Chapter 9

Financial statement analysis and financial ratios

Understanding a company's financial statements is an essential step for successful stock selection. Financial statements reveal the details of a company's operating and financial historical performance. Financial authorities require timely dissemination of company financial statements to the public, and investment analysts and fund managers use the data in financial statements to identify problems or opportunities that might affect existing or potential investments. Reported accounting data can be used for comparing similar companies within an industry. The data is also utilized to assess a company's ability to meet financial obligations such as interest payments and subsequently to determine bankruptcy risk. Analysts use accounting data to predict future profitability of companies and to estimate future rates of return in the stock market.

A public company's annual report is a good primary source of company financial information. Other sources such as specialized web sites are also available, for example www.hoovers.com, and the SEC's Electronic Data Gathering and Retrieval archives (EDGAR) accessible at www.sec.gov. In some countries, such as the US, the annual report is updated quarterly; in others, reports are provided semi-annually. The formats and items listed on the reports can also vary from country to country

The financial statement comprises the following three major financial reports:

1 **The income statement** (also known as the profit and loss statement) reports the company's operating performance over the accounting period, and summarizes the company's turnover and expenses
2 **The balance sheet** provides a 'snapshot' of the firm's assets and liabilities on a given date
3 **The cash flow statement** (or statement of sources and uses of funds) reports how the firm generated cash and where it was utilized over the accounting period.

Understanding the format and content of the above reporting statements is crucial in order for analysts and fund managers to provide value-added earnings and cash flow analysis. Accounting data are also useful in assessing the economic prospects of the firm. Economic data used for valuation purposes are based on available accounting data.

The three parts of the financial statement are discussed here in more detail, along with a description of some of the more popular financial ratios used to investigate the sources of a firm's profitability and to evaluate the soundness of the earnings.

The income statement

The income statement shows the profitability of the firm over a period of time, such as a year or a quarter. It summarizes the flow of sales, expenses and earnings during the designated period. The income statement is also known as the profit and loss account, or P&L. It states revenues generated during the operating period, the expenses incurred during that same period, and the firm's net earnings or profits (the difference between revenues and expenses). The income statement helps investors to assess the ability of management to produce profits and to control expenses.

Regarding expenses, four broad classes of expenses are considered:

1 **Cost of good sold:** the direct cost attributable to producing the product sold by the firm

2 **General administrative expenses:** the overhead expenses, including salaries, advertising and other costs that are not directly related to production
3 **Interest expenses:** interest paid on the firm's debt
4 **Taxes on earnings:** taxes owed to federal and local governments.

The information contained in the income statement assists investors in answering numerous questions they may have about the company's profitability. First and foremost, did the company make a profit or a loss? What has the trend in the revenues, costs and profit been over the last few years? What were the primary sources of expenses?

Table 9.1 is a sample income statement for Company Z.

In this case, the company's gross profits and net income have both gone up over the past year. Even though all expenses were up apart from taxes paid, the company experienced an extraordinary loss last year, which reduced net

Table 9.1 Income statement for Company Z (in millions $)

	This year	*Last year*
Net Sales	100	90
Costs of goods sold	(30)	(25)
Gross profit	70	65
Administrative expenses	(10)	(8)
Operating income	60	57
Investment income	5	5
Interest expense	(3)	(1)
Income before tax	62	61
Income taxes	(14)	(14)
Minority interest income	1	1
Profit after tax	49	48
Extraordinary items	0	(2)
Net income	**49**	**46**
Dividends	(12)	(11)
Retained earnings	37	35

income. Dividends were also slightly higher this year due to the higher net income. Net income is often the last line of the income statement. In this example, however, dividends and retained earnings information have been added. One point of note is that the sum of dividends and retained earnings is equal to net income:

Net income = Dividends + Retained earnings

Operating income is the difference between operating revenues and operating costs. Income from other sources is then added to obtain earnings before interest and taxes (EBIT). This is what the firm would have earned if it were not for obligations to its creditors and tax authorities. In this case, EBIT would equal 65 (operating income of 60 plus investment income of 5) for this year.

One major expense that requires close observation is depreciation. The way an asset changes in value over time can be markedly different from how it is expensed on the income statement. Also, firms can depreciate assets using different methods, and inflation can distort the difference between an asset's economic value and accounting value. A firm's EBITDA is equal to earnings before interest, tax, depreciation and amortization.

