




COST-VOLUME-PROFIT ANALYSIS

- ❖ **COST-VOLUME-PROFIT (CVP) ANALYSIS** IS USED TO DETERMINE HOW CHANGES IN COSTS AND VOLUME AFFECT A COMPANY'S OPERATING INCOME AND NET INCOME.
 - ❖ **COST-VOLUME-PROFIT (CVP) ANALYSIS** IS A MANAGERIAL ACCOUNTING TECHNIQUE WHICH STUDIES THE EFFECT OF SALES VOLUME AND PRODUCT COSTS ON OPERATING PROFIT OF A BUSINESS.
 - ❖ IT SHOWS HOW OPERATING PROFIT IS AFFECTED BY CHANGES IN VARIABLE COSTS, FIXED COSTS, SELLING PRICE PER UNIT AND THE SALES MIX OF TWO OR MORE PRODUCTS.
 - ❖ IT IS ALSO KNOWN AS **BREAK EVEN POINT ANALYSIS**.
 - ❖ IT IS A LOGICAL EXTENSION OF THE CONCEPT **MARGINAL COSTING**.
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ELEMENTS OF COST-VOLUME-PROFIT

- ❖ COST + VOLUME + PROFIT .
- ❖ COST INCLUDES FIXED COST AND VARIABLE COST.
- ❖ VOLUME INCLUDES PRODUCTION UNITS.
- ❖ PROFIT MEANS REVENUE MINUS COST.

RELATIONSHIP BETWEEN COST-VOLUME-PROFIT

- THERE IS NEGATIVE RELATIONSHIP BETWEEN VOLUME OF PRODUCTION AND COST OF PRODUCTION. I.E, WITH THE INCREASE IN VOLUME OF PRODUCTION THERE ARE CHANCES OF DECREASE IN COST OF PRODUCTION PER UNIT.
- THERE IS NEGATIVE RELATIONSHIP BETWEEN COST OF PRODUCTION AND AMOUNT OF PROFIT. I.E, WITH THE DECREASE IN COST OF PRODUCTION PER UNIT THERE ARE CHANCES OF INCREASE IN PROFIT.
- THERE IS POSITIVE RELATIONSHIP BETWEEN VOLUME OF PRODUCTION AND AMOUNT OF PROFIT I.E, WITH THE INCREASE IN VOLUME OF PRODUCTION THERE ARE CHANCES OF INCREASE IN PROFIT.

IMPORTANCE OF COST VOLUME PROFIT ANALYSIS.

