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COST-VOLUME-PROFIT AND BREAK- EVEN ANALYSIS

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COST-VOLUME-PROFIT (CVP) ANALYSIS

- CVP analysis, together with cost behavior information, helps managers perform many useful analyses.
- More specifically, it looks at the effects on profits of changes in such factors as variable costs, fixed costs, selling prices, volume, and mix of products sold.
- By studying the relationships among costs, sales and net income, management is better able to cope with many planning decisions.

BREAK-EVEN ANALYSIS

- Break-even analysis, a branch of CVP analysis, determines the break-even sales, which is the level of sales at which total costs equal total revenue.

QUESTIONS ANSWERED BY CVP ANALYSIS

CVP analysis tries to answer the following questions:

- What sales volume is required to break even?
- What sales volume is necessary in order to earn a desired profit?
- What profit can be expected on a given sales volume?
- How would changes in selling price, variable costs, fixed costs, and output affect profits?
- How would a change in the mix of products sold affect the break-even and target income volume and profit potential?

CONTRIBUTION MARGIN (CM)

- The contribution margin is the excess of sales (S) over the variable costs (VC) of the product.
- It is the amount of money available to cover fixed costs (FC) and to generate profits.
 - $CM = \text{sales (S)} - \text{variable costs (VC)}$

UNIT CONTRIBUTION MARGIN (CM)

- The unit contribution margin is the excess of the unit selling price (p) over the unit variable cost (v)
 - Unit CM = unit selling price (p) – unit variable cost (v)

CONTRIBUTION MARGIN RATIO (CM ratio)

- The contribution margin ratio is the contribution margin as a percentage of sales, i.e.,

- $$\text{CM ratio} = \frac{CM}{S} = \frac{S-VC}{S} = 1 - \frac{VC}{S}$$

- The CM ratio can also be computed using per-unit data as follows:

- $$\text{CM ratio} = \frac{\text{Unit CM}}{p} = \frac{p-v}{p} = 1 - \frac{v}{p}$$

- For example, if variable costs account for 70 percent of the price, the CM ratio is 30 percent.

BREAK-EVEN ANALYSIS

- The break-even point, the point of no profit and no loss, provides managers with insights into profit planning.
- It can be computed in three different ways:
 1. The equation approach
 2. The contribution approach
 3. The graphical approach

BREAK-EVEN POINT – THE EQUATION APPROACH

- The equation approach is based on the cost-volume equation, which shows the relationships among sales, variable and fixed costs, and profit.
 - $S = VC + FC + \text{profit}$
- At the break-even volume:
 - $S = VC + FC + 0$
- or
 - $\text{Profit} = S - VC - FC$
 - $0 = P*Q - v*Q - FC$

BREAK-EVEN POINT – THE CONTRIBUTION MARGIN APPROACH

- The contribution margin approach, another technique for computing the break-even point, is based on solving the cost-volume equation.

- $$Q_{BEP} = \frac{\text{Fixed costs}}{\text{unit selling price} - \text{unit variable cost}} = \frac{FC}{p-v}$$

- BEP in dollars = BEP in units * unit sales price

or

- $$\text{BEP in dollars} = \frac{\text{Fixed costs}}{\text{CM ratio}}$$

- $$\text{BEP with profit} = \frac{\text{Fixed costs} + \text{target profit}}{\text{unit selling price } (p) - \text{unit variable cost } (v)}$$

MARGIN OF SAFETY (MS)

- The margin of safety is a measure of difference between the actual level of sales and the break-even sales.
- It is the amount by which sales revenue may drop before losses begin, and is expressed as a percentage of budgeted sales:
 - $$MS = \frac{\text{Budgeted sales} - \text{break-even sales}}{\text{Budgeted sales}}$$
- The margin of safety is often used as a measure of risk.
- The larger the ratio, the safer is the situation, since there is less risk of reaching the break-even point.

Thank you for your attention.