

# 14

## FINANCIAL ANALYSIS THROUGH RATIOS (RATIO ANALYSIS)

### Learning Objectives

**After completing this chapter, you should be able to understand**

- ratio, as an analytical tool
- concepts of liquidity, solvency and profitability
- types of liquidity ratios
- types of activity ratios
- types of solvency ratios
- types of profitability ratios
- significance of ratio analysis
- limitations of ratio analysis

### RATIO ANALYSIS

Ratio analysis is the process of determining and interpreting numerical relationships based on financial statements. By computing ratios, it is easy to understand the financial position of the firm. Ratio analysis is used to focus on financial issues such as liquidity, profitability and solvency of a given firm.

### LIQUIDITY, PROFITABILITY AND SOLVENCY

Liquidity, profitability and solvency, if independently looked into, are three conflicting factors which are mutually exclusive. If one factor is focussed, there is a danger of missing the others.

Liquidity refers to how well the firm is in a position to meet its short-term commitments such as payment of salaries, taxes, and so on. Profitability refers to how capably the firm is conducting its business operations in a profitable manner. Solvency refers to the firm's position to meet its long-term commitments such as repayment of long-term loans, and so on.

The issues when seen together, offer a complex job to deal with. It is because, if more funds are retained to take care of liquidity, it may erode profitability.

The crux of the job of the finance manager is to maintain a balance among the factors of Liquidity, solvency and profitability of the firm.

## WHAT IS A RATIO?

Ratio is simply a number expressed in terms of another. It refers to the numerical or quantitative relationship between two variables which are comparable. It is an expression derived by dividing one variable by the other. It is a statistical measure that provides an insight into the relationships between two variables. Ratios used rightly may even develop understanding and stimulate thinking. Ratios can be expressed in terms of percentages, proportions, and quotients also.

### How to Select a Ratio?

The utility of ratio is based on its selection. The ratio selected should match with the purpose. Use the standard ratios to avoid misinterpretation. Items selected for computation of ratio should be related so as to provide meaningful results. The quantity demanded for a particular product when studied in relation to income of the consumer provides meaningful results.

### Standard List of Ratios

There is no standard list of ratios used for financial analysis. A ratio can be conceptualised based on the need. There are significant variations in the ratios used in different firms of the same industry. Even the formula used for a given ratio may differ slightly. It is because the needs of these firms are different.

### Interpretation

Interpretation refers to evaluating the ratio in terms of the laid out standards or norms; nature of the industry/sector; and identifying the possible cause for improvement or decline in the performance of the company. An insight into the logical functioning of business and the knowledge of cause and effect relationship among the given variables in the micro- and macro-business environment will enhance the quality of interpretation. Interpretation is to be made with meticulous care because future decisions are based on the results of interpretation.

In this chapter, such ratios are used often in judging liquidity, profitability and solvency of the firm. These are discussed and illustrated.

## TYPES OF RATIOS

Based on their nature, the ratios can broadly be classified into four categories:

- Liquidity ratios
- Activity ratios
- Capital structure ratios
- Profitability ratios

## Liquidity Ratios

Liquidity ratios express the ability of the firm to meet its short-term commitments as and when they become due. Creditors are interested to know whether the firm will be in a position to meet its commitments on time or not. If the firm is not in a position to meet its short-term commitments such as payment of taxes, wages and salaries, and so on, then it cannot continue in business for long despite its strong capital base. Liquidity ratios help in identifying the danger signals for the firm in advance. Apart from the firm itself, all the financing companies offering short-term finances are interested in these ratios.

Liquidity ratios can be classified into two types:

**(a) Current Ratio** Current ratio is the ratio between current assets and current liabilities. The firm is said to be comfortable in its liquidity position if the current ratio is 2:1. It is almost considered as a yardstick to assess short-term liquidity. However, it may vary from one industry sector to the other. In other words, for every rupee of current liability, there should be two rupees worth current assets. The interests of the creditors are safeguarded if the current ratio is at least 2:1.

$$\text{Current Ratio} = \text{Current Assets}/\text{Current Liabilities}$$

The current assets include stock, debtors, bills receivable, cash at bank, cash in hand, prepaid expenses, income yet to be received, and so on. All these are short term assets. The current liabilities are creditors, bank overdraft payable in a period less than one year duration, bills payable, outstanding expenses, incomes received in advance, all provisions, dividends payable, and so on. All these are current liabilities.

The current ratio is also called working capital ratio. It is because it is related to the working capital of the firm. Higher the current ratio, the better is the coverage of current assets for the short-term claims. This parameter is very useful in inter-firm comparison.

Extremely high current ratio may imply improper handling of stocks. If larger stocks are lying unsold, this will push up the current ratio. Unrealised debtors, too much cash balances or few creditors also could push up the current ratio. So, extremely high current ratios should not be taken for granted for increased efficiency. This also means profitability is eroded to that extent in the sense that stocks are lying unsold or debts are not realised. This affects working capital and also the volume of profits.

