



14

Interpretation of
Accounting Ratios

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14

LEARNING OUTCOME

After studying this chapter students should be able to:

- ▶ interpret a full range of accounting ratios.

14.1 Introduction

This chapter covers the calculation and interpretation of various accounting ratios. Section 14.2 focuses on identification of the user and understanding the business. Sections 14.3 to 14.5 cover ratios that you will be familiar with, including ratios on performance, liquidity, and capital structure. Section 14.6 looks specifically at investors' ratios and finally Section 14.7 looks at how to use relevant ratios when analysing the statement of cash flows.

14.2 Interpretation and analysis

The IASB *Framework* states:

The objective of financial statements is to provide information ... that is useful to a wide range of users in making economic decisions.

Interpretation and analysis of the financial statements is the process of arranging, examining and comparing the results in order that users are equipped to make such economic decisions.

The interpretation process is assisted by adopting an analytical framework. The main components of an appropriate framework are:

- identification of the user of the analysis;
- an understanding of the nature of the business, industry and organisation;

- identification of relevant sources of data for analysis;
- numerical analysis of the data available;
- interpretation of the results of the analysis;
- writing the report detailing the analysis of the results and recommendations.

14.2.1 Identification of the user of the analysis

There is a wide range of user groups that may be interested in an entity's financial statements. Historically, of course, financial statements have been prepared for the benefit of the investor group. However, those interested in the statements extend far beyond existing investors.

A major creditor of an entity, such as a bank which has provided material amounts of long-term finance, may commission specific financial reports, in fact it may be a condition of continuing financial backing that the entity prepares, say, quarterly statements to the bank's specifications. Most users, however, are not in a position to command such privileges.

Although the various user groups will almost invariably be using general-purpose financial reports, their needs may vary. It is important that any analysis and interpretation exercise is oriented towards the needs of the particular user who requires a report.

Examination questions will usually identify the type of user for whom a report is being prepared, so it is important to recognise the differences between users and their needs.

Present and potential investors

Both present and potential investors are interested in information that is useful in making buy/sell/hold decisions. Will the entity be able to generate cash in the future? How risky is the investment? Does its financial performance exceed that of other potential investee entities? How much is the investment likely to yield in capital growth and/or dividend? Analysis of the financial statements can help to answer these questions. There is a range of ratios of particular interest to the investor group; these are examined in detail later in the chapter in Section 14.6. In addition, return on capital employed (ROCE) and related performance and asset management ratios are likely to be of interest to this group of users.

Lenders and potential lenders

Lenders are principally interested in assessing whether or not the loans that they have made are likely to be repaid, and whether or not the related interest charge will be paid in full and on time. Potential lenders require analysis of financial statements in order to assist them in deciding whether or not to lend. Lender groups are likely to be particularly interested in ratios such as interest cover and gearing, and will be interested in the nature and longevity of other categories of loan to the entity.

Suppliers and other creditors

This group is interested in information that helps them to decide whether or not to supply goods or services to an entity. Availability of cash will be of particular interest, together with such evidence as is available in general-purpose financial statements about the entity's record in paying its creditors on time. Working capital ratios, and the working capital cycle, may be appropriate calculations to undertake when analysing financial statements for the benefit of this class of user.

Employees

In large organisations employees are likely to be particularly interested in one part of the entity's operations. They may, therefore, find segmental information to be useful. More generally, they need to be able to assess the stability and performance of the entity in order to gauge how reliable it is likely to be as a source of employment in the longer term. Employees are likely to be interested in disclosures about retirement benefits and remuneration.

Customers

Customers may be in a vulnerable position if there are few potential suppliers in a market for goods. They may therefore be interested in assessing the risks which threaten their supplier. Potentially they may be interested in takeover opportunities in order to ensure the continuing supply of a particular raw material.

Governments and their agencies

The governmental group is in a position to require special-purpose reports. Tax computations would fall into this category. However, general-purpose reports may also be of use, for example in gathering statistics on particular industries.

The general public

Members of the public may have special interests in the activities of certain entities, especially where, say, an individual entity dominates the local employment market. Pressure groups and their members would also fall under the umbrella category of 'general public', and their needs will vary according to their special interest. Environmental issues are of increasing concern to many people, and it is likely that pressure groups will take a particular interest in firms that are perceived as polluters. Analysis of the financial statements for this type of user would tend to focus on any additional voluntary disclosures made about the entity's environmental policies, on provisions and contingent liabilities related to environmental damage, and on capital investment (e.g., investment in new plant).