The balance sheet

The balance sheet enumerates the assets, liabilities, and equity of a firm on a given date. The balance sheet is based on the following identity equation:

Assets = Liabilities + Owners' equity

Another way of putting this equation is that the difference in assets and liabilities is the net worth of the firm, or the stockholders' (owners') equity. The balance sheet determines the size of the firm, the balance between fixed and current assets, and the firm's capital structure.

The first part of the balance sheet shows a listing of the assets of the firm, starting with current assets. Current assets are cash items or items that can

be easily converted to cash, or items that will be used within a year. For example, accounts receivable will be collected as cash, and inventory will be sold. Next on the balance sheet comes a listing of long-term assets or fixed assets, which have an expected life of more than one year and are used in normal business operations. Fixed assets may be tangible or intangible. Tangible assets include property, plants and equipment, while intangible assets include patents and licences. Except for land, fixed assets normally depreciate in value over time. Securities held for investment purposes are also considered to be long-term assets.

The liability and stockholders' equity (also called shareholders' equity) section of the balance sheet starts with the short-term or current liabilities, which include accounts payable, accrued taxes, and debts that are due within one year. Next are the long-term debt and other longer-term liabilities that are due in more than a year. Other liabilities include assorted items that do not belong to any other liability category. Stockholders' equity is the difference between total assets and total liabilities. This represents the net worth or book value of the firm. Stockholders' equity is broken down into paid-in capital, which is the proceeds realized from the sale of stock to the public, and retained earnings, which are accumulated earnings not paid out as dividends and used to finance company growth. Even if a firm issues no new equity, the book value should increase each year as long as retained earnings of the firm are increasing.

Table 9.2 is a sample balance sheet for Company Z.

In Table 9.2, the main changes to the balance sheet are an increase in property and plant due to a purchase of some new land, an increase in long-term debt due to an issuance of a new bond, and changes to the depreciation amount and cash.

Also, as can be seen from the above example, the total assets equal the total liabilities plus shareholders' equity. It is extremely important to read the 'Notes to the Financial Statements' section, which accompanies the financial reports. Here will be found the accounting conventions used to calculate how inventories, raw materials, work in progress and finished goods are carried on the balance sheet, and the depreciation policy applied

Table 9.2 Balance sheet for Company Z (in millions $)

	This year	*Last year*
Assets		
Cash	60	33
Accounts receivable	100	100
Inventories	400	400
Other current assets	200	200
Total current assets	760	733
Property and plant	800	620
Equipment	200	200
Accumulated depreciation	(100)	(30)
Other investments	50	50
Intangibles	10	10
Other assets	20	20
Total assets	**1740**	**1603**
Liabilities		
Short-term debt	100	100
Accounts payable	40	40
Other current liabilities	150	150
Total current liabilities	290	290
Long-term debt	370	270
Minority interest	10	10
Other liabilities	200	200
Total Liabilities	**870**	**770**
Paid-in capital	300	300
Retained earnings	570	533
Total shareholders' equity	870	833
Total liabilities and shareholders' equity	**1740**	**1603**

to property, plant and equipment. Different conventions apply to different industries and in different countries.

The cash flow statement

The cash flow statement reports the company's sources and uses of cash over a specific period. It reports the cash flow generated by the company's operations, investments, and financial activities. The statement of cash flows recognizes only transactions where actual cash is involved. For example, if

the company sells a product now but payment is only due in 60 days, the income statement and the balance sheet will immediately be adjusted by the sales amount, whereas the cash flow statement will not recognize the transaction until the bill is paid and cash is in hand. Cash flow also differs from income in that income contains non-cash items, such as depreciation, which must be added back to net income when calculating cash flow.

Operating cash flow is reported in the first section of the cash flow statement. The second section of the statement is investment cash flow, which includes any purchases or sales of fixed assets and investments. Following that is the financing cash flow section, which includes any funds raised by the issuance of new securities or funds used to repurchase outstanding securities. Dividend payments are considered financing cash flows, whereas interest payments are considered operating cash flows. The sum of the operating cash flow, investment cash flow, and financing cash flow produces the net change in the company's cash level. This figure reveals how much cash flowed into or out of the firm's cash account during an accounting period.

Table 9.3 is a simplified sample statement of cash flow for Company Z:

Table 9.3 Statement of cash flow for Company Z (in millions of $)

	This year
Net income	49
Depreciation	100
Operating cash flow	149
Investment cash flow	(180)
Financing cash flow	88
Net cash Increase	57

In the example, the net income is adjusted by adding back depreciation. The investment cash flow amount is due to the purchase of some land (property and plant). Long-term debt increased by $100 m, but is adjusted by the $12 m dividend payout to attain the $88 m financing cash flow figure.

