

MARGINAL COSTING

The term marginal cost implies the additional cost involved in producing an extra unit of output, which can be calculated by total variable cost assigned to one unit.

From the Cost Accountant's view point: Marginal Costing is the Aggregate of all variable costs. The Marginal cost can be calculated as follows:

$$\begin{aligned} \text{Marginal Cost} &= \text{Direct Material} + \text{Direct Labour} + \text{Direct Expenses} + \\ &\quad \text{Variable Overheads} \\ \text{Or Prime Cost} &+ \text{Variable Overhead} \end{aligned}$$

As per CIMA,(London) : “Marginal costing is the ascertainment of marginal cost and the effect on profit due to changes in volume(or type) of output by differentiating fixed costs and variable cost.”

FEATURES OF MARGINAL COSTING

- (i) All costs are classified on the basis of variability into Variable Costs and Fixed Costs.
- (ii) Semi-variable costs find no place in Marginal Costing. Semi-variable costs should be segregated into Variable and Fixed costs and included in the respective groups.
- (iii) Marginal (i.e., variable) costs alone are considered in the determination of the cost of product or service.
- (iv) Fixed Costs are recovered from contribution earned during a period.
- (v) The finished goods and work-in-progress are valued on the basis of Marginal Cost (i.e., do not include fixed costs).
- (vi) Selling Price is based on *Marginal Cost* Plus a certain *Contribution* (based on policy of the organisation).
- (vii) Break-even analysis and Cost-Volume-Profit (CVP) analysis are integral parts of this technique.
- (viii) The relative profitability of products (or departments) is based on the contribution made by each of the products (or departments).
- (ix) Profit is calculated not in the usual manner. There are two stages in the determination of Profit.
Stage-1: Sales – Marginal Costs = Contribution
Stage-2: Contribution – Fixed Costs = Profit (or loss)
- (x) It is a technique for managerial decision making.

Advantages of Marginal Costing

The advantages of marginal costing are as follows:

- Easy to operate and simple to understand.
- Marginal costing is useful in profit planning; it is helpful to determine profitability at different level of production and sale.

- It is useful in decision making about fixation of selling price, export decision and make or buy decision.
- Break even analysis and P/V ratio are useful techniques of marginal costing.
- Evaluation of different departments is possible through marginal costing.
- By avoiding arbitrary allocation of fixed cost, it provides control over variable cost.
- Fixed overhead recovery rate is easy.
- Under marginal costing, valuation of inventory done at marginal cost. Therefore, it is not possible to carry forward illogical fixed overheads from one accounting period to the next period.
- Since fixed cost is not controllable in short period, it helps to concentrate in control over variable cost.

Disadvantages of Marginal Costing:

Despite its superiority over absorption costing, the marginal costing technique has its own limitations.

(a) Segregation of all costs into fixed and variable costs is very difficult. In practice, a major technical difficulty arises in drawing a sharp line of demarcation between fixed and variable costs. The distinction between them hold good only in the short run. In the long run, however, all costs are variable.

(b) In marginal costing, greater importance is attached to the sales function thereby relegating the production function largely to a secondary position. But, the real efficiency of a business is to be assessed only by considering the selling and production functions together.

(c) The elimination of fixed costs from the valuation of inventories is illogical since costs are also incurred in the manufacture of goods. Further, it results in the understatement of the value of stock, which is neither the cost nor the market price.

(d) Pricing decision cannot be based on contribution alone. Sometimes, the contribution will be unrealistic when increased production and sales are effected, either through extensive use of existing machinery or by replacing manual labour by machines. Another possibility is that there is danger of too many sales being affected at marginal cost, resulting in denial to the business of inadequate profits.

(e) Although the problem of over or under absorption of fixed overheads can be overcome to a certain extent, the same problems still persists with regard to variable overheads.

(f) The application of the technique is limited in the case of industries in which, according to the nature of business, large stocks have to be carried by way of work-in-progress (e.g. contracting firms).

Managerial Uses of Marginal Costing:

The following may be listed as specific managerial uses:

(a) Cost Ascertainment:

Marginal costing technique facilitates not only the recording of costs but their reporting also. The classification of costs into fixed and variable components makes the job of cost ascertainment easier. The main problem in this regard is only the segregation of the semi-variable cost into fixed and variable elements. However, this may be overcome by adopting any of the methods in this regard.

(b) Cost Control:

Marginal cost statements can be understood easily by the management than those presented under absorption costing. Bifurcation of costs into fixed and variable enables management to exercise control over production cost and thereby affect efficiency.

In fact, while variable costs are controllable at the lower levels of management, fixed costs can be controlled at the top level. Under this technique, management can study the behaviour of costs at varying conditions of output and sales and thereby exercise better control over costs.

