5 Categories of Financial Ratio's

1) Liquidity Ratios - ability to satisfy short term obligations.
   - Current ratio = Current assets / Current liabilities

★ The higher the current ratio, the more liquid the firm.

2) ~~Quick~~
   - Quick ratio (acid test) = (Current assets − inventory) / Current liabilities

★ Quick ratio of 1+ is acceptable.

2) Activity ratios - speed to convert accounts into sales or cash
   - Average collection Period = Trade receivables / Avg. sales per day = Trade receivables / (Annual sales/365)
   - Average payment period = Trade + other payables / Avg. purchase per day
   - Total Asset Turnover = Sales / Total Assets
   - Inventory Turnover = Cost of goods sold / Inventory

3) Debt ratios - measures proportion of assets financed by creditors
   - Debt ratio = Total liabilities / Total assets
   - Times interest earned ratio = Earnings before interest + tax (Profit from operations) / Interest

Operating Profit → Operating / Interest

★ Ability to make contractual interest payments. The higher it's ~~s~~ value the better able ~~to~~ the firm to fulfil its interest obligations.

4) Profitability ratios - evaluate firm's profits
   - Earnings per share (EPS) = Earnings available for common stockholders (Profit for the year − Preference share dividend) / # of shares of common stock outstanding.
   - Gross profit margin = Gross Profit / Sales
   - Net profit margin = Earnings available for common stockholders (Profit for the year − Preference share dividend) / Sales

market risk premium = $r_m - R_F$
= market return − risk free return

- Operating profit margin = Operating profits / Sales
- Return on total assets (ROA) = Earnings available for common stockholders / Total Assets
  (Profit for the year − Pref. share dividend)
  Profit after tax / Total assets ~ net profit margin × Total asset turnover
- return on Common equity (ROE) = Earnings available for common stockholders / Common stock equity
  (Profit for the year − Preference share dividend)
  (Total equity − preference share capital)

5) Market ratios - firms market value as measured by its current share price

- Price Earnings ratio (P/E) = Market price per share of common stock / Earnings Per share
- market book ratio (M/B) = Market price per share of common stock / Book value per share of common stock
  (Total equity − preference share capital)

★ The higher the P/E Ratio the greater the investor confidence.

★ DuPont ~

ROA = Net profit margin × Total asset turnover

FLM (Financial leverage Multiplier) = Total assets / Common stock equity

DuPont − ROE = ROA × FLM or Net Profit margin × Total asset turnover × FLM = ROE

P_t = Price of asset at t

C_t = Cash flow received from asset

$$\text{required return} = \frac{C_t + P_t - P_{t-1}}{P_{t-1}} = r_t$$

↑ income received on an investment plus any change in the market price

n = # of possible returns

Pr_j = probability of jth outcome

r_j = jth possible return.

$$\text{Expected return} = \bar{r} = \sum_{j=1}^{n} r_j \times Pr_j$$

↑ the most likely return on an asset (Avg. return)

higher = more risky.
lower = less risky

$$\text{Standard deviation} = \sigma_r = \sqrt{\sum_{j=1}^{n} (r_j - \bar{r})^2 \times Pr_j}$$

↑ indicator of assets risk - measures dispersion around expected value (the average return)

$$\text{Coefficient of variation} = CV = \frac{\sigma_r}{\bar{r}} = \frac{\text{std deviation}}{\text{expected return (mean)}}$$

it is a # not a %.

★ Higher CV means investment has more volatility + is more risky)

B_j = beta coefficient
R_F = risk free rate.
R_m = market return (expected rate of return)

$$\text{CAPM} = r_j = R_F + [b_j \times (r_m - R_F)]$$

Capital Asset Pricing model

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

r_s = required return

Expected return (dividend valuation) $= \frac{D_1}{P_0} + g$ so $\frac{D_0(1+g)}{P_0} + g$ (for current price at 0)

Expected return $\hat{r}$ = **Expected benefit during each period / Current price of asset.**

Current required return (CAPM)

$$r_0 = R_f + (b_{Ai} \times (r_m - R_f)$$

risk free rate + (shares beta × (market return − risk free rate))

Calculating share value

For zero growth (same dividend yearly): Dividend (annual) / required return or Dividend / current price $= r_s$

Used for preferred shares

Constant growth model (Gordon): Dividend (most recent) / (required return − annual growth)

$$P_0 = \frac{D_1}{r_s - g}$$

Book value per share: Total assets − total liabilities / ordinary shares issued

Liquidation value: Price if assets sold today − total liabilities / ordinary shares issued

Variable growth:

$$P_0 = \frac{D_0 \times (1+g_1)^t}{(1+r_s)^t} + \left[\frac{1}{(1+r_s)^N} \times \frac{D_{N+1}}{r_s - g_2}\right]$$

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Present value of dividends during initial growth

Present value of price of share at end of initial growth

Price / Earnings multiples approach:

Earnings per share × P/E ratio for similar firms.

