

Cost Volume Profit analysis

A potent tool for managers to aid
decision making.

Cost drivers

- Identify activities and determine measures of output for each activity.
- Then relate each output measure to the resources necessary to produce it.
- Any output measure that causes cost is called a cost driver.

For example

- Activity: spare parts delivery to production shed
- Measure: number /Weight of parts received
- Drives: use of moving trolley/its fuel costs

Cost drivers

- Research staff salaries- number of new products proposals.
- Salaries of product engineers- complexity of new product.
- Labour wages- hours
- Supervisor salary- number supervised
- Depreciation of machinery: machine hours

Cost behaviour

- Understanding cost drivers and their influences on cost behavior is vital for CVP analysis.
- The effect of changes in environment, sales volume, costs and thereby profitability needs to be addressed in all decisions.
- Breakeven analysis is therefore very vital in all business.

Variable viz fixed

- Variable costs change with variations in their cost drivers but fixed costs don't.

As Cost driver level changes

- Variable cost per unit is fixed
- Fixed costs are fixed but per unit varies..

concept

- This is a study of relationships between costs and volume and their impact on profits.
- Volume refers to volume of activities either in production, sales, process orders, number of bills, number of admissions etc.
- It seeks to determine the interrelationships of the activity, costs, sales prices, and sales mix to earnings.

Concepts.....

- The effect on profits due to changes in fixed costs,/variable costs/sales volume/sales prices/sales mix.
- Such a comprehensive dissection allows the manager to determine Relative profitability by examining incremental effect on CVP.
- Thus optimal utilization of resources is made possible.

equations

S= selling price per unit

V= variable cost per unit

F= fixed cost

P= operating profit

X= Number of units

$$P = (S - V)X - F.$$

$$S - V = \text{Contribution margin} = C$$

Incremental analysis

- The backbone of management accounting is incremental analysis.

It must be understood that variable costs cause incremental changes in the system while fixed costs do not cause changes in the system within a given cost range.

Hence for all practical purposes we use variable costing with incremental analysis for decision making

Contribution margin

$$C = F + P$$

$$C = S - V$$

$$C - F = P/L$$

This is relevant in ascertaining the breakeven point. For this we need to know P/V ratio and variable cost ratios.

P/V Ratio

- $P/V = \text{Contribution per unit} \div \text{selling price per unit}$
- $\text{Sales revenue} - \text{variable costs} \div \text{sales revenue}$
- $F + P \div \text{Sales revenue}$
- $\text{Change in contribution} \div \text{change in sales}$.

Using p/v ratio

- Helps to eliminate non profit making lines by indicating low p/v ratios or low volume.
- Helps in finding breakeven sales.

Variable cost ratio

- It is variable cost per unit in relation to the selling price.
- $1 - \text{P/V ratio} = \text{Variable cost ratio}.$

Break even analysis

- B-E point establishes the action volume which evenly breaks costs and revenues .
- It is defined as the output level where the profits are zero.
- It is the point where Total revenues = Total Costs
- Thus it is the minimum level of operations that the unit must sustain to avoid a loss.

Crisis point

- It is therefore understandable that the firm has covered its variable and fixed costs i.e all costs at this level.
- Indicates the level from where profit/loss commences
- Calculated with formula/ through graphs

B-E formula

$$\text{BEP} = \frac{\text{FIXED COST}}{\text{CONTRIBUTION PER UNIT.}}$$

This gives the volume level in numbers where breakeven occurs. To find in terms of value we use

BES = Fixed costs divided by P/V ratio

Margin of safety

- Difference between actual sales and breakeven sales is called MOS.
- Allows the manager to know where he stands from the BEP.

Marginal costing

- Allows net income to be measured as a function of only one variable – sales volume
- Known as **Marginal costing** in UK, **Direct costing** in USA now commonly referred to as **Variable Costing**

MC defined

A principle whereby variable costs are charged to cost units and the fixed cost attributable to the relevant period is written off in full against the contribution of that period.

Hence it represents the added costs, the additional costs of production. These are the out of pocket outlays which would not be incurred if a particular product were eliminated.

Absorption costing

- Also called full costing as it absorbs or includes both fixed and variable costs. Also called cost attach.

Conventional pattern

Profit = Sales Volume (selling price - full cost price)

Absorption viz marginal

Cooper India is a single product firm.

The relevant data as follows.

Sales 20000 units @ 15 Rs. Each unit

Manufacturing costs:

Variable costs Rs.8 per unit, Fixed costs are rs40000.

Non manufacturing costs

Sales commission 5% of sales, distribution expenses

1 re per unit and fixed admin costs

50000Rs. Considering tax at 40 % show income statements in full and marginal costing formats.

As per Marginal costing

• Sales 20000x15	=3,00,000
• - variable cost@8	=1,60,000
• -sales commis@5%	= 15,000
• -distri exp@ 1/-	= 20,000
• -----	
• Contribution	= 1,05,000
• -fixed costs	= 50000
• Profit before tax	= 55000
• Less tax @40%	= 22000
• -----	
• Profit after tax	= 33000