Finance and Ratios

NPV, IRR: projects and required rate of return

- Net Present Value (NPV): The present value of the future cash flows are matched to the original outlay of capital to screen projects
  - A required rate of return is the discount rate used in evaluating present value; positive amount is acceptable
- Internal Rate of Return (IRR): all cash flows associated with a project or investment are used to derive a rate of return
- If the IRR = required rate of return, then NPV = $0
- Return on Investment (ROI): Net income from investment / investment
- Accounting Rate of Return: Increase in average operating income less depreciation / Initial investment

Capital Asset Pricing Model
The expected return of a capital asset includes its Beta (sensitivity to non-diversified risk), the expected market return (R_m & risk-free rate (R_f))

\[ E(R_i) = R_f + \beta_i (E(R_m) - R_f) \]

Liquidity Ratios
The ability of a company to pay its bills when they come due and to meet any needs for cash that a company may not foresee

- The Current Ratio shows the ability that current assets have to meet current liabilities
  \[ \frac{\text{Current Assets}}{\text{Current Liabilities}} \]
- The Quick Ratio measures the ability to pay short-term debts
  \[ \frac{\text{Cash + Marketable Securities + Receivables}}{\text{Current Liabilities}} \]
- Times Interest Earned shows if earnings are enough to cover interest
  \[ \frac{\text{Net Income}}{\text{Interest Expense}} \]

Efficiency Ratios: To find the average number of days for each turnover, divide 365 days by these ratios

- To know how to measure the size of accounts receivable and the effectiveness of collecting, then look at Receivables Turnover
  \[ \frac{\text{Net Sales}}{\text{Average Accounts Receivable}} \]
- The inventory turnover is how many times a full lot of inventory is sold
  \[ \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} \]
- Payables turnover tells the quickness that purchases are paid for. A higher number, the shorter the time. A lower number means that cash is short or there is a delay in the company paying.
  \[ \frac{\text{Cost of Goods Sold}}{\text{Average Accounts Payable}} \]

Safety Ratios
The Debt to Equity ratio shows the capital structure of funds provided by lenders in relation to funds provided by owners:

\[ \frac{\text{Total Liabilities}}{\text{Total Equity}} \]

- Debt coverage indicates if cash flow can cover debt and if the company has the ability to take on further debt:
  \[ \frac{\text{Net Profit + Non-cash expenses}}{\text{Debt}} \]

Profitability Ratios
Sales Growth shows the percentage increase or decrease in sales between two time periods:

\[ \frac{\text{Current period’s sales}}{\text{Previous period’s sales}} \]

- Cost of Goods Sold to Sales shows what percentage of sales revenue was taken by the cost of the goods sold:
  \[ \frac{\text{Cost of Goods Sold}}{\text{Total Sales}} \]

- Gross Profit Margin shows what percentage of profits were earned on products themselves:
  \[ \frac{\text{Gross Profit (Sales – Cost of Goods Sold)}}{\text{Total Sales}} \]

- Return on Equity gives the rate of return for investor’s contribution
  \[ \frac{\text{Net Profit}}{\text{Shareholder’s Equity}} \]

- Return on Assets shows how effectively the assets generate a return
  \[ \frac{\text{Net Profit}}{\text{Total Assets}} \]