The yardstick to assess the short-term liquidity varies from industry to industry, firm to firm within the same industry and season to season within the same company. Indiscriminate use of this yardstick may result in wrong conclusions. It is to be noted that the current assets are not the only source of funds to meet the short-term commitments. A firm can borrow from new creditors to meet the old commitments.

**(b) Quick Ratio** Quick ratio is also called acid test ratio. It measures the firm's ability to convert its current assets quickly into cash in order to meet its current liabilities. It is the ratio between liquid assets and liquid liabilities. It supplements the information given by current ratio.

$$\text{Quick Ratio} = \text{Quick Assets}/\text{Current Liabilities}$$

where Quick assets = Current assets - (Stock + Prepaid expenses)

Quick assets are those assets that can be converted into cash quickly. These are also called liquid assets. Since stock can not be sold quickly, it is not included in the list of quick assets. All current assets except stock and prepaid expenses, if any, are called quick or liquid assets. The standard for this ratio is 1:1. In other words, for every rupee of quick liability, there should be one rupee worth quick asset. Quick ratio provides a hard and rigorous measure of short term liquidity.

The quick ratio when read along with current ratio provides better picture of the firm's ability to meet its short-term commitments with the short-term assets.

**Note:** Stocks and prepaid expenses are not to be taken as quick assets.

### Example 1

From the following Balance Sheet of XYZ Co. Ltd., calculate liquidity ratios.

**Balance Sheet of XYZ Co. Ltd.  
as on 31.12.200X**

<i>Liabilities</i>	<i>Rs</i>	<i>Assets</i>	<i>(Rs in thousand)</i>
			<i>Rs</i>
Preference share capital	100	Land and Buildings	225
Equity share capital	150	Plant and Machinery	250
General reserve	250	Furniture and Fixtures	100
Debentures	400	Stock	250
Creditors	200	Debtors	125
Bills payable	50	Cash at Bank	250
Outstanding expenses	50	Cash in hand	125
Profit and loss account	100	Prepaid expenses	50
Bank Loan (Long-term)	200	Marketable securities	125
	1500		1500

### Solution

**Calculation of Current Ratio** From the above balance sheet, identify the current assets and current liabilities.

The current assets include stock (250), debtors (125), cash at bank (250), cash in hand (125), prepaid expenses (50), and marketable securities (125). The total of these is 925.

The current liabilities include creditors (200), bank overdraft (50), and outstanding expenses (50). The total of these is 300.

$$\begin{aligned}
 \text{Current ratio} &= \text{Current assets}/\text{Current liabilities} \\
 &= 925/300 \\
 &= 3.08:1
 \end{aligned}$$

For every one rupee of current liabilities, there is Rs 3.08 worth current assets. The liquidity position is satisfactory as it is more than the standard of 2:1.

**Calculation of Quick Ratio** Now identify the quick assets. Exclude stock and prepaid expenses from the list of current assets. In this case, the quick assets are  $925 - (250 + 50) = 625$ .

$$\begin{aligned}\text{Quick ratio} &= \text{Quick assets}/\text{Current liabilities} \\ &= 625/300 \\ &\approx 2.08\end{aligned}$$

Since this also is above the standard of 1:1, short-term liquidity position of the company is satisfactory.

## Activity Ratios

Activity ratios express how active the firm is in terms of selling its stocks, collecting its receivables and paying its creditors. These are three types:

- (a) Inventory turnover Ratio
- (b) Debtors Turnover Ratio
- (c) Creditors Turnover Ratio

### Inventory Turnover Ratio

It is also called stock turnover ratio. It indicates the number of times the average stock is being sold during a given accounting period. It establishes the relation between the cost of goods sold during a given period and the average amount of inventory outstanding during that period. The higher the inventory turnover ratio, the better is the performance of the firm in selling its stocks.

It helps in determining the liquidity of the firm by giving the rate at which inventories are converted into sales and then to cash. It also helps the financial manager to design an appropriate inventory policy so as to avoid piling of inventories. It is calculated as given below:

$$\text{Inventory turnover ratio} = \text{Cost of goods sold}/\text{Average inventory}$$

Where cost of goods sold = Sales - Gross profit;

Average inventory is the average of opening stock at the beginning of the year and the closing stock at the end of the year, that is,

$$\text{Average stock} = \frac{\text{Opening stock} + \text{Closing stock}}{2}$$

A high inventory turnover ratio implies the efficiency of the firm whereas a low inventory turnover ratio indicates that the firm is not in a position to clear its stocks.

From inventory turnover ratio, we can also determine the inventory holding period. It is determined as given below:

$$\text{Inventory holding period} = 365 \text{ days}/\text{Inventory turnover ratio}$$

#### Example 2

A firm sold goods worth Rs 5,00,000 and its gross profit is 20 percent of sales value. The inventory at the beginning of the year was Rs 16,000 and at end of the year was 14,000. Compute Inventory turnover ratio and also the Inventory holding period.

