MARGINAL COSTING AND BREAK EVEN ANALYSIS

A presentation by Aryan Singh, 14200121176, Department of Computer Science and Engineering

Introduction

Marginal costing is not a method of cost ascertainment like job costing or contract costing. Marginal costing is a technique of costing, which may be used with other methods of costing, viz., job process. For decision-making, it is more helpful to the management. The other names for marginal costing are direct costing, differential costing, incremental costing and comparative costing.

In marginal costing, only variable items of costs are taken into account. These variable costs will change in direct relation to the change in the volume of production or change in the production by one unit. As such, variable costs are called product costs and are charged to production. Fixed costs are not allocated to cost unit; and these are charged directly to profit and loss account during the period and are called as period costs or capacity costs.

Definition of Marginal Cost and Marginal Costing

Marginal cost means the same thing as variable cost. The term is not a new one. The accountants' concept for marginal cost differs from economists' concept of marginal cost. The accountant's view on marginal cost is, "Marginal cost is the additional cost of producing an additional unit of a product.

According to Chartered Institute of Management Accountants, London, the term "Marginal Cost" means 'the amount at any given volume of output by which aggregate costs are charged if the volume of outputs increased or decreased by one unit.'

On analyzing this definition we can conclude that the term, 'Marginal cost" refers to increase or decrease in the amount of cost on account of increase or decrease or production by a single unit. The unit may be a single article or a batch of similar articles.

A factory produces 500 fans per annum. The variable cost per fan is Rs.50. The fixed cost is Rs.10,000 per annum. Thus, the cost of producing 500 fans will be

:

Variable Cost [500 X 50] Rs.25,000 Fixed Cost[Constant]

Rs.10,000

Total cost for 500 fans Rs.35,000

If production is increased by one unit, i.e., it becomes 501 fans per annum, the cost will then appear as follows:

Variable Cost [501 X 50] Rs.25,050 Fixed Cost[Constant]

Rs.10,000 Total cost for 500 fans Rs.35,050

Therefore, the marginal cost per unit is, Rs.50 [Rs.35,050 – Rs.35,000]

Thus, the marginal cost is the total variable cost because within the capacity of the firm, an increase of one unit in production or decrease in one unit of production wills cause an increase or decrease in variable cost only.

An example for better understanding the concepts discussed previously

Marginal Cost and Costing

Marginal Cost = Total Variable Cost

= Direct Materials + Direct Labour + Direct [Variable] Expenses + Variable overheads

= Total Cost – Fixed Cost

Marginal costing is a technique where only the variable costs are considered while computing the cost of a product. The fixed costs are met against the total fund arising out of excess of selling price over the total variable cost. This fund is known 'Contribution' in marginal costing.

According to Chartered Institute of Management Accountants, London, the term "Marginal Costing is a technique where, ' only the variable costs are charged to cost units, the fixed cost attributed being written off in full against the contribution for that period".

Batty defines Marginal costing as, 'technique of cost accounting which pays special attention to the behaviour of costs with changes in the volume of output".

Marginal Costing also defined as, 'the ascertainment of marginal costs and of the effect of profit of changes in volume or type of output by differentiating between fixed costs and variable costs.

From the above definitions, we can understand that marginal costing involves two things:

[a] Ascertainment of marginal cost;

[b] Deriving of cost-volume-profit relationship by differentiating between fixed costs and variable costs.

Marginal cost is the additional cost of producing an additional unit of a product. Marginal cost is defined by I.C.M.A, London as 'the amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit. In practice, this is measured by the total variable costs attributable to one unit".

Salient features of Marginal Costing

1. Marginal costing is a technique of control or decision making.

2. Under marginal costing the total cost is classified as fixed and variable costs.

3. Fixed costs are ascertained separately and excluded from cost of products. The fixed costs are charged to Costing Profit and Loss account. The need for apportionment and absorption of overheads does not arise at all.

