CHAPTER

24

FINANCIAL STATEMENT ANALYSIS

In the previous chapter, we looked at the contents of the financial statements and pointed towards the danger of imputing economic significance to accounting numbers. Yet, financial analysts depend primarily on these statements to diagnose financial performance. Why? It appears that there are three principal reasons: (i) As long as the accounting biases remain more or less the same over time, meaningful inferences can be drawn by examining trends in raw data and in financial ratios. (ii) Since similar biases characterise various firms in the same industry, inter-firm comparisons are useful. (iii) Experience seems to suggest that financial analysis 'works' if one is aware of accounting biases and makes adjustments for the same.

If properly analysed and interpreted, financial statements can provide valuable insights into a firm's performance. Analysis of financial statements is of interest to lenders (short-term as well as long-term), investors, security analysts, managers, and others. Financial statement analysis may be done for a variety of purposes, which may range from a simple analysis of the short-term liquidity position of the firm to a comprehensive assessment of the strengths and weaknesses of the firm in various areas. It is helpful in assessing corporate excellence, judging creditworthiness, forecasting bond ratings, predicting bankruptcy, and assessing market risk.

This chapter discusses how information can be extracted from financial statements for analysing financial performance. It is divided into four sections:

- Financial ratios
- Comparative analysis
- Du Pont analysis
- Problems in financial statement analysis

24.1 FINANCIAL RATIOS

A ratio is an arithmetical relationship between two figures. Financial ratio analysis is a study of ratios between various items or groups of items in financial statements. Financial ratios have been classified in several ways. For our purposes, we divide them into five broad categories as follows:

- Liquidity ratios
- Leverage ratios
- Turnover ratios

- Profitability ratios
- Valuation ratios

To facilitate the discussion of various ratios, the financial statements of Horizon Limited, shown in Tables 24.1 and 24.2, will be used.

Table 24.1 Horizon Limited: Profit and Loss Account for the Year Ending 31st March 20X5

		(Rs in million)
	20X5	*20X4*
Net sales	70.1	62.3
Cost of goods sold	55.2	47.5
Stocks	42.1	37.0
Wages and salaries	6.8	5.5
Other manufacturing expenses	6.3	5.0
Gross profit	14.9	14.8
Operating expenses	5.6	4.9
Depreciation	3.0	2.6
General administration	1.2	1.1
Selling	1.4	1.2
Operating profit	9.3	9.9
Non-operating surplus/deficit	(0.4)	0.6
Earnings befcre interest and tax	8.9	10.5
Interest	2.1	2.2
Profit before tax	6.8	8.3
Tax	3.5	4.1
Profit after tax	3.3	4.2
Dividends	2.7	2.7
Retained earnings	0.6	1.5
Per share data (in rupees)		
Earnings per share	2.2	2.8
Dividend per share	1.8	1.8
Market price per share	21.0	20.0
Book value per share	17.46	17.07

Liquidity Ratios

Liquidity refers to the ability of a firm to meet its obligations in the short run, usually one year. Liquidity ratios are generally based on the relationship between current assets (the sources for meeting short-term obligations) and current liabilities. The important liquidity ratios are: current ratio, acid-test ratio, and bank finance to working capital gap ratio.

Current Ratio A very popular liquidity ratio, the current ratio is defined as:

$$\frac{\text{Current assets}}{\text{Current liabilities}}$$

Current assets include cash, marketable securities, debtors, inventories (stocks), loans and advances, and pre-paid expenses. Current liabilities consist of loans and advances (taken), trade creditors, accrued expenses, and provisions.

Table 24.2 Horizon Limited: Balance Sheet as on 31st March 20X5

(Rs in million)

Liabilities	*20X5*	*20X4*	*Assets*	*20X5*	*20X4*
Share capital	15.00	15.00	Fixed assets (net)	33.00	32.20
Equity	15.00	15.00	Gross block	59.00	46.20
Preference	—	—	Acc. depr'n	26.00	14.00
Reserves & surplus	11.20	10.60	Investments	1.00	1.00
Secured loans	14.30	13.10	Current assets, loans,		
Term loans	7.00	5.80	and advances	23.40	15.60
Cash credit	7.30	7.30	Cash & bank	1.00	0.60
Unsecured loans	6.90	2.50	Debtors	11.40	6.80
Bank credit	2.50	2.50	Inventories	10.50	7.20
Inter-corporate	4.40	—	Pre-paid exp.	0.50	1.00
Current liabilities and provisions	10.50	8.10	Miscellaneous expenditures and losses	0.50	0.50
	57.90	49.30		57.90	49.30

