CA INTER – FINANCIAL MANAGEMENT FORMULA SHEET

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Financial Planning and Analysis – Ratio Analysis

LIQUIDITY RATIOS

Current Ratio

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

Quick Ratio

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

Cash Ratio

$$= \frac{\text{Cash \& Bank} + \text{Marketable securities}}{\text{Current Liabilities}}$$

$$= \frac{\text{Cash \& Bank} + \text{Current investments}}{\text{Current Liabilities}}$$

Net Working Capital

= Current Assets – Current Liabilities

CAPITAL STRUCTURE RATIOS

Equity Ratio

$$= \frac{\text{Shareholder's Equity}}{\text{Net Assets}}$$

Debt Ratio

$$= \frac{\text{Total Debt}}{\text{Net Assets}}$$

Debt to Equity Ratio

$$= \frac{\text{Total Outside Liability}}{\text{Shareholder's Equity}}$$

$$= \frac{\text{Total Debt}}{\text{Shareholder's Equity}}$$

$$= \frac{\text{Long term Debt}}{\text{Shareholder's Equity}}$$

Debt to Total Assets

$$= \frac{\text{Total Outside Liability}}{\text{Total Assets}}$$

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

Proprietary Ratio

$$= \frac{\text{Proprietary Fund}}{\text{Total Assets}}$$

COVERAGE RATIOS

Debt Service Coverage Ratio

$$= \frac{\text{Earning available for debt service}}{\text{Interest} + \text{Installments}}$$

Interest Coverage Ratio

$$= \frac{\text{EBIT}}{\text{Interest}}$$

Preference Dividend Coverage Ratio

$$= \frac{\text{Earnings after tax}}{\text{Preference Dividend}}$$

Equity Dividend Coverage Ratio

$$= \frac{\text{EAT} - \text{Preference dividend}}{\text{Equity Dividend}}$$

Fixed Charges Coverage Ratio

$$= \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest} + \text{Repayment of Loan}}$$

TURNOVER (TO) RATIOS

Total Assets TO Ratio

$$= \frac{\text{Sales } *}{\text{Total Assets}}$$

Fixed Assets TO Ratio

$$= \frac{\text{Sales } *}{\text{Fixed Assets}}$$

Capital / Net Assets TO Ratio

$$= \frac{\text{Sales } *}{\text{Net Assets}}$$

Current Assets TO Ratio

$$= \frac{\text{Sales } *}{\text{Current Assets}}$$

Working Capital TO Ratio

$$= \frac{\text{Sales } *}{\text{Working Capital}}$$

Inventory TO Ratio

$$= \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

Raw Material Inventory TO Ratio

$$= \frac{\text{Raw Material Consumed}}{\text{Average Raw Material Stock}}$$

Receivables TO Ratio

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

Receivables Velocity

$$= \frac{\text{Average Account Receivables}}{\text{Average Daily Credit Sales}}$$

$$= \frac{\text{12 months / 52 weeks / 360 days}}{\text{Receivables TO Ratio}}$$

**Use COGS, if Sales not available*

Payable TO Ratio

$$= \frac{\text{Annual Net Credit Purchases}}{\text{Average Accounts Payables}}$$

Payable Velocity

$$= \frac{\text{Average Account Receivables}}{\text{Average Daily Credit Sales}}$$

$$= \frac{\text{12 months / 52 weeks / 360 days}}{\text{Receivables TO Ratio}}$$

PROFITABILITY RATIOS

Gross Profit Ratio

$$= \frac{\text{Gross Profit}}{\text{Sales}} \text{ x 100}$$

Net Profit Ratio

$$= \frac{\text{Net Profit / EAT}}{\text{Sales}} \text{ x 100}$$

Pre-tax Profit Ratio

$$= \frac{\text{EBT}}{\text{Sales}} \text{ x 100}$$

Operating Profit Ratio

$$= \frac{\text{Operating Profit / EBIT}}{\text{Sales}} \text{ x 100}$$

Cost of Goods Sold Ratio (COGS)

$$= \frac{\text{Cost of Goods Sold}}{\text{Sales}} \text{ x 100}$$

Operating Expenses Ratio

$$= \frac{\text{Admin. exp} + \text{Selling \& Dist. OH}}{\text{Sales}} \text{ x 100}$$

