5 Categories of Financial Ratio's

1) <u>Liquidity Ratios</u> - ability to satisfy short term obligations.

- <u>Current ratio</u> = $\dfrac{\text{Current assets}}{\text{Current liabilities}}$

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

2) ~~Quick~~ • <u>Quick ratio (acid test)</u> = $\dfrac{\text{Current assets - inventory}}{\text{Current liabilities}}$

★ Quick ratio of 1+ is acceptable.

2) <u>Activity ratios</u> - speed to convert accounts into sales or cash

- <u>Average collection Period</u> = $\dfrac{\text{Trade receivables}}{\text{Avg. sales per day}}$ = $\dfrac{\text{Trade receivables}}{\text{Annual sales}/365}$

- <u>Average payment period</u> = $\dfrac{\text{Trade + other payables}}{\text{Avg. purchase per day}}$

- <u>Total Asset Turnover</u> = $\dfrac{\text{Sales}}{\text{Total Assets}}$

- <u>Inventory Turnover</u> = $\dfrac{\text{Cost of goods sold}}{\text{Inventory}}$

3) <u>Debt ratios</u> - measures proportion of assets financed by creditors

- <u>Debt ratio</u> = $\dfrac{\text{Total liabilities}}{\text{Total assets}}$

operating profit → • <u>Times interest earned ratio</u> = $\dfrac{\text{Earnings before interest + tax (profit from operations)}}{\text{Interest}}$
interest

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

4) <u>Profitability ratios</u> - evaluate firm's profits.

- <u>Earnings per share (EPS)</u> = $\dfrac{\text{Earnings available for common stockholders}}{\text{\# of shares of common stock outstanding.}}$

  (Profit for the year - Preference share dividend).

- <u>Gross profit margin</u> = $\dfrac{\text{Gross Profit}}{\text{Sales}}$

- <u>Net profit margin</u> = $\dfrac{\text{Earnings available for common stockholders}}{\text{Sales}}$

  Profit for the year - Preference share dividend

- Operating profit ~~or~~ = $\dfrac{\text{Operating profits}}{\text{Sales}}$
  margin

$\dfrac{\text{Profit after tax}}{\text{Total Assets}}$ → - $\dfrac{\text{Return on}}{\text{total assets (ROA)}}$ = $\dfrac{\text{Earnings available for common stockholders}}{\text{Total Assets}}$ (Profit for the year - Pref. share dividend)

Net profit margin x Total asset turnover

- $\dfrac{\text{return on}}{\text{Common equity (ROE)}}$ = $\dfrac{\text{Earnings available for common stockholders}}{\text{Common stock equity}}$ (Profit for the year - Preference share dividend) (Total equity - preference share capital)

5) ~~Firms mar~~ <u>Market ratios</u> - firms market value as measured by its current share price

- $\dfrac{\text{Price Earnings}}{\text{ratio (P/E)}}$ = $\dfrac{\text{Market price per share of common stock}}{\text{Earnings Per share}}$

- $\dfrac{\text{market book}}{\text{ratio (M/B)}}$ = $\dfrac{\text{Market price per share of common stock}}{\text{Book value per share of common stock}}$ (Total equity - ~~preference share capital~~)

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

* DuPont ~

ROA = Net profit margin x Total asset turnover

$\dfrac{\text{FLM (Financial}}{\text{leverage Multiplier)}}$ = $\dfrac{\text{Total assets}}{\text{Common stock equity}}$

DuPont - ROE = ROA x FLM or Net Profit margin x Total asset turnover x FLM = ROE

$\dfrac{\bar{R} = \text{required}}{\text{return}}$ ~~R = Expected~~ = $\dfrac{C_t + P_t - P_{t-1}}{P_{t-1}} = r_t$

P_t = Price of asset a) t
C_t = Cash flow received from asset

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

$\dfrac{\text{Expected}}{\text{return}}$ = $\bar{r} = \sum\limits_{j=1}^{n} r_j \times P_{r_j}$

n = # of possible returns
P_{r_j} = probability of jth outcome
r_j = jth possible return.