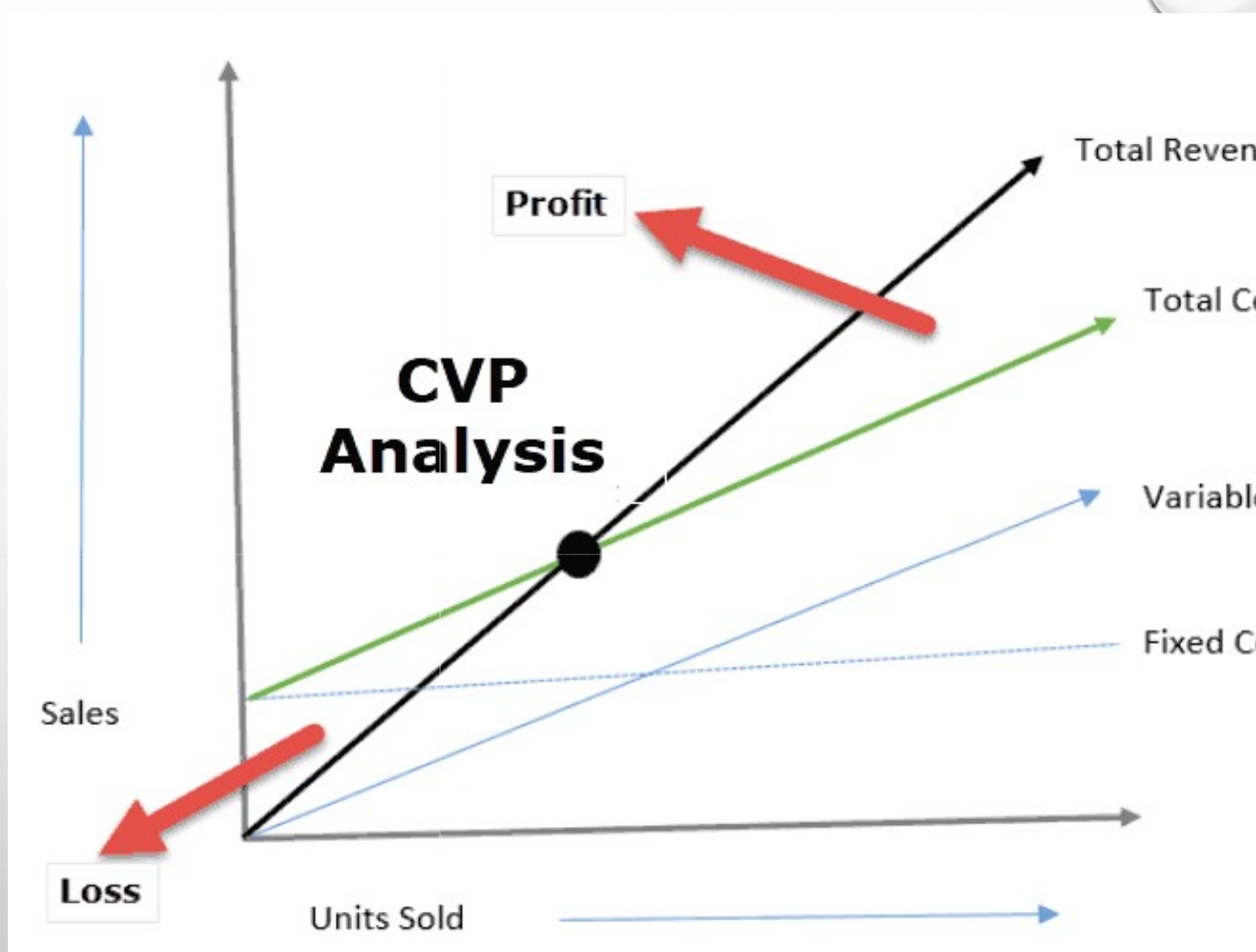
- SETTING UP FLEXIBLE BUDGET.
- DETERMINATION OF B.E.P.
- PROFIT PLANNING.
- HELPFUL IN PRICE FIXATION.
- ANALYSIS OF EFFECT OF CHANGES IN PRICES.

BREAK EVEN POINT ANALYSIS.

THE **BREAK-EVEN POINT** CAN BE DEFINED AS A POINT WHERE TOTAL COSTS (EXPENSES) AND TOTAL SALES (REVENUE) ARE EQUAL. BREAK-EVEN POINT CAN BE DESCRIBED AS A POINT WHERE THERE IS NO NET PROFIT OR LOSS. THE FIRM JUST “BREAKS EVEN.”

NO PROFIT – NO LOSS SITUATION.

TOTAL REVENUE = TOTAL EXPENSES



ASSUMPTIONS OF BREAK-EVEN ANALYSIS

The break-even analysis is based upon the following assumptions :

1. **Fixed and Variable Costs** : The basic assumption of Break-even analysis is that all elements of cost (*i.e.*, production, administration, selling and distribution) can be divided into two parts, *i.e.*, fixed cost and variable cost.
2. **Proportionate Variable Cost** : It is assumed that variable cost remains constant per unit at all levels of production. In other words, variable cost fluctuates directly in proportion to changes in volume of production.
3. **Certain and Constant Fixed Cost** : Fixed cost remains certain and constant at any level of activity from zero production to full capacity.
4. **Unchanged Selling Price** : Selling price per unit remains constant or unchanged at all levels of production, *i.e.*, there is no change in selling price despite increase or decrease in supply or demand of goods.
5. **Linear Behaviour** : Behaviour of different costs is linear, *i.e.*, a straight line will be drawn if cost data are represented on a graph paper.
6. **Technological Stability** : It is assumed that during the period, for which break-even analysis is being made, there will be no change in production system, efficiency of machines or technology of production.
7. **No Role of Stock** : Production and sales both are taken as equal. In other words, whatever will be produced, all will be sold and there will be no role of stock of finished goods.
8. **No Change in General Price Level** : It is assumed that during a specific period there will be no change in general price level, *i.e.*, cost of material, labour and other overheads.
9. **Unchanged Sales-mix** : There is only one product. If several products are being produced and sold, the sales-mix will remain constant.
10. **Relationship between Volume and Cost** : An important assumption of break-even analysis is that volume of production is the only factor which does effect the cost of production.

