FINANCIAL ANALYSIS AND PLANNING - RATIO ANALYSIS

Classification of Ratios

1. Liquidity Ratio / Short term solvency Ratio
2. Solvency Ratio / Leverage Ratios / Long term solvency ratio.
3. Activity / Efficiency / Performance / T/o ratio.
4. Profitability ratio.

I) Liquidity Ratio:

- Liquidity / short term solvency } means ability of the business to pay short term liabilities.

- Types of liquidity ratios:
  1. current Ratio
  2. Quick Ratio / Acid test ratio
  3. cash Ratio / Absolute Liquidity Ratio
  4. Basic Defence Interval or Interval Measure Ratio
  5. Net working capital Ratio.

Period : < 1 yr.

Current ratio :

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

Current Asset = Inventories + Sundry Debtors + Cash & Bank bal. + Receivables / Accruals + Loan & Advances + Disposable Investments + Any other current assets.

Current Liabilities = Creditors for goods & services + short term loans + Bank overdraft + cash credit + o/s expenses + provision for taxation + proposed dividend + unclaimed dividend + any other current liability.

Note: Prov. for Doubtful Debt is to be reduced from Sundry Drs.

Ideal ratio = 2:1

C.A

cash & bank bal

Sundry Debtors

Inventory

Marketable securities

short term loan & Advances

other current assets
- ↳ prepaid exp
- ↳ adv. tax

Q)1 . From following info , calculate current ratio:

Particulars	₹	Particulars	₹
Trade payables	70,000	Inventories	95,000
Advance tax	4000	Trade Receivables	3,40,000
short term borrowing	10,000	current Investment	10,000
Accrued Incomes	2000	Provision for doubtful debts	30,000
Other current liabilities	20,000	Cash & cash eq.	10,000
Short term provisions	1,20,000	Short term loans & advances	4000
Prepaid Exp	5,000		

Soln :

~~C.A = 95000 + (3,40,000 - 30,000) + 10,000 + 30,000~~

current Assets :

Adv tax	4,000
Accrued Income	2,000
Prepaid expn	5000
Inventories	95,000
Trade Receivables (3,40,000 - 30,000)	3,10,000
current Inv.	10,000
Cash & cash eqn	10,000
Short term loans & advances	4000
	4,40,000

Current Liabilities

Trade payables	70,000
Short term borrowings	10,000
Other C.L	20,000
Short term provisions	1,20,000
	2,20,000

$$\text{Current ratio} = \frac{\text{C.A}}{\text{C.L}} = \frac{4,40,000}{2,20,000} = \frac{2}{1}$$

Quick ratio :

Period : 1/2/3 months
⇒ cash

$$\text{Quick ratio} = \frac{\text{Quick Assets}}{\text{current liabilities}}$$

Also use liquid liabilities

Quick asset ⇒ assets which are quickly convertible to cash.

Quick assets = Current Assets − Inventory − Prepaid Expenses.

Ideal ratio = 1 : 1

Note: Prov. for doubtful debt is to be ~~repair~~ substracted from total amount of Sundry Debtor.

Eg : C.A = 4,40,000 — Calculate Quick ratio

Inventory 95000

Prepaid exp 5000

C.L 3,40,000

Trade payables 20,000

→ Quick ratio = $\frac{\text{Current Asset} - \text{Inv} - \text{Prepaid exp}}{\text{C.L}}$

$= \frac{3,40,000}{3,40,000}$

$= 1:1$

If simply 'current liability' is mentioned then it includes trade payables.

liq liability => current liabilities (-) Bank OD (-) Cash credit.

~~C.A~~

within
Period → 1/2/3/4 days
↳ cash

Cash ratio / Absolute liquidity ratio

Immediately to cash.

