Important Formulae: Financial Management (CA - IPCC)

Ratio Analysis

Current Ratio = CA / CL

Quick Ratio or **Liquid Ratio** or **Acid Test Ratio** = QA / QL or QA / CL (QA = CA – Stock – Prapaid Exp.) (QL = CL – Bank OD - CC)

Absolute Liquidity or Cash Ratio = (Cash & Bank +Mkt. Sec.) / CL

Basic Defense Interval = Quick Assets / Cash Expenses per Day

Cash Expense per day = (Operating Cash Expense + Interest + Tax) / 365

Debt Equity Ratio = Debt / Equity (Debt = Long Term Funds & Debentures)) (Equity = (ESC+PSC+R&S))

Equity Ratio = Equity / Equity + Total Debt

Capital Gearing Ratio = Long Term Funds + PSC / Equity Shareholder's Fund

Debt Ratio = Total Debt or TOL / Equity + Total Debt (TOL)

Proprietary Ratio = Equity / Total Assets or Equity / Equity + TOL

OP Ratio	NP Ratio	PV Ratio
=	=	=
Operating Profit / Sales	Net Profit / Sales	Contribution / Sales

EPS = (PAT - Preference Dividend) / No of Equity Shares

Yield = DPS / MPPS * 100 (Dividend Per Share / Market Price Per Share)

MV / BV Ratio = Market Value per Share / Book Value per Share

PE Ratio or Price Earning Ratio = Market Price Per Share / Earning Per Share

Du Pont Chart

ROE = PAT / Sales * Sales / Net Assets * Net Assets / Net Worth (NW)

ROE = Profit Margin * Assets Turnover * Equity Multiplier

Alternative Formula,

ROE = EBIT / Sales * Sales / Net Assets * PAT / EBIT

ROE = Profit Margin * Assets Turnover * Financial Leverage

Note: (Fin. Leverage Formula in Du Pont Chart is different.)

ROI or ROCE	ROE	ROA
=	=	=
PBIT* / Capital Employed	PAT / Equity or NW	PBIT or PAT / Total Assets

CE = Equity + LTL – Non Trade Invt.

Or CE = FA + Trade Invt. + WC

*PBIT = PBIT + Non Trade Expense – Non Trade Income

Ratio Analysis

Dividend Coverage Ratio (CR)

Pref. Div. CR	Div CR	Eq. Div. CR
=	=	=
PAT / Pref. Div	PAT / Pref. Div & Eq. Div	PAT – Pref. Div. / Equity Div.

Interest Coverage Ratio = PBIT / Interest

Debt Service Coverage Ratio (DSCR)

Earnings Available for Debt Service / Debt Service Commitments or PAT + Dep^{n} + Interest / (Interest + Installment)

Turnover Ratios (TR)

RM TR =	WIP TR =	FG TR =
Material Consumed / Avg Stock of RM	Factory Cost / Avg Cost of WIP	COGS / Avg. Stock of FG
Capital TR =	**Fixed Assets TR =**	**WC TR =**
Sales / `Avg. CE	Sales / Avg. Fixed Assets	Sales / Avg. WC
Debtors TR =	**Creditors TR =**	
Sales / Avg. Debtors	Raw Material Purchase or COGS / Avg. Creditors	

Earning Yield = EPS*100 / Market Value per Share

Book Value Per Share = Net Worth-Pref Sh.Cap / No. of Equity Shares

Time Value of Money

Calculation Steps through Calculator:

Discounting of Rs. 1:

PV@10% for 5th yrs (PV_5) → 1.1"÷" 5 times "="

AV @ 10% for 5 yrs (AV_5) → 1.1 "÷" 5times "=" "GT"

(Assumption: The Cash Flow is at the end of year)

Compounding of Rs 1:

Future Value @ 10% for 5thyr **(FV_5)** → 1.1 "*" 4 times "="

(Assumption: The Cash Flow is at the beginning of year)

Future Annuity Value @ 10% for 5 years **(FAV_5)** → 1.1+1*1.1+1*1.1+1*1.1+1*1.1+1

(Assumption: The Cash Flow is at the end of Year)

Future Value of Present Amt (FV_n) = $P_0 (1 + i)^n$ (P_0 = Present Amt, N = No. of Period, I = Interest Rate per)

Future Value of Annuity = $R * \frac{(1+i)^n - 1}{i}$

R = Equal Amt to be received / paid for n period

i = Interest Rate per period

Present Value of Growing Perpetuity = Amount / k – g (k = Discounting Rate, g = Growth Rate)

EMI = Total Principal Amt / AV Factor of the period

Financing Decision

Cost of Irredeemable Debentures/Debt:

