

FORMULA SHEET

FINANCIAL STATEMENT ANALYSIS (RATIO ANALYSIS)

LIQUIDITY RATIOS	
CURRENT RATIO	<p style="text-align: center;">Current Ratio: $\frac{\text{Current Assets}}{\text{Current liabilities}}$</p> <p>Current assets include cash, current investments, Trade Receivables, inventories (stocks), Short Term loans and advances, and prepaid expenses.</p> <p>Current Liabilities include Trade Payables, Outstanding Expenses, Bank Overdraft, Short Term Loans & Advances.</p>
ACID TEST RATIO/ QUICK RATIO/ LIQUID RATIO	$\frac{\text{Current Assets} - \text{Inventories}}{\text{Current liabilities}}$
CASH RATIO	$\frac{\text{Cash and bank balances} + \text{Current investments}}{\text{Current liabilities}}$
LEVERAGE / SOLVENCY RATIOS	
DEBT EQUITY RATIO	<p>Debt-Equity Ratio = Long Term Debts / Shareholders' Funds</p> <p>where:</p> <p><u>Shareholders' Funds (Equity)</u> = Share capital + Reserves and Surplus + Money received against share warrants + Share application money pending allotment</p> <p>Share Capital = Equity share capital + Preference share capital</p> <p>or</p> <p>Working Capital = Current Assets – Current Liabilities</p>
DEBTTTO CAPITAL EMPLOYED RATIO	<p>Debt to Capital Employed Ratio = Long-term Debt / Capital Employed (or Net Assets)</p> <p>Capital employed is equal to the long-term debt + shareholders' funds.</p>

INTEREST COVERAGE RATIO	$\frac{\text{Profit before interest and taxes}}{\text{Interest on Long term debts}}$
FIXED CHARGES COVERAGE RATIO	$\frac{\text{Profit before interest and taxes} + \text{Depreciation}}{\text{Repayment of loan Interest} + (1 - \text{Tax rate})}$
DEBT SERVICE COVERAGE RATIO	$\frac{\text{Profit after tax} + \text{Depreciation} + \text{Other non} - \text{Interest on term loa}}{\text{Interest} + \text{Lease rentals} + \text{Repayment of term lo}}$
TURNOVER RATIOS	
INVENTORY TURNOVER	$\frac{\text{Cost of goods sold}}{\text{Average inventory}}$ <p>COGS = Opening Stock + Net Purchases – Closing Stock</p> <p>Average Inventory = (Opening Stock + Closing Stock) / 2</p>
DEBTORS TURNOVER	$\frac{\text{Net credit sales}}{\text{Average sundry debtors}}$ <p>Net Credit Sales = Total Sales – Cash Sales</p> <p>Average Sundry Debtors = (Opening + Closing) / 2</p>
FIXED ASSET TURNOVER	$\frac{\text{Net sales}}{\text{Average net fixed assets}}$
TOTAL ASSET TURNOVER	$\frac{\text{Net sales}}{\text{Average total assets}}$
PROFITABILITY RAITOS (%)	
GROSS PROFIT MARGIN	$\frac{\text{Gross profit}}{\text{Net sales}} \times 100$ <p>Gross Profit = Net Sales – COGS</p> <p>Net Sales = Gross Sales – Sales return</p>
EBITDA MARGIN	$\frac{\text{Earnings before interest, taxes, depreciation, and amortisation}}{\text{Net sales}}$

	$\times 100$
NET PROFIT MARGIN	$\frac{\text{Net profit} \times 100}{\text{Net sales}}$
EARNING POWER	$\text{Earning power} = \frac{\text{Profit before interest and tax}}{\text{Average total assets}} \times 100$
RETURN ON CAPITAL EMPLOYED	$\text{ROCE} = \frac{\text{Profit before interest and tax}}{\text{Average total assets}} \times 100$
RETURN ON EQUITY	$\frac{\text{Equity earnings}}{\text{Average equity}} \times 100$