Ratio analysis

Ratio analysis is used to compare the financial trends of a company over a given time horizon. Ratio analysis facilitates the comparison of firms of different sizes, and it helps to identify the risks as well as potential earnings growth inherent to a given company. Ratios are typically categorized into three groups: liquidity ratios, profitability ratios and leverage ratios. Liquidity ratios measure the ability of the firm to pay its immediate liabilities; profitability ratios measure the firm's earning potential; and leverage or debt ratios indicate the financial risk of a firm by evaluating the firm's ability to pay its debt obligations. Below is a summary of some key financial ratios.

Liquidity ratios

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

The current ratio shows to what extent the claims of short-term creditors are covered by assets which can be converted to cash in a short time frame.

$$\text{Quick ratio (acid test ratio)} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$$

This ratio measures the firm's ability to pay off short-term obligations without relying on the sale of its inventories

Profitability ratios

$$\text{Gross profit margin} = \frac{\text{Sales} - \text{Cost of goods sold}}{\text{Sales}}$$

The gross profit margin indicates the total margin available to cover operating expenses and still yield a profit.

$$\text{Operating profit margin (return on sales)} = \frac{\text{Profits before taxes and interest}}{\text{Sales}}$$

The operating profit margin shows the firm's profitability from current operations without taking into consideration the interest charges.

$$\text{Net profit margin (net return on sales)} = \frac{\text{Profits after taxes}}{\text{Sales}}$$

This ratio measures the after tax profits per unit of sales. Low profit margins indicate that the firm's sales prices are relatively low or that its costs are relatively high, or both.

$$\text{Return on stockholder's equity} = \frac{\text{Profits after taxes}}{\text{Total stockholders' equity}}$$

The return on stockholders' equity or return on net worth, as the ratio is also sometimes called, shows the rate of return on stockholders' investment in the company.

Leverage ratios

$$\text{Debt to asset ratio} = \frac{\text{Total debt}}{\text{Total assets}}$$

This ratio measures the extent to which borrowed funds have been utilized to finance the company's operations

$$\text{Debt to equity ratio} = \frac{\text{Total debt}}{\text{Total stockholders' equity}}$$

The debt to equity ratio provides a comparative measure of the funds provided by creditors versus the funds provided by owners.

$$\text{Interest cover ratio} = \frac{\text{Profits before interest and taxes}}{\text{Total interest charges}}$$

This ratio measures how easily the company can meet its interest obligations.

Other ratios

$$\text{Dividend payout ratio} = \frac{\text{Annual dividends per share}}{\text{After tax earnings per share}}$$

The dividend payout ratio indicates the percentage of profits paid out as dividends.

$$\text{Dividend yield on common stock} = \frac{\text{Annual dividends per share}}{\text{Share price}}$$

This ratio provides a measure of the return to the owners received in the form of dividends.

In the previous chapter, price ratios were discussed to analyse stock values. A review of the formulas is given below:

$$\text{Price to earnings ratio} = \frac{\text{Share price}}{\text{After tax earnings per share}}$$

$$\text{Price to book ratio} = \frac{\text{Stock price}}{\text{Book value per share}}$$

$$\text{Price to sales ratio} = \frac{\text{Stock price}}{\text{Annual sales revenue per share}}$$

$$\text{Price to cash flow ratio} = \frac{\text{Share price}}{\text{Annual operating cash flow per share}}$$

Earnings per share

$$\text{Earnings per share} = \frac{\text{Profits after taxes}}{\text{No. of shares of common stock outstanding}}$$

Reported earnings per share (EPS) measures the past performance of the firm. Analysts rely on EPS to form valuation estimates. They usually use the income statement and reported EPS to estimate the future earnings capability of a firm. However, several adjustments must usually be made,

including the exclusion in the EPS figure of non-recurring items, such as the one-time sale of an asset.

Analysts will also attempt to assess the quality of the earnings by seeing how much the actual operating earnings differ form reported EPS. Ranking systems are sometimes devised to evaluate the quality of earnings. Low quality implies that the reported EPS number differs significantly form the firm's actual operating earnings. An analyst will seek to analyse how stable the earnings are over time, and whether the accounting procedures employed by the company are conservative or liberal. Other checks on quality of earnings include monitoring accounts receivables for large increases, checking for many one-time sources of income, and reading the independent auditor's report. If auditors have reservations about the financial statements of a company, they will usually express these in the letter to shareholders and Board of Directors. However, as a point of note, auditors do not always discover problems with the accounts.