Horizon's current ratio for the 20X5 year-end is:

$$23.4/17.4 = 1.34.$$

The current ratio measures the ability of the firm to meet its current liabilities—current assets get converted into cash in the operating cycle of the firm and provide the funds needed to pay current liabilities. Apparently, the higher the current ratio, the greater the short-term solvency. However, in interpreting the current ratio the composition of current assets must not be overlooked. A firm with a

high proportion of current assets in the form of cash and accounts receivable is more liquid than one with a high proportion of current assets in the form of inventories even though both the firms have the same current ratio.

Acid-test Ratio Also called the *quick ratio,* the acid-test ratio is defined as:

$$\frac{\text{Quick assets}}{\text{Current liabilities}}$$

Quick assets are defined as current assets excluding inventories.

Horizon's acid-test ratio for 20X5 year-end is:

$$12.8/17.4 = 0.74.$$

The acid-test ratio is a fairly stringent measure of liquidity. It is based on those current assets which are highly liquid—inventories are excluded from the numerator of this ratio because inventories are deemed to be the least liquid component of current assets.

Leverage Ratios

Financial leverage refers to the use of debt finance. While debt capital is a cheaper source of finance, it is also a riskier source of finance. Leverage ratios help in assessing the risk arising from the use of debt capital. Two types of ratios are commonly used to analyse financial leverage: structural ratios and coverage ratios. Structural ratios are based on the proportions of debt and equity in the financial structure of the firm. The important structural ratios are: debt–equity ratio and debt–assets ratio. Coverage ratios show the relationship between debt servicing commitments and the sources for meeting these burdens. The important coverage ratios are: interest coverage ratio, fixed charges coverage ratio, and debt service coverage ratio.

Debt-equity Ratio The debt–equity ratio shows the relative contributions of creditors and owners. It is defined as:

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

The numerator of this ratio consists of all liabilities, short-term as well as long-term, and the denominator consists of net worth plus preference capital.[1, 2]

Horizon's debt-equity ratio for the 20X5 year-end is:

$$31.7/26.2 = 1.21$$

In general, the lower the debt–equity ratio, the higher the degree of protection enjoyed by the creditors. In using this ratio, however, the following points should be borne in mind:

1. The book value of equity may be an understatement of its true value in a period of rising prices. This happens because assets are carried at their historical values less depreciation, not at current values.

[1]Alternatively, the ratio of long-term debt to equity may be calculated. What is important is that the same ratio is used consistently when comparisons are made.

[2]For the sake of simplicity, preference capital is subsumed under equity. Since preference capital is usually a very minor source of finance, its inclusion or exclusion hardly makes any difference.

2. Some forms of debt (like term loans, secured debentures, and secured short-term bank borrowing) are usually protected by specific charges and hence enjoy superior protection.

Debt Ratio The debt ratio measures the extent to which borrowed funds support the firm's assets. It is defined as:

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

The numerator of this ratio includes all liabilities, short-term as well as long-term, and the denominator of this ratio is the total of all assets (the balance sheet total). Horizon's debt ratio for the 20X5 year-end is:

$$31.7/57.9 = 0.55$$

This ratio is related to the debt–equity ratio as follows:

$$\frac{\text{Debt}}{\text{Assets}} = \frac{\dfrac{\text{Debt}}{\text{Equity}}}{1+\dfrac{\text{Debt}}{\text{Equity}}} \qquad (24.1)$$

Interest Coverage Ratio Also called the *times interest earned,* the interest coverage ratio is defined as:

$$\frac{\text{Earnings before interest and taxes}}{\text{Interest}}$$

Horizon's interest coverage ratio for 20X5 is:

$$8.9/2.1 = 4.23$$

Note that earnings before interest and taxes are used in the numerator of this ratio because the ability of a firm to pay interest is not affected by tax payment, as interest on debt funds is a tax-deductible expense. A high interest coverage ratio means that the firm can easily meet its interest burden even if earnings before interest and taxes suffer a considerable decline. A low interest coverage ratio may result in financial embarrassment when earnings before interest and taxes decline. This ratio is widely used by lenders to assess a firm's debt capacity. Further, it is a major determinant of bond rating.