14.2.2 Understanding the business

It is often thought that financial analysis involves the direct application of a routine set of numerical calculations to a set of published accounts. This is only one part of the task. In order to interpret those calculations it is important to understand the relationships between the data and the underlying reasons, economic and other, that account for the business's current position.

The history of the business underlies the current position and future outlook. Furthermore, the owners and their individual characteristics will influence factors such as the level of risk in the business and dividend policy. Knowledge of the quality, qualifications and experience of management will assist in evaluating the performance and position of the business.

Financial analysis requires an understanding of the products, services and operating characteristics of the business. This will assist in understanding data such as turnover, profitability, inventories and working capital.

The business operates within an industry consisting of businesses with similar operating characteristics. If the analysis requires comparison of the business with the industry norms, it is important to identify the key characteristics of the industry and to establish benchmarks such as gross profit ratios, receivables collection days, etc.

14.2.3 Identifying relevant sources of data

In practice, the analyst needs to consider carefully the possible sources of information available about an entity. Perhaps the most obvious source is the wealth of financial and non-financial information contained in the entity's annual report. In addition to all the information that statute law and accounting standards require to be included in the annual report, there may be further voluntary disclosures that will be helpful to the analyst. Examples of such voluntary disclosures include supplementary information about an entity's environmental impact, employment reports, graphs, pie charts and ratio calculations. In some jurisdictions, interim financial reports are also available. Listed companies in the USA report quarterly, but in the UK, for example, listed companies (with a very small number of exceptions) report every 6 months.

There are likely to be further useful sources of information available to the analyst, especially in the case of larger, listed, companies. Specialist agencies collect and analyse data about industry sectors from which it may be possible (often at a price) to obtain, say, average return on capital employed figures for a sector. Brokers' reports may contain information about the prospects for the entity, together with predictions about certain key ratios such as earnings per share. Because this information has a value it is usually available to the broker's clients only, at least initially. However, some listed entities have started to make this information available, after a certain lapse of time, on their websites. It is always worth examining the website of an entity in case it contains some additional voluntary disclosures that may be useful in the analysis.

In the *Financial Management* examination it will not be possible, because of time restrictions, to carry out an analysis in great depth, and there are obvious limitations on the amount of information that can be provided in an examination question. The information provided for analysis in a question is likely to include one or more of the following:

- income statement data for one or more years;
- cash flow data for one or more years;
- industry wide ratios and benchmarks;
- statement of financial position data for one or more years;
- budget data, and variance analysis;
- data regarding a competitor, potential subsidiary or customer applying for credit.

Working with this information and with any descriptive background provided in the question, we need to gain an understanding of the business and the relationships between the data. Where information in the form of extracts from the financial statements is given, it is often possible (and is often specifically required by the requirements of the question) to calculate a set of financial ratios as the basis for further analysis and comment. The rest of this chapter examines numerical data analysis in the form of the most frequently used accounting ratios.

14.3 Performance ratios

14.3.1 Profitability ratios

Revenue

When analysing the performance of an entity, a useful starting point is the examination of revenue. Revenue is important in both absolute and relative terms. Increases or decreases in

revenue may be attributable to changes in selling prices or sales volumes or a combination of the two factors.

Problems can arise in making a valid interpretation of movements in revenue. For example:

- Accounting policies on revenue recognition may vary between businesses. There may be inconsistencies between accounting periods, especially where the business derives some or all of its revenue from long-term contracts.
- Inflation may account for some of the increase in price.
- A detailed breakdown of revenue for the business may not be available. To some extent IFRS 8 *Operating Segments* (see Chapter 16 of this *Learning System* for more details) stipulates revenue details for different segments of the business. However, there are, as we shall see, problems in using segmental data, in that, for example, segments may not be consistently defined.

Understanding the reasons for movements in revenue may help to explain movements in costs such as cost of sales, advertising, selling and distribution costs and telephone charges. If revenue increases, then a similar increase in these revenue-related costs could be expected. Conversely, an increase in, say, marketing and advertising expenditure might help to explain an increase in revenue.

