Profit Planning

The Cost – Volume Profit relationship is perfectly analysed to reveal efficiency of products, processes, and departments. Break – even Point and Margin of Safety are the two important concepts helpful in profit planning.

6. Cost Control and Cost Reduction

Marginal costing technique is helpful in preparation of flexible budgets as the costs are classified into fixed and variable. The emphasis is laid on variable cost for control. The constant focus is on cost and volume and their effect on profit pave the way for cost reduction.

7. Pricing Policy

Marginal costing is immensely helpful in determination of selling prices under different situations like recession, depression, introduction of new product, etc. Correct pricing can be developed under the marginal costs technique with the help of the cost information revealed therein.

8. Helpful to Management

Marginal costing is helpful to the management in exercising decisions regarding make or buy, exporting, key factor and numerous other aspects of business operations.

Limitations of Marginal Costing

Following are the limitations of marginal costing:

- **Classification of Cost**

Break up of cost into fixed and variable portion is a difficult problem. More over clear cost division of semi – variable or semi – fixed cost is complicated and cannot be accurate.

- **Not Suitable for External Reporting**

Since fixed cost is not included in total cost, full cost is not available to outsiders to judge the efficiency.

- **Lack of Long – term Perspective**

Marginal costing is most suitable for decision making in a short term. It assumes that costs are classified into fixed and variable. In the long term all the cost are variable. Therefore it ignores time element and is not suitable for long term decisions.

- **Under Valuation of Stock**

Under marginal costing only variable costs are considered and the output as well as stock are undervalued and profit is distorted. When there is loss of stock the insurance cover will not meet the total cost.

- **Automation**

In these days of automation and technical advancement, huge investments are made in heavy machinery which results in heavy amount of fixed costs. Ignoring fixed cost in this context for decision making is irrational.

- **Production Aspect is Ignored**

Marginal costing lays too much emphasis on selling function and as such production aspect has been considered to be less significant. But from the business point of view, both the functions are equally important.

- **Not Applicable in all Types of Business**

In contract type and job order type of businesses, full cost of the job or the contract is to be charged. Therefore it is difficult to apply marginal costing in all these types of businesses.

- **Misleading Picture**

Each product is shown at variable cost alone, thus giving a misleading picture about its cost.

- **Less Scope for Long – term Policy Decision**

Since cost, volume, and profits are interlinked in price determination, which can be changed constantly, development of long term pricing policy is not possible.

Marginal Costing and Absorption Costing

Absorption costing charges all the costs i.e., both the fixed and variable fixed to the products, jobs, processes, and operations. Marginal costing technique charges variable cost. Absorption is not any specific method of costing. It is common name for all the methods where the total cost is charged to the output.

Absorption Costing is defined by I.C.M.A, England as *"the practice of charging all costs, both fixed and variable to operations, processes, or products"*

From this definition it is inferred that absorption costing is full costing. The full cost includes prime cost, factory overheads, administration overheads, selling and distribution overheads.

Distinction between Absorption Costing and Marginal Costing

Absorption Costing	**Marginal Costing**
1. Total cost technique is the practice of charging all cost, both variable and fixed to operations, process or products. 2. It values stock at the cost which includes fixed cost also. 3. It is guided by profit which is the excess of sales over the total costs in solving managerial problems 4. In total cost technique, there is a problem of apportionment of fixed costs which may result in under or over recovery of expenses.	1. Marginal costing charges only variable cost to products, process, or operations and excludes fixed cost entirely. 2. It values stock at total variable cost only. This results in higher value of stock under absorption costing than in marginal costing. 3. It focuses its attention on Contribution which is excess of sales over variable cost. 4. It excludes fixed cost. Therefore, there is no question of arbitrary apportionment.

The difference between marginal costing and absorption costing is shown with the help of the following examples.