Operating Ratio

$$= \frac{\text{COGS} + \text{Operating exp}}{\text{Sales}} \text{ x 100}$$

Financial Expenses Ratio

$$= \frac{\text{Financial exp}}{\text{Sales}} \text{ x 100}$$

OVERALL RETURN ON ASSETS/ INVESTMENTS

Return on Investments

$$= \frac{\text{Return / Profit / Earnings}}{\text{Investment}} \text{ x 100}$$

= Profitability x Investment TO Ratio

Return on Assets

$$= \frac{\text{Net Profit after taxes}}{\text{Average Total Assets}^{\#}} \text{ x 100}$$

#Alternatively, Average Tangible Assets or Avg Fixed Assets can be used

Basic Defense Interval $= \dfrac{\text{Cash and Bank balances} + \text{Net Receivables} + \text{Market Securities}}{\text{Operating Expenses} \div \text{No.of days}}$

Capital Gearing Ratio $= \dfrac{\text{Preference Share Capital} + \text{Debentures} + \text{Other Borrowed funds}}{\text{Equity Share Capital} + \text{Reserves \& Surplus} - \text{Losses}}$

Return on Assets can also be calculated as:

$$= \frac{\text{Net Profit after taxes + Interest}}{\text{Average Total Assets*}} \times 100$$

Return on Total Assets

$$= \frac{\text{EBIT } (1 - t)}{\text{Average Total Assets}} \times 100$$

Return on Net Assets

$$= \frac{\text{EBIT } (1 - t)}{\text{Average Net Assets}} \times 100$$

Return on Capital Employed

$$= \frac{\text{Net Profit after taxes + Interest}}{\text{Capital Employed}} \times 100$$

Pre-tax $= \frac{\text{EBIT}}{\text{Capital Employed}} \times 100$

Post-tax $= \frac{\text{EBIT } (1-t)}{\text{Capital Employed}} \times 100$

Return on Equity

$$= \frac{\text{PAT} - \text{Preference dividend}}{\text{Net worth}} \times 100$$

Profitability / Net Profit margin

$$= \frac{\text{Profit / Net Income}}{\text{Sales / Revenue}}$$

Investment TO Ratio

$$= \frac{\text{Sales / Reveue}}{\text{Investment}}$$

Asset TO Ratio

$$= \frac{\text{Sales / Reveue}}{\text{Assets}}$$

Capital TO Ratio

$$= \frac{\text{Sales / Reveue}}{\text{Capital}}$$

Equity Multiplier

$$= \frac{\text{Investment / Assets / Capital}}{\text{Shareholder's Equity}}$$

<u>RATIOS FROM OWNER's POINT OF VIEW</u>

Earnings per Share (EPS)

$$= \frac{\text{Net profit available to equity holders}}{\text{No. of equity shares outstanding}}$$

Dividend per Share (DPS)

$$= \frac{\text{Total Dividend paid to equity holders}}{\text{No. of equity shares outstanding}}$$

Dividend Pay-out Ratio (DP)

$$= \frac{\text{DPS}}{\text{EPS}}$$

Price-Earnings Ratio (P/E Ratio)

$$= \frac{\text{Market Price per Share (MPS)}}{\text{Earnings per Share (EPS)}}$$

Dividend and Earning Yield

$$= \frac{\text{Dividend } \pm \text{ Change in share price}}{\text{Initial share price}}$$

$$= \frac{\text{Dividend per Share (DPS)}}{\text{Market Price per Share (MPS)}} \times 100$$

Earnings Yield or EP Ratio

$$= \frac{\text{Earnings per Share (EPS)}}{\text{Market Price per Share (MPS)}} \times 100$$

Market Value / Book Value per Share

$$= \frac{\text{Average share price}}{\text{Net worth } \div \text{ No. of equity shares}}$$

$$= \frac{\text{Closing share price}}{\text{Net worth } \div \text{ No. of equity shares}}$$