Profitability

Several profit figures are identified in a typical income statement. Each may be used to evaluate the profitability of the business.

Gross profit margin

The CIMA *Official Terminology* definition of gross profit percentage is:

$$\pi \quad \frac{(\text{Sales} - \text{cost of sales})}{\text{Sales for the period}} \times 100$$

This ratio might be expected to be more or less constant from 1 year to the next within a business. Even if there is an increase in direct costs, an efficient business could be expected to pass on the increases in the form of increased sales prices. However, this may not be the case in practice.

The gross profit margin requires a detailed breakdown in order to gain an understanding of variations. Ideally, the analyst requires information relating to opening and closing inventories, purchases, direct wages and overheads. Further information as to the following items would be required in order to evaluate gross profit margin fully:

- breakdown by product, geographical area or other segment;
- inventory valuation policies;
- overhead allocation methods;
- purchasing details such as bulk discounts, purchasing errors, wastage or theft;
- selling prices of different products over the period.

Obviously, much of this information is not available from a business's annual report. Some businesses do not even report gross profits.

Operating profit margin

$$\pi \quad \frac{\text{Operating profit}}{\text{Revenue}} \times 100$$

The operating profit margin is the trading or operating profit in relation to revenue, expressed as a percentage.

Operating profit is the profit from the trading activities of the business; it comprises profits after operating costs, but before finance costs and tax, and before investment income. Note that IAS 1 revised does not encourage the reporting of operating profit as a separate line item, although there is nothing to prevent entities providing additional information. It is likely, though that in many cases it will not be possible to calculate operating profit margin. Further analysis might include measuring operating costs as a percentage of revenue, and comparing to benchmarks, budgets, previous years or industry averages. For example:

$$\frac{\text{Administration costs}}{\text{Revenue}} \times 100$$

$$\frac{\text{Telephone costs}}{\text{Revenue}} \times 100$$

$$\frac{\text{Advertising costs}}{\text{Revenue}} \times 100$$

Net profit margin

Net profit margin expresses the relationship between net profit and sales. Net profit for this purpose would be profit after deduction of finance cost. It may be calculated on either pre-tax or post-tax profit.

$$\pi \quad \frac{\text{Net profit}}{\text{Revenue}} \times 100$$

Where comparing net profit year on year, it is important to allow for any exceptional charges or credits. Also, it would be sensible to take into account any large adjustments in respect of under- or over-provided tax provisions.

EBITDA

EBITDA is an acronym for earnings before interest, tax, depreciation and amortisation. In recent years many large entities have adopted EBITDA as a key measure of financial performance. Sceptics suggest that they do this in order to publicise a higher measure of earnings than profit from operations (this type of measurement is sometimes cynically referred to as EBB – earnings before the bad bits).

However, it does make some sense to measure EBITDA, provided that the user fully understands what is included and what is left out. Depreciation and amortisation are accounting adjustments, not representing cash flows, that are determined by management. It can therefore be argued that excluding these items in assessing earnings eliminates a major area where management bias can operate. Unfortunately, EBITDA is consequently often misunderstood as being a measurement of cash flow, which of course it is not. Even though two categories of non-cash adjustment are eliminated, financial statements are prepared on an accruals basis. EBITDA makes no adjustments in respect of accruals or working capital movements, and so is emphatically not a cash flow measurement.

14.3.2 Activity ratios

A further, related, set of ratios can be calculated that indicate the efficiency of usage of the entity's assets in producing revenue and profits.

Asset turnover

$$\pi \quad \frac{\text{Revenue}}{\text{Total assets}}$$

This calculation is usually expressed as a simple ratio, rather than as a percentage. It shows how much revenue is produced per dollar of investment in fixed assets.

The overall ratio can be further broken down to show revenue in relation to other categories of asset. For example, a useful ratio in certain contexts is:

$$\frac{\text{Revenue}}{\text{Non-current assets, excluding investments}}$$

This ratio shows the productivity of non-current assets in generating sales. It should be noted that this ratio is not always useful or informative. Where a business is using assets that are nearing the end of their useful lives, having been subject to annual depreciation charges over a relatively long period, the ratio is likely to be rather high. Similarly, where a business uses the historical cost convention, unmodified by revaluation, asset values are also likely to be relatively low, an effect which is more intrusive as the assets age. Also, in labour-intensive businesses, where the non-current asset base is low, the ratio tends to lack significance.

