RATIO ANALYSIS
Topics to be Enlightened...

- Introduction and Meaning
- Interpretation of Ratio
- Usefulness of Ratio Analysis
- Limitations of Ratio Analysis
- Classification of Ratio Analysis
  + Traditional Classification
  + Functional Classification
    - Profitability Ratio
    - Turnover Ratio
    - Liquidity Ratio
    - Ownership/Solvency Ratio
  + Classification by Users
It is one of the tools of measuring financial performance of the organization.

It is a comparative analysis between two factors.

Business performance can be measured by the use of ratios.

It must be interpreted against some standards.

Apart from the absolute profit figures, the management might find a need of relative data/information about the variables, thus, at this time, ratio analysis assists the management.

It evaluates the financial conditions and the purpose of a firm through various yardsticks.

This tool is useful for all the various stakeholders of the company like, shareholders, bankers, creditors, lenders, investors, government, etc.

The following are four ways to analyze ratio:
### Four Ways to Analyse Ratio

<table>
<thead>
<tr>
<th>Trend analysis</th>
<th>Comparative analysis</th>
<th>Individual ratio analysis</th>
<th>Group ratio analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• It helps you analyse the movement of the variables compared across years</td>
<td>• This helps to make comparisons of two companies of the same industry</td>
<td>• It helps you look into the persistent record of a particular variable for detailed analysis</td>
<td>• It helps the firm to determine the group of ratios of variable in various forms, e.g. gross profit, net profit, operating profit, etc.</td>
</tr>
</tbody>
</table>
Usefulness of Ratio Analysis

- Simplification of data
- Helps in disclosing operational efficiency
- Benchmark for comparison
- Planning
- Managerial tool
- Analyzing financial statement
- Scanning Device
Limitations of Ratio Analysis

- It depends on the past data which in itself serves as a limiting factor.
- It may not represent the correct picture of the business.
- Only accounting information is used while analyzing and interpreting the results of ratio analysis.
- In taking corrective actions, the management might concentrate more on improving the ratio over the years rather than solving the major reason behind such an adverse condition.
- At times, when the two items are compared, it is not necessary that due to the items in questions leads to the changes in the output. There could be other reasons as well which lead to the adverse ratio.
Classification of Ratio Analysis

Classification

- Traditional
- Functional
Traditional Classification

Traditional
- Revenue Statement Ratios
- Balance Sheet Ratios
- Composite Ratio
Classification by Users

Management
- Operating ratio
- Debtors turnover
- Stock turnover
- Solvency ratio
- Return on capital

Creditors
- Current ratio
- Solvency ratio
- Fixed asset ratio
- Creditors turnover

Shareholders
- Yield rate
- Proprietary ratio
- Dividend rate
- Capital gearing
- Return on capital fund
Profitability Ratio

× In relation to sales
  + Gross profit ratio
  + Operating ratio
  + Expense ratio
  + Operating profit ratio
  + Net profit ratio

× In relation to investment
  + Return on capital employed
  + Return on shareholders fund
  + Return on equity shareholders fund
In Terms of Sales

- Gross profit ratio – It measures the gross margin of profit over the total sales of a unit:

\[
\text{Gross Profit Margin} = \frac{\text{Gross profit}}{\text{Sales}} \times 100
\]

- Operating ratio – Operating ratio is measured to find out proportion of cost of goods sold and operating expenses to sales:

\[
\text{Operating ratio} = \frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net Sales}} \times 100
\]
Expense Ratio
- Operating expense ratio
- Material cost ratio
- Labor cost ratio
- Conversion cost ratio
- Administration cost ratio
- Selling & distribution cost ratio
Cont...

- Operating Profit Ratio - It is calculated by reducing administration, selling and distribution expenses from Gross Profits:

\[
\text{Operating Profit ratio} = \frac{\text{Operating Profit}}{\text{Net Sales}} \times 100
\]

- Net Profit Ratio - It measures the margin of revenues available to the owners of the business after satisfying all costs, expense, and losses:

\[
\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Net Sales}} \times 100
\]
In Terms of Investments

- **Return on Capital Employed** - The return on the investment is measured by dividing the net profit or the income by total capital invested:

  \[
  \text{ROI} = \frac{\text{Net Profit (EBIT)}}{\text{Capital Employed}} \times 100
  \]

- **Return on Shareholders Fund** - This ratio indicates the margin available for the shareholders after satisfying all other obligations and taxes as well:

  \[
  \text{ROSF} = \frac{\text{Net Profit (PAT)}}{\text{Shareholders Fund}} \times 100
  \]
Return on Equity Shareholders Fund - This measures returns available for equity shareholders, but it excludes preference share capital:

\[
\text{ROESF} = \frac{\text{Net Profit (PAT)} - \text{preference Dividend}}{\text{Equity Shareholders Fund}} \times 100
\]
Liquidity Ratio