Though widely used, this ratio is not a very appropriate measure of interest coverage because the source of interest payment is cash flow before interest and taxes, not earnings before interest and taxes. In view of this, we may use a modified interest coverage ratio:

$$\frac{\text{Earnings before interest and taxes} + \text{Depreciation}}{\text{Debt interest}}$$

For Horizon Limited, this ratio for 20X5 is: 12.9/2.1 = 6.14.

Fixed Charges Coverage Ratio This ratio shows how many times the cash flow of the firm covers all fixed financing charges. It is defined as:

$$\frac{\text{Earnings before interest and taxes} + \text{Depreciation}}{\text{Interest} + \dfrac{\text{Repayment of loan}}{1 - \text{Tax rate}}}$$

In the denominator of this ratio only the repayment of loan is adjusted upwards for the tax factor because the loan repayment amount, unlike interest, is not tax deductible.

Horizon's fixed charges coverage ratio for 20X5 is:

$$\frac{12.9}{2.1 + \dfrac{1.0}{0.49}} = 3.12$$

This ratio measures debt servicing ability comprehensively because it considers both the interest and the principal repayment obligations.[1] The ratio may be amplified to include other fixed charges like lease payment and preference dividends.[2]

Debt Service Coverage Ratio Used by term-lending financial institutions in India, the debt service coverage ratio is defined as:

$$\frac{\text{Profit after tax} + \text{Depreciation} + \text{Interest on term loan} + \text{Lease}}{\text{Interest on term loan} + \text{Lease rental} + \text{Loan repayment instalm}}$$

Financial institutions calculate the average debt service coverage ratio for the period during which the term loan for the project is repayable. Normally, financial institutions regard a debt service coverage ratio of 1.5 to 2.0 as satisfactory.

Turnover Ratios

Turnover ratios, also referred to as *activity ratios* or *asset management ratios,* measure how efficiently the assets are employed by a firm. These ratios are based on the relationship between the level of activity, represented by sales or cost of goods sold, and levels of various assets. The important turnover ratios are: inventory turnover, average collection period, receivables turnover, fixed assets turnover, and total assets turnover.

Inventory Turnover The inventory turnover, or *stock turnover,* measures how fast the inventory is moving through the firm and generating sales. It is defined as:

$$\frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

Horizon's inventory turnover for 20X5 is:

$$\frac{55.2}{(10.5 + 7.2)/2} = 6.24$$

[1]It is assumed that Rs 1 million of term loan is repayable.

[2]A ratio along these lines is:

$$\frac{\text{Earnings before depreciation interest and lease payment}}{\text{Debt interest} + \text{Lease payments} + \dfrac{\text{Loan repayment instalment}}{(1 - \text{Tax rate})} + \dfrac{\text{Preference dividends}}{(1 - \text{Tax rate})}}$$

The inventory turnover reflects the efficiency of inventory management. The higher the ratio, the more efficient the management of inventories and vice versa. However, this may not always be true. A high inventory turnover may be caused by a low level of inventory which may result in frequent stockouts and loss of sales and customer goodwill.

Notice that as inventories tend to change over the year, we use the average of the inventories at the beginning and the end of the year. In general, averages may be used when a flow figure (in this case, *cost of goods sold*) is related to a stock figure (*inventories*).

Accounts Receivable Turnover This ratio shows how many times accounts receivable (debtors) turn over during the year. It is defined as:

$$\frac{\text{Net credit sales}}{\text{Average accounts receivable}}$$

If the figure for net credit sales is not available, one may have to make do with the net sales figure. Horizon's accounts receivable turnover for 20X5 is:

$$70.1 \div [(11.4 + 6.8/2] = 7.70$$

Obviously, the higher the accounts receivable turnover the greater the efficiency of credit management.