Note that, where possible, the average asset figure over the year should be used in the denominator of the fraction. This is likely to give a more consistent and representative result. External users of annual reports do not have access to monthly information with which to calculate an average, but opening and closing figures often give a reasonable approximation.

Inventory turnover

Conventionally, inventory turnover is expressed in terms of cost of sales, rather than of revenue. If cost of sales is not available, perhaps because the entity does not have a policy of disclosing gross profit, revenue could be used. Provided it is used consistently when making comparisons, the ratio will have some information content. However, where the information is available, cost of sales is to be preferred. The inventory turnover ratio indicates the liquidity of inventories. The higher the ratio, the more quickly inventory is being sold:

$$\pi \quad \frac{\text{Cost of sales}}{\text{Average inventory}}$$

Application of this formula produces a figure which shows the number of times, on average, that inventory has turned over during the year. If only a closing figure is available for inventory, then that can be used. However, the result must be treated with some caution, as the closing figure may be unrepresentative.

The ratio can be inverted to give the number of days, weeks or months that inventory, on average, has remained in the warehouse:

$$\frac{\text{Average inventory}}{\text{Cost of sales}} \times 365 \text{ days (or 52 weeks, or 12 months)}$$

14.3.3 Return on capital ratios

Return on capital employed

Return on capital employed (ROCE) is a measurement that is frequently used in the analysis of financial statements. This shows the overall performance of the business, expressed as a percentage return on the total investment. It measures management's efficiency in generating profits from the resources available.

Return on capital employed is expressed as a percentage, and is calculated as follows:

$$\pi \quad \frac{\text{Profit}}{\text{Capital employed}} \times 100$$

For the purposes of the ROCE measurement, capital employed includes the following:

- Issued share capital
- + Reserves
- + Preference shares
- + Non-controlling interests
- + Loan capital
- + Provisions (including provisions for tax)
- + Bank overdraft
- Investments

It is important in this type of calculation that the numerator and denominator should be consistent. Therefore, in calculating ROCE, the numerator should include profit before any deductions for finance cost. If capital employed includes a bank overdraft, the profit figure used in the calculation should exclude interest paid and payable on the overdraft.

Return on assets

Return on assets (ROA) involves a similar calculation to ROCE, but the denominator represents total assets (i.e., the statement of financial position total). Where a business has a policy of regular revaluation of assets, both ROCE and ROA are likely to provide a better measure of economic performance.

ROA, which is expressed as a percentage, is calculated as follows:

$$\pi \quad \frac{\text{Operating profit}}{\text{Total assets}} \times 100$$

Return on assets: relationship with other ratios

ROA can be broken down into two component ratios that have already been introduced: operating profit margin and asset turnover ratio.

$$\text{Operating profit margin} \times \text{asset turnover} = \text{Return on assets}$$

The relationship becomes clear when we put the ratio calculations into the formula:

$$\frac{\text{Operating profit}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Assets}} = \frac{\text{Operating profit}}{\text{Assets}}$$

Return on shareholders' funds

Sometimes it can be useful to calculate return from the shareholders' point of view. The formula for the ratio is:

$$\pi \quad \frac{\text{Profits attributable to shareholders}}{\text{Shareholders' funds}}$$

Profits attributable to shareholders comprises profits after tax, non-controlling interest and non-equity appropriations (such as preference dividends). Shareholders' funds comprise equity share capital and reserves.

14.4 Liquidity ratios

14.4.1 Working capital analysis

The profitability and activity ratios indicate how the business is performing. It is important to supplement this review with an examination of the effects of the performance on the liquidity and cash position of the business.

The bank balance

The analysis of the liquidity of an entity may commence with a review of the actual bank balance in absolute terms. Has the bank balance increased or decreased significantly? It could be that the overdraft is near to its permitted limit or that high cash resources indicate a good takeover prospect.

Short-term liquidity

The liquidity of the business is measured by examining the relationships between current assets and current liabilities. To what extent is the business able to meet its current liabilities as they fall due?