(a) Calculation of Inventory Turnover Ratio To calculate Inventory turnover ratio, we need cost of goods sold and average stock

$$\text{Cost of goods sold} = \text{Sales} - \text{Gross Profit}$$

$$\text{Gross profit} = 20\% \text{ of sales value, i.e., Rs } 1,00,000$$

$$\begin{aligned}\text{Cost of goods sold} &= \text{Rs } 5,00,000 - \text{Rs } 1,00,000 \\ &= \text{Rs } 4,00,000.\end{aligned}$$

$$\begin{aligned}\text{Average inventory} &= (16,000 + 14,000)/2 \\ &= \text{Rs } 15,000\end{aligned}$$

$$\begin{aligned}\text{Inventory turnover ratio} &= \text{Cost of goods sold}/\text{average inventory} \\ &= 4,00,000/15,000 \\ &= 26.66 \text{ times}\end{aligned}$$

This means that during the year, the average stock is being sold 26.66 times.

$$\begin{aligned}\text{(b) Inventory holding period} &= 365 \text{ days}/\text{Inventory turnover ratio} \\ &= 365 \text{ days}/26.66 \\ &= 13.69 \text{ days or 14 days approximately.}\end{aligned}$$

**Debtors' Turnover Ratio** Debtors turnover ratio reveals the number of times the average debtors are collected during a given accounting period. In other words, it shows how quickly the firm is in a position to collect its debts. It is necessary to keep close monitoring of realisation of debts because it directly affect the working capital position. In case, the firm is not in a position to collect its debts, to meet the working capital requirements, it has to borrow paying interest. This further erodes the profitability. The successful companies maintain the aged list of the debtors showing the details of when to collect, how much to collect and from which debtor.

Debtors' Turnover Ratio is calculated as given below:

$$\text{Debtors turnover ratio} = \text{Credit sales}/\text{Average debtors}$$

Where credit sales refer to goods sold on credit. Average debtors is the average of opening and closing balances of debtors for the given accounting period.

A higher debtors' turnover ratio explains that the firm is efficient in collecting its debts whereas lower ratio signifies its inefficiency.

**Debt Collection Period** Debt collection period refers to the time taken to collect the debts. From debtors' turnover ratio, we can find out the debt collection period as follows.

$$\text{Debt collection period} = 365 \text{ days}/\text{Debtors turnover ratio}$$

The lesser the time, more is the efficiency of the firm and vice versa.

### Example 3

A firm's sales during the year was Rs 400,000 of which 60 percent were on credit basis. The balance of debtors at the beginning and end of the year were 25,000 and 15,000 respectively. Calculate debtors' turnover ratio of the firm. Also find out debt collection period.

### Solution

$$\begin{aligned}\text{Credit sales} &= 60\% \text{ of } 400,000 \\ &= 2,40,000\end{aligned}$$

$$\begin{aligned}\text{Average debtors} &= (\text{Opening balance of debtors} + \text{Closing balance of Debtors})/2 \\ &= (25,000 + 15,000)/2 \\ &= 20,000\end{aligned}$$

Calculation of debtors turnover ratio =  $240,000/20,000$   
= 12 times.

In this example, the firm is collecting its average debtors 12 times during the given accounting period.

$$\begin{aligned}
 &= 365 \text{ days}/\text{Debtors turnover ratio} \\
 &= 365/12 \\
 &= 30.41 \text{ days.}
 \end{aligned}$$

On an average, the firm is taking around 31 days to collect its debts.

### Creditors Turnover Ratio

**Creditors turnover ratio** Creditors turnover ratio reveals the number of times the average creditors are paid during a given accounting period. In other words, it shows how promptly the firm is in a position to pay its creditors. It is necessary to keep close monitoring of payment schedules because it directly affects the working capital position. In case, the firm is not in a position to pay its creditors, it will affect the goodwill or further supplies may be cut off. To be on safe side, most of the firms maintain the aged list of the creditors which provides the details of when to pay, how much to pay and to whom to pay.

Creditors turnover ratio is calculated as given below:

Creditors Turnover Ratio = Credit Purchases/Average Creditors

From this, we can also determine the creditors payment period by using the given formula:

Creditors Payment Period = 365 Days/Credit Turnover Ratio

## Capital Structure Ratios (Leverage Ratios)

Capital Structure or leverage ratio is defined as 'the financial ratio, which focusses on the long-term solvency of the firm'. The long-term solvency of the firm is always reflected in its ability to meet its long-term commitments such as payment of interest periodically without fail, repayment of principal as and when due.

All the financial institutions offering long-term finances are interested in these nations.

The following are the most commonly used capital structure ratios:

- (a) Debt-equity ratio  
 (b) Interest coverage ratio

### **Box 14.1 Is Debt-equity Ratio Important?**

Debt-equity ratio is one of the principal norms followed by the financial institutions while funding the project proposals.

