Chapter 6: Break-Even & CVP Analysis

One of the main concerns in running a business is achieving a desired level of profitability. Cost-volume profit analysis and break-even analysis are used to evaluate the potential effects of decisions on profitability.

You would know if you sold 5 shirts and each shirt cost $10, that you had received $50 worth of sales revenue. Total Revenue (TR) is found by multiplying the quantity (Q) of units sold by the selling price per unit (P). We write the equation as shown below:

$$TR = P \times Q$$

If as a business you pay $200 a month in rent, and you sold 5 shirts that cost you $8 each to produce in one month, your total costs for the month would be $200 + ($8/unit × 5 units) = $240. Total Cost (TC) is made up of fixed costs and variable costs. **Fixed costs** (FC) are things like rent or utilities bills: these costs remain constant for all levels of production. **Variable costs** are things like material costs: they increase or decrease with the number of units produced. We find the total variable costs by multiplying the variable cost per unit (VC) times quantity (Q).

$$TC = FC + VC \times Q$$

You can use a **break-even analysis** to find the break-even point in terms of quantity of items or in dollars. Think about the everyday use of "just breaking even" — the money you make just covers your expenses: your total revenue from sales just covers your total costs (no profit and no loss). In other words, your revenue equals your costs.

$$TR = TC$$
$$P \times Q = FC + VC \times Q$$

Example 1:
A market survey for a new gizmo indicates that the product can be sold at $40 per unit. The fixed costs per period are $8430, and the variable selling expense is $25 per unit. Production capacity per period is 850 units. Perform a break-even analysis and find: (i) the equations for total revenue and total cost; (ii) the break-even point in units and (iii) the break-even point in dollars.

(i) Total Revenue = Price × Quantity   Price is $40 per unit, so:
    TR = 40 × Q   (this tells us how to find TR at any quantity)

    Total Cost = FC + VC × Q
    Fixed costs are given at $8430 and the variable cost per unit is $25, so:
    TC = 8430 + 25 × Q   (this tells us how to find TC at any quantity)