BREAKEVEN ANALYSIS

The study of cost-volume-profit relationship is often referred as BEA. BEP is defined as a no profit or no loss point. BEP is the point at which total revenue is equal to total cost.

Assumptions:

1. All costs are classified into two – fixed and variable.
2. Fixed costs remain constant at all levels of output.
3. Variable costs vary proportionally with the volume of output.
4. Selling price per unit remains constant in spite of competition or change in the volume of production.
5. There will be no change in operating efficiency.
6. There will be no change in the general price level.
7. Volume of production is the only factor affecting the cost.
8. Volume of sales and volume of production are equal. Hence there is no unsold stock.
9. There is only one product or in the case of multiple products. Sales mix remains constant.

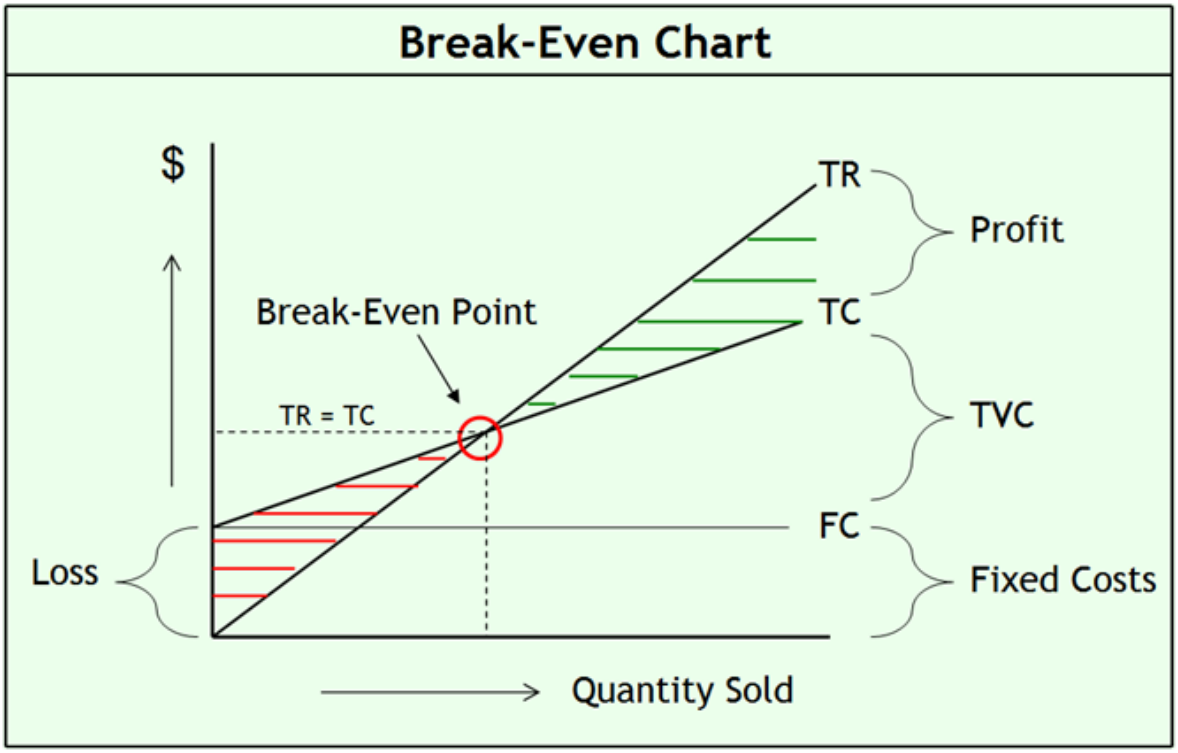
Merits:

1. Information provided by the Break Even Chart can be understood more easily.
2. To ascertain the profit on a particular level of sales volume or a given capacity of production.
3. To calculate sales required to earn a particular desired level of profit.
4. To compare the efficiency of the different forms.
5. To decide to make or buy a given component or spare part.
6. To assess the impact of changes in fixed cost, variable cost or selling price on BEP and profits during a given period.

Demerits:

1. Break-even point is based on fixed cost, variable cost and total revenue. A change in one variable is going to affect the BEP.
2. All costs cannot be classified into fixed and variable costs. We have semi variable costs also.
3. In case of multi product firm, a single chart cannot be of any use. Series of charts have to be drawn.
4. It is based on fixed cost concept and hence holds good only in the short run.
5. Where the business conditions are volatile, BEP cannot give stable results.
6. It assumes production is equal to sale. It is not always true because generally there may be opening stock and closing stock
7. When production increases variable cost per unit may not remain constant but may reduce on account of bulk buying etc.

Graphical representation of BEP:



Key terms used in Break Even Analysis:

1. ***Fixed cost:***.
2. ***Variable Cost:***
3. ***Contribution:*** It is the difference between sales and variable cost or it is the sum of fixed cost and profit.