4. The stock of work-in-progress and finished goods stocks are valued at variable cost. Fixed costs will not be included in valuation of the stocks.

5. Contribution is ascertained by reducing the marginal cost or variable cost from the selling price.

6. The profitability of products, departments or processes is determined on the basis of contribution.

7. Profits are ascertained by reducing the fixed cost from the contribution of all the products or departments or processes or divisions, etc.

8. The profitability of various levels of activity is ascertained by calculating cost-volume-profit analysis.

Merits of Marginal Costing

1. Simplicity: The statement prepared under marginal costing can be easily followed as it breaks up the costs as variable and fixed.

2. Stock Valuation: Stock valuation can be easily done and understood as it includes only the variable costs.

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

4. Effect of Fixed Costs: The fixed costs are treated as period costs and are charged to P/L 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. Most advantageous volume and cost to maximize profits within the existing limitations can be planned.

6. Cost Control and Cost Reduction: Marginal costing technique is helpful in preparation of flexible budget as the costs are split into fixed and variable portions. The emphasis is laid on variable cost for control. The fixed costs are also controlled by ascertaining them separately for computing profit and for control. The constant focus on cost and volume, and their effect on profit pave 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 products, etc. correct pricing policy can be developed under the marginal costing technique with the help of the cost information, revealed therein.

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

Demerits of Marginal Costing

1. Difficult to analyze overhead: Separation of costs into fixed and variable is a difficult problem. In marginal costing, semi-variable or semi-fixed costs are not considered.

2. Time element is ignored: Fixed costs and variable costs are different in the short run; but in the long run, all costs are variable. In the long run all costs change at varying levels of operation. When new plants and equipments are introduced, fixed costs and variable costs will vary. Therefore, it ignores time element and is not suitable for long-term decisions.

3. Not suitable for external reporting: Since fixed cost is not included in total costs, full cost is not available to outsiders to judge the efficiency.

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

5. Automation: In these days of automation and technical advancement, huge investment are made in heavy machinery which results in heavy amount of fixed costs. Ignoring fixed costs, in this context for decision making is not rational.

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

Absorption Costing and Marginal Costing

Absorption costing is the practice of charging all costs, both fixed and variable to operations, process or products. In marginal costing, only variable costs are charged to productions.

The Institute of Cost and Management Accountants (U.K.) defines it as, “the practice of charging all costs, both variable and fixed to operations, processes or products”. This explains why this technique is also called full costing. Administrative, selling and distribution overheads as much form part of total cost as prime cost and factory burden.

Costs Volume Profit Analysis

As the term itself suggests, the cost-volume-profit (CVP) analysis is the analysis of three variables, viz., cost, volume and profit. In CVP analysis, an attempt is made to measure variations of costs and profit with volume. Profit as a variable is the reflection of a number of internal and external conditions which exert influence on sales revenue and costs.

The cost volume profit analysis helps or assists the management in profit planning. In order to increase the profit, a concern must increase the output. When the output is at maximum, within the installed capacity, it adds to the contribution.

In the words of Heiser, “The most significant single factor in profit planning of the average business is the relationship between the volume of business, costs and profit.” Thereby, cost volume profit analysis is the relationship among cost, volume and profit. When volume of output increases, unit cost of production decreases, and vice versa; because the fixed cost remains unaffected. When the output increases, the fixed cost per unit decreases. Therefore, profit will be more, when sales price remains constant. Generally, costs may not change in direct proportion to the volume. Thus, a small change in the volume will affect the profit.

Cost Volume Profit Analysis: Marginal Cost analysis, Break-Even Analysis, Profit volume ratio, Profit graph, Key factor, and Sales mix. etc.

Concepts of Cost–Volume–Profit Analysis

Fixed cost

It is the total of all those costs which are termed ‘period costs’ or ‘Time costs’. They do not depend on the volume of production and sales. They must be incurred irrespective of the actual activity or operations. Examples: Office rent, Factory rent, Manager’s salary, etc. i.e., fixed overheads.