Q Ratio

$$= \frac{\text{Market Value of equity \& liability}}{\text{Estimated replacement cost of asset}}$$

$$= \frac{\text{Market Value of a Company}}{\text{Assets Replacement Cost}}$$

Cost of Capital

Cost of Irredeemable Debentures

$$k_d = \frac{I}{NP}(1 - t)$$

Cost of Redeemable Debentures

$$k_d = \frac{I\,(1 - t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

If discount on issue or premium on redemption is also tax deductible then,

$$k_d = \frac{I + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}} \; (1 - t)$$

Internal Rate of Return,

$$IRR = L + \frac{NPV_L}{NPV_L - NPV_H}(H - L)$$

Amortised Value of a Debenture

$$V_B = \sum_{t=1}^{n} \frac{C_t}{(1 + k_d)}$$

Where, C = Cash flows
K_d = Interest rate

Cost of Irredeemable Preference Shares

$$k_p = \frac{PD}{P_0}$$

Cost of Redeemable Preference Shares

$$k_p = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

Cost of Equity,

<u>Dividend Price Approach</u>

$$k_e = \frac{D}{P_0}$$

<u>Earnings Price Approach</u>

$$k_e = \frac{E}{P}$$

<u>Growth Approach / Gordon's Model</u>

$$k_e = \frac{D_1}{P_0} + g$$

If floatation cost is incurred

$$k_e = \frac{D_1}{P_0 - F} + g$$

Estimation of Growth rate

(i) Average Method

$$g = \sqrt[n]{\frac{D_0}{D_n}} - 1$$

(ii) Gorden's Growth Model

$$g = b \times r$$

<u>Capital Asset Pricing Model Approach</u>

$K_e = R_f + \beta\,(R_m - R_f)$

Cost of Retained Earnings

<u>Dividend Price Approach</u>

$$k_r = \frac{D}{P}$$

<u>Earnings Price Approach</u>

$$k_r = \frac{EPS}{P}$$

<u>Growth Approach</u>

$$k_r = \frac{D_1}{P_0} + g$$

Also $K_r = K_e\,(1 - t_p)(1 - f)$

Financing Decisions – Capital Structure

Value of the firm, V = S + D

Where, S = Market value of Equity
D = Market value of Debt

Also, $V = \frac{EBIT}{K_O}$

$S = \frac{NI}{K_e}$

Where, K_0 = Overall cost of capital
NI = Earnings available for equity shareholders
K_e = Equity Capitalisation Rate

Modigliani-Miller (MM) Approach

<u>Without tax</u> –

$$V_g = V_u$$

Where, V_g = Value of levered firm
V_u = Value of unlevered firm

$$K_e = K_o + (K_o - K_d)\frac{\text{Debt}}{\text{Equity}}$$

<u>With tax</u> –

$$V_g = V_u + TB$$

Where, TB = Tax benefit

$$K_{eg} = K_{eu} + (K_{eu} - K_d)\frac{\text{Debt}}{\text{Debt + Equity}}$$

Where,
K_{eg} = Cost of equity in a levered Co.
K_{eu} = Cost of equity in an unlevered Co

WACC in a levered company

$K_{og} = K_{eu}\,(1 - tL)$

Where,
K_{eu} = Cost of equity in an unlevered Co
t = tax rate

$$L = \frac{\text{Debt}}{\text{Debt + Equity}}$$

Financial Break-even point

$$= \text{Interest} + \frac{\text{Prefrence dividend}}{1 - \text{tax rate}}$$

Indifference point

$$\frac{(EBIT - I_1)(1 - t)}{E_1} = \frac{(EBIT - I_2)(1 - t)}{E_2}$$

Financial Decisions - Leverages

Degree of Operating Leverages (DOL)

$$= \frac{\%\ \text{change in EBIT}}{\%\ \text{change in Sales}}$$

$$= \frac{\text{Contribution}}{\text{EBIT}}$$

Break-even point

$$\text{in units,} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

Margin of Safety

$$= \frac{\text{Sales} - \text{BEP Sales}}{\text{Sales}} \times 100$$

$$= \frac{\text{EBIT}}{\text{Contribution}}$$

Degree of Financial Leverage (DFL)

$$= \frac{\%\ \text{change in EPS}}{\%\ \text{change in EBIT}}$$

$$= \frac{\text{EBIT}}{\text{EBT}}$$

Combined Leverage

= DOL x DFL

$$= \frac{\%\ \text{change in EPS}}{\%\ \text{change in Sales}}$$

$$= \frac{\text{Contribution}}{\text{EBT}}$$

Investment Decisions

TRADITIONAL CAPITAL BUDGETING TECHNIQUES

Payback Period

$$= \frac{\text{Total initial capital investment}}{\text{Annual expected after tax NCF}}$$

