

Formulas

Financial Statement Analysis

Current Ratio = Current Assets / Current Liabilities
 Quick Ratio = (Current Assets – Inventory) / Current Liabilities
 Cash Ratio = Cash / Current Liabilities
 Debt Ratio = Total Liabilities / Total Assets
 Debt-Equity Ratio = Total Liabilities / Total Equity
 Equity Multiplier = Total Assets / Total Equity
 Times Interest Earned Ratio = EBIT / Interest
 Cash Coverage = (EBIT + Depreciation & Amort.) / Interest
 Inventory Turnover = COGS / Inventory
 Days' Sales in Inventory = 365 Days / Inventory Turnover
 Receivables Turnover = Sales / Accounts Receivable
 Days' Sales in Receivables = 365 Days / Receivables Turnover
 Total Asset Turnover = Sales / Total Assets
 Net Profit Margin = Net Income / Sales
 EBITDA Margin = EBITDA / Sales
 Return on Assets (ROA) = Net Income / Total Assets
 Return on Equity (ROE) = Net Income / Total Equity
 Earnings per Share = Net Income / Shares Outstanding
 Price / Earnings (PE) Ratio = Price per Share / Earnings per Share
 Market-to-Book (M / B) Ratio = Market Value per Share / Book Value per Share
 Market Capitalization = Price per Share x Shares Outstanding
 Enterprise Value = Market Cap. + Market Value of Interest-bearing Debt - Cash
 Enterprise Value Multiple = EV / EBITDA
 DuPont Identity: ROE = Profit Margin x Total Asset Turnover x Equity Multiplier

Forecasting

External Financing Needed = (Assets/Sales) x Δ Sales –
 (Spontaneous Liabilities/Sales) x Δ Sales –
 (Net Income/Sales) x Projected Sales x (1 – Dividends/Net Income)

$$\text{Internal Growth Rate} = \frac{\text{ROA} \times \left(1 - \frac{\text{Dividends}}{\text{Net Income}}\right)}{1 - \left[\text{ROA} \times \left(1 - \frac{\text{Dividends}}{\text{Net Income}}\right)\right]}$$

$$\text{Sustainable Growth Rate} = \frac{\text{ROE} \times \left(1 - \frac{\text{Dividends}}{\text{Net Income}}\right)}{1 - \left[\text{ROE} \times \left(1 - \frac{\text{Dividends}}{\text{Net Income}}\right)\right]}$$

Present Value and Future Value of a Single Cash Flow

$$FV_t = PV_0 \times (1 + r)^t$$

$$PV_0 = \frac{FV_t}{(1 + r)^t}$$

Where: PV = present value
 FV = future value

Present Value of Perpetuities

$$\text{Perpetuity: } PV_0 = \frac{CF_1}{r}$$

$$\text{Growing Perpetuity: } PV_0 = \frac{CF_1}{r - g}$$

Present Value and Future Value of Ordinary Annuities

$$PV_0 = \frac{CF_1}{r} \times \left[1 - \frac{1}{(1 + r)^t} \right]$$

$$FV_t = \frac{CF}{r} \times \left[(1 + r)^t - 1 \right]$$

Effective Annual Rate

$$EAR = \left[1 + \left(\frac{APR}{m} \right) \right]^m - 1$$

Where: m = number of compounding periods per year.
 APR = Annual Percentage Rate.

Risk and Return

$$\text{Percentage return} = \frac{\text{Cash flow over the period} + \text{Change in market value}}{\text{Beginning market value}}$$

$$\text{CAPM (the Security Market Line): } E[R_i] = R_f + \beta_i (R_m - R_f)$$

Where: R_m is the expected return of the market.
 R_f is the risk-free rate of return.

$$\text{Sample variance: } \sigma^2 = \left[\frac{1}{T-1} \right] \times \left[(R_1 - \bar{R})^2 + (R_2 - \bar{R})^2 + \dots + (R_T - \bar{R})^2 \right]$$

$$\sigma^2 = \frac{1}{T-1} \sum_{t=1}^T (R_t - \bar{R})^2$$

$$\text{Variance of expected returns: } \sigma^2 = \left[P_1 \times (R_1 - \bar{R})^2 \right] + \left[P_2 \times (R_2 - \bar{R})^2 \right] + \dots + \left[P_T \times (R_T - \bar{R})^2 \right]$$

$$\text{Covariance: } \text{Cov}(X, Y) = P_1 [(X_1 - \bar{X})(Y_1 - \bar{Y})] + P_2 [(X_2 - \bar{X})(Y_2 - \bar{Y})] + \dots$$

$$\sigma^2 = \sum_{t=1}^T P_t \times (R_t - \bar{R})^2$$

$$\text{Cov}(X, Y) = \sum_{t=1}^T P_t (X_t - \bar{X})(Y_t - \bar{Y})$$

$$\text{Cov}(X, Y) = \rho_{X,Y} \times \sigma_X \times \sigma_Y$$

$$\text{Portfolio Variance: } \sigma_p^2 = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1 w_2 \text{Cov}(R_1, R_2)$$

$$\sigma_p^2 = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1 w_2 \rho_{1,2} \sigma_1 \sigma_2$$

Cost of Capital

$$WACC = \left[\left(\frac{E}{D+P+E} \right) \times R_E \right] + \left[\left(\frac{P}{D+P+E} \right) \times R_P \right] + \left[\left(\frac{D}{D+P+E} \right) \times R_D \times (1-T) \right]$$

Where: D = market value of total debt
 P = market value of preferred stock
 E = market value of common stock
 T = tax rate
 R_D = cost of debt
 R_P = cost of preferred stock
 R_E = cost of common stock