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

$\dfrac{\text{Standard}}{\text{deviation}}$ = $\sigma_r = \sqrt{\sum\limits_{j=1}^{n} (r_j - \bar{r})^2 \times P_{r_j}}$

higher = more risky
lower = less risky

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

$\dfrac{\text{Coefficient of}}{\text{variation}}$ = $CV = \dfrac{\sigma_r}{\bar{r}} = \dfrac{\text{std deviation}}{\text{expected return (mean)}}$ it is a # not a %.

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

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

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

Capital Asset Pricing
model.

Basic Share valuation $P_0 = \dfrac{D_1}{(1+r_s)^1} + \dfrac{D_2}{(1+r_s)^2} + \ldots + \dfrac{D_x}{(1+r_s)^x}$

Equation

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

Constant growth: $P_0 = \dfrac{D_1}{r_s - g}$ r_s = required return

                                      g = growth rate

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

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

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

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

Effective interest rate

$$\mathcal{E}AR = \left(1 + \dfrac{i}{m}\right)^m - 1$$

i = nominal rate
m = frequency

Anual percentage Rate (APR) = nominal rate × 12

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

                 Nominal rate = $r^* + IP + RP$

                                risk premium

risk free rate $R_F = r^* + IP$ r^* = real rate of interest   IP = inflation premium

                              R_F = risk free rate of return

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

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

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

bond valuation for indefinite steam: $\dfrac{\text{Cash flow}}{\text{required return}}$

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

P_0 = current price at 0

Expected return dividend valuation $= \frac{D_1}{P_0} + g$ so $\frac{D_0(1 \times g)}{P_0} + g$

r_s = required return

Expected return

$$\hat{r} = \frac{\text{Expected benefit during each period}}{\text{Current price of asset}}$$

Current required return (CAPM)

$$r_0 = R_F + \left(b_{A_1} \times \left(r_m - R_f\right)\right)$$

$\underbrace{\text{risk free}}_{\text{rate}} + \left(\underbrace{\text{shares beta}}_{} \times \underbrace{(\text{market return} - \text{risk free})}_{\text{rate}}\right)$

Calculating share value

For zero growth (same dividend yearly): $\dfrac{\text{Dividend (annual)}}{\text{required return}}$ or $\dfrac{\text{Dividend}}{\text{Current price}} = r_s$

Good for preferred shares

Constant growth model (Gordon): $\dfrac{\text{Dividend (most recent)}}{\text{required return} - \text{annual growth}}$

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

Book value per share : $\dfrac{\text{Total assets} - \text{total liabilities}}{\text{ordinary shares issued}}$

Liquidation value : $\dfrac{\text{Price if assets sold today} - \text{total liabilities}}{\text{ordinary shares issued}}$

Variable growth :

$$P_0 = \frac{D_0 \times (1+g)_{i1}^t}{(1+r_s)^t} + \left[\frac{1}{(1+r_s)^N} \times \frac{D_{N+1}}{r_s - g_2}\right]$$

Study book pg 315 + 316

$\underbrace{\qquad}_{\substack{\text{Present value of} \\ \text{dividends during} \\ \text{initial growth}}}$ $\underbrace{\qquad\qquad}_{\substack{\text{Present value of price of} \\ \text{share at end of initial growth}}}$

Price / Earnings multiples approach :

$\text{Earnings per share} \times \text{P/E ratio for similar firms.}$

Free cash flow valuation model

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

value of company

Perpetuity (infinite I.A) $\dfrac{1}{i}$ and multiply that by PMT to get PV.

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

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

market price = P/E ratio × EPS

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

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

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.
$$P_0 = \dfrac{D_1}{r_s - g}$$

ASSESSMENTS?

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

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

Market to book ratio = $\dfrac{\text{market price per share}}{\text{book value per share}}$

Networking Capital = Total Assets - Total liabilities

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

EPS = market price ÷ P/E Ratio

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

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

Net Profit = EPS × outstanding shares
Total Equity = $\dfrac{\text{Net Profit}}{\text{ROE}}$

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

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

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

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

β = $\dfrac{\text{Required return} - \text{risk free rate}}{\text{Market return} - \text{risk free rate}}$

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