Economics Formulas for Running a Business

A comprehensive cheat sheet of formulas for revenue, costs, profit, finance, productivity, and market analysis.

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1. Revenue & Sales

- **Total Revenue (TR)**

$$TR = P \times Q$$

- **Average Revenue (AR)**

$$AR = \frac{TR}{Q}$$

- **Marginal Revenue (MR)**

$$MR = \frac{\Delta TR}{\Delta Q}$$

- **Revenue Growth Rate (%)**

$$\text{Revenue Growth Rate} = \frac{TR_{current} - TR_{previous}}{TR_{previous}} \times 100$$

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2. Costs

- **Total Cost (TC)**

$$TC = FC + VC$$

- **Average Cost (AC)**

$$AC = \frac{TC}{Q} = AFC + AVC$$

- **Average Fixed Cost (AFC)**

$$AFC = \frac{FC}{Q}$$

- **Average Variable Cost (AVC)**

$$AVC = \frac{VC}{Q}$$

- **Marginal Cost (MC)**

$$MC = \frac{\Delta TC}{\Delta Q}$$

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3. Profit & Break-even

- **Profit (π)**

$$\pi = TR - TC$$

- **Break-even Point (BEP) in units**

$$BEP = \frac{FC}{P - AVC}$$

- **Break-even Point (BEP) in sales value**

$$BEP_{sales} = BEP \times P$$

- **Profit Margin (%)**

$$\text{Profit Margin} = \frac{\pi}{TR} \times 100$$

- **Operating Profit Margin (%)**

$$\text{Operating Profit Margin} = \frac{\text{Operating Profit}}{TR} \times 100$$

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4. Market & Demand Analysis

- **Price Elasticity of Demand (PED)**

$$PED = \frac{\%\ \Delta Q_d}{\%\ \Delta P}$$

- **Income Elasticity of Demand (YED)**

$$YED = \frac{\%\ \Delta Q_d}{\%\ \Delta \text{Income}}$$

- **Cross Price Elasticity (XED)**

$$XED = \frac{\%\ \Delta Q_{dA}}{\%\ \Delta P_B}$$

- **Market Share (%)**

$$\text{Market Share} = \frac{\text{Firm's Sales}}{\text{Total Market Sales}} \times 100$$

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5. Investment & Financial Analysis

- **Return on Investment (ROI)**

$$ROI = \frac{\text{Net Profit}}{\text{Investment Cost}} \times 100$$

- **Net Present Value (NPV)**

$$NPV = \sum_{t=1}^{n} \frac{R_t}{(1+i)^t} - C_0$$

- **Internal Rate of Return (IRR)**
- Discount rate that makes $NPV = 0$
- **Payback Period**

$$\text{Payback Period} = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}}$$

- **Debt-to-Equity Ratio**

$$\text{Debt-to-Equity} = \frac{\text{Total Debt}}{\text{Equity}}$$

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6. Productivity & Efficiency

- **Labor Productivity**

$$\text{Labor Productivity} = \frac{\text{Output}}{\text{Labor Input}}$$

- **Capital Productivity**

$$\text{Capital Productivity} = \frac{\text{Output}}{\text{Capital Input}}$$

- **Inventory Turnover**

$$\text{Inventory Turnover} = \frac{COGS}{\text{Average Inventory}}$$

- **Days Inventory Outstanding (DIO)**

$$DIO = \frac{\text{Average Inventory}}{COGS} \times 365$$

- **Accounts Receivable Turnover (ART)**

$$ART = \frac{\text{Net Credit Sales}}{\text{Average Accounts Receivable}}$$

- **Days Sales Outstanding (DSO)**

$$DSO = \frac{\text{Average Accounts Receivable}}{\text{Net Credit Sales}} \times 365$$

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7. Pricing & Costing Strategies

- **Markup Pricing**

$$\text{Selling Price} = \text{Cost Price} + (\text{Cost Price} \times \text{Markup \%})$$

- **Contribution Margin per unit**

$$CM = P - AVC$$

- **Contribution Margin Ratio (%)**

$$CM\% = \frac{CM}{P} \times 100$$

- **Target Profit Pricing**

$$\text{Price} = \frac{FC + VC + \text{Target Profit}}{Q}$$

- **Variable Costing / Direct Costing**

$$\text{Profit} = \text{Sales} - \text{Variable Costs} - \text{Fixed Costs}$$

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8. Liquidity & Efficiency Ratios

- **Current Ratio**

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

- **Quick Ratio (Acid Test)**

$$\text{Quick Ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$$

- **Operating Cycle**

$$\text{Operating Cycle} = DIO + DSO$$

- **Cash Conversion Cycle (CCC)**

$$CCC = DIO + DSO - \text{Days Payable Outstanding (DPO)}$$

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9. Growth & Performance Metrics

- **Revenue Growth Rate (%)**

$$\text{Revenue Growth Rate} = \frac{TR_{current} - TR_{previous}}{TR_{previous}} \times 100$$

- **Net Profit Growth Rate (%)**

$$\text{Net Profit Growth Rate} = \frac{\pi_{current} - \pi_{previous}}{\pi_{previous}} \times 100$$

- **Return on Assets (ROA)**

$$ROA = \frac{\text{Net Income}}{\text{Total Assets}} \times 100$$

- **Return on Equity (ROE)**

$$ROE = \frac{\text{Net Income}}{\text{Shareholder Equity}} \times 100$$