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

Basic Defense Interval / Interval Measure

C&B Bal + Marketable securities + Net Receivables
or

$$\text{Basic Defense Interval} = \frac{\text{Current Asset} - \text{Prepaid Exp} - \text{Inventories}}{\text{Daily Operating Expenses}}$$

$$\text{Daily operating expenses} = \frac{\text{Operating expenses}}{360}$$

- COGS
- (+) S&D expn
- (-) Depreciation
- (-) Other non-cash expenditure

Net working capital

Net working capital = C.A − C.L [exclude short term bank borrowing]

II) Long term Solvency Ratio | Leverage or Solvency Ratio (Period > 1yr)

* Debt ⇒ Money borrowed from outsiders + Invested in business
* Equity ⇒ own funds invested in business.

1) Debt:

→ Borrowed funds / Loan funds

→ (1) Debentures + Long term loans from Bank & FI etc.

→ (2) Total Debt − C.L

→ (3) Capital employed − Equity
[Total amnt invested in business]
Equity + Debt

2) Equity:

→ Net worth / shareholders funds / owners funds / own fund

→ (1) Equity share capital xxx
(+) P.S Capital xxx
Total share capital xxx
(→) Accumulated losses (xxx)
Equity xxx

3) Equity shareholders funds:

Share capital

ES capital + PS capital = Equity

Total equity − PS capital = ES capital

4) Total funds

→ capital employed = Debt + Equity
or
→ Long term funds
→ Investment

Leverage Ratios

Capital structure Ratio

1. Equity ratio
2. Debt ratio
3. Debt to Equity ratio
4. Debt to total assets ratio
5. Capital gearing ratio
6. Proprietary Ratio

Coverage Ratio

1. Debt - service Coverage ratio
2. Interest coverage ratio
3. Preference Dividend Coverage ratio
4. Fixed charges Coverage ratio

B/sheet

Capital Employed: Equity	ESC	xx		F.A	xx
	PSC	xx			xx
	Reserves & surplus.			Other non-current asset	xx
Debt	Debentures	xx			
	Long term prov	xx		Current asset	xx
Current liabilities	Sundry Crs	xx			
	other current liabilities	xx			
		xx			xx

Equity + Debt = Total Debt

Non Current Asset

Current Asset

I] CAPITAL STRUCTURE RATIO

1] Debt ratio

Debt ratio > 1 => • assets funded by debt
• risky scenario.

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

$$\frac{\text{Long term borrowings} + \text{Long term provisions}}{\text{Debt} + \text{Equity}}$$

2] Equity ratio

$$\frac{\text{Equity}}{\text{Net Assets}}$$

$$\frac{\text{ESC} + \text{PSC} + \text{Reserves \& surplus}}{\text{Net Assets}}$$

Higher the proportion of owner's fund, lower is the degree of risk for potential lenders.

3] Debt Equity ratio

$$\frac{\text{Debt}}{\text{Equity}}$$

- ★ High debt to equity ratio ⇒ less protection for creditors
- ★ Low ratio ⇒ wider safety cushion
- ★ used for making capital structure decisions such as issue of shares and/or debentures.
- ★ Debt equity ratio is the indicator of firm's financial leverage.

eg: $\frac{4}{1}$ → not a good sign of health of business

$\frac{1}{1}$ → very good health of business

eg: (1)

ESC	-	1,50,000
PSC	-	1,00,000
R&S	-	1,50,000
Long term Borrowings	-	6,00,000
Long term provisions	-	2,00,000

Calculate Debt Equity ratio.

→ Debt = LTB + LTP

= 6,00,000 + 2,00,000 = 8,00,000

Equity = ESC + PSC + RBS

= 1,50,000 + 1,00,000 + 1,50,000 = 4,00,000

Debt Equity Ratio = $\frac{\text{Debt}}{\text{Equity}}$ = $\frac{8,00,000}{400,000}$ = $\frac{2}{1}$ =

eg (2) :

Current ratio = 3:1

Net Working Capital = ₹ 2,00,000

Total assets = ₹ 3,50,000

Total Debt = ₹ 3,00,000

Calculate Debt Equity ratio.