LIMITATIONS OF BREAK-EVEN ANALYSIS

Break-even analysis is based on various assumptions but these assumptions have certain limitations which are as follows :

(1) **Division in Fixed and Variable Costs** : It may be difficult to divide all costs into fixed and variable costs. Moreover, in many cases cost may not remain either absolutely fixed or absolutely variable in relation to the volume of output.

(2) **Static Concept** : The break-even analysis assumes a static situation that cannot exist during long periods of time. For example, it assumes no changes in general price level, selling price, production technology, efficiency of machines, etc., but in practice there is constant change in these factors as management wants to improve production system and increase efficiency.

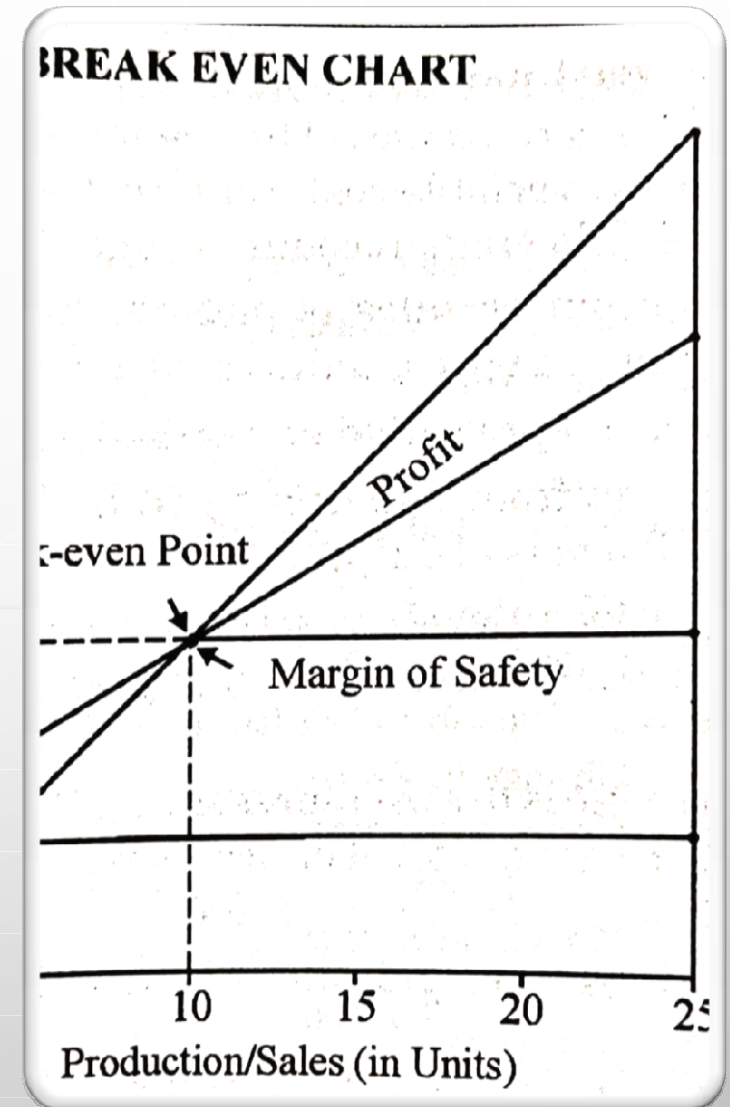
(3) **Limitation of Linear Behaviour of Costs** : It is assumed that fixed costs are constant at all levels and variable costs vary in direct proportion to output. However, such linear behaviour of costs is valid only within a limited range of operations and in many cases cost curve may not be exactly a straight line.

(4) **Difference in Production and Sales** : It is not necessary that production and sales will be equal. The fact is that in practice certain level of stock is necessary.