Two common ratios are used to answer this question: the current ratio and the quick ratio:

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

$$\quad \quad \quad \text{Quick ratio} = \frac{\text{Current assets less inventory}}{\text{Current liabilities}}$$

The quick ratio recognises that the time taken to convert inventory into cash in many businesses is significantly longer than other current assets and so gives a more conservative view of liquidity. However, it is important to select ratios suitable for the circumstances of the business. If inventory is an insignificant amount (as it would be, for example, in most service businesses), there is little point in calculating the quick ratio.

There is no standard number that should be expected in these calculations; it should depend on the industry and should be linked to other areas of the analysis. The higher the ratio, the more liquid the business, but high liquidity can itself be a problem. It may mean that the business is unable to utilise cash effectively by investing it profitably.

The immediate liquidity of a business can be defined using the cash balance itself:

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

The working capital cycle

The length of the working capital cycle can assist in determining the immediate effects of the financial position on the bank balance.

The working capital cycle comprises cash, receivables, inventory and payables. The business uses cash to buy inventory. Additional inventory may be purchased on credit.

Inventories are sold and become receivables. Receivables pay and then the business has cash available to repay payables or buy further inventory.

The length of this cycle is determined using ratios of inventory turnover, receivables days and payables days.

Earlier, we examined the calculation of inventory turnover in terms of days, weeks or months. The same type of calculation is used for both receivables and short-term payables:

Receivables days

The number of days it takes for the average customer to pay may be measured as follows:

$$\pi \quad \frac{\text{Average receivables}}{\text{Credit sales}} \times 365 \text{ days (or 52 weeks) (or 12 months)}$$

A retail or cash-based business may have zero or very low receivables days. Note that, where a business sells for both cash and on credit, it will be necessary to split revenue into the two types.

Payables days

The length of time taken to settle payables may be measured as follows:

$$\pi \quad \frac{\text{Average payables}}{\text{Credit purchases}} \times 365 \text{ days (or 52 weeks) (or 12 months)}$$

Current payables comprise a form of finance which is free, or almost free. However, there may be costs in terms of loss of prompt payment discount, and loss of supplier goodwill where excessive time is taken to pay. Efficiency is measured relative to industry norms, receivables days and supplier terms.

In the ratios above, if figures are not available for credit sales and credit purchases (as may well be the case if the data source is a set of published accounts) an approximation may be obtained by using total revenue and cost of sales respectively, but the results of such ratio calculations must be treated with caution.

The total length of the working capital cycle is the inventory turnover days plus the receivables days less the payables days, which approximates to the total time it takes to purchase the inventory, sell the inventory and receive cash.

Example 14.A

X: statement of financial position (extract)

	20X2 \$'000	20X1 \$'000
Inventories	790	650
Trade receivables	503	535
Financial assets	86	75
Cash	113	–
	<u>1,492</u>	<u>1,260</u>
Current liabilities*	<u>773</u>	<u>751</u>
Net current assets	<u>719</u>	<u>509</u>

*Current liabilities analysed as follows:

	20X2	20X1
	\$'000	\$'000
Trade payables	520	443
Income tax	139	164
Other payables	114	108
Bank overdraft	—	36
	<u>773</u>	<u>751</u>

X: income statement (extract)

	20X2	20X1
	\$'000	\$'000
Revenue	3,559	3,343
Cost of sales*	<u>(2,420)</u>	<u>(2,240)</u>
Gross profit	<u>1,139</u>	<u>1,103</u>

*Cost of sales is analysed as follows:

	20X2	20X1
	\$'000	\$'000
Opening inventory	650	630
Add: purchases	2,560	2,260
Less: closing inventory	<u>(790)</u>	<u>(650)</u>
Cost of sales	<u>2,420</u>	<u>2,240</u>

In both 20X1 and 20X2 credit sales comprise 83% of total revenue. Calculate the working capital cycle for each of 20X2 and 20X1 for X.