   Contribution = Sales – Variable cost (S-V.C)

   Contribution = Fixed Cost + Profit. (F+P)
4. ***Margin of safety:*** Margin of safety is the excess of actual sales over the break even sales. It can be expressed in absolute sales amount or in percentage.
5. ***Angle of incidence:*** This is the angle between sales line and total cost line at the Break-even point. It indicates the profit earning capacity of the concern. Large angle of incidence indicates a high rate of profit; a small angle indicates a low rate of earnings.
6. ***Profit Volume Ratio*** is usually called P. V. ratio. The ratio of contribution to sales is the P/V ratio. It may be expressed in percentage.
7. ***Break – Even- Point:***BEP is the point at which total revenue is equal to total cost or no profit no loss zone.

DETERMINATION OF BREAK – EVEN POINT

Selling price(**S**ales) = **F**ixed **C**ost + **V**ariable **C**ost + **P**rofit/**L**oss

S = V.C + F.C + p

S-V.C = F.C + P

Contribution (C):

C = **S-V.C** or **F.C + P** or **F.C – L** or **Sales * p/v Ratio** or

Fixed Cost: BEP sales * p/v Ratio

Profit Volume (P/V) Ratio:

$$\frac{\text{Contribution}}{\text{Sales}} \text{ X } 100; \frac{\text{S - V.C}}{\text{Sales}} \text{ X } 100; \frac{\text{F.C + P}}{\text{Sales}} \text{ X } 100; \frac{\text{Change in profits}}{\text{Change in sales}} \text{ X } 100$$

Break Even Point:

1. Break Even point (Units) = $\frac{\text{Fixed Expenses}}{\text{Contribution per unit}}$
2. Break Even point (In Rupees) = $\frac{\text{Fixed expenses}}{\text{Contribution}}$ X sales

Sales required earn given (desired) profit:

1. Sales (Units) = $\frac{\text{Fixed Expenses} + \text{desired profit}}{\text{Contribution per unit}}$
2. Sales (In Rupees) = $\frac{\text{Fixed expenses} + \text{desired profit}}{\text{Contribution}}$ X sales

Margin of Safety:

$$\text{Actual Sales} - \text{BEP Sales} \textbf{ or } \frac{\text{Profit}}{\text{P/V Ratio}}$$

QUESTIONS

1. The PV ratio of matrix books Ltd Rs. 40% and the margin of safety is 30%. You are required to work out the BEP and Net Profit if the sales volume is Rs. 14000.

2. A Company reported the following results for two period

Period	Sales	Profit
I	Rs. 20,00,000	Rs. 2,00,000
II	Rs. 25,00,000	Rs. 3,00,000

Ascertain the BEP, PV ratio, fixes cost and Margin of Safety.

3. The information about Raj & Co are given below:
PV ratio : 20%
Fixed Cost : Rs. 36,000/-
Selling Price Per Unit. Rs. 150/-
Calculate: (i) BEP in rupees (ii) BEP in Units(iii) Variable cost &Contribution per unit.

4. Sales of a Co. 10000 units,selling price Rs. 20/- per unit, Variable cost is Rs. 10/- per unit and fixed cost Rs. 80000. Find out BEP in Units and sales revenue.Find out the profit. What should be the sales for earning a profit of Rs. 60000/-

5. Sales of Rs 1,10,000 producing a profit of Rs. 4000/- in period I, sales of Rs 150000 producing a profit of Rs. 12000/- in period II. Determine BEP & fixed expenses.

6. Sales of a product are 200 units per months @ Rs. 10/- per unit. Fixed overheads is Rs. 400/- per month and variable cost is Rs. 6/- per unit. There is a proposal to reduce prices by 10%. Calculate present and future P/V ratio. How many units must be sold to earn a target profit of present level?

7. A Company presented the following data for two period

Period	**Sales**	**Profit**
I	Rs. 10,000	Rs. 2,000
II	Rs. 15,000	Rs. 4,000

Calculate p/v Ratio, Fixed Cost, BEP, Sales to earn a profit of Rs.2000 and Profit when sales are Rs8000.

8. Fixed overheadRs. 2,40,000, Variable Cost 15 p.u. and Selling Price 30 p.u.
Calculate BEP in units & Rs and if selling price reduced by 10% what will be the new BEP.

9. Profit Rs 200, Sales Rs 2000 and Variable Cost 75% of sales.
Determine BEP and what would be the sales volume to earn a profit of Rs. 500.

10. Sales 10,00,000, Fixed Cost 3,00,000 and Profit 2,00,000
Calculate BEP and Margin of Safety.

11. BEP Rs. 8,000 and Fixed Cost Rs. 3,200. Find out profit when sales are Rs. 10,000.