For small projects, the debt-equity norm is 2:1 whereas for medium and large scale projects it is 1.5:1. It is only a broad guideline, variations are permitted on a case-to-case basis. Other things remaining the same, the projects are funded based on the following considerations:

- A highly capital-intensive project is eligible for a significantly higher debt-equity ratio
  - A project located in a backward area qualifies for funding based on higher debt-equity ratio
  - An export-oriented unit is eligible for a higher debt-equity ratio

- (c) Ratio of Proprietors' funds to total assets
  - (i) Ratio of Fixed Assets to Proprietors' Funds
  - (ii) Ratio of Current Assets to Proprietors' Funds

**(a) Debt-Equity (D/E) Ratio** Debt-equity ratio is the ratio between outsiders' funds (debt) and insider's funds (equity). This is used to measure the firm's obligations to creditors in relation to the owners' funds. It is a measure of solvency. The yardstick for this ratio is 1:1. In other words, for every rupee of debt, there should be one rupee worth internal funds.

This is also industry/sector specific ratio. Depending upon the industry, the standard for the debt-equity ratio differs. For instance, in case of capital intensive industries such as shipping companies or steel manufacturing companies, the D/E ratio can be as high as 20:1. So this ratio has to be interpreted considering the nature of industry and competitors' D/E ratios.

A high D/E ratio implies that the creditors stake is more as compared to that of owners. In other words, if the project fails financially, there is greater risk for the creditors. This may further mean that the creditors have higher degree of control in the management of the company.

On the other hand, a low D/E ratio is desirable which means less risk to the creditors leaving higher margin of safety for the creditors. From the firm's point of view, this is also good in terms of lower commitment to pay fixed interest charges. This will deprive the company to take advantage of borrowed funds to enhance the profitability.

Debt-equity ratio is calculated as follows:

$$\text{Debt-Equity Ratio} = (\text{Debt}/\text{Equity}) \text{ or} \\ (\text{Outsiders' Funds}/\text{Insiders' or Shareholders' Funds})$$

Debt or outsiders' funds include debentures, bonds, long-term loans, and so on. Shareholders' funds or equity here includes share capital (both preference and equity), reserves (both general and specific), retained earnings, and such others. Equity does not only mean equity share capital. Equity here is interpreted as 'insiders' funds'. 'Debt' here means only long-term debt.

#### Example 4

Calculate Debt-Equity ratio from the data given in Example 1,

The following are the outsiders' funds:

$$\begin{aligned}\text{Outsiders' funds} &= \text{Debentures Rs. } 4,00,000 + \text{Long-term loan } 2,00,000 \\ &= \text{Rs. } 6,00,000\end{aligned}$$

$$\text{Insiders' funds} = \text{Rs. } 6,00,000.$$

(Preference share capital Rs 1,00,000 + Equity share capital Rs 1,50,000 + General Reserve Rs 2,50,000 + Profit and Loss Account Rs 100,000)

$$\begin{aligned}\text{Debt equity ratio} &= 6,00,000/6,00,000 \\ &= 1:1\end{aligned}$$

Debt equity ratio of 1:1 means that for every Re 1.00 of debt, there is an equity fund of Re 1, which meets the standard yardstick of 1:1. This is quite satisfactory.

**(b) Interest Coverage Ratio** Interest coverage ratio is calculated to judge the firm's capacity to pay the interest on debt it borrows. It gives an idea of the extent the firm's earnings may contract before it is unable to pay interest payments out of current earnings. It is a very important ratio for the financial institutions to judge the ability of the borrower to service the loan from the current year's profits. The higher the ratio, better it is. In other words, a higher ratio implies that the company has no problems in paying interest.

Interest coverage ratio is calculated as follows:

Interest Coverage Ratio =

(Net profit before Interest and Taxes/Fixed Interest Charges)

The more the number of times of coverage, the better is the solvency position of the borrower.

#### Example 5

The earnings before interest and taxes (EBIT) of a company is Rs 5,60,000. Its fixed commitments include Payment of 10 percent on 7000 debentures of Rs 100 each. It is subject to tax of 30 percent per annum.

Calculate interest coverage ratio.

Net profit before interest and taxes = Rs 5,60,000

Fixed Interest charges on the debentures =  $(7000 \times 100) \times 10\% = \text{Rs } 70,000$ .

Interest coverage ratio =  $(5,60,000 / 70,000) = 8 \text{ times}$

Interest coverage ratio of 8 times means that the net profit earnings are 8 times to the fixed interest charges payable during the year.

The more the number of times the coverage, the safer is the investment. Extending finances to such a company getting a net profit covering 8 times of its fixed charges, is a safe bet for the lender.

**(c) Ratio of Proprietors' Funds to Total Assets** This establishes the relationship between proprietors' funds and the total assets. Here, the total assets include the tangible fixed assets plus current assets. As a guideline a ratio of around 0.5:1 or 50 percent is considered as the minimum desirable. In other words, half of the tangible assets are owned by the ordinary shareholders or owners and half by contributors of other types of share and loan capital and by creditors. Intangible assets such as goodwill are not considered here because, if the business has to be sold off forcibly, goodwill may not be of any worth. This shows that the proprietors have solid stake in the organisation.

Ratio of Proprietors' Funds to Total Assets =  $(\text{Proprietors Funds} / \text{Total Assets}^*) \times 100$

#### Example 6

Compute ratio of proprietors' funds to total assets from the data given in Example 1.