Soln :-

$CR = \frac{CA}{CL} = \frac{3}{1}$

C.A = 3X C.L — (1)

N.W.C = CA − CL

2,00,000 = 3CL − CL — (2)

2,00,000 = 2CL

CL = ₹ 1,00,000

C.A = ₹ 3,00,000

TD = Debt + C.L

Debt = TD − CL = 3,00,000 − 1,000

= 2,00,000

Equity = T.A − T.D

= 3,50,000 − 3,00,000

= ₹ 50,000

Debt Equity ratio = $\frac{D}{E} = \frac{2,00,000}{50,000} = 4:1$

Calculation of proprietor's funds [or SH's funds]

Particulars	₹
Method (1)	
A. SC (ESC + PSC)	xx
B. (+) R&S	xx
C. Proprietors funds (A+B)	xx
Method (2)	
A. ESC	xx
B. + PSC	xx
C. + R&S	xx
D. Proprietors' funds (A+B+C)	xx

Particulars	₹
Method (4)	
A. Non-Current asset	xx
B. (+) Current asset	xx
C. (−) Current Liabilities	(xx)
D (−) Non C.L	(xx)
E. Proprietors funds	xx
Method (5)	
A. Non-Current Assets	xx
B (+) Working capital	xx
C (−) Non. C.L	(xx)
D Proprietors funds	xx

Method (3)

A	Capital employed	xx
B (-)	Non-current liabilities (or Debt)	(xx)
C	Proprietors' funds	xx

Method (6)

A	Total assets	xx
B (-)	Total Debts [current + Non current]	(xx)
C	Proprietors' funds	xx

4] Capital Gearing ratio.

$$\frac{\text{PSC + Debt}}{\text{ESH's funds}}$$

ESH's funds:
- ESC
- (+) R&S

* It shows the portion of fixed charge (Dividend / Interest) Bearing capital to ESH's funds.

5] Proprietary Ratio

$$\frac{\text{Proprietary fund}}{\text{Total Assets}}$$

Proprietary fund:
- ESC
- (+) PSC
- (+) R&S

Total Assets:
- Non C.A
- (+) C.A.

exclude
- ✓ fictitious asset
- ✓ losses.

* shows extent of owners funds utilized in financing assets of business

Calculation of total assets

Method (1)

Value - Depn

Non · C·A (Net F·A) + Non Current Inv + Long term loans & Adv)

(+) C·A

Total Asset

Method (2)

Shareholder's funds

(+) Non. C·L· (eg: LTB , LT Provisions)

(+) C·L

Total Assets.

Method (3)

Shareholder's funds

(+) Total Debts [Non. Current & Current)

Total Asset

Method (4)

Capital Employed

(+) C·L

Total Assets.

6] Debt to total assets ratio

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

II] COVERAGE RATIO.

✓ Ability to serve fixed liabilities.

↓

(1) Long term liabilities.

(2) F.L

Debt

Pref. Dividend

Interest + Principal

Income Statement

	Sales Revenue	xx
(-)	Expenses on operations	(xx)
	Earnings before Int & Tax (EBIT)	xx
(-)	Int. on LT Debt	(xxx)
	Earnings Before tax (EBT)	xx
(-)	Tax	(xx)
	Earnings after tax (EAT)	xx

xx — SH's — Pref / Equity.

	EAT	xx
(-)	Pref. Dividend	(xx)
	ESH's	xx

1] Debt service Coverage Ratio

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

$$\frac{\text{EBIT}}{\text{Int.} + \text{Installments}}$$

$$\frac{\text{EAT} + \text{tax} + \text{Int}}{\text{Int} + \text{Installments}}$$

$$\frac{\text{EAT} + \text{Depn} + \text{Interest} + \text{Non-operating exp}}{\text{Int} + \text{Installments}}$$

1.5 to 2 → satisfactory

2] Interest Coverage Ratio

$$\frac{EBIT}{Int.}$$

→ Indicate Firm's liability to meet interest obligations

3] Preference Dividend Coverage Ratio

$$\frac{EAT}{Pref.\ Dividend.}$$

→ Indicate margin of safety available to PSHs.