Examples

Using the financial statements given above for Company Z, some financial ratios can be calculated for this year as follows:

$$\text{Acid test ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$$

$$= \frac{760 - 400}{290}$$

$$= 1.24$$

$$\text{Net profit margin} = \frac{\text{Profit after taxes}}{\text{Sales}}$$

$$= \frac{49}{100}$$

$$= 49\%$$

$$\text{Debt to equity ratio} = \frac{\text{Total debt}}{\text{Total stockholders' equity}}$$

$$= \frac{(100 + 370)}{870}$$

$$= 54\%$$

$$\text{Interest cover} = \frac{\text{Profit before interest and taxes}}{\text{Total interest charges}}$$

$$= \frac{65}{3}$$

$$= 21.7$$

The sampling of ratios above shows that Company Z is in a relatively comfortable position. Its net profit margins are quite high at 49%, and even though the debt to equity ratio is high at over 50%, the interest cover is extremely good with profits covering interest charges over 21 times. The acid test ratio shows that the current assets minus inventory can more than cover the current liabilities.

Assuming the number of shares outstanding for Company Z is 35 million both this year and last year, and that the year-end stock price this year is $20, the following ratios can also be calculated:

$$\text{EPS (this year)} = \frac{\text{Profits after taxes}}{\text{No. of shares of common stock outstanding}}$$

$$= \frac{\$49}{35}$$

$$= \$1.40$$

$$\text{EPS (last year)} = \frac{\$46}{35}$$

$$= \$1.31$$

$$\text{EPS growth rate} = \frac{\$1.40 - \$1.31}{\$1.31}$$

$$= \$6.9\%$$

$$\text{P/E ratio} = \frac{\text{Share price}}{\text{After tax earnings per share}}$$

$$= \frac{\$20}{\$1.40}$$

$$= 14.3$$

The P/E ratio is not particularly high at 14.3, but given an EPS growth rate of about 7%, a high P/E ratio would not be expected. Whether a 7% EPS growth rate would be considered low depends on the economic environment in place at the time. If the economy is in a recession, a 7% growth rate might look attractive. A comparison of actual and expected EPS growth rate of similar companies in the same sector would also point to whether Company Z's EPS growth rate was considered low, average, or even high. A similar comparative analysis would also be done for the company's P/E ratio.

The interpretation of financial ratios is a skill that takes practice. Different analysts in different countries can utilize slightly different methods of calculating ratios. Also, analysts must become particularly astute at monitoring accounts for techniques of creative accounting or financial engineering. Analysts often back up their study of the company accounts by visits to the companies themselves to 'kick the tyres' and verify information that is presented in the financial statements.

Quiz: Chapter 9

1 A company's overhead costs including salaries and advertising are known as _____ and are found in the _____ .

(A) cost of goods sold, income statement
(B) general administrative expenses, income statement
(C) interest expenses, income statement
(D) general administrative expenses, balance sheet
(E) cost of goods sold, balance sheet

2 Using the financial statement information for Company Z, what is the company's current ratio for this year?

(A) 2.62
(B) 1.24
(C) 2.00
(D) 0.50
(E) 0.40

3 Using the financial statement information for Company Z, the company's gross profit margin for this year and for last year are _____ and _____ .

(A) 49%, 51%
(B) 62%, 68%
(C) 60%, 63%
(D) 37%, 39%
(E) 70%, 72%

4 What is the rate of return on stockholders' investment in Company Z this year, using the data given in the chapter?

(A) 8.6%
(B) 2.8%
(C) 5.6%
(D) 16.8%
(E) 15.4%

5 Company Z's dividend payout ratios for this year and for last year are _____ and _____ .

(A) 24.5%, 23.9%
(B) 19.4%, 18.0%
(C) 20.0%, 19.3%
(D) 32.4%, 31.4%
(E) 17.1%, 16.9%

6 Consider two stocks. Stock X has a P/E ratio of 15, an EPS of 6.7% and an earnings growth rate of 10%; stock Y has a P/E ratio of 20, an EPS of 5% and an earnings growth rate of 20%. The share prices of both stocks are 100. In a year's time, stock X's share price will be _____ and stock Y's share price will be _____ . The better investment will be _____ .

(A) 111, 120, stock X
(B) 115, 125, stock Y
(C) 115, 125, stock X
(D) 111, 120, stock Y
(E) 100, 120, stock Y