Illustration No: 1 **Cost of Production**

(10000 units)

	Per Unit (Rs. P)	**Total (Rs)**
Variable cost	**1.50**	**15000**
Fixed Cost	**0.25**	**2500**
	Total cost	**17500**

Sales 5000 units at Rs. 2.50 per unit Rs. 125000 Closing stock 5000 units at Rs. 1.75 Rs. 8750 Solution:

Under absorption costing, the profit will be calculated as follows:

	Rs.
Sales	12500
Closing stock	8750
	21250
Less: Total cost	17500
Profit	3750

Under marginal costing method, the profit will be calculated as follows:

	Rs.
Sales	12500
Less: Marginal	
Cost of 5000 units (5000 X 1.50)	7500
	5000
Less: Fixed cost	2500
Profit	2500

Closing stock will be valued at Rs.7500 only at marginal cost.

Illustration No: 2

The monthly cost figures for production in a manufacturing company are as under:

	Rs.
Variable cost	120000
Fixed cost	35000
Total cost	155000

Normal monthly sales is Rs. 200000/-. Actual sales figures for the three separate months are:

Ist Month	IInd Month	IIIrd Month
Rs. 200000	Rs. 165000	Rs. 235000

If marginal cost is not used, stocks would be valued as follows:

	Ist Month	IInd Month	IIIrd Month
Opening Stock	Rs. 108500	Rs. 108500	Rs. 135625
Closing Stock	Rs. 108500	Rs. 135625	Rs. 108500

Prepare two tabulations side by side to summarize these results for each of the three months basing one tabulation on marginal costing theory and the other tabulation along side on absorption cost theory.

Solution:

	Marginal Costing			Absorption Costing		
	Ist Month	IInd Month	IIIrd Month	Ist Month	IInd Month	IIIrd Month
Opening Stock (Rs)	84000	84000	105000	108500	108500	135625
Variable Cost (Rs)	120000	120000	120000	120000	120000	120000
Fixed Cost (Rs)	-	-	-	35000	35000	35000
Total (Rs)	204000	204000	225000	263500	263500	290625
Less: Closing Stock (Rs.)	84000	105000	84000	108500	135625	108500
Cost of Sales (A)	120000	99000	141000	155000	127875	182125
Sales (B)	200000	165000	235000	200000	165000	235000
Contribution (B – A) Less: Fixed Cost (Rs)	80000 35000	66000 35000	94000 35000	45000 -	37125 -	52875 -
Profit (Rs)	45000	31000	59000	45000	37125	52875

Note: Stocks at marginal cost is based on variable portion of the monthly total cost given as follows:

$$\text{Marginal cost in Rs.108500} = 108500 \times \frac{120000}{155000} = \text{Rs. } 84000$$

$$\text{Marginal costs in Rs. } 135625 = 135625 \times \frac{120000}{155000} = \text{Rs. } 105000$$

Differential Costing

The concept of differential cost is a relevant cost concept in those decision situations which involve alternative choices. It is the difference in the total costs of two alternatives. This helps in decision making. It can be determined by subtracting the cost of one alternative from the cost of another alternative. Differential costing is the change in the total cost which results from the adoption of an alternative course of action. The alternative may arise on account of sales, volume, price change in sales mix, etc decisions. Differential cost analysis leads to more correct decisions than more marginal costing analysis. In this technique the total costs are considered and not the cost per unit. Differential costs do not form part of the accounting system while marginal costing can be adapted to the routine accounting itself. However, when decisions involve huge amount of money differential cost analysis proves to be useful.

In the illustration given below, differential cost at levels of activity has been shown:

Alternative I	**Alternative II**	**Differential cost**
Activity level	80%	100%
Sales (Rs)	80000	100000 20000
Direct materials	40000	50000 10000

Direct labour	16000	20000	4000
Variable overheads	4000	5000	1000
Fixed overheads	3000	3000	-
Cost of sales	63000	78000	15000

Differential cost is generally confused with marginal cost. Of course, these two techniques are similar in some aspects but these also differ in certain other respects.

Similarities

(i) Both the differential cost analysis and marginal cost analysis are based on the classification of cost into fixed and variable. When fixed costs do not change, both differential and marginal costs are same.

(ii) Both are the techniques of cost analysis and presentation and are used by the management in formulating policies and decision making.

Dissimilarities

(i) Marginal cost may be incorporated in the accounting system where as differential cost are worked out for reporting to the management for taking certain decisions.

