Cost-Volume-Profit Relationships

Contribution margin approach

SALES Less: variable costs = contribution margin

CONTRIBUTION MARGIN Less: fixed costs = net operating income

$$\textbf{Contribution Margin Ratio} = \frac{CM}{Sales} = \frac{TotalCM}{TotalSales} = \frac{UnitCM}{UnitSellingprice}$$

Break-even equation method

Sales = variable costs plus fixed costs plus profits

Profits = zero for break-even profits = desired profit to determine units sales for that number

Break even contribution margin method

$$\text{BE in Units Sold} = \frac{FixedCosts}{UnitCM}$$

$$\text{BE in Total Sales \$} = \frac{FixedCosts}{CMRatio}$$

Margin of safety: the excess of budgeted sales dollars over break even volume of sales dollars

Margin of safety = total budgeted or actual sales break even sales

$$\text{Margin of Safety Percentage} = \frac{\text{Margin of Safety in Dollars}}{\text{Total Budgeted Sales}}$$

$$\text{Degree of Operating Leverage} = \frac{CM}{\text{Net Operating Income}}$$