Average Collection Period The average collection period represents the number of days' worth of credit sales that is locked in debtors (accounts receivable). It is defined as:

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

If the figure for credit sales is not available, one may have to make do with the net sales figure. Horizon's average collection period is:

$$[(11.40 + 6.80)/2] + (70.1/365) = 47.4 \text{ days}$$

Note that the average collection period and the accounts receivable turnover are related as follows:

$$\text{Average collection period} = \frac{365}{\text{Accounts receivable turnover}}$$

The average collection period may be compared with the firm's credit terms to judge the efficiency of credit management. For example, if the credit terms are 2/10, net 45, an average collection period of 85 days means that the collection is slow and an average collection period of 40 days means that the collection is prompt. An average collection period which is shorter than the credit period allowed by the firm needs to be interpreted carefully. It may mean efficiency of credit management or excessive conservatism in credit granting that may result in the loss of some desirable sales.

Fixed Assets Turnover This ratio measures sales per rupee of investment in fixed assets. It is defined as:

$$\frac{\text{Net sales}}{\text{Average net fixed assets}}$$

Horizon's fixed assets turnover ratio for 20X5 is:

$$70.1 + [(33.0 + 32.2)/2] = 2.15$$

This ratio is supposed to measure the efficiency with which fixed assets are employed—a high ratio indicates a high degree of efficiency in asset utilisation and a low ratio reflects inefficient use of assets. However, in interpreting this ratio, one caution should be borne in mind. When the fixed assets of the firm are old and substantially depreciated, the fixed assets turnover ratio tends to be high because the denominator of the ratio is very low.

Total Assets Turnover Akin to the output–capital ratio in economic analysis, the total assets turnover is defined as:

$$\frac{\text{Net sales}}{\text{Average total assets}}$$

Horizon's total assets turnover ratio for 20X5 is:

$$70.1 \div [(57.9 + 49.3)/2] = 1.31$$

This ratio measures how efficiently assets are employed, overall.

Profitability Ratios

Profitability reflects the final result of business operations. There are two types of profitability ratios: profit margin ratios and rate of return ratios. Profit margin ratios show the relationship between profit and sales. The two popular profit margin ratios are: gross profit margin ratio and net profit margin ratio. Rate of return ratios reflect the relationship between profit and investment. The important rate of return measures are: return on total assets, earning power, and return on equity.

Gross Profit Margin Ratio The gross profit margin ratio is defined as:

$$\frac{\text{Gross profit}}{\text{Net sales}}$$

Gross profit is defined as the difference between net sales and cost of goods sold.

Horizon's gross profit margin ratio for 20X5 is:

$$14.9/70.1 = 0.21 \text{ or } 21 \text{ per cent}$$

This ratio shows the margin left after meeting manufacturing costs. It measures the efficiency of production as well as pricing. To analyse the factors underlying the variation in gross profit margin the proportion of various elements of cost (labour, materials, and manufacturing overheads) to sales may be studied in detail.

Net Profit Margin Ratio The net profit margin ratio is defined as:

$$\frac{\text{Net profit}}{\text{Net sales}}$$

Horizon's net profit margin ratio for 20X5 is:

$$3.3/70.1 = 0.047 \text{ or } 4.7 \text{ per cent}$$

This ratio shows the earnings left for shareholders (both equity and preference) as a percentage of net sales. It measures the overall efficiency of production, administration, selling, financing, pricing, and tax management. Jointly considered, the gross and net profit margin ratios provide a valuable understanding of the cost and profit structure of the firm and enable the analyst to identify the sources of business efficiency/inefficiency.

Return on Total Assets A commonly used rate of return measure, the return on total assets is defined as:

$$\frac{\text{Net income (profit)}}{\text{Average total assets}}$$

Horizon's return on total assets for 20X5 is:

$$3.3 \div [(57.9 + 49.3)/2] = 0.062 \text{ or } 6.2 \text{ per cent}$$

The net income to total assets ratio is supposedly a measure of how efficiently the capital is employed. Though widely used, this is an odd measure because the numerator measures the return to shareholders (equity and preference) and the denominator represents the contribution of shareholders as well as creditors.