(ii) Entire fixed cost are excluded from costing where as some of the relevant fixed costs may be included in the differential cost analysis.

(iii)In marginal costing, contribution and p/v ratio are the main yardstick for evaluating performance and decision making. In differential cost analysis emphasis is made between differential cost and incremental or decremental revenue for making policy decisions.

(iv)Differential cost analysis may be used in absorption costing and marginal costing.

Marginal Cost

Marginal cost is the cost of producing one additional unit of output. It is the amount by which total cost increases when one extra unit is produced or the amount of cost which can be avoided by producing one unit less.

The ICMA, England defines marginal cost as, *"the amount of any given volume of output by which the aggregate cost are charged if the volume of output is increased or decreased by one unit".*

In practice, this is measured by the total cost attributable to one unit. In this context, a unit may be single article, a batch of articles, an order, a stage of production, a process etc., often managerial costs, variable costs are used to mean the same.

Features of Marginal Cost

- It is usually expressed in terms of one unit.
- It is charged to operation, processes, or products.
- It is the total of prime cost plus variable overheads of one unit.

Marginal Cost Statement

In marginal costing, a statement of marginal cost and contribution is prepared to ascertain contribution and profit. In this statement, contribution is separately calculated for each of the product or department.These contributions are totaled up to arrive at the total contribution. Fixed cost is deducted from the total contribution to arrive at the profit figure. No attempt is made to apportion fixed cost to various products or departments.

Marginal Cost Equation

For convenience the element of cost statement can be written in the form of an equation as given below:

Sales – Variable Cost = Fixed Cost plus or minus Profit or Loss.

Or

Sales – Variable Cost = Fixed Cost plus or minus Profit or Loss

In order to make profit, contribution must be more than fixed cost and to avoid loss, contribution should be equal to fixed cost.

The above equation can be illustrated in the form of a statement.

Marginal Cost Statement Rs.

Sales	**xxxxx**
Less: Variable Cost	**(xxxx)**
	---------- Contribution
xxxxx	
Less: Fixed Cost	**(xxxx)**
	---------- Profit / Loss
xxxx	

Illustration No.3:

A company is manufacturing three products X, Y and Z. It supplies you the following information:

	Products		
	X	**Y**	**Z**
	(Rs)	**(Rs)**	**(Rs)**
Direct Materials	**2500**	**10000**	**1000**
Direct Labour	**3000**	**3000**	**500**
Variable Overheads	**2000**	**5000**	**2500**
Sales	**10000**	**20000**	**5000**

Total fixed overheads Rs. 3000/-

Prepare a marginal cost statement and determine profit and loss.

Solution:

Marginal Cost Statement

Products

X	Y	Z	Total
	(Rs)	(Rs)	(Rs)	(Rs)
Sales (A)	10000	20000	5000	35000
Direct materials	2500	10000	1000	13500
Direct Labour	3000	3000	500	6500
Variable Overheads	2000	5000	2500	9500
Marginal Cost (B)	7500	18000	4000	29500
Marginal Contribution (A – B)	2500	2000	1000	5500
Less:FixedCost				3000
NetProfit				2500

Contribution:

Contribution is the difference between selling price and variable cost of one unit. The greater contribution from the selling unit indicates that the variable cost is less compared to selling price. Total contribution is the number of units multiplied by contribution per unit. Contribution will be equal to the total fixed costs at break even point where profit is zero.

Illustration No.4:

Calculate contribution and profit from the following details:

Sales Rs. 12000

Variable Cost Rs. 7000

Fixed Cost Rs. 4000

Solution:

Contribution = Sales – Variable cost

Contribution = Rs. 12000 – Rs. 7000 = **Rs. 5000**

Profit = Contribution – Fixed Cost

Profit = Rs. 5000 – Rs. 4000 = **Rs. 1000**

Profit / Volume Ratio

This is the ratio of contribution to sales. It is an important ratio analysing the relationship between sales and contribution. A high p/v ratio indicates high profitability and low p/v ratio indicates low profitability. This ratio helps in comparison of profitability of various products. Since high p/v ratio indicates high profits, the objective of every organisation should be to improve or increase the p/v ratio.