(5) **Change in Sales-mix** : The quantum of production and product-mix may be kept constant but the quantum of sales and the sales-mix may not be as anticipated.

MARGIN OF SAFETY

MARGIN OF SAFETY (MOS) IS A DIFFERENCE BETWEEN ACTUAL/BUDGETED SALES AND LEVEL OF BREAK-EVEN SALES.



The background is a light gray gradient with a subtle grid. In the top-left and bottom-right corners, there are clusters of realistic water droplets of various sizes. Faint, thin white circles are scattered across the upper half of the page.

THANK YOU.....

IMPORTANT FORMULAE

Contribution

$$\begin{aligned} \text{Contribution or } C &= S - V \\ &= \text{Fixed Cost} + \text{Profit (- Loss)} \\ &= \text{Sales} \times \text{P/V Ratio} \\ C_{pu} &= S_{pu} - V_{pu} \end{aligned}$$

P/V Ratio

$$\text{P/V Ratio} = \frac{S - V}{S} \times 100 \text{ or } \frac{C}{S} \times 100$$

$$\text{P/V Ratio} = \frac{\text{FC} + \text{Profit}}{\text{Sales}} \times 100$$

$$\text{P/V Ratio} = 1 - \text{Variable Cost Ratio}$$

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

$$\text{P/V Ratio} = \frac{\text{Profit}}{\text{Margin of Safety}} \times 100$$

$$\text{P/V Ratio} = \frac{\text{Fixed Cost}}{\text{B.E.P. (₹)}} \times 100$$

B.E.P.

$$\text{B.E.P. (₹)} = \frac{\text{FC} \times S}{C}$$

$$\text{B.E.P. (₹)} = \frac{\text{FC}}{\text{P/V Ratio}}$$

$$\text{B.E.P. (₹)} = \text{Sales (₹)} - \text{M.O.S. (₹)}$$

$$\text{B.E.P. (units)} = \frac{\text{FC}}{C \text{ per unit}}$$

$$\text{B.E.P. (units)} = \frac{\text{B.E.P. (₹)}}{S_{pu}}$$

$$\text{B.E.P. (units)} = \text{Sales (units)} - \text{M.O.S. (units)}$$

Margin of Safety

$$\text{M.O.S. (₹)} = \text{Sales (₹)} - \text{B.E.P. (₹)}$$

$$\text{M.O.S. (₹)} = \frac{\text{Profit}}{\text{P/V Ratio}}$$

$$\text{M.O.S. (units)} = \text{Sales (units)} - \text{B.E.P. (units)}$$

$$\text{M.O.S. (units)} = \frac{\text{Profit}}{C \text{ per unit}}$$

$$\% \text{ of M.O.S.} = \frac{\text{M.O.S.}}{\text{Sales}} \times 100$$

Sales for Desired Profit

$$\text{Sales (₹)} = \frac{\text{FC} + \text{Profit}}{C} \times S$$

$$\text{Sales (₹)} = \frac{\text{FC} + \text{Profit}}{\text{P/V Ratio}}$$

$$\text{Sales (units)} = \frac{\text{FC} + \text{Profit}}{C_{pu}}$$

$$\text{Sales (₹)} = \frac{\text{FC} \times S_{pu}}{C_{pu} - \text{Profit per unit}}$$

$$\text{Sales (units)} = \frac{\text{FC}}{C_{pu} - \text{Profit per unit}}$$

(6) Profit on Sales

(i) Profit = Sales - (FC + VC)

(ii) Profit = Sales × P/V Ratio - FC

(iii) Profit = Sales in units × C_{pu} - FC

(iv) Profit = M.O.S. × P/V Ratio

(7) Fixed Cost

(i) FC = Sales - (VC + Profit)

(ii) FC = Sales × P/V Ratio - Profit

(8) Variable or Marginal Cost

$$\text{VC} = \text{Sales} \times (1 - \text{P/V Ratio})$$

(9) Capacity B.E.P.

$$= \frac{\text{B.E.P.}}{\text{Capacity}} \times 100$$

(10) B.E. Ratio

$$= \frac{\text{B.E.P.}}{\text{Actual Sales}} \times 100$$