Free cash flow valuation model

$$V_c = \frac{FCF_1}{(1+r_a)^1} + \frac{FCF_2}{(1+r_a)^2} \ldots \frac{FCF_\infty}{1+r_a^\infty} \text{ or } \frac{FCF_1}{\text{Avg cost of capital} - \text{avg growth}}$$

(V_c = value of company)

Basic Share valuation Equation: $P_0 = \frac{D_1}{(1+r_s)^1} + \frac{D_2}{(1+r_s)^2} + \dots + \frac{D_\infty}{(1+r_s)^\infty}$

P_0 = value of common stock D = dividend r_s = required return

Constant growth: $P_0 = \frac{D_1}{r_s - g}$ r_s = required return, g = growth rate

Growth rate: $g = \left[\left(\frac{\text{div new}}{\text{div old}}\right)^{\frac{1}{n}} - 1\right] \times 100$

$FV = PV + (1+i)^n$

$PV = \frac{FV}{(1+i)^n}$

$PVIF = \frac{1}{(1+i)^n}$

Continuous compounding: $PV \times e^{i \cdot n}$ to find value for e you type in the i x n figure + press e^x on calculator

Effective interest rate

$EAR = \left(1 + \frac{i}{m}\right)^m - 1$ i = nominal rate, m = frequency

Anual percentage Rate (APR) = nominal rate x 12

Annual percentage yield (APY) = (1 + effective monthly rate)$^{12} - 1$

Nominal rate = $r^* + IP + RP$ (risk premium)

r^* = real rate of interest IP = inflation premium

risk free nominal rate: $R_F = r^* + IP$ R_F = risk free rate of return

Current yield = $\frac{\text{annual interest payment}}{\text{current bond price}}$

Basic valuation Model = $\frac{CF_1}{1+r^1} + \frac{CF_2}{(1+r)^2} \dots \frac{CF_n}{(1+r)^n}$

★ Basic bond valuation = $I \times PVIFA_{rd,n} + M \times PVIF_{rdn}$

bond valuation for indefinite stream: $\frac{\text{cash flow}}{\text{required return}}$

Perpetuity (infinite l.f) $\frac{1}{i}$ and multiply that by PMT to get PV. $EAR = \left(1 + \frac{i}{m}\right)^m - 1$

Price of preference share = $\frac{\text{Dividend}}{\text{Expected return}}$

market price = PE Ratio × EPS

$\frac{\text{EPS}}{\text{(earnings per share}} = \frac{\text{Earnings available to ordinary shareholders}}{\text{Number of shares outstanding}}$

To calculate value of an ordinary share using constant growth model

First: Calculate next year dividend $D_1 = D_0 \times (1+g)$.

Then: use constant growth model to calculate P_0.

$$P_0 = \frac{D_1}{rs - g}$$

$\frac{\text{P/E Ratio}}{}$ = $\frac{\text{Market price per ordinary share}}{\text{EPS.}}$

$\frac{\text{Book value per share}}{}$ = $\frac{\text{Equity} - \text{Pref share Capital}}{\text{Number of outstanding shares}}$

$\frac{\text{Market to book ratio}}{}$ = $\frac{\text{Market price per share}}{\text{book value per share.}}$

$\frac{\text{Current yield}}{}$ = $\frac{\text{Annual coupon amount}}{\text{Current bond price}}$

Networking Capital = Total Assets − Total liabilities

EPS = market price ÷ P/E Ratio

EPS = $\frac{\text{Net profit}}{\text{outstanding shares}}$

Net Profit = EPS × outstanding shares

Total Equity = $\frac{\text{Net Profit}}{\text{ROE}}$

Total Assets = $\frac{\text{Total liabilities}}{\text{Debt ratio}}$

AAI Avg. Age of Inventory = $\frac{365}{\text{Inventory Turnover ratio}}$

FLM = $\frac{\text{Total Assets}}{\text{Equity}}$

ROA = $\frac{\text{Net profit} - \text{Pref share dividend}}{\text{Total Assets}}$

ROE = $\frac{\text{Net Profit} - \text{Pref dividend}}{\text{Equity} - \text{Preference share Capital}}$

ROI $\frac{\text{Return on Investment}}{}$ = $\frac{\text{Profit for the year}}{\text{Total Assets}}$

β_j = $\frac{\text{required return} - \text{risk free rate}}{\text{Market return} - \text{risk free rate}}$

growth rate $\left[\left[\frac{\text{div new}}{\text{div old}}\right]^{\frac{1}{n}} - 1\right] \times 100$