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

K_d = Cost of Debt; I = Interest amt; t = Tax rate; NP = Net proceeds/market price

Cost of Redeemable Debentures:

$K_d = \frac{I (1 - t) + \frac{(RV - NP)}{N}}{\frac{(RV + NP)}{2}}$

NP = Net proceeds; RV = Redemption Value; N = No. of Yrs of Redemption

Cost of Irredeemable Preference Shares:

$K_p = \frac{PD}{NP}$

K_p = Cost of Pref. Shares; PD = Preference Dividend; NP = Net proceeds/Mkt. Price

Cost of Redeemable Preference Shares:

$K_e = \frac{PD + \frac{(RV - NP)}{N}}{\frac{(RV + NP)}{2}}$

Kp = Cost of capital; PD = Pref. Dividend; NP = Net Proceeds; RV = Redn Value

Cost of Equity / Retained Earnings:

(a) Dividend Price Approach: $K_e = \frac{D_1}{P_0}$

(b) Earning Price Approach: $K_e = \frac{E_1}{P_0}$

(c) Realized Yield Approach: $K_e = \frac{D_1 + (P_1 - P_0)}{P_0}$

Ke = Cost of equity; D1 = Dividend of year 1; PO = Price of year 0; E1 = Earnings of year 1; P1 = Price of year 1

(d) Capital Asset Pricing Model Approach (CAPM): $K_e = R_f + b (R_m – R_f)$

R_m = Rate of return of Mkt; R_f = Risk free return; b = Beta

(e) DCF (Discounted Cash Flow Method) / Growth Method: $K_e = \frac{D_1}{P_0} + G$ $D_1 = D_0 (1+G)$

(f) Modigillani Miller Approach (Assuming no PSC): $K_e = K_o + \frac{D}{E} (K_o – K_d)$

D = Debt or Loan; E = Equity

Indifference point: (Where EPS of 2 Alternatives are Same)

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

EBIT = Indifference point

E_1 & E_2 = Number of Equity Shares in Alternative 1 & 2

I_1 & I_2 = Interest in Alternative 1 & 2

t = Tax-rate

Overall Cost of Capital $K_o = \frac{(K_d * D) + (K_p * P) + (K_e * E)}{D+P+E}$

E = Equity; D = Debt; P = PSC

Working Capital Management

Tandon Committee: Maximum Permissible Bank Finance =

75% of (CA-CL) or (75% of CA) – CL or {75% of (CA- CCA)} – CL

Method 1 | Method 2 | Method 3

Where, CCA is Core / Permanent Current Assets

Baumol's Economic Order Quantity Model

Cash Deposit = $\frac{2 A O}{C}$ (Optimum cash balance)

A = Annual cash disbursement; O = Fixed cost per transaction.

Working Capital Management

RM Storage Period (In Days) = 365 / Raw Material Turnover Ratio

WIP Holding Period (In Days) = 365 / WIP Turnover Ratio

FG Holding Period (In Months) = 12 / FG Turnover Ratio

Debtor Collection Period (In Weeks) = 52 / Debtor Turnover Ratio

Creditor Payment Period (In Months) = 12 / CreditorsTurnover Ratio

Operating Cycle = (RM+WIP+FG) Storage Period (+) Debtors Collection Period (-) Creditors Payment Period

RM storage Period = Average stock of RM / Avg. cost of RM Consumption/day

Creditors Payment Period = Average A/c Payables / Avg. credit purchase/ day

Debtors Collection Period = Average A/c Receivables / Avg. Credit Sales per day

Finished Goods Storage Period = Average stock of Finished goods / Avg. cost of goods sold per day

Effective Cost of Factoring = (Factoring Commission + Interest) – (Savings on Factoring) / Net amount Received from Factor

Investment Decision

IRR = Base Rate$_{(Min)}$ + Δ in Rate * Δ Desired$_{(Amt)}$ from Base / Δ in Amount

(This is simple unitary method formula, practice IRR Calculation)

ARR (Accounting rate of Return) = Average Annual Net Income / Initial Investment or Average Investment

NPV = PV of Inflow (-) PV of Outflow

Payback period = Total initial capital investment / Annual CFAT and other Annual Inflows

PI = PV of Inflow / PV of Outflow

Leverages

Financial Leverage (FL): EBIT / EBT or EBIT / EBIT - Interest

Alternative Formula:

OL = % Change in EBIT / % Change in Sales or Contribution

FL = % Change in EBT / % Change in EBIT

CL = % Change in EBT or PAT or EPS / Change in Sales %

Operating Leverage (OL): Cont. / EBIT or Contribution / Cont. – Fixed Cost

Combined Leverage (CL): Contribution / EBT or **(OL * FL)**