$$\text{P / V Ratio} = \text{Contribution / Sales} \times 100 \text{ or } C / S \times 100$$

(Or)

$$\frac{\text{Fixed Cost + Profit}}{\text{Sales}}$$

(Or)

$$\frac{\text{Sales – Variable Cost}}{\text{Sales}}$$

When profits and sales for two consecutive periods are given, the following formula can be applied:

$$\frac{\text{Change in Profit}}{\text{Change in Sales}}$$

P / V ratio is also used in making the following type of calculations:

a) Calculation of Break even point.

b) Calculation of profit at a given level of sales.

c) Calculation of the volume of sales required to earn a given profit.

d) Calculation of profit when margin of safety (discussed below) is given.

e) Calculation of the volume of sales required to maintain the present level of profit if selling price is reduced.

Margin of safety:

The excess of actual or budgeted sales over the break-even sales is known as the margin of safety.

Margin of safety = actual sales - break-even sales

So this shows the sales volume which gives profit. Larger the margin of safety greater is the profit.

$$\text{Margin of safety ratio} = \frac{\text{Budget sales - break-even sales}}{\text{Budget sales}}$$

(Or)

$$\frac{\text{Profit}}{\text{P/V Ratio}}$$

When margin of safety is not satisfactory, the following steps may be taken into account:

a) Increase the volume of sales.

b) Increase the selling price.

c) Reduce fixed cost.

d) Reduce variable cost.

e) Improve sales mix by increasing the sale of products with P/V ratio.

The effect of a price reduction will always reduce the P / V ratio, raise the break – even point shorten the margin of safety.

Angle of incidence:

This is obtained from the graphical representation of sales and cost. When sales and output in units are plotted against cost and revenue the angle formed between the total sales line and the total cost line at the break-even point is called the angle of incidence.

Large angle indicates a high rate of profit while a narrow angle would show a relatively low rate of profit.

Profit goal:

To earn a desired amount of profit i.e., a profit goal can be reached by the formula given below

$$\text{Sales volume to reach profit goal} = \frac{\text{Fixed cost + Desired profitability}}{\text{Contribution ratio}}$$

If the profit goal is stated in terms of profit after taxes

$$\text{Sales volume to reach profit goal} = \frac{\text{Fixed cost + \{(desired after-tax profit)/1-tax rate\}}}{\text{Contribution ratio}}$$

Operating leverage: An important concept in context of the CVP analysis is the operating leverage. This refers to the use of the fixed costs in the operation of a firm, and it accentuates fluctuations in the firm's operating profit due to change in sales. Thus the degree of operating leverage may be defined as the percentage change in operating profit (earning before interest and tax) on account of a change in sales.

$$\text{Degree of Leverage DOL} = \frac{\text{\% Change in operating profit}}{\text{\% Change in sales}}$$

(Or)

$$\text{Degree of Leverage DOL} = \frac{\text{Change in EBIT}}{\text{EBIT}} \div \frac{\text{Change in sales}}{\text{Sales}}$$

Test Yourself:

1. What is marginal costing? What are its main features?
2. Define marginal cost?
3. What is absorption costing?
4. State the differences between absorption costing and marginal costing.
5. State the limitations of marginal costing.
6. What is contribution? What are the uses of contribution to management?
7. What is margin of safety? How is it calculated?
8. What is angle of incidence? What does it indicate?
9. What are the advantages and disadvantages of marginal costing?

Problems

1. The selling price of a particular product is Rs.100 and the marginal cost is Rs.65. During the month of April, 800 units produced of which 500 were sold. There was no opening at the commencement of the month. Fixed costs amounted to Rs. 18000. Provide a statement using a) Marginal costing and b) Absorption costing, showing the closing stock valuation and the profit earned under each principle.
2. From the following information, calculate the amount of contribution and profit.

	Rs.
Sales	1000000
Variable cost	600000
Fixed cost	150000

3. Determine the amount of fixed cost from the following.

	Rs.
Sales	300000
Variable cost	200000
Profit	50000

4. Determine the amount of variable cost from the following.

	Rs.
Sales	500000
Fixed cost	100000
Profit	100000

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