TIME VALUE OF MONEY

PRESENT VALUE OF SINGLE CASH FLOW	$\text{PV} = \frac{\text{Future Value}}{(1+i)^t}$
FUTURE VALUE OF SINGLE CASH FLOW	$\text{FV}^t = \text{PV} * (1+i)^t$
FUTURE VALUE OF ANNUITY	$\text{FVA} = R \frac{(1+i)^t - 1}{i}$
PRESENT VALUE OF ANNUITY	$\text{PVA} = R \frac{(1+i)^t - 1}{i(1+i)^t}$
PRESENT VALUE OF PERPETUITY	$\frac{R}{i}$
	WITH GROWTH:
	$\frac{R}{i - g}$

CAPITAL BUDGETING

PACKBACK PERIOD	UNIFORM CASH FLOW: $\text{Pay Back Period} = \frac{\text{Initial Investment}}{\text{Annual cash flows}}$
AVERAGE RATE OF RETURN	$\text{ARR} = \frac{\text{Average net income after taxes}}{\text{Average investment}} \times 100$

NET PRESENT VALUE	NPV = Sum of Discounted Cash Inflows - Discounted Cash Outflows
PROFITABILITY INDEX	$\text{Profitability index} = \frac{PV \text{ of Future cash flows}}{\text{Initial cash investment}}$

CAPITAL STRUCTURE

CAPITAL STRUCTURE THEORIES (NI & NOI)	<p>Value of Firm = $\frac{EBIT}{K_o}$</p> <p>Total Value of Firm = Value of Debt + Market Value of Equity</p> <p>Value of Equity = $\frac{EBIT - \text{Interest}}{K_e}$</p>
OVERALL COST OF CAPITAL (WACC)	$K_o = K_d \times \frac{D}{(D + E)} + K_e \times \frac{E}{(D + E)}$
MM APPROACH	$V_l = V_u = \frac{EBIT}{K_{ol}} = \frac{EBIT}{K_{ou}}$
OPERATING LEVERAGE	<p>Operating Leverage = $\frac{\text{Contribution}}{\text{Operating Profit (EBIT)}}$</p> <p>Degree of OL = $\frac{\% \text{ change in EBIT}}{\% \text{ Change in Sales}}$</p>
FINANCIAL LEVERAGE	<p>Financial Leverage = $\frac{\text{Operating Profit (EBIT)}}{\text{Profit Before Tax}}$</p> <p>Degree of FL = $\frac{\% \text{ change in EPS}}{\% \text{ Change in EBIT}}$</p>
COMBINED LEVERAGE	<p>DCL = DOL × DFL = $\frac{\text{Contribution}}{EBIT} \times \frac{EBIT}{PBT} = \frac{\text{Contribution}}{PBT}$</p> <p>Degree of CL = $\frac{\% \text{ change in EPS}}{\% \text{ Change in Sales}}$</p>
WORKING CAPITAL LEVERAGE	Working Capital Leverage = $\frac{CA}{TA + \Delta CA}$

FINANCIAL BREAK-EVEN POINT	$FBP = Interest + \frac{Preference\ Dividend}{1 - t}$
INDIFFERENCE POINT	$\frac{(EBIT - Interest)(1 - t) - PD(1 + t)}{No.\ of\ equity\ shares\ in\ Plan\ A}$ $= \frac{(EBIT - Interest)(1 - t) - PD(1 + t)}{No.\ of\ equity\ shares\ in\ Plan\ B}$