4] Fixed Charges Coverage Ratio

Interest Installment

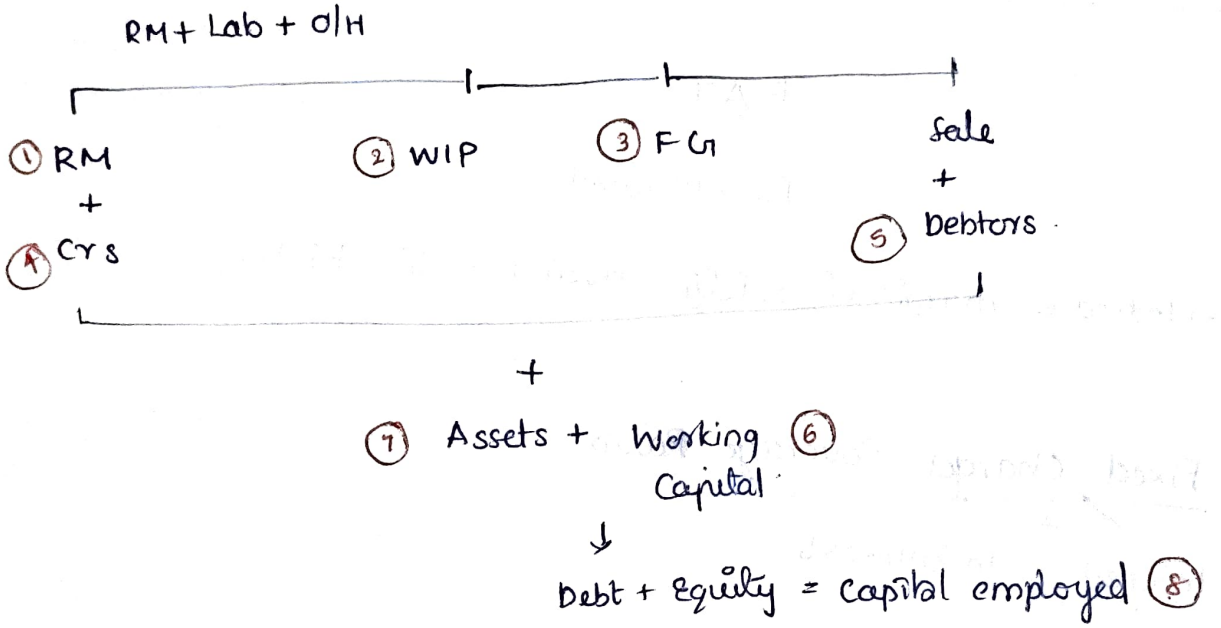
$$\frac{EBIT + Depn.}{Interest + \frac{Installment}{1 - tax\ rate}}$$