- Current Ratio - This ratio measures the liquidity position of the concern for a short period:

  \[
  \text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}
  \]

- Quick Ratio - It is designed to show how the amount of cash is made available to meet immediate payments:

  \[
  \text{Quick Ratio} = \frac{\text{Liquid Assets}}{\text{Liquid Liabilities}}
  \]

- Acid Test Ratio - The actual liquidity is measured by comparing the cash and bank balance as well as the marketable securities with liquid liabilities:

  \[
  \text{Acid-test Ratio} = \frac{\text{Quick Assets}}{\text{Liquid Liabilities}}
  \]
**Turnover Ratio**

- **Inventory turnover ratio** –

  \[
  \text{Inventory turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}
  \]

- **Debtors turnover ratio** –

  \[
  \text{Debtors Ratio} = \frac{\text{Debtors + Bills Receivable}}{\text{Average Daily Credit Sales}}
  \]

  \[
  \text{Credit Sales} = \frac{\text{Credit Sales}}{365 / 360 \text{ days}}
  \]
Cont...

× **Creditors turnover ratio** –

\[
\text{Creditor Turnover Ratio} = \frac{\text{Creditors + Bills Payable}}{\text{Average Credit Purchase per day}}
\]

\[
\text{Credit Purchase Per day} = \frac{\text{Credit Purchases}}{365 / 360 \text{ days}}
\]

× **Fixed assets turnover ratio**

\[
\text{Fixed Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Fixed Assets}}
\]

× **Total assets turnover ratio**

\[
\text{Total Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Total Assets}}
\]
Ownership Ratio

- **Debt – Equity Ratio**

  \[
  \text{Debt-equity Ratio} = \frac{\text{Long Term Liabilities}}{\text{Shareholders’ funds}}
  \]

- **Shareholders equity ratio**

  \[
  \text{Shareholders Equity Ratio} = \frac{\text{Shareholders Funds}}{\text{Total assets (tangible)}}
  \]

- **Capital gearing ratio**

  \[
  \text{Capital Gearing Ratio} = \frac{\text{Fixed Int. or Dividend Securities}}{\text{Eq. S. H. Fund/ Net worth}}
  \]

- **Long term funds to fixed assets ratio**

  \[
  \text{Fixed Assets Ratio} = \frac{\text{Long term Funds}}{\text{Fixed Assets}}
  \]
Practical Problems

- Problem – I Revenue Ratios
- Problem – II Balance Sheet Ratios
- Problem – III Composite Ratios
The following Trading and Profit and Loss Account of Fantasy Ltd. for the year 31-3-2000 is given below. Calculate: Gross Profit Ratio, Expenses Ratio, Operating Ratio, Net Profit Ratio, Operating Ratio, Stock Turnover Ratio.

<table>
<thead>
<tr>
<th>Particular</th>
<th>Rs.</th>
<th>Particular</th>
<th>Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Opening Stock</td>
<td>76,250</td>
<td>By Sales</td>
<td>5,00,000</td>
</tr>
<tr>
<td>“ Purchases</td>
<td>3,15,250</td>
<td>“ Closing stock</td>
<td>98,500</td>
</tr>
<tr>
<td>“ Carriage and Freight</td>
<td>2,000</td>
<td>“ Operating incomes:</td>
<td></td>
</tr>
<tr>
<td>“ Wages</td>
<td>5,000</td>
<td>“ Non-operating expenses:</td>
<td></td>
</tr>
<tr>
<td>“ Gross Profit b/d</td>
<td>2,00,000</td>
<td>“ Interest on Securities</td>
<td>1,500</td>
</tr>
<tr>
<td></td>
<td>5,98,500</td>
<td>“ Dividend on shares</td>
<td>3,750</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“ Profit on sale of shares</td>
<td>750</td>
</tr>
<tr>
<td>To Administration expenses</td>
<td>1,01,000</td>
<td>By Gross Profit b/d</td>
<td>2,00,000</td>
</tr>
<tr>
<td>“ Selling and Dist. expenses</td>
<td>12,000</td>
<td>“ Non-operating expenses:</td>
<td></td>
</tr>
<tr>
<td>“ Non-operating expenses</td>
<td>2,000</td>
<td>“ Interest on Securities</td>
<td></td>
</tr>
<tr>
<td>“ Financial Expenses</td>
<td>7,000</td>
<td>“ Dividend on shares</td>
<td></td>
</tr>
<tr>
<td>Net Profit c/d</td>
<td>84,000</td>
<td>“ Profit on sale of shares</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2,06,000</td>
<td></td>
<td>2,06,000</td>
</tr>
</tbody>
</table>
SOLUTION – I