Solution

The components of the working capital cycle are:

Inventories

$$\frac{\text{Average inventories}}{\text{Cost of sales}} \times 365 \text{ days}$$

$$20X1: \frac{(650 + 630)/2}{2,240} \times 365 \text{ days} = 104 \text{ days}$$

$$20X2: \frac{(790 + 650)/2}{2,420} \times 365 \text{ days} = 109 \text{ days}$$

Trade receivables

$$\frac{\text{Trade receivables}}{\text{Credit sales}} \times 365 \text{ days}$$

$$20X1: \frac{535}{3,343 \times 0.83} \times 365 \text{ days} = 70 \text{ days}$$

$$20X2: \frac{503}{3,559 \times 0.83} \times 365 \text{ days} = 62 \text{ days}$$

Trade payables

$$\frac{\text{Trade payables}}{\text{Credit purchases}} \times 365 \text{ days}$$

$$20X1: \frac{443}{2,260} \times 365 \text{ days} = 71 \text{ days}$$

$$20X2: \frac{520}{2,560} \times 365 \text{ days} = 74 \text{ days}$$

Working capital cycle

	20X2	20X1
Inventories days	109	104
+ Trade receivables days	62	70
– Trade payables days	<u>(74)</u>	<u>(71)</u>
Total	<u>97</u>	<u>103</u>

The working capital cycle has shortened in 20X2. Although inventories are, on average, spending an extra 5 days on the premises, collection from receivables has improved in 20X2 and X is taking an extra 3 days on average to meet its payables. It is very difficult to make a judgement, in absolute terms, about this length of working capital cycle. Much depends upon the nature of the industry, the type of inventories held and acceptable patterns of payment. If we had access to some industry averages for the working capital cycle we would be able to comment more confidently.

14.5 Analysis of capital structure

The gearing (or leverage) ratio is an important measure of risk. It is important to analyse, particularly for users such as shareholders and creditors, the ability to satisfy debts falling due after 1 year. There are two elements to consider: repayment of capital and payment of interest.

The assessment of an entity's gearing risk can be identified from two areas. The statement of financial position shows the current liquidity and capital structure of the business, that is the short-term liquidity and the level of fixed prior charge capital. The income statement shows the profitability of the business generally, indicating its ability to generate cash, some of which may be available to repay debt.

The capital structure of the business provides information about the relative risk that is accepted by shareholders and creditors. As long-term debt increases relative to shareholders' funds then more risk is assumed by long-term creditors and so they would require higher rewards, thereby decreasing resources available for the shareholders. As risk increases, creditors require higher interest in order to compensate for the higher risk.

However, the use of debt by management in their capital structure can assist in increasing profits available to shareholders. Cash received into the business from lenders will be used to generate revenue and profits. As interest costs are fixed, any profits generated in excess of the interest costs will accrue to the shareholders. There is, however, a negative side to the use of debt in the business. If the cash from the debt does not raise sufficient profits then the fixed interest cost must be paid first and so profits available to shareholders are decreased, and may be extinguished completely.

14.5.1 Measuring the performance effects of capital structures

Although the use of debt may generate higher profits for shareholders there is a limit to its use. This may be gauged from the income statement by focusing on the profitability and interest repayments in the interest cover ratio:



$$\frac{\text{Profit before interest and tax}}{\text{Interest expense}}$$

This ratio indicates the number of times profits will cover the interest charge; the higher the ratio, the better.

14.5.2 Measuring statement of financial position gearing

The gearing ratio can be calculated using either of the following:

$$\frac{\text{Total long-term debt}}{\text{Shareholders' funds}} \times 100$$

Or:

$$\frac{\text{Total long-term debt}}{\text{Shareholders' funds} + \text{long term debt}} \times 100$$

Long-term debt includes debentures, mortgages and other long-term debt, including preference shares. Any bank overdraft would be included to the extent that it is actually a source of long-term finance. Shareholders' funds comprises equity share capital and reserves.

Another useful ratio is the ratio of long-term debt to total assets, which is calculated as follows:

$$\frac{\text{Total long-term debt}}{\text{Total assets}} \times 100$$

This can provide very useful information for creditors as it measures the availability of assets in the business in relation to the total debt.

14.6 Valuation ratios and analysis for the investor

The analytical process for investment purposes will utilise the ratios identified in the above sections. These ratios may be supplemented by further ratios specifically for investors. The use of the market price of equity is an important component of this type of analysis.

14.6.1 Price/earnings ratio

A common benchmark for investors analysing different companies is the use of the price/earnings (P/E) ratio:

$$\pi \frac{\text{Current market price per share}}{\text{Earnings per share}}$$

Earnings per share is basically the earnings available for distribution divided by the number of ordinary shares in issue. The calculation of earnings per share is covered in detail in Chapter 15 of this *Learning System*.

The P/E ratio calculation produces a number which can be useful for assessing the relative risk of an investment.