*Solution*

The ratio of Proprietors' funds to Total assets can be computed as follows:

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\* Here, total assets include only tangible assets. Intangible assets such as goodwill are not considered.

Proprietors' funds = Rs 7,00,000 (Preference share capital Rs 1,00,000 + Equity share capital Rs 1,50,000 + General reserve Rs 2,50,000 + Employee provident fund Rs 1,00,000 + Profit and loss account Rs 1,00,000)

$$\text{Total assets} = \text{Rs } 15,00,000$$

$$\begin{aligned}\text{Ratio of proprietors' funds to total assets} &= (7,00,000/15,00,000) \times 100 \\ &= 46.66\%\end{aligned}$$

This reveals that 46.66 percent of the total assets are financed by proprietors' funds. In other words, the balance (53.34%) is financed by outsider's funds. This ratio is further explained in a finer way by considering the volume of fixed assets and current assets to the proprietors' funds separately.

**(i) Ratio of Fixed Assets to Proprietors' Funds** This ratio explains whether the fixed assets have been bought from the proprietors' funds or not. By matching the long-term investment with the long-term finance, it is possible to determine whether the borrowing has been made to finance fixed assets. It is not safe to use short-term finance to buy long-term assets because when the borrowing is to be repaid, there may be a problem, as the fixed assets cannot be readily converted into cash. The long-term sources of finance can be used for buying current assets but no short-term sources of finance can be utilised to acquire fixed assets.

This ratio shows the percentage of proprietors' funds locked up in fixed assets. Normally, for industrial establishments this can be 65 percent of the proprietors' funds.

$$\text{Ratio of Fixed Assets to Proprietors' Funds} = (\text{Fixed assets}/\text{Proprietors' funds}) \times 100$$

#### Example 7

Compute ratio of fixed assets to proprietors' funds from the data given in Example 1:

From Example 1, Fixed assets are = Rs 5,75,000 and Proprietors' funds are Rs 7,00,000

$$\text{Ratio of Fixed Assets to Proprietors' Funds} = (5,75,000/7,00,000) \times 100 = 82.14\%$$

Considering that this is industrial establishment, 82 percent is on very high side. A large portion of proprietors' funds is blocked in fixed assets. This is not desirable.

**(ii) Ratio of Current Assets to Proprietors' Funds** A higher ratio of current assets to proprietors' funds is considered as financial strength to the business. It is necessary to hold adequate funds in working capital to generate profits.

This is calculated as follows:

$$\text{Ratio of current assets to proprietors' funds} = (\text{Current assets}/\text{Proprietors' funds}) \times 100$$

#### Example 8

Compute ratio of current assets to proprietors' funds from the data given in example 1:

$$\begin{aligned}\text{Ratio of current assets to proprietors' funds} &= (\text{Current assets}/\text{Proprietors' funds}) \times 100 \\ &= (9,25,000/7,00,000) \times 100 \\ &= 132\%\end{aligned}$$

## Profitability Ratios

Profitability ratios throw light on how well the firm is organising its activities in a profitable manner. The owners expect reasonable rate of return on their investment. The firm should generate enough profits not only to meet the expectations of the owners, but also to finance the expansion activities.

The following are the eight ratios most commonly used to explain profitability

1. Gross profit ratio
2. Net profit ratio
3. Operating ratio
4. Return on investment (ROI)
  - (i) Return on capital employed
  - (ii) Return on equity
5. Earnings per share (EPS)
6. Dividend yield
7. Price/Earnings ratio (P/E ratio)
8. Earning power

**1. Gross Profit Ratio** Gross profit ratio is the ratio between gross profit to sales during a given period. It is expressed in terms of percentage. Gross profit is the difference between the net sales and the cost of goods sold.

$$\text{Gross Profit Ratio} = (\text{Gross Profit}/\text{Sales}) \times 100$$

Gross profit should be adequate to cover the operating expenses and to provide fixed charges, dividends and reserves. There is no fixed norm to judge the gross profit ratio. The higher the gross profit ratio, the better it is. Gross profit is affected by several factors such as cash profits or cash losses, stock losses, mark ups or mark downs, purchase prices, stock valuation, expenses, and so on. For instance, if the mark up or profit margin is high, the gross profit is high. For any reason, goods have to be disposed off at throwaway prices or mark down, this affects the gross profit.

### Example 9

Suppose the Net sales is 50,000 for a firm and cost of goods sold is Rs 20,000. The gross profit ratio is calculated as below:

$$\begin{aligned}\text{Gross Profit Ratio} &= (30,000/50,000) \times 100 \\ &= 60 \text{ percent.}\end{aligned}$$

In other words, 60 percent of its sales is the gross profit.