1. Gross Profit Margin = \( \frac{\text{Gross profit}}{\text{Sales}} \times 100 \)
   \[
   \frac{2,00,000}{5,00,000} \times 100 \]
   = 40%

2. Expenses Ratio = \( \frac{\text{Op. Expenses}}{\text{Net Sales}} \times 100 \)
   \[
   \frac{1,13,000}{5,00,000} \times 100 \]
   = 22.60%

3. Operating Ratio = \( \frac{\text{Cost of goods sold + Op. Expenses}}{\text{Net Sales}} \times 100 \)
   \[
   \frac{3,00,000 + 1,13,000}{5,00,000} \times 100 \]
   = 82.60%

   Cost of Goods Sold = Op. stock + purchases + carriage and
   Freight + wages – Closing Stock
   = 76250 + 315250 + 2000 + 5000 + - 98500
   = 3,00,000 Rs.
4. **Net Profit Ratio** = \( \frac{\text{Net Profit}}{\text{Net Sales}} \times 100 \)
   
   \[
   \frac{84,000}{5,00,000} \times 100 = 16.8\%
   \]

5. **Operating Profit Ratio** = \( \frac{\text{Op. Profit}}{\text{Net Sales}} \times 100 \)
   
   Operating Profit = Sales – (COGS + Op. Exp.)
   
   \[
   \frac{87,000}{5,00,000} \times 100 = 17.40\%
   \]

6. **Stock Turnover Ratio** = \( \frac{\text{Cost of goods sold}}{\text{Avg. Stock}} \)
   
   \[
   \frac{3,00,000}{87,375} = 3.43 \text{ times}
   \]
**Problem – II**

The balance sheet of Punjab Auto Limited as on 31-12-2002 was as follows:

From the below, compute (A) the current ratio, (B) quick ratio, (C) debt-equity ratio, and (D) proprietary ratio.

<table>
<thead>
<tr>
<th>Particular</th>
<th>Rs.</th>
<th>Particular</th>
<th>Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity Share Capital</td>
<td>40,000</td>
<td>Plant and Machinery</td>
<td>24,000</td>
</tr>
<tr>
<td>Capital Reserve</td>
<td>8,000</td>
<td>Land and Buildings</td>
<td>40,000</td>
</tr>
<tr>
<td>8% Loan on Mortgage</td>
<td>32,000</td>
<td>Furniture &amp; Fixtures</td>
<td>16,000</td>
</tr>
<tr>
<td>Creditors</td>
<td>16,000</td>
<td>Stock</td>
<td>12,000</td>
</tr>
<tr>
<td>Bank overdraft</td>
<td>4,000</td>
<td>Debtors</td>
<td>12,000</td>
</tr>
<tr>
<td>Taxation:</td>
<td></td>
<td>Investments (Short-term)</td>
<td>4,000</td>
</tr>
<tr>
<td>Current</td>
<td>4,000</td>
<td>Cash in hand</td>
<td>12,000</td>
</tr>
<tr>
<td>Future</td>
<td>4,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit and Loss A/c</td>
<td>12,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>1,20,000</strong></td>
<td></td>
<td><strong>1,20,000</strong></td>
</tr>
</tbody>
</table>
1. Current Ratio  

\[ \text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} \]

Current Assets = Stock + debtors + Investments (short term) + Cash In hand

Current Liabilities = Creditors + bank overdraft + Provision for Taxation (current & Future)

\[ \text{CA} = 12000 + 12000 + 4000 + 12000 \]
\[ = 40,000 \]
\[ \text{CL} = 16000 + 4000 + 4000 + 4000 \]
\[ = 28,000 \]
\[ = 40,000 \]
\[ 28,000 \]
\[ = 1.43 : 1 \]

2. Quick Ratio  

\[ \text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Quick Liabilities}} \]

