Unit 15: Break Even Analysis

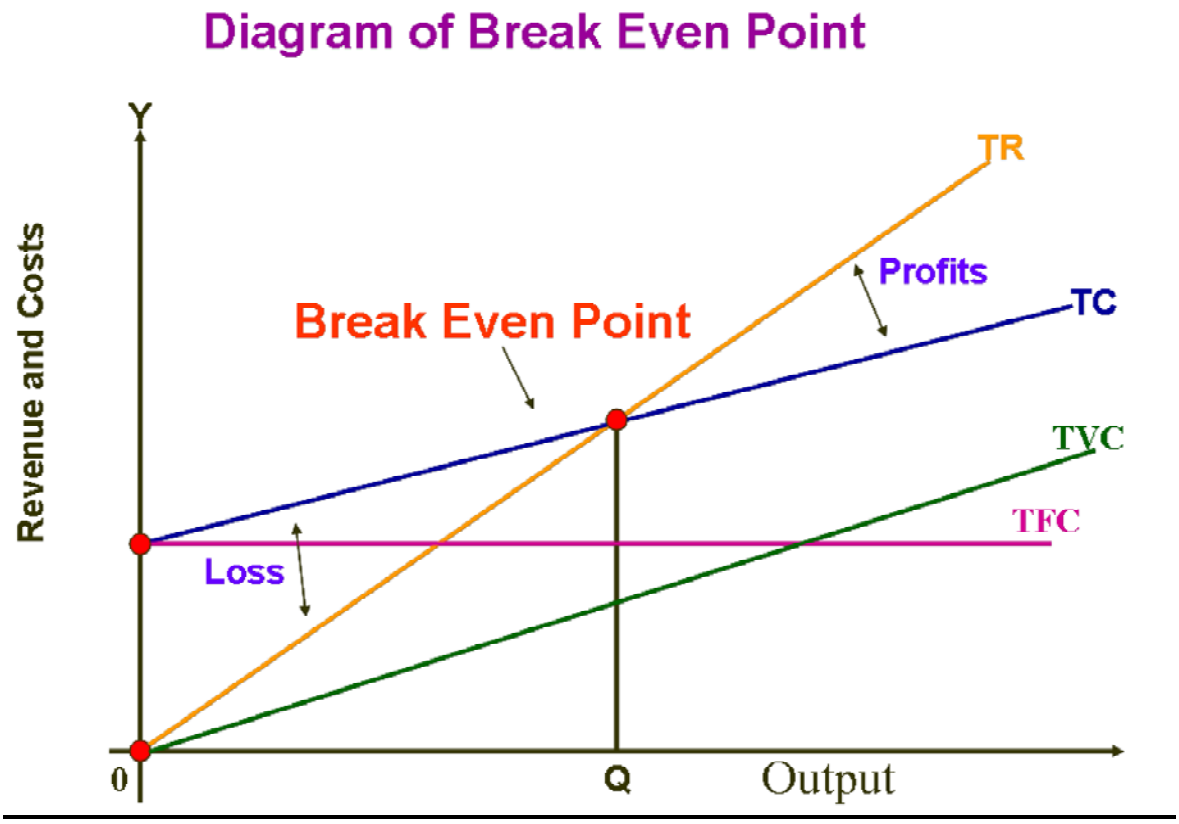
Break Even Analysis (Cost-Volume Analysis) is concern with the interrelationship of costs, volume (quantity of output or sale) and profit. The break-even point is that magic place where costs and revenue are exactly equal.

Assumption of Breakeven Analysis

1) The revenue per unit is the same regardless the quantity produced.
2) The Variable cost is the same regardless the quantity produced.
3) The Fixed Cost is the same Regardless the quantity Produced.
4) Only one type of product involves.
5) All output is sold.
6) Price always exceeds variable cost.

Components of Break Even

- Volume: the level of output of a machine, department or **quantity** of sales.
- Revenue: the income generated by sales of the product.
- Cost : - Costs that's must be taken into account:-
  - Fixed Cost: are not related to the Volume of output.
  - Variable Cost: Increase and Decrease with output.



Equations of Break Even Quantity

- *TR = Total Revenue = Total Sales = Quantity Produces x Unit Price = Q x P*
- *TC = Total Cost = Variable Cost + Fixed Cost = Q x UVC + FC*
- *Profit = Total Revenue – Total Cost = Q x P – (Q x UVC + FC)*
- $Q_{BEP} = \frac{Fixed\ \ Cost}{\text{Price} - Unit\ Variable\ \ Cost} = \frac{FC}{P - UVC}$
- *Quantity at Known Profit* $Q = \frac{profit + Fixed\ \ Cost}{\text{Price} - Unit\ Variable\ \ Cost} = \frac{\text{Profit} + FC}{P - UVC}$

Example

A small firm produces and sells Furniture's expect to consolidate assembly of its bedrooms line at single location. Currently operation in three widely scattered locations will have a monthly fixed cost of $ 7000 and other monthly fixed cost is $ 5000 the variable cost is $ 500 per Bed Room and Price per Bed Room is $ 900 for each.

a) What is Break Even Point?
b) Find the Revenue and profit when 30 Bed Room sold?
c) Determine volume when profit is $ 4000?
d) If competition let the owner reduced price to $ 850 what is the new breakeven point?

Solution

FC1=7000 $

FC2=5000 $

UVC=500 $

P=900 $

TFC= FC1+FC2= 7000+5000=12000 $

a) $Q_{BEP} = \frac{Fixed\ \ Cost}{\text{Price} - Unit\ Variable\ \ Cost} = \frac{FC}{P - UVC} = \frac{12000}{900 - 500} = \frac{12000}{400} = 30$

b) TR=Q x P= 30 x 900= 27000 $

Profit = Total Revenue – Total Cost = Q x P – (Q x UVC + FC)

Profit= 30 x 9000 – (30 x 500+12000)= 27000-27000= 0 $

c)

$$Q = \frac{profit + Fixed\ \ Cost}{\text{Price} - Unit\ Variable\ \ Cost} = \frac{\text{Profit} + FC}{P - UVC} = \frac{4000 + 12000}{900 - 500} = \frac{16000}{400} = 40$$

d)

$$Q_{BEP} = \frac{FC}{P - UVC} = \frac{12000}{850 - 500} = \frac{12000}{350} = 52.17 \cong 53$$