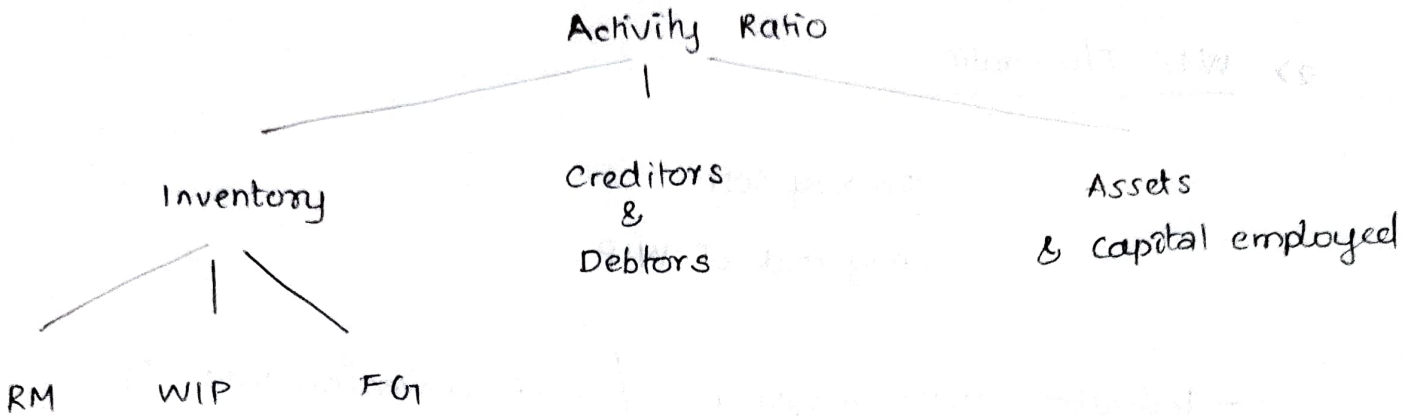
5] Equity Dividend coverage Ratio

$$\frac{EAT - Pref.\ Dividend}{Equity\ Dividend}$$

III) ACTIVITY RATIOS / EFFICIENCY RATIOS / PERFORMANCE RATIOS / TURNOVER RATIO

Business activity / operations.





I) R INVENTORY

1) Raw material T/o ratios

$$\frac{\text{Cost of RM consumed}^*}{\text{Avg stock of RM}^*}$$

* Cost of RM consumed = opg stock + pur − clg stock
* Avg stock of RM = $\frac{\text{opg + clg stock}}{2}$

Note: If opg stock not given, then take only closing stock and give a note.

2> WIP T/o ratio

$$\frac{\text{Factory cost}}{\text{Avg stock of WIP}}$$

- Indicates WIP movement / WIP conversion into FG.

→ ↑ ratio better is the rate of conversion of WIP into FG.

★ Factory cost = RM consumed + Wages + Overheads.

★ Avg stock of WIP = $\frac{\text{opg stock} + \text{clg stock}}{2}$

3> FG T/o ratio / Inventory / Stock T/o ratio

$$\frac{\text{COGS}}{\text{Avg stock of FG}}$$

★ Indicates how fast Inventory is used or sold

★ ↑ ratio : good ✓

★ ~~COGS~~ Avg = $\frac{\text{opg} + \text{clg}}{2}$

★ COGS :

→ Manfachurer of goods : → POV:

opg stock of FG + Cost of Prodⁿ − clg stock of FG

→ Trader :- POV:

opg + cost of goods purchased − clg stock of FG

II) CREDITORS / DEBTORS

4) Debtors T/o Ratio (Receivables) T/o Ratio

$$\frac{\text{Credit sale}}{\text{Avg. accounts receivables}}$$

Credit sale = Total Sales − Cash sale − Sales Return

Avg accounts receivables = $\frac{\text{opg bal} + \text{clg bal}}{2}$

High ratio → collections made rapidly.

5) Creditors T/o Ratio (Payable) T/o ratio

$$\frac{\text{Credit purchases}}{\text{Avg account payables.}}$$

- Indicates speed of payment to Crs.
- Credit Purchase = Total purchase − Cash purchase − Purchase Return
- Avg account payable [Crs + Bill payable] = $\frac{\text{opg bal} + \text{clg bal}}{2}$

Receivables (Debtors) Velocity / Average collection period

$$\frac{\text{Average accounts receivables}}{\text{Average daily credit sales}}$$

or

$$\frac{\text{12 months / 52 weeks / 360 days}}{\text{Receivable T/o ratio}}$$

* Avg. daily credit sales = $\frac{\text{Credit sales}}{\text{No: of days in year [say 360]}}$

Payables ~~T/o~~ Velocity / Average payment period

$$\frac{\text{Average accounts Payable}}{\text{Average daily credit purchases}}$$

or

$$\frac{\text{12 months / 52 weeks / 360 days}}{\text{Payable T/o ratio}}$$

III ASSETS & WORKING CAPITAL

6) Working capital T/o ratio

- operating t/o ratio
- cash T/o Ratio

$$\frac{\text{Sales / COGS}}{\text{Net working capital} \rightarrow (C.A - C.L) \text{ or } \left(\frac{\text{opg WC} + \text{clg WC}}{2}\right)}$$

↳ Ability to generate sales per rupee of working capital

↳ High ratio ⟶ more efficient is utilisation of WC in generating sales

7) Fixed Assets Turnover Ratio

$$\frac{\text{Sales / COGS}}{\text{Net Fixed Assets.}}$$

* high ratio → indicate efficient utilisation of F.A in generating sales.