Quick Assets = Current Assets - Stock
Quick Liabilities = Current Liabilities – (BOD + PFT future)

\[ \text{QA} = 40,000 - 12,000 \]
\[ = 28,000 \]
\[ \text{QL} = 28,000 - (4,000 + 4,000) \]
\[ = 20,000 \]
\[ = 28,000 \]
\[ 20,000 \]
\[ = 1.40 : 1 \]
3. Debt – Equity Ratio = \[
\frac{\text{Long Term Debt (Liabilities)}}{\text{Shareholders Fund}}
\]
\[
\text{LTL} = \text{Debentures} + \text{long term loans}
\]
\[
\text{SHF} = \text{Eq. Sh. Cap.} + \text{Reserves} \& \text{Surplus} + \text{Preference Sh. Cap.} – \text{Fictitious Assets}
\]
\[
\text{LTL} = 32,000
\]
\[
\text{SHF} = 40,000 + 8,000 + 12,000
\]
\[
= 60,000
\]
\[
= 32,000
\]
\[
60,000
\]
\[
= 0.53 : 1
\]

4. Proprietary Ratio = \[
\frac{\text{Shareholders’ Funds}}{\text{Total Assets}}
\]
\[
\text{SHF} = \text{Eq. Sh. Cap.} + \text{Reserves} \& \text{Surplus} + \text{Preference Sh. Cap.} – \text{Fictitious Assets}
\]
\[
\text{Total Assets} = \text{Total Assets} – \text{Fictitious Assets}
\]
\[
\text{SHF} = 40,000 + 8,000 + 12,000
\]
\[
= 60,000
\]
\[
\text{TA} = 1,20,000
\]
\[
= 60,000
\]
\[
= 1,20,000
\]
\[
= 0.5 : 1
\]
The details of Shreenath company are as under:
Beside the details mentioned above, the opening stock was of Rs. 3,25,000. Taking 360 days of the year, calculate the following ratios; also discuss the position of the company: (1) Gross profit ratio. (2) Stock turnover ratio. (3) Operating ratio. (4) Current ratio. (5) Liquid ratio. (6) Debtors ratio. (7) Creditors ratio. (8) Proprietary ratio. (9) Rate of return on net capital employed. (10) Rate of return on equity shares.

<table>
<thead>
<tr>
<th>Particular</th>
<th>Rs.</th>
<th>Particular</th>
<th>Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity share capital</td>
<td>20,00,000</td>
<td>Fixed Assets</td>
<td>55,00,000</td>
</tr>
<tr>
<td>10% Preference share capital</td>
<td>20,00,000</td>
<td>Stock</td>
<td>1,75,000</td>
</tr>
<tr>
<td>Reserves</td>
<td>11,00,000</td>
<td>Debtors</td>
<td>3,50,000</td>
</tr>
<tr>
<td>10% Debentures</td>
<td>10,00,000</td>
<td>Bills receivable</td>
<td>50,000</td>
</tr>
<tr>
<td>Creditors</td>
<td>1,00,000</td>
<td>Cash</td>
<td>2,25,000</td>
</tr>
<tr>
<td>Bank-overdraft</td>
<td>1,50,000</td>
<td>Fictitious Assets</td>
<td>1,00,000</td>
</tr>
<tr>
<td>Bills payable</td>
<td>45,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outstanding expenses</td>
<td>5,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>64,00,000</strong></td>
<td><strong>Total</strong></td>
<td><strong>64,00,000</strong></td>
</tr>
</tbody>
</table>

Sales (40% cash sales) 15,00,000
Less: Cost of sales 7,50,000
Gross Profit: 7,50,000
Less: Office Exp. (including int. on debentures) 1,25,000
Selling Exp. 1,25,000
Profit before Taxes: 2,50,000
Less: Taxes 2,50,000
Net Profit: 2,50,000
1. Gross Profit Margin = \[
\frac{\text{Gross profit}}{\text{Sales}} \times 100
\]
\[
\frac{7,50,000}{15,00,000} \times 100 = 50\%
\]

2. Stock Turnover Ratio = \[
\frac{\text{Cost of goods sold}}{\text{Avg. Stock}}
\]
Avg. stock = \(\frac{\text{Opening Stock} + \text{Closing Stock}}{2}\)
COGS = Sales – GP
\[
\frac{3,25,000 + 1,75,000}{2} = 2,50,000
\]
\[
\text{COGS} = 15,00,000 - 7,50,000 = 7,50,000
\]
\[
\frac{7,50,000}{2,50,000} = 3 \text{ times}
\]
3. Operating Profit Ratio = \( \frac{\text{Op. Profit}}{\text{Net Sales}} \times 100 \)

Operating Profit = Sales – (Op. Exp. + COGS.)
OP = 15,00,000
– (7,50,000 + 1,25,000 + 25,000)

= 6,00,000
(excluding Interest on Debentures)

= \( \frac{6,00,000}{15,00,000} \times 100 \)

= 40%

4. Current Ratio = \( \frac{\text{Current Assets}}{\text{Current liabilities}} \)

Current Assets = Stock + debtors + Bills receivable + Cash

Current Liabilities = Creditors + bank overdraft + Bills payable + Outstanding expenses