Example 14.B

	V	W
Current market price per share	396¢	288¢
Most recent earnings per share	13.4¢	35.6¢
P/E ratio	29.6	8.1

W has much higher earnings per share than V, but the price of one share in W is lower than one share in V, giving rise to two very different P/E ratios. Generally, the lower the P/E ratio the greater the indication of risk for the investor.

The rational expectations of buyers and sellers in the stock market tend to be incorporated in the price of the share. The P/E ratios of these entities tend to suggest that the market considers investment in W to be riskier than investment in V.

There may be reasons to account for this difference, for example:

- The numerator of the fraction is current (an up-to-date market price can be obtained easily during the market's opening hours), but the EPS figure is the latest available which, for a listed entity in many markets, can be up to 6 months old. The EPS of either entity may therefore be quite significantly out of date.
- W may have issued a profits warning, or might have suffered adverse events, such as, for example, the loss of a major contract or the resignation of a key director. These events may have depressed the share price.
- W may be in a sector which is unfashionable or relatively undervalued.
- W may have had a difficult recent history with a volatile pattern of earnings. On the whole, markets prefer companies with a smooth profit record.

As usual, the process of analysis leads to demands for more information. A better picture could be obtained of V and W if share price graphs for the last year, for example, were available, so that the analyst could see whether the share prices quoted above are near to average or not.

14.6.2 Dividend-related ratios

Growth potential and the ability to generate future wealth in the business may depend on the amount of profits retained. This relationship may be measured using the profit retention ratio:

$$\pi \frac{\text{Profit after dividends}}{\text{Profit before dividends}} \times 100$$

The higher the proportion of earnings retained, the higher the growth potential. Cash is retained in the business for growth as opposed to being paid to shareholders.

$$\frac{\text{Cash dividend per share}}{\text{Earnings per share}} \times 100$$

When analysing financial statements from an investor's point of view it is important to identify the objectives of the investor. Does the investor require high capital growth, usually associated with high risk, or a lower risk fixed dividend payment and low capital growth?

Dividend yield will indicate the return on capital investment, relative to market price:

$$\frac{\text{Dividend per share}}{\text{Market price per share}} \times 100$$

Dividend cover measures the ability of the entity to maintain the existing level of dividend and is used in conjunction with the dividend yield:

$$\frac{\text{Earnings per share}}{\text{Dividends per share}}$$

The higher the dividend cover, the more likely it is that the dividend yield can be maintained.

14.6.3 Statement of financial position ratios

The statement of financial position may be used in computing ratios of particular interest to the investor. The book value per share indicates the asset backing of the investment:

$$\frac{\text{Shareholders' funds}}{\text{No. of equity shares in issue at the balance sheet date}}$$

However, this must be interpreted with care:

1. Assets in the statement of financial position may be measured on historical cost values. Other valuations of assets may be more informative.
2. The ratio may be irrelevant in service-based businesses where the major asset is the quality of staff and other intangibles which may not be included in the statement of financial position.

The book value per share may be compared to the market value per share to determine the market's evaluation of the business.

Example 14.C

This example will be used to illustrate the calculation of most of the accounting ratios illustrated so far in this chapter.

The income statement of PX for the year ended 31 December 20X4 and its statement of financial position at that date are as follows:

<i>Income statement</i>		
	\$m	\$m
Revenue		1,845
Cost of sales		(758)
Gross profit		<u>1,087</u>
Distribution costs	(136)	
Administrative expenses	<u>(61)</u>	
		<u>(197)</u>
Profit from operations		890
Finance cost		<u>(104)</u>
		786
Income tax expense		<u>(69)</u>
Profit for the period		<u>717</u>
<i>Statement of financial position</i>		
	\$m	\$m
Assets		
Non-current assets		
Property, plant and equipment		4,002
Current assets		
Inventories	42	
Trade receivables	180	
Cash and cash equivalents	<u>113</u>	
		<u>335</u>
Total assets		<u>4,337</u>
Equity and Liabilities		
Issued capital (\$1 shares)	600	
Retained earnings	<u>1,132</u>	
		1,732
<i>Non-current liabilities</i>		
Interest-bearing borrowings	2,022	
Deferred tax	<u>291</u>	
		2,313
<i>Current liabilities</i>		
		<u>292</u>
Total equity and liabilities		<u>4,337</u>

Note 1: The market price of one share of PX at 31 December 20 × 4 was \$ 10.22.