The fixed costs do not normally change upto the full capacity of a firm. So unless otherwise mentioned, between ‘0’ and 100% of a firm’s capacity, fixed cost remain constant. Fixed costs are fixed in total but variable per unit.

Variable costs

These are the costs which increase or decrease in proportion to the output and sales. Variable costs are called ‘Product costs’ or ‘Marginal costs. Usually they vary in direct proportion to the output. They include all the direct costs, i.e., direct material, direct wages, direct expenses and variable overheads. The variable costs vary in total but they remain constant per unit Variable costs or marginal costs are the focal point in the application of marginal costing as a technique.

Contribution is the difference between sales and marginal cost. It is the contribution towards fixed costs and profit. In marginal costing technique contribution is a very important concept as it is used to find the profitability of products, processes, departments and divisions.
Practically all decision are based on and oriented towards contribution.
Contribution is different from the profit which is the net margin remaining after reducing fixed expenses from the total contribution. Contribution can be ascertained as given below:

Contribution = Selling price – Marginal cost

Contribution = Fixed expenses + Profit

Contribution – Fixed expenses = Profit

Break Even Analysis and Break even point

Break even analysis is a method of studying relationship between revenue and costs in relation to sales volume of a business enterprise and determination of volume of sales at which total costs are equal to revenue. According to Matz Curry an Frank “a break-even analysis determines at what level cost and revenue are in equilibrium”. Thus, break even analysis refers to a system of determination of that level of activity where total sales are just equal to total costs. This level of activity is generally termed as break-even point (B.E.P.). At the break even point a business man neither earns any profit nor incurs any loss. Break even point is also called “No profit, no loss point” or “Zero profit & zero loss point”.

Fixed Expense / Selling price per unit Marginal cost per unit

– or –

Fixed Cost / Contribution per unit

– or –

Break Even Sales value / Selling price per unit

Break even point (in rupees) (or)
Break even sales value
Break even sales value = Break even point in units x Selling price per unit.

Fixed Cost / P/V Ratio

Break even ratio: Break even ratio is the ratio between break-even sales and actual sales of a business concern. Break even ratio is ascertained by the following formula:

Break Even Sales / Actual Sales

Composite Break even point: This is the combined break even point or overall break even point of a concern calculated only when a business concern makes two or more products. The composite break-even point is calculated by the following formula: Total Fixed Cost / Composite P/V Ratio

(B.E.P in units / Total Capacity in units) *100

– or –

(B.E.P in rupees / Total Capacity in rupees) * 100

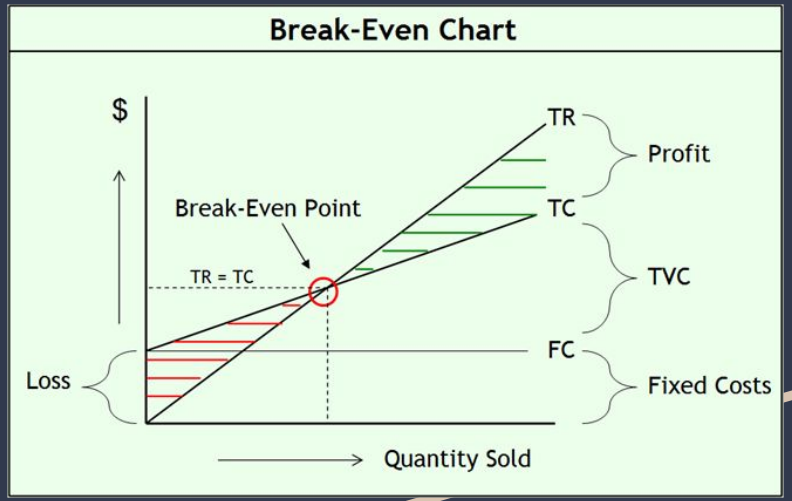
Margin of Safety

Break even analysis includes the concept of margin of safety. Margin of safety is the difference between actual sales and break even sales. Margin of safety is calculated in rupees, units or even in percentage form. Margin of safety indicates the value/volume of sales which directly contribute to profit, as fixed costs have already been recovered at break even point. Margin of safety is calculated by the following formula:
Margin of Safety = Actual sales – Break even sales