Accounting Rate of Return (ARR)

$$= \frac{\text{Average Annual net income}}{\text{Investment}}$$

TIME ADJUSTED CAPITAL BUDGETING TECHNIQUES

Net Present Value (NPV)

$$= \sum_{t=1}^{n} \frac{C_t}{(1+k)^t} - I$$

Where, C = Cash flows
k = Discount rate
n = Life of the project
I = Investment

Profitability Index (PI)

$$= \frac{\text{Sum of discounted cash in flows}}{\text{Intial cash outlay}^*}$$

*also, total discounted cash outflow

Internal Rate of Return (IRR)

$$= LR + \frac{NPV_L}{NPV_L - NPV_H} \times (HR - LR)$$

$$= LR + \frac{PV_L - CI}{PV_L - PV_H} \times (HR - LR)$$

Dividend Decisions

Growth, g = b x r
Where,
b = Retention ratio
r = Rate of return on investment

MM Approach

Market price of Shares

$$P_0 = \frac{P_1 + D_1}{1 + K_e}$$

Where,
P_1 = Price at the end of the period
D_1 = Dividend at the end of the period
K_e = Cost of equity

Value of the firm

$$V_f \text{ or } nP_0 = \frac{(n + \Delta n)P_1 - I + E}{(1 + K_e)}$$

Where,
n = No. of shares in the beginning
Δn = No. of shares issued
I = Amount required for investment
E = Earnings during the period

Walter's Model

Market price of Shares

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

Where,
E = Earnings per share
D = Dividend per share
r = Internal rate of return

Gordon's Model

Market price

$$P_0 = \frac{E_1(1-b)}{K_e - br} = \frac{D_0(1+g)}{K_e - g}$$

Dividend Discount Model

Intrinsic value of the stock
= Sum of PV of future cash flows
= Sum of PV of Dividends
+ PV of Stock Sale Price

$$= \frac{D_1}{(1+K_e)^1} + \frac{D_2}{(1+K_e)^2} + \cdots + \frac{D_n}{(1+K_e)^n} + \frac{RV_n}{(1+K_e)^n}$$

Graham & Dodd Model

$$\text{Market price, } P = m[D + \frac{E}{3}]$$

Where, m = multiplier

Linter's Model

$D_1 = D_0 + [(E \text{ x Target payout}) - D_0] \text{ x } Af$

Where, AF = Adjustment factor

Management of Working Capital

Unit-1: INTRODUCTION

Working Capital
= Current Assets – Current Liabilities

Operating Cycle
= R + W + F + D – C

Where,
R = Raw material storage period
W = Work-in-progress inventory holding period
F = Finished goods storage period
D = Debtors collection period
C = Credit period allowed by creditors

Raw Material (RM) Storage Period

$$= \frac{\text{Avg stock of RM}}{\text{Avg cost of RM Consumption per day}}$$

Work-in-Progress (WIP) inventory holding period

$$= \frac{\text{Avg WIP inventory}}{\text{Avg cost of Production per day}}$$

Finished Goods (FG) storage period

$$= \frac{\text{Avg stock of FG}}{\text{Avg cost of Goods Sold per day}}$$

Debtors Collection period

$$= \frac{\text{Avg Receivables}}{\text{Avg Credit Sales per day}}$$

Credit period allowed by creditors

$$= \frac{\text{Avg Payables}}{\text{Avg Credit Purchases per day}}$$

Estimation of Current Assets

Raw Materials Inventory

$$= \frac{\text{Estimated production (units)}}{12 \text{ months} / 365 \text{ days}}$$
x Estimated cost per unit
x Average RM storage period

Work-in-Progress Inventory

$$= \frac{\text{Estimated production (units)}}{\text{12 months / 365 days}}$$
x Estimated WIP cost per unit
x Average WIP holding period