Net F.A = F.A (-) depreciation

8) Capital Turnover Ratio / Net Asset Turnover Ratio

Capital → money invested to run a business.
(Debt + Equity ⇒ capital employed)

$$\frac{\text{Sales / COGS}}{\text{capital employed}}$$

or

$$\frac{\text{sales / COGS}}{\text{Net assets}}$$

* firm's ability of generating sales / COGS per rupee of long term investment.

9) Current Assets Turnover Ratio

$$\frac{\text{Sales / COGS}}{\text{current Assets}}$$

IV PROFITABILITY RATIO

→ measure the profitability / operational efficiency.
→ reflect the final results of business operations.

Trading & P&L a/c

opg stock	xxx	Sales	xxx
Purchases	xxx	clg stock	xxx
Direct exp	xxx		
gross profit	xxx		xxx
	xxx		
Exps.	xx	gross profit	xx
	xxx	other income	xx
Net profit			xxx
	xxx		

Net Profit (-) Tax = Earnings.

Profitability Ratios (Always represented as %)

- Sales
- Over all Return on Assets & Investments
- Owner's point of view.

I) SALES

1) Gross profit ratio

$$\frac{\text{Gross profit}}{\text{Sales}} \times 100$$

→ Indicator of basic profitability.

2) Net profit ratio

$$\frac{\text{Net profit}}{\text{Sales}} \times 100$$

or

$$\frac{\text{EAT}}{\text{Sales}} \times 100$$

[Choose (1) Net profit or (2) EAT depending upon info given in Q]

→ Indicator of overall profitability of business.

→ Sales ⇒ Sales - Sales Return

3) operating profit ratio.

$$\frac{\text{Operating profit}}{\text{Sales}} \times 100$$

or

$$\frac{\text{Earnings before interest \& taxes (EBIT)}}{\text{Sales.}} \times 100$$

* operating profit ⇒ Any profit earned from operations of business.

operating profit ⇒

	Net profit as per P&L a/c.	xxx
(+)	Non operating Exp (eg: Loss on sale of F.A)	xxx
(−)	Non operating Income (eg: Profit on sale of F.A)	xxx
	operating profit.	xx

operating profit = Sales − COGS − operating expenses.

4) Expenses Ratio

$$\text{COGS Ratio} = \frac{\text{COGS}}{\text{Sales}} \times 100$$

$$\text{Operating expenses ratio} = \frac{\text{Admin. Exp.} + \text{S\&D OH}}{\text{Sales}} \times 100$$

$$\text{Operating ratio} = \frac{\text{COGS} + \text{Operating exp}}{\text{sales}} \times 100$$

$$\left.\begin{matrix}\text{Financial Expenses} \\ \text{Ratio}\end{matrix}\right\} = \frac{\text{Financial exp}^{*}}{\text{Sales}} \times 100.$$

* → exclude taxes, loss due to theft, goods destroyed by fire etc..

II) PROFITABILITY RATIOS ON THE BASIS OF OVERALL RETURN ON ASSETS & INVESTMENT

Income / Profit statement

Sales / Revenue	xxx
(-) Operating expenses	(xxx)
Earnings before interest & tax (EBIT)	xxx
(-) Interest on long term borrowings	(xxx)
Earnings before tax (EBT)	xxx
(-) Tax @ 30%	(xxx)
Earnings after tax (EAT)	xxx
(-) Preference dividend	(xxx)
Earnings for ESH's	xxx

(A) RETURN ON INVESTMENT ← ROA, ROCE, ROE

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

or

$$= \frac{\text{Return / Profit / Earnings}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Investment}}$$

or

= Profitability ratio × Investment T/o ratio

→ % of return on funds invested in the business by its owners.