**2. Net Profit Ratio** Net profit ratio is the ratio between net profits after taxes and net sales. It indicates what portion of sales is left to the owners after operating expenses. Non-operating income such as interest on investments, gain on sale of fixed assets and so on are added to the operating profit and non-operating expenses such as loss on sale of fixed assets and so on are deducted from such profit. This is the net profit after adjusting non-operating income and non-operating expenses.

$$\text{Net profit ratio} = (\text{Net profit after taxes}/\text{Net sales}) \times 100$$

**Example 10**

Suppose the net sales is 50,000 for a firm and cost of goods sold is Rs 20,000. The details of expenses are as given below:

Administration expenses	Rs 3000
Selling and distribution expense:	Rs 4000
Loss on sale of fixed asset	Rs 3000
Interest on investment	Rs 2000
Taxes 20 %	

**Computation of Net Profits**

	(in Rs)
Sales	50,000
Less Cost of goods sold	<u>20,000</u>
Gross profit	30,000
Less Administration expenses	3,000
Selling and Distr. Expenses	<u>4,000</u>
Net profit	8,000
Add: Interest on investments (Non-operating income)	<u>2,000</u>
	20,000
Less: Loss on sale of Asset	<u>3,000</u>
	17,000
Taxes @ 20%	3,400
<b>Net profit after taxes:</b>	<b>13,600</b>

$$\begin{aligned} \text{Net profit ratio} &= (13,600/50,000) \times 100 \\ &= 27.2\% \end{aligned}$$

The higher the net profit ratio, the better is the profitability and vice versa. This ratio is widely used as a measure of overall profitability. It should be used along with operating ratio for better interpretation.

**3. Operating Ratio** Operating ratio is the ratio between costs of goods sold plus operating expenses and the net sales. This is expressed as a percentage to net sales. The higher the operating ratio, the lower is the profitability and vice versa.

$$\text{Operating ratio} = (\text{Operating expenses}/\text{Net sales}) \times 100$$

Where Operating expenses = (Cost of goods sold + Administrative expenses + Selling and distribution expenses)

Administrative expenses cover all office and management expenses such as salaries, office rent, insurance, director's fee, legal expenses, and so on. Selling and distribution expenses include salaries to sales staff, advertising, travelling expenses, cost of samples and so on.

Net sales is equal to 'sales less sales returns'.

In interpreting operating ratio, the possibility of variations in expenses from year to year or company to company due to change in policies should be considered.

$$\text{Profitability (\%)} = (100 - \text{Operating ratio \%})$$

Operating ratio of 60 percent means the firm has remaining 40 percent of its sales revenue as profit. It is always desirable to have a low operating ratio.

Operating expenses are more in manufacturing firms than in service rendering firms. In manufacturing firms, the operating ratio ranges from 75–85 percent of the sales. The non-manufacturing organisations find their operating ratio anywhere between 40–60 percent.

**4. Return on Investment (ROI)** Return on investment is one of the very important parameters affecting business plans. The profitability of the firm is measured in terms of return on investment. The term 'investment' may refer to total assets, capital employed or owners' equity.

$$\text{ROI} = \frac{\text{Net Profit After Taxes}}{\text{Total Investment}}$$

Generally, the firm may be interested in assessing the return on total capital employed; the equity shareholders are interested in return on 'equity'. Some of the important ratios under this head are:

(i) **Return on capital employed (ROCE)** This is a widely used ratio. This is the only satisfactory measure which reveals the overall performance of a firm in terms of profitability. It shows whether the funds entrusted to the management have been properly used or not. ROCE is calculated as given below:

$$\text{ROCE} = \frac{\text{Adjusted net profits}}{\text{Capital Employed}}$$

Where 'adjusted' net profits refer to

Net profits duly adjusted for

1. any abnormal or non-recurring losses or gains
2. depreciation based on replacement cost of the assets
3. income from investments outside the business
4. interest on long-term liabilities (which is to be added back to the net profits for consistency)
5. income tax (always take net profits before income tax).

Net capital employed refers to the total of

1. Paid up share capital
2. Reserves (both capital and revenue reserves)
3. Debentures, if any.

(ii) **Return on equity (ROE)** This relates the net profits available to equity shareholders to the amount invested by them. The higher the ROE is, the more is the profitability and vice versa.

$$\text{ROE} = \frac{\text{Net profits} - \text{Dividends payable to Preference shareholders}}{\text{Equity share capital}}$$

This ratio is compared with that of other companies. The equity shareholder can take a decision to switch over from one company to the other by selling the shares based on this ratio.

**5. Earnings Per Share (EPS)** EPS is the relationship between net profits and the number of shares outstanding at the end of the given period. This can be compared with previous years to provide a basis for assessing the company's performance.

$$\text{EPS} = \frac{\text{Net profit after taxes}}{\text{Number of shares outstanding}}$$

#### Example 11

Given that the number of shares is 10,000 and the net profit after taxes for a given accounting period is Rs 4,50,000; the EPS can be calculated as follows:

$$\begin{aligned} \text{EPS} &= 4,50,000 / 10,000 \\ &= \text{Rs } 45. \end{aligned}$$

The higher the EPS is, the more is likely to be the demand for the shares of that company. However, it is to be noted that EPS is one of the many factors affecting the demand for a given share.

**6. Dividend Yield** Yield refers to the amount of total return the investor will receive for a given period of time for the amount of his investment.