COST OF CAPITAL

IRREDEEMABLE DEBT	$K_d \text{ after taxes} = K_d (1 - \text{tax rate})$
REDEEMABLE DEBT	$K_d = \frac{I(1 - t) + (RV - NP)/n}{\left(\frac{RV + NP}{2}\right)} \times 100$
IRREDEEMABLE PREFERENCE SHARES	$K_p \text{ (cost of pref. share)}$ $= \frac{\text{Annual dividend of preference shares}}{\text{Market price of the preference stock}}$
REDEEMABLE PREFERENCE SHARES	$K_p = \frac{PD + \left(\frac{RV - NP}{n}\right)}{\left(\frac{RV + NP}{2}\right)} \times 100$
COST OF EQUITY	<p><u>CAPM:</u> $K_e = R_f + \beta (R_m - R_f)$</p> <p><u>DIVIDEND YIELD:</u> $C_e(\text{after tax}) = \frac{DPS}{MP} \times 100$</p> <p><u>EARNINGS YIELD:</u> $C_e(\text{after tax}) = \frac{DPS}{MP} \times 100$</p> <p><u>DIVIDEND GROWTH:</u> $C_e(\text{After tax}) = \left(\frac{DPS}{MP(\text{or } NP)} \times 100\right) + G$</p>

COST OF NEWLY ISSUED EQUITY SHARES	$C_e(\text{After - tax})$ $= \frac{EPS}{NP}$ $\times 100 \text{ or } \left(\frac{DPS}{MP} \times 100\right) \text{ or } \left(\frac{DPS}{NP} \times 100\right) + G$
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DIVIDEND POLICY

WALTER FORMULA	$P = \frac{D + \frac{r}{k}(E - D)}{k}$
GORDON FORMULA	$P = \frac{E(1 - b)}{k_e - br}$
MM MODEL	$P_0 = \frac{1}{1+r} (D_1 + P_1)$
DIVIDEND PAYOUT	$\text{Dividend Payout Ratio} = \left(\frac{\text{Total Dividends}}{\text{Net Income}}\right) \times 100$ <p>DIVIDEND PAYOUT = 1 - RETENTION</p>
RETENTION RATIO	$\text{Retention Ratio} = \frac{\text{Net Income} - \text{Dividends}}{\text{Net Income}} \times 100$ <p>RETENTION RATIO = 1 - DIVIDEND PAYOUT</p>

WORKING CAPITAL MANAGEMENT

OPERATING CYCLE	R + W + F + D - C
R (RAW MATERIAL HOLDING PERIOD)	$r = \frac{\text{Average inventory of raw materials and stores}}{\text{Average per day consumption of raw materials and stores}}$
C (CREDITORS PERIOD)	$c = \frac{\text{Average trade creditors}}{\text{Average cost of production per day}}$
W (WIP PERIOD)	$w = \frac{\text{Average work - in - progress}}{\text{Average cost of production per day}}$

F (FINISHED GOODS HOLDING)	$f = \frac{\text{Average inventory of Finished goods}}{\text{Average cost of sales per day}}$
D (DEBTORS COLLECTION)	$D = \frac{\text{Average book debts}}{\text{Average credit sales per day}}$
BAUMOL'S CASH MANAGEMENT MODEL	$C = \sqrt{\frac{2A \times F}{O}}$ <p>where, C = Optimum cash balance A = Annual (or monthly) cash disbursements F = Fixed cost per transaction O = Opportunity cost of holding cash</p>
MILLER ORR MODEL CASH MANAGEMENT	$z = \sqrt[3]{\frac{3b\sigma^2}{4i}}$ <p>Where, b = fixed cost associated with a security transaction σ^2 = variance of daily net cash flows i = interest rate per day on marketable securities.</p> <p>The optimal value of h is simply 3z. Upper Limit = Lower Limit + 3z Return Point = Lower Limit + z or = Upper Limit - 2z Average Cash Balance = Lower Limit + z</p>
VARIOUS LEVEL OF INVENTORY MANAGEMENT	<p>Minimum Stock Level = Re-order Level - (Normal Consumption x Normal re-order Period)</p> <p>Re-ordering Level = Maximum Consumption x Maximum Re-order period</p> <p>Maximum stock level = Re-ordering Level + Re-ordering Quantity - (Minimum Consumption x Minimum Re-ordering period)</p> <p>Average Stock Level = Minimum Stock Level + 1/2 of re-ordering quantity</p>