CA = 1,75,000 + 3,50,000 + 50,000 + 2,25,000

= 8,00,000

CL = 1,00,000 + 1,50,000 + 45,000 + 5,000

= 3,00,000

= \( \frac{8,00,000}{3,00,000} \)

= 2.67 : 1
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Quick Ratio / Liquid Ratio</td>
<td>Liquid Assets</td>
<td>Liquid Liabilities</td>
</tr>
<tr>
<td></td>
<td>(Liquid) Quick Assets = Current Assets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stock</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Liquid) Quick Liabilities = Current Liabilities – BOD</td>
<td></td>
</tr>
<tr>
<td>QA = 8,00,000 – 1,75,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>= 6,25,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QL = 3,00,000 – 1,50,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>= 1,50,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>= 6.25 : 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 6. Debtors Ratio | Debtors + Bills receivable X 365 / 360 days |
|   | Credit sales |
|   | = 3,50,000 + 50,000 |
|   | = 9,00,000 X 360 days |
|   | (60% of 15,00,000) |
|   | = 0.444 X 360 days |
|   | = 160 days |

| 7. Creditors Ratio | Creditors + Bills payable X 365 / 360 days |
|   | Credit Purchase |
|   | = 1,00,000 + 45,000 |
|   | = 7,50,000 X 360 days |
|   | Notes: If credit purchase could not find out at that point Cost of Goods sold consider Credit purchase |
|   | = 0.193 X 360 days |
|   | = 69 days |

Note: If credit purchase could not find out at that point Cost of Goods sold consider Credit purchase.
8. Proprietary Ratio = \frac{\text{Shareholders' Funds}}{\text{Total Assets}}

\text{SHF} = \text{Eq. Sh. Cap.} + \text{Reserves \\ & Surplus} + \text{Preference Sh. Cap.} - \text{Fictitious Assets}

\text{Total Assets} = \text{Total Assets} - \text{Fictitious Assets}

\text{SHF} = 20,00,000 + 20,00,000 + 11,00,000 - 1,00,000

= 50,00,000

\text{TA} = 64,00,000 - 1,00,000

= 63,00,000

= \frac{50,00,000}{63,00,000}

= 0.79 : 1
Cont...

<table>
<thead>
<tr>
<th>Rate of Return on Capital Employed</th>
<th>Rate of Return on Share holders Fund</th>
<th>Rate of return on Equity Shareholders Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT Capital employed</td>
<td>PAT / SHF</td>
<td>PAT – Pref. Div. / ESHF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sales</th>
<th>15,00,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less: Cost of goods sold</td>
<td>7,50,000</td>
</tr>
<tr>
<td>Gross profit</td>
<td>7,50,000</td>
</tr>
<tr>
<td>Less: Operating expenses (including Depreciation)</td>
<td>1,50,000</td>
</tr>
<tr>
<td>Earnings before Interest &amp; Tax (EBIT)</td>
<td>6,00,000</td>
</tr>
<tr>
<td>Less: Interest Cost</td>
<td>1,00,000</td>
</tr>
<tr>
<td>Earnings before Tax (EBT)</td>
<td>5,00,000</td>
</tr>
<tr>
<td>Less: Tax liability</td>
<td>2,50,000</td>
</tr>
<tr>
<td>Earnings after Tax (EAT/ PAT)</td>
<td>2,50,000</td>
</tr>
<tr>
<td>Less: Preference share dividend</td>
<td>2,00,000</td>
</tr>
<tr>
<td>Distributional Profit</td>
<td>50,000</td>
</tr>
<tr>
<td></td>
<td>9. Rate of Return on Capital Employed</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Rate of Return on Capital Employed</td>
</tr>
<tr>
<td></td>
<td>Rate of Return on Capital Employed</td>
</tr>
<tr>
<td></td>
<td>= \frac{EBIT}{\text{Capital employed}} \times 100</td>
</tr>
<tr>
<td></td>
<td>CE = \text{Eq Sh. Cap.} + \text{Pref. Sh. Cap.} + \text{Reserves} + \text{Surplus} + \text{Debenture} + \text{Long Term Loan} - \text{Fictitious Assets}</td>
</tr>
<tr>
<td></td>
<td>CE = 20,00,000 + 20,00,000 + 10,00,000 - 1,00,000 = 60,00,000</td>
</tr>
<tr>
<td></td>
<td>= 6,00,000 \text{\over 60,00,000} \times 100</td>
</tr>
<tr>
<td></td>
<td>= 10%</td>
</tr>
</tbody>
</table>