Dividend yield refers to the percentage return on the price paid for shares. It is calculated as given below:

$$\text{Dividend yield} = \frac{\text{Nominal or face value of the share}}{\text{Cost or market price of the share}} \times \% \text{ dividend per annum}$$

#### Example 12

Given that current market price of a share Rs 300; face value of the share is Rs 100; percentage of dividend declared is 20 percent, then yield is

$$\begin{aligned} \text{Dividend yield} &= (300/100) \times 20 \\ &= 6 \text{ per annum} \end{aligned}$$

In general, yield and risk are inversely proportional. In other words, the higher the yield reflects that the investments are riskier and the lower the yield, safer are the investments.

**7. Price/Earnings Ratio** This is the share price divided by the earnings per share.

$$\text{Price/Earnings Ratio} = (\text{Market price per share} / \text{Earnings per share})$$

#### Example 13

Given that market price of a share is Rs. 340 and EPS is 10, calculate P/E ratio.

$$\begin{aligned} \text{Price/Earnings Ratio} &= (\text{Market price per share} / \text{Earnings per share}) \\ \text{EPS} &= (340/10) \\ &= 34 \end{aligned}$$

Thus a share with a market price of Rs 340 and an EPS of Rs 10 would have a P/E ratio of Rs 34.

Shares of companies with good profit record tend to have high P/E ratio and usually a low yield. On the other hand, companies with poor profit record will usually have a low P/E ratio.

The ratios of P/E, EPS and yield are very useful to take 'buy or sell' decisions in respect of company shares. Investors make use of the P/E ratio to assess the 'expensiveness' of a given share. In general, high P/E ratio indicates that the stock market price has been pushed up in anticipation of an expected rapid improvement in earnings. This makes the share now expensive. A low P/E ratio implies that investors do not expect much growth in the company's earnings in the nearest future.

In other words, selling a share with P/E ratio 20 at a price of Rs 100 is better than selling a share with P/E ratio 30 at a price of Rs 100. It is because the share with P/E ratio of 30 is more promising.

**8. Earning Power as a Measure of Overall Profitability** A firm can sell small quantities at higher prices or large quantities at relatively lower prices to continue to be making profits. In other words, the earning power of the company is based on two factors: (a) net profit margin and (b) the investment turnover.

These factors together present a complete picture of the effectiveness of the firms' operations. The percentage of return on investment (ROI) can highlight the firms operating efficiency. ROI reflects the earning power and it is the product of net profit margin and investment turnover.

$$\begin{aligned}\text{Earning power} &= \text{Return on investment} \\ &= \text{Net profit margin} \times \text{Investment turnover} \\ \text{Earning power} &= \frac{\text{Net profit after taxes}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total capital}} \\ &= \frac{\text{Net profit after taxes}}{\text{Total capital}}\end{aligned}$$

Here the total capital may mean (a) total assets or (b) equity share capital.

The following example illustrates the concept of earning power:

#### Example 14

There are two firms *P* and *Q* each having total assets worth Rs 4,00,000 and average net profits of 20 percent that is 80,000 each. Firm *P* has sales of Rs 100,000 and Firm *Q* has sales of Rs 10,00,000. Determine the earning power of both firms.