Angle of Incidence

In graphic presentation of marginal cost data, i.e., a break-even chart, the total cost line and sales line cross each other. The point of their crossing is termed 'Break-even point'. The angle at which the sales line crosses the total cost line is called the 'Angle of incidence'. 'The bigger is the angle, the more will be the contribution and profit with every additional sale. Firms with higher P/V ratio and comparatively less variable costs have a higher angle of incidence. Such firm can magnify their profits in high demand conditions. The angle of incidence at a glance can signify or reveal the ability of a firm to earn higher profits with every increase in sales.

Break Even Charts



The technique of break-even analysis can be made easy with the help of graph or mathematical formula. Graphical representation of break-even point is known as the break-even chart. Dr.Vance is of the opinion that “it is a graph showing the amount of fixed variable costs and the sales revenue at different volumes of operation. It shows at what volume the firm first covers all costs with revenue of break-even”. B.E.C. show the profitability or otherwise of an undertaking at various levels of activity, and indicates the point at which neither profit nor loss is made. Break-even point is known as “no profit, no loss point”. So the chart is also known as break-even chart. At this point, the total costs are recovered and profit begins.

Advantages

i) Total cost, variable cost and fixed cost can be determined.

ii) B.E. output or sales value can be determined.

iii) Cost, volume and profit relationship can be studied, and they are very useful to the managerial decision-making.

iv) Inter-firm comparison is possible.

v) It is useful for forecasting plans and profits.

vi) The best products mix can be selected.

vii) Total profits can be calculated.

viii) Profitability of different levels of activity, various products or profit, i.e., plant can be known.

ix) It is helpful for cost control.

P/V = [Changes in Profit / Changes in Sales] * 100= [Rs.5,000 / Rs.20,000] * 100 = 25 %

For 2020, MOS = Profit / P/V Ratio

[20000 / 25%] = 80,000 ; 2021, MOS = [25000 / 25%] = 100,000

MOS(Margin of Safety) = Actual Sales – Break even Sales

Break Even Sales = Actual Sales – MOS

2020 = [1,50,000 - 80,000] = 70,000

2021 = [1,70,000 – 1,00,000] = 70,000

BEP(sales) = Fixed Cost / P/V Ratio

Fixed Cost = BEP(sales) X P/V Ratio = 17,500.

Required Sales or Desired Sales = Fixed Cost + Desired Profit / P/V Ratio

= 17500 + 40,000 / 25% = 2,30,000

Required Sales or Desired Sales = Fixed Cost + Desired Profit / P/V Ratio = 2,50,000 = 17500 + Desired Profit / 25%

Desired Profit = [2,50,000 * 25%] - 17,500 = 62,500 – 17500 = 45,000

Break Even Sum. 2020 Sales: 1.5L for 20k and 2021 1.7L for 25k find PV ratio, BEP, and MOS

Limitations and Types of Break Even Charts

B.E.C. is constructed under some unrealistic assumptions.

i) Constant selling price is not true.

ii) Detailed information cannot be known from the chart. To know all the information about fixed cost, Variable cost and Selling price, a number of charts must be drawn.

iii) No importance is given to opening and closing stocks.

iv) Various product mix on profits cannot be studied as the study is concerned with only one sales mix or product mix.

v) If the business conditions change during a period, the B.E.C. becomes out of data as it assumes no change in business condition.

From the point of view of methods of preparation and purpose for which the chart is prepared, break even chart may be various types. Normally, following types are most commonly used.

i) Simple break-even chart

ii) Contribution break even chart

iii) Profit break even chart

iv) Profit chart for product-wise analysis

v) Cash break even chart

vi) Control break even chart

Thank You!

From Aryan Singh, 14200121176