(i) Return on Assets (ROA)

Return generated per rupee investment in asset

Asset

- Total Asset
  - ★ Total of asset side of BS
- Tangible asset
  - ★ Assets which can be seen & touched
  - ex: P&M, L&B
- Fixed asset
  - ★ P&M, L&B
  - Current assets - X

★ Fictitious assets are not to be considered:
— Preliminary exp, Adv Tax, Misc Exp

Return

Pre. tax

EBT + Interest

EBIT

Post. tax

EAT + Interest

EBIT (1 - tax)

Return on Total assets = $\frac{\text{EBIT / EBIT (1 - tax)}}{\text{Total assets / tangible assets / fixed assets}} \times 100$

(ii) Return on capital employed (ROCE)

$\frac{\text{Return}}{\text{capital employed}} \times 100$

* capital employed → Debt + Equity
* non operating assets are to be excluded.
  - ↳ eg: Trade Investment.

iii) Return on Equity

Own funds invested in business.

$$\frac{\text{Profit after tax (EAT)}}{\text{Equity}} \times 100$$

* Equity = ESC + R&S + Pref. SC − Accumulated losses

* Equity shareholder's funds = Equity − PSC

Return on equity shareholders funds

$$= \frac{\text{EAT} - \text{Preference Dividend}}{\text{Eq. Shareholder's funds.}}$$

Du Pont Analysis

Du Pont analysis is an extended analysis of a company's return on equity. It concludes that a company can earn a high return on equity if it:

Earns a high net profit margin	Uses its assets effectively to generate more sales	Has a high financial leverage.
Net profit / Sales	Sales / Assets.	Investment / Asset SH & equity.

* Financial Leverage.

I) own funds = 5,00,000

II) own funds + Debt = 5,00,000 + 10,00,000

Profit / Earning = 1,00,000

Profit = 3,00,000
(-) Cost = 1,00,000
(e.g.: interest on debt)
= 2,00,000

leverage =

* Rate of interest on debt should be less than the rate of earning

III PROFITABILITY RATIO FROM OWNER'S POV :

1) Earning per share (EPS)

2) Earnings available for SH

$$\frac{\text{EAT} - \text{Pref Dividend}}{\text{No: of Equity shares}}$$

Higher ratio ⇒ better it is

2) Dividend per share (DPS)

$$\frac{\text{Profit distributed as equity dividend}}{\text{No: of Equity shares}}$$

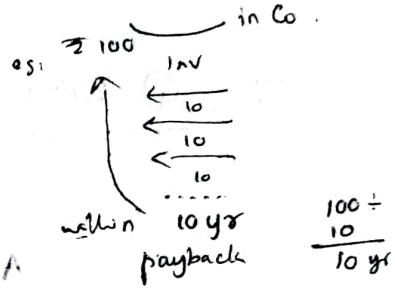
Higher ratio ⇒ better it is

3> Dividend Payout Ratio.

$$\frac{DPS}{EPS}$$

4> Price earning ratio

$$\frac{\text{Market Price of share}}{EPS}$$



→ Payback period for your Investment.

5> Earning Yield / Dividend Yield

1 share — Market price - ₹100
— Earnings. - ₹10
— Dividend - ₹5

$$\text{Earning yield} = \frac{EPS}{\text{Market price}} \times 100.$$

$$\text{Dividend yield} = \frac{DPS}{\text{Market price}} \times 100$$

6) Market response ratio / Market value - Book values ratio

$$\frac{\text{Market value per share}}{\text{Book value per share}} =$$

7) Q Ratio

Asset - ₹5,00,000 MV = 1,50,000

desire to replace : Replacement cost = 2,00,000

MV < Replacement cost

Hence, no benefit on replacing it.

$$\text{Q Ratio} = \frac{\text{Market value of all assets}}{\text{Replacement cost of assets.}}$$