**Table 14.1 Earning Power of Firms *P* and *Q***

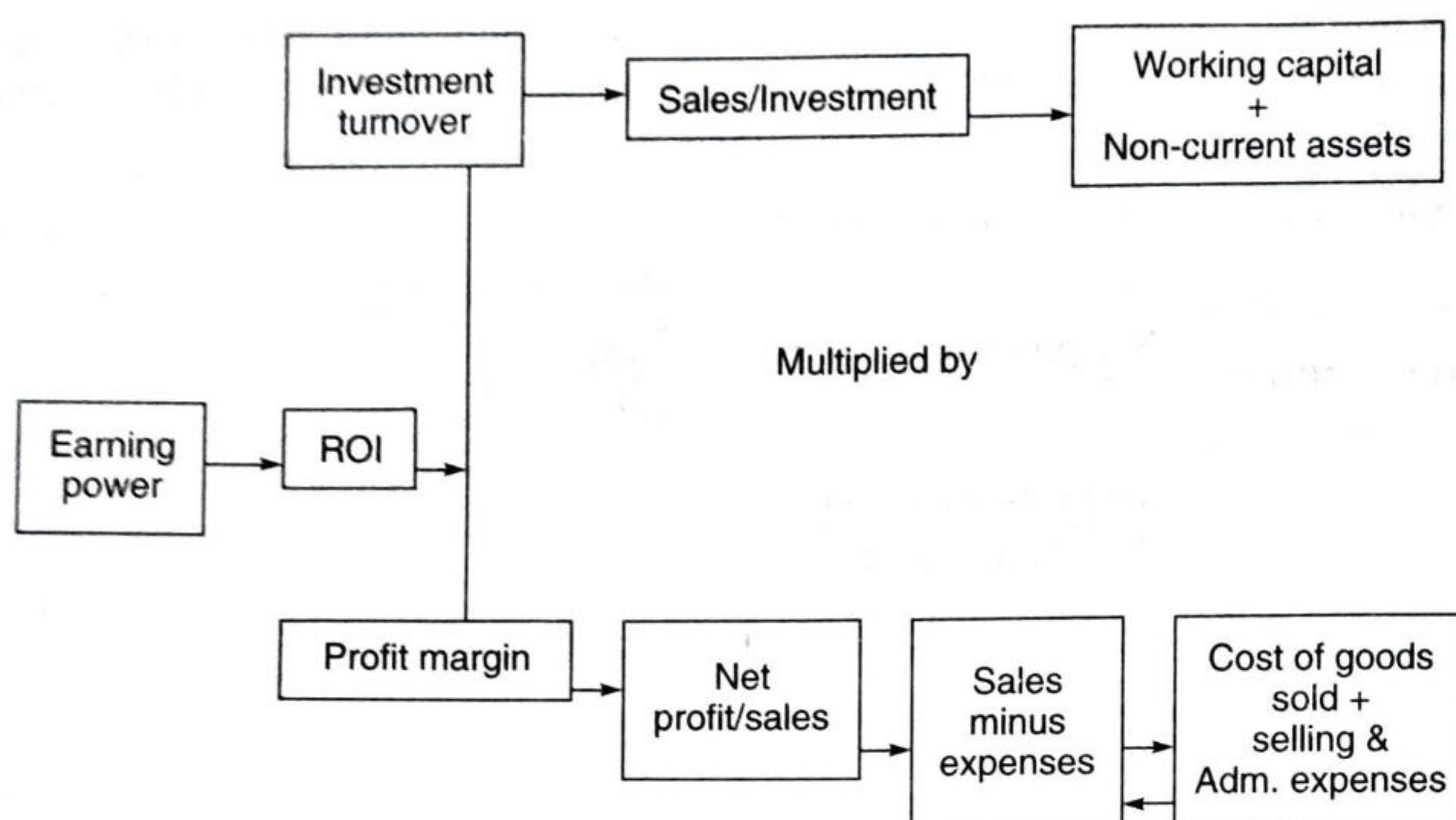
	Firm P	Firm Q
a. Net sales	1,00,000%	10,00,000%
b. Net profit	20,000%	20,000%
c. Total Assets	400,000%	400,000%
d. Profit margin (b/a)	20 %	2%
e. Investment turnover (a/c)	0.25 %	2.5 times
f. ROI ratio (d ' e)	5 %	5%

The Table 10.1 reveals that there is no advantage of higher volume of sales when profit margin is so low. Firm *P* could make similar ROI to that of firm *Q* despite lower volume of sales because the profit margin is high.

**DuPont Chart:** The elements that go into computation of earning power have been built into the following chart by Du Pont company for the first time and hence it is called Du Pont Chart (Fig. 14.1).

From Fig. 10.1, it can be seen that the earning power is dependent on many variables. Any change in these factors will affect the earning power. If the selling price increases, it will increase the profits and vice versa. If the cost of goods sold increases, the profit margin declines. The earning power will improve only if turnover or net profit or both increase.

Earning power is an important ratio that can be used to evaluate and compare the performances of departments as well as the firm as a whole. It is a valuable tool for inter-firm comparison also.



**Fig. 14.1 Du Pont Chart Showing the Elements of Earning Power**

## LIMITATIONS OF RATIO ANALYSIS

Ratio analysis, despite its wide applications, is not free from limitations.

1. *Accounting ratios are retrospective* The ratios are computed based on the past data or previous performance. They may not necessarily hold good in the future and may not be helpful in making projections into future.
2. *Accounting methods, policies and procedures are not common* Where accounting data is generated following different accounting methods (such as different methods of depreciation or methods of valuing closing stock following FIFO or LIFO), the ratios are not strictly comparable. The difference in the accounting methods or policies may lead to distorted conclusions.
3. *Inflationary tendencies cannot be highlighted* In times of inflation, the accounting data of several years cannot be compared. Any analysis of such data based on ratios cannot be meaningful.
4. *Concepts of Ratios are not the same* Based on the needs of the firm, the ratios are built upon. The formula may have been different. Interterm comparison cannot be realistic in such a case.
5. *Qualitative factors cannot be considered* Factors such as character or managerial abilities cannot be considered here. It is because Ratio analysis is purely quantitative analytical tool.
6. *Ratio by itself has no utility* Ratios to be meaningful have to be read along with the other ratios. Any single ratio is meaningless by itself.
7. *Ratios can be manipulated* During festival season, there will be good turnover of stocks when compared to the earlier periods. If this inventory turnover ratio is considered for decision making, the results get distorted. It is necessary to consider the average inventories to present a fair view of the business activity.
8. *Factors weakening ratio analysis* Sudden changes in the economy such as economic crisis, lack of uniform data, identifying the right type of ratio for analysis and interpretation and so forth are some of the factors that threaten the utility of ratio analysis.

Despite the limitations, ratio analysis continues to be a powerful tool for analysis and comparison of financial statements.