Finished Goods

$$= \frac{\text{Estimated production (units)}}{\text{12 months / 365 days}}$$
x Estimated cost of production per unit
x Average FG storage period

Receivables (Debtors)

$$= \frac{\text{Estimated credit sales (units)}}{\text{12 months / 365 days}}$$
x Estimated cost of sales per unit
x Average debtors collection period

Estimation of Current Liabilities

Direst wages =

$$\frac{\text{Estimated labour hours x Wage rate per hour}}{\text{12 months/365 days}}$$

x Average time lag in payment of wages

Trade Payables

$$= \frac{\text{Estimated credit purchases}}{\text{12 months / 365 days}}$$
x Credit period allowed by suppliers

Overheads (OH)

$$= \frac{\text{Estimated Overheads}}{\text{12 months / 360 days}}$$
x Average time lag in payment of OH

Unit-2: TREASURY & CASH MANAGEMENT

Optimum Cash Balance

$$= \sqrt{\frac{2U \times P}{S}}$$

Where,
U = Annual cash disbursement
P = Fixed cost per transaction
S = Opportunity cost of one rupee p.a.

Unit-3: MANAGEMENT OF INVENTORY

Economic Order Quantity

$$= \sqrt{\frac{2A \times O}{C}}$$

Where,
A = Annual demand of inventory
O = Cost per Order
C = Carrying cost per unit p.a.

Unit-4: MANAGEMENT OF RECEIVABLES

Total Fixed Cost

= [Average Cost per unit
– Variable Cost per unit]
x No. of units sold on credit under Present Policy

Opportunity Cost

= Total Cost of Credit Sales
$$\times \frac{\text{Collection period (Days)}}{\text{365 (or 360)}} \times \frac{\text{Required Rate of Return}}{100}$$

Unit-5: MANAGEMENT OF PAYABLES

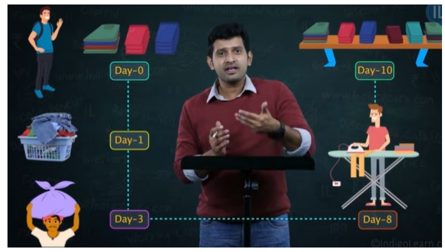
Nominal Cost of Payables

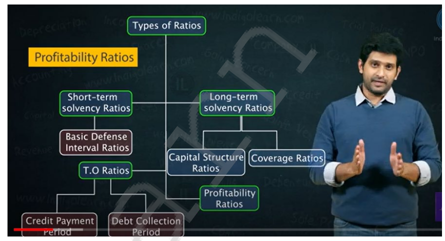
$$= \frac{d}{100 - d} \times \frac{\text{365 days}}{t}$$

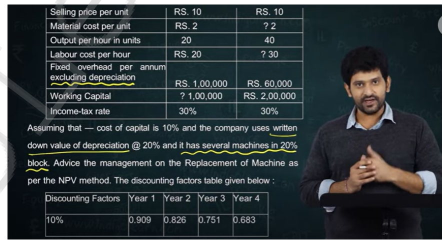
Cost of Lost Cash Discount

$$= \left(\frac{100}{100 - d}\right)^{\frac{365}{t}} - 1$$

Where,
d = rate of discount
t = the reduction in the payment period in days







"VARSHAA M
Thank you so much Aditya sir. I used to hate FM before. But, once I took the classes, FM became my favorite subject. I never got bored listening to the classes. You made it very interesting. What I thought to be the most difficult, you made it so simple and easy. I scored 69 in FM-Eco. Thank you so much sir. Without your classes, it wouldn't have been possible."

"Shwetha Ram
Conceptual clarity, easy & simple way of understanding. Thank you so much sir ! Your videos helped a lot in preparing FM."

"Visnu Prasath
Everything is directly getting into mind easily, very simple ways and easy to get it"

"Suresh Kumar Vishnubhatla
Excellent dwelling explanation with time to time revision of previous teachings and moving forward.Numerous problems seeked from best required sources put together.Good and neat explanation."

"Ajith Kumar
Good teaching Good Mind mapping Techniques Good Quality Clarity Of Voice Quality Video."