(c) Decision-Making:

Modern management is faced with a number of decision-making problems every day. Profitability is the main criterion for selecting the best course of action. Marginal costing through 'contribution' assists management in solving problems.

Some of the decision-making problems that can be solved by marginal costing are:

- (a) Profit planning
- (b) Pricing of products
- (c) Make or buy decisions
- (d) Product mix etc.

SUMMARY OF FORMULA:

1. Sales – variable cost = Contribution
2. Contribution = Fixed Cost + Profit
3. Sales – variable cost = Fixed Cost + Profit
4. P/V ratio (C/S ratio) = Cont./ Sales

OR, Cont.p.u / Selling price p.u

OR, Change in Cont./Change in Sales

OR, Change in Profit / Change in Sales

Or, Profit/ Margin of Safety

5. Contribution = Sales x P/v ratio

6. Sales = Cont./P/V ratio

7. Variable Cost = sales x Complement of P/V ratio

OR, Sales x (1- P/V ratio)

OR, Sales x (100 – p/v Ratio %)

8. Profit = (Sales x P/v ratio) – Fixed Cost

OR, P/V ratio x Margin of Safety

9. Break-even point (in units) = Total Fixed Cost / Cont. p.u

10. Break-even point (in sale value) = Total Fixed cost / P/V ratio

11. Margin of Safety = Profit/ P/V ratio

OR, Actual Sales – Break- even sale (sale at break-even point)

PROFIT/VOLUME RATIO (P/V RATIO) [OR CONTRIBUTION-SALES RATIO (C/S RATIO)]

The Profit/Volume Ratio (P/V Ratio) expresses the relation of contribution to sales. This Ratio is also known as contribution to sales (C/S) Ratio.

Symbolically, P/V Ratio (or C/S Ratio) is expressed as follows:

$$P/V \text{ (or C/S) Ratio} = \frac{\text{Contribution}}{\text{Sales}} = \frac{C}{S}$$

For determining different requirements, different formulae are available:

(a) $P/V \text{ Ratio} = \frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} = \frac{S - V}{S}$

(b) $P/V \text{ Ratio} = \frac{\text{Fixed Cost} + \text{Profit (or loss)}}{\text{Sales}} = \frac{F + P \text{ (or } L)}{S}$

(c) $P/V \text{ Ratio} = \frac{\text{Change in Contribution}}{\text{Change in Sales}}$

(d) $P/V \text{ Ratio} = \frac{\text{Change in Profit (or Loss)}}{\text{Change in Sales}}$

P/V Ratio indicates relative profitability of different products, processes and departments so that framing of sales strategy is facilitated. In other words, P/V Ratio indicates the rate at which profit is being earned. A high P/V Ratio indicates high profitability and low P/V Ratio indicates low profitability.

Utility of P/V Ratio

- (i) P/V Ratio helps in determining Break-even Point; [Break-even point = $\frac{\text{Fixed Cost}}{\text{P/V Ratio}}$]
- (ii) It helps in calculating profit at any volume of sales;
[Volume of Sales \times P/V Ratio = Contribution; Profit = Contribution – Fixed Cost]
- (iii) It helps in calculating the needed sales volume required to earn a desired profit;
[Required Sales Volume = $\frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{P/V Ratio}}$]
- (iv) It helps in calculating profitability of products, processes and departments;
- (v) It helps in ascertaining profit when Margin of Safety is provided;
[Profit = Margin of Safety \times P/V Ratio]
- (vi) It helps in determining the required selling price per unit;
[Required Selling Price per unit = $\frac{\text{Variable Cost}}{(1 - \text{P/V Ratio})}$]

BREAK-EVEN ANALYSIS

Break-even Point (B.E.P.): The Break-even point refers to the volume of output at which total cost is exactly equal to total sales revenue. It is a point of neither profit nor loss. This is the critical point of production at which total cost is recovered and after this point, profits begin. Therefore, at Break-even Point, Contribution is equal to Fixed Cost.

Determination of Break-even Point:

- (a) Break-even Point (in units) = $\frac{\text{Fixed Cost}}{\text{Contribution per unit}}$
- (b) Break-even Point (in ₹) = $\frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

Shift of Break-even Point:

- (i) Break-even Point rises when variable cost per unit increases (provided fixed costs and selling price remain unchanged).
- (ii) Break-even Point falls when variable cost per unit decreases.
- (iii) Break-even Point rises when selling price per unit decreases.
- (iv) Break-even Point falls when selling price per unit increases.
- (v) Break-even Point rises with the rise in fixed cost.
- (vi) Break-even Point falls with the fall in fixed cost.