To ensure internal consistency, the following variant of return on total assets may be employed:

$$\frac{\text{Net income} + \text{Interest}(1 - \text{tax rate})}{\text{Average total assets}}$$

Horizon's return on total assets for 20X5 is:

$$(3.2 + 2.5(1 - .51)) + [(57.9 + 49.3)/2] = .075 \text{ or } 7.5 \text{ per cent}$$

Earning Power A measure of operating profitability, the earning power is defined as:

$$\frac{\text{Earnings before interest and taxes}}{\text{Average total assets}}$$

Horizon's earning power for 20X5 is:

$$8.9 \div [(57.9 + 49.3)/2] = 0.166 \text{ or } 16.6 \text{ per cent}$$

The earning power is a measure of business performance which is not affected by interest charges and tax payments. It abstracts away the effect of financial structure and tax rate and focuses on operating performance. Hence, it is eminently suited for inter-firm comparisons. Further, it is internally consistent. The numerator represents a measure of pre-tax earnings belonging to all sources of finance and the denominator represents total financing.

Return on Equity A measure of great interest to equity shareholders, the return on equity is defined as:

$$\frac{\text{Equity earnings}}{\text{Average net worth}}$$

The numerator of this ratio is equal to profit after tax less preference dividends. The denominator includes all contributions made by equity shareholders (paid-up capital + reserves and surplus). This ratio is also called the *return on net worth.*

Horizon's return on equity for 20X5 is:

$$3.3 \div [(26.2 + 25.6)/2] = 0.127 \text{ or } 12.7 \text{ per cent}$$

The return on equity measures the profitability of equity funds invested in the firm. It is regarded as a very important measure because it reflects the productivity of the ownership (or risk) capital employed in the firm. It is influenced by several factors: earning power, debt-equity ratio, average cost of debt funds, and tax rate.

In judging all the profitability measures it should be borne in mind that the historical valuation of assets imparts an upward bias to profitability measures during an inflationary period. This happens because the numerator of these measures represents current values, whereas the denominator represents historical values.

Valuation Ratios

Valuation ratios indicate how the equity stock of the company is assessed in the capital market. Since the market value of equity reflects the combined influence of risk and return, valuation ratios are the most comprehensive measures of a firm's performance. The important valuation ratios are: price-earnings ratio, yield, and market value to book value ratio.

Price-earnings Ratio Perhaps the most popular financial statistic in stock market discussion, the price-earnings ratio is defined as:

$$\frac{\text{Market price per share}}{\text{Earnings per share}}$$

The market price per share may be the price prevailing on a certain day or the average price over a period of time. The earnings per share is simply: profit after tax less preference dividend divided by the number of outstanding equity shares. Horizon's price-earnings ratio at the end of 20X5 is:

$$21.0/2.2 = 9.55$$

The price-earnings ratio (or the *price-earnings multiple* as it is commonly referred to) is a summary measure which primarily reflects the following factors: growth prospects, risk characteristics, shareholder orientation, corporate image, and degree of liquidity.

Yield This is a measure of the rate of return earned by shareholders. It is defined as:

$$\frac{\text{Dividend} + \text{Price change}}{\text{Initial price}}$$

This may be split into two parts:

$$\underbrace{\frac{\text{Dividend}}{\text{Initial price}}}_{\textit{Dividend yield}} + \underbrace{\frac{\text{Price change}}{\text{Initial price}}}_{\textit{Capital gains/losses yield}}$$

For Horizon, the dividend yield and the capital gains yield for 20X5 are as follows:

Dividend yield = 1.8/20.0 = 9 per cent Capital gains yield = 1.0/20.0 = 5 per cent

Hence, the total yield for 20X5 was 14 per cent.

Generally companies with low growth prospects offer a high dividend yield and a low capital gains yield. On the other hand, companies with superior growth prospects offer a low dividend yield and a high capital gains yield.

Market Value to Book Value Ratio Another popular stock market statistic, the marktet value to book value ratio is defined as:

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

Horizon's market value to book value ratio at the end of 20X5 was:

$$21.00/17.46 = 1.20$$

In a way, this ratio reflects the contribution of a firm to the wealth of society. When this ratio exceeds 1 it means that the firm has contributed to the creation of wealth in the society—if this ratio is, say, 2, the firm has created a wealth of one rupee for every rupee invested in it. When this ratio is equal to 1, it implies that the firm has neither contributed to nor detracted from the wealth of society.

It may be emphasised here that if the market value to book value ratio is equal to 1, all the three ratios, namely, return on equity, earnings–price ratio (which is the inverse of the price–earnings ratio), and total yield, are equal.