

Break Even Analysis

Break Even Analysis (Cost-Volume Analysis) is concern with the interrelationship of costs, volume (quantity of output or sale) and profit.

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

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

Examples

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 BD 7000 and other monthly fixed cost is BD 5000 the variable cost is BD 500 per Bed Room and Price per Bed Room is BD 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 BD 4000?
- d) If competition let the owner reduced price to BD 850 what is the new breakeven point?

Problem#1

The selling price of the product is \$199.95. The variable costs per unit are

Labor	\$60.26
Raw Material	\$25.70
Purchased Components	\$21.50
Variable Overhead	\$17.50

The fixed total cost \$300,000 per year; perform breakeven analysis of this company:

- What is the total revenue function?
- What is the total cost function?
- What is the profit function?
- What is the breakeven point in units of the product?
- What is the revenue at the breakeven point?
- Estimate the profit when 9000 units of the product are sold in a year?
- How many units must be sold for the company to make \$900,000?

Problem # 3

A one machine shop producing bolts has a fixed cost of \$2000 and a variable cost of \$ 2 per bolts. The selling price is \$ 6 per unit. Find break even volume of production and total revenue corresponding to the break even volume?

Problem#2

The Bach Company produces office chairs. The price of the chairs is \$99.75 and the variable cost per chair is \$49.75 the following fixed cost is incurred:

Depreciation of plant and equipment per year	\$20,000
Property Tax per year	\$12,000
Fixed Overhead	\$5,200

Perform breakeven analysis of this company:

- What is the total revenue function?
- What is the total cost function?
- What is the profit function?
- What is the breakeven point in units in number of chairs?
- What is the revenue at the breakeven point?
- Estimate the profit when 1500 chairs are produced in a year?
- How many chairs must be sold for the company to make \$750000 in a year?

Problem # 5

One person automobile oil change in Rural Mississippi has a fixed overhead of \$900 per month. The Variable cost per oil change is \$10. The price Tag is \$30 for one oil change. Find the breakeven number of oil change per month. If the owner Joe Smith desires to have a contribution per month of \$2100 the number of oil change he should do per month is?