	<p>OR</p> <p>Average Stock Level = Minimum Stock Level + Maximum Stock Level</p> <p>Danger Level = Average Consumption x Maximum re-ordering period for emergency purchases</p>
ECONOMIC ORDER QUANTITY	$EOQ = \sqrt{\frac{2 \times R \times C_p}{C_H}}$ <p>Where R = Annual quantity used (in units) CP = Cost of placing an order / ordering cost per order CH = Cost of holding one unit / Inventory carrying cost of one unit / carrying cost of one unit per year</p>

SECURITY ANALYSIS

PRICE EARNING RATIO	<p>P/E = Stock Price Per Share / Earnings Per Share (or) P/E = Market Capitalization / Total Net Earnings (or) Justified P/E = Dividend Payout Ratio / R – G</p>
PRICE TO BOOK VALUE RATIO	$P/B \text{ Ratio} = \frac{\text{Market Price per Share}}{\text{Book Value per Share}}$
PRICE TO SALES RATIO	$P/S \text{ Ratio} = \frac{MVS}{SPS}$ <p>Where: MVS = Market Value per Share SPS = Sales per Share</p>
PRICE TO CASH FLOW RATIO	$\text{Price – to – Cash Flow Ratio} = \frac{\text{Share Price}}{\text{Operating Cash Flow per Share}}$
PRICE TO EARNINGS GROWTH RATIO	$PEG \text{ Ratio} = \frac{\text{Price/EPS}}{\text{EPS Growth}}$

HOLDING PERIOD RETURN	<p>Holding Period Return = $\frac{\text{Income} + (\text{End of Period Value} - \text{Initial Value})}{\text{Initial Value}}$</p> <p>Annualized HPR = $(\text{HPR} + 1)^{1/n} - 1$</p>
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OPERATIONAL APPROACH TO FINANCIAL DECISION

BASIC	<p>Contribution = Sales – Variable Cost Contribution = Fixed Cost + Profit Fixed Cost = Contribution – Profit</p> <p>Selling Price * Selling Quantity = Sales Value Selling Price = Sales Value / Sales Quantity Sales Quantity = Sales Value / Selling price</p>
BREAK EVEN POINT	<p>$Break - Even\ point\ (unit) = \frac{Fixed\ cost}{Contribution\ per\ unit}$</p> <p>Break-Even point(₹) = $\frac{Fixed\ cost}{P/V\ ratio}$</p> <p>or = Break – even units × Selling price p.u.</p>
P/V RATIO	<p>$P/V\ ratio = \frac{Contribution}{Sales} \times 100$</p>
DESIRED SALES	<p>$Desired\ sales\ (Rs.) = \frac{Fixed\ cost + Desired\ profit}{p/v\ ratio}$</p> <p>$Desired\ sales\ (Units) = \frac{Fixed\ cost + Desired\ profit}{Contribution\ per\ unit}$</p>
MARGIN OF SAFETY	<p>Margin of Safety = Actual Sales – Break- Even Sales</p> <p>Or = Profit / PV ratio</p> <p>Or = Profit * Selling price p.u / Contribution p.u</p> <p>Margin of Safety as % of Total Sales = $\frac{\text{Margin of Safety}}{\text{Total Sales}} * 100$</p>

CHANGE FORMULA	<p>PV Ratio = Change in Profit / Change in sales * 100</p> <p>VC Ratio = Change in Total Cost / Change in Sales *100</p>
OTHERS	<p>Break Even Sales(%) + Margin of Safety (%) = 100%</p> <p>BES(%) = 100% - MOS(%)</p> <p>MOS(%) = 100% - BES (%)</p> <p>VC% + PV% = 100%</p> <p>VC% = 100% - PV%</p> <p>PV% = 100% - VC%</p>