For determining different requirements different formulae are available:

- (i) Break-even Point (in ₹) = $\frac{\text{Fixed Cost} \times \text{Sales}}{\text{Fixed Cost} + \text{Profit}}$
- (ii) Break-even Point (in ₹) = $\frac{\text{Fixed Cost}}{1 - \frac{\text{Variable Cost}}{\text{Sales}}}$

COST-VOLUME-PROFIT (CVP) ANALYSIS

The study of the relationship between cost, volume and profit is known as Cost-Volume-Profit (CVP) Analysis. CVP is used as an important management accounting tool for profit planning. Cost-Volume-Profit Analysis is used for studying the effect on profit due to various factor changes such as:

- (i) Changes in Variable Costs; (ii) Changes in Fixed Costs; (iii) Changes in Selling Price; (iv) Changes in Volume.

Now, we shall consider the effect of various factor changes on: (a) Profit Volume (P/V) Ratio; (b) Break-even Point (B.E.P.); and (c) Margin of Safety (M/S).

| Changes in variable cost | Changes in fixed cost | Changes in selling price | Changes in volume |
|---|--|--|---|
| (a) Increase in variable costs (i) P/V Ratio decreases (ii) B.E.P. moves to a higher point (iii) M/S decreases | (a) Increase in fixed costs (i) P/V Ratio unchanged (ii) B.E.P. moves to a higher point (iii) M/S decreases | (a) Increase in selling price (i) P/V Ratio increases (ii) B.E.P. declines (iii) M/S increases | (a) Increase in volume (i) P/V Ratio unchanged (ii) B.E.P. unchanged (iii) M/S increases |
| (b) Decrease in variable costs (i) P/V Ratio increases (ii) B.E.P. declines (iii) M/S increases | (b) Decrease in fixed costs (i) P/V Ratio unchanged (ii) B.E.P. declines (iii) M/S increases | (b) Decrease in selling price (i) P/V Ratio decreases (ii) B.E.P. moves to a higher point (iii) M/S decreases | (b) Decrease in volume (i) P/V Ratio remains same (ii) B.E.P. remains same (iii) M/S decreases |

Objects of Cost-Volume-Profit (CVP) Analysis

- (i) CVP analysis is useful for profit planning, profit maximisation, cost reduction and cost control.
- (ii) It is useful in setting up Flexible Budgets which indicate costs and profits at various levels of activity.
- (iii) It assists in fixation of sales volume for a desired profit and to ascertain sales at Break-even Point.
- (iv) It assists in ascertaining profit for a desired volume of sales.
- (v) It helps in evaluating the effect of reduction (or increase) in selling price on profitability.
- (vi) It helps in determining comparative profitability of each product line and thereby helps in selecting the most profitable sales-mix.
- (vii) It helps in evaluating performance of an organisation for the purpose of control.

Limitations of Cost-Volume-Profit (CVP) Analysis

The main limitations of CVP Analysis are given below:

- (i) CVP Analysis fails if material prices, labour rates and selling prices change frequently.
- (ii) For a multi-product organisation, it is difficult to forecast with reasonable accuracy the volume of the sales-mix which would optimise the profit.
- (iii) CVP Analysis assumes that expected production facilities do not change. Therefore, CVP Analysis is affected by expansion of existing capacity.
- (iv) CVP Analysis assumes that efficiency of workers and other production facilities remain same as expected. CVP Analysis is affected by Cost Reduction programmes (such as: use of low cost substitute materials; replacement of manual labour by machines etc.).

Distinction between marginal costing and absorption costing

| <i>Marginal costing</i> | <i>Absorption costing</i> |
|--|--|
| (1) Treatment of fixed and variable costs Variable Costs are only charged to products, processes or operations. Fixed Costs are treated as period costs and are deducted from contribution earned to arrive at profit. | Both Variable and Fixed costs are charged to products, processes or operations. |
| (2) Under/over absorption of fixed overheads There is no under/over absorption of Fixed Overhead as it is excluded from product costs. | Fixed overheads are included in product costs. These are apportioned to various products, processes or operations. This leads to under/over absorption of overheads. |
| (3) Valuation of closing stocks: Closing Stocks are valued at Variable (or Marginal) Cost. Fixed Costs are not inventorised. | Closing Stocks are valued at total costs which include both Variable and Fixed Costs. Thus, Stock values in Absorption Costing are higher than that of Marginal Costing. |
| (4) Measurement of profitability Managerial decisions are guided by <i>relative contribution</i> made by products and/or departments. | Managerial Decisions are guided by <i>relative profit</i> made by products and/or departments. |

References:

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Book:

Cost and Management Accounting II by J. K Mitra.