



STUDY NOTE - 4

CAPITAL BUDGETING

SECTION - 1

COST-VOLUME-PROFIT ANALYSIS

This Section includes

- **Cost-Volume-Profit Analysis**
- **Assumptions of CVP Analysis:**
- **Benefits of CVP:**
- **Time Value of Money**

1.1 COST-VOLUME-PROFIT ANALYSIS

1.1.1 Cost-Volume-Profit (CVP) Analysis, also known as Break-even Analysis is a Short-Term Planning and Analysis Tool. It is widely used in financial analysis, especially to see the level at which a unit has to operate to cover its fixed costs and subsequently get into profit mode.

1.2 ASSUMPTIONS OF CVP ANALYSIS

1.2.1 A number of assumptions are commonly made with respect to CVP analysis:

1. The analysis assumes a linear revenue function and a linear cost function.
2. The analysis assumes that price, total fixed costs and unit variable costs can be accurately identified and remain constant over the relevant range.
3. The analysis assumes that what is produced is sold.
4. For multiple-product analysis, the sales mix is assumed to be known.
5. The selling prices and costs are assumed to be known with certainty

Any change between assumption and actual on above assumptions would tilt the CVP considerably.

1.3 BENEFITS OF CVP

1.3.1 The benefits of CVP Analysis are given below:

1. Assists in establishing prices of products.
2. Assists in analyzing the impact of volume on short-term profits.



3. Assists in focusing on the impact that changes in costs (variable and fixed) have on profits.
4. Assists in analyzing how the mix of products affects profits.
5. Absorption of Fixed Cost and the stage when the additional Fixed costs have to be committed and the resultant investment decisions to be made.

1.4 CVP ANALYSIS: A SIMPLE ILLUSTRATION

Fixed costs (F)	=	Rs.40,000
Selling price per unit (P)	=	Rs.10
Variable cost per unit (V)	=	Rs.6
Tax rate	=	40%

1. What is the break-even point in units?
2. What is the break-even point in Rs.?

1. Let X = break-even point in units

Operating income = Sales revenue - Variable expenses - Fixed expenses

$$0 = \text{Rs.}10X - \text{Rs.}6X - \text{Rs.}40,000$$

$$\text{Rs.}10X - \text{Rs.}6X = \text{Rs.}40,000$$

$$\text{Rs.}4X = \text{Rs.}40,000$$

$$X = 10,000 \text{ units}$$

2. Break-even point in Rs. sales is:

$$10,000 \times \text{Rs.}10 \text{ or Rs.}100,000$$

This can be shown with a variable-costing income statement.

Sales (10,000 x Rs.10)	Rs.100,000
Less: Variable expenses (10,000 x Rs.6)	<u>60,000</u>
Contribution margin	Rs. 40,000
Less: Fixed expenses	<u>40,000</u>
Profit before taxes	0
Less: Income taxes	<u>0</u>
Profit after taxes	0
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- 1.5.0 Alternative approach to solving break-even point in sales price:

Let X equal break-even sales in rupees

Operating income = Sales revenue - Variable expenses - Fixed expenses

$$0 = X - 0.6X - \text{Rs.}40,000$$

$$X - 0.6X = \text{Rs.}40,000$$

$$0.4X = \text{Rs.}40,000$$

$$X = \text{Rs.}100,000$$

Note: V is the variable cost percentage which is obtained by:



$$\frac{\text{Variable Cost per Unit}}{\text{Selling Price per Unit}} = \frac{6}{10} = 0.6$$

1.6.0 Assume that a company has the following projected income statement:

	Rs.
Sales	100,000
Less: Variable expenses	<u>60,000</u>
Contribution margin	40,000
Less: Fixed expenses	<u>30,000</u>
Income before taxes	10,000
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Break-even point in Rs. (R):

$$R = \text{Rs.}30,000 / 0.4 = \text{Rs.}75,000$$

$$\text{Margin of Safety} = \text{Rs.}100,000 - \text{Rs.}75,000 = \text{Rs.}25,000$$