Note 2: Earnings per share is calculated as \$717m/600m = 1 19.5¢

Note 3: All sales are made on credit

Note 4: Purchases on credit in the year were \$527 million and trade payables at 31 December 20 × 4 was \$61 million

Note 5: The dividend for the year was \$400 million.

Performance: profitability ratios

Gross profit margin:

$$\frac{\text{Gross profit}}{\text{Revenue}} \times 100 = \frac{1,087}{1,845} \times 100 = 58.9\%$$

Operating profit margin:

$$\frac{\text{Operating profit}}{\text{Revenue}} \times 100 = \frac{890}{1,845} \times 100 = 48.2\%$$

Net profit margin

$$\frac{\text{Net profit}}{\text{Revenue}} \times 100 = \frac{717}{1,845} \times 100 = 38.9\%$$

Performance: activity ratios

Asset turnover:

$$\frac{\text{Revenue}}{\text{Total assets}} = \frac{1,845}{4,337} = 0.42$$

(This means that for every \$1 invested in assets, the business has produced \$0.42 in revenue)

Non-current asset turnover:

$$\frac{\text{Revenue}}{\text{Non-current assets}} = \frac{1,845}{4,002} = 0.46$$

Inventory turnover:

$$\frac{\text{Cost of sales}}{\text{Average inventory}} = \frac{758}{42} = 18 \text{ times}$$

$$\frac{\text{Average inventory}}{\text{Cost of sales}} \times 365 = \frac{42}{758} \times 365 = 20.2 \text{ days}$$

(Note that in this case the opening inventory figure is not available and we cannot, therefore, calculate an average, so closing inventory has been used.)

Performance: return on capital ratios

Return on capital employed:

$$\frac{\text{Profit}}{\text{Capital employed}} \times 100 = \frac{890}{4,337 - 292^*} \times 100 = 22\%$$

*Capital employed is calculated as issued capital + accumulated profits + interest-bearing borrowings + deferred tax provision, that is, total assets less current liabilities. If a breakdown of current liabilities were available, any bank overdraft could also be included.

Return on assets

$$\frac{\text{Operating Profit}}{\text{Total assets}} \times 100 = \frac{890}{4,337} \times 100 = 20.5\%$$

To demonstrate the relationship with other ratios, return on assets can be broken down as follows:

Operating profit margin × asset turnover = return on assets

From the calculations above:

$$48.2\% \times 0.42 = 20.5\%$$

Liquidity ratios: short term liquidity

Current ratio:

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{335}{292} = 1.15:1$$

Quick ratio:

$$\frac{\text{Current assets less inventory}}{\text{Current liabilities}} = \frac{335 - 42}{292} = 1.0:1$$

Note that these ratios are usually expressed as shown above, that is, as a figure compared to 1.

Immediate liquidity ratio:

$$\frac{\text{Cash}}{\text{Current liabilities}} = \frac{113}{292} = 0.37:1$$

Liquidity ratios: the working capital cycle

Trade receivables days:

$$\frac{\text{Average receivables}}{\text{Credit sales}} \times 365 = \frac{180}{1,845} \times 365 = 35.6 \text{ days}$$

Trade payables days:

$$\frac{\text{Average payables}}{\text{Credit purchases}} \times 365 = \frac{61}{527} \times 365 = 42.2 \text{ days}$$

Note that, because of limited information, closing receivables and payables have been used instead of average figures. Working capital cycle:

Inventories days	20.2
+ Receivables days	35.6
– Trade payables days	<u>(42.2)</u>
	<u>13.6</u>

Analysis of capital structure: performance effects

Interest cover:

$$\frac{\text{Profit before interest and tax}}{\text{Interest expense}} = \frac{890}{104} = 8.6 \text{ times}$$

Analysis of capital structure: gearing

Gearing ratio (debt to equity):

$$\frac{\text{Total long-term debt}}{\text{Shareholders' funds}} \times 100 = \frac{2,022}{1,732} \times 100 = 116.7\%$$

Debt to total assets ratio:

$$\frac{\text{Total long-term debt}}{\text{Total assets}} \times 100 = \frac{2,022}{4,337} \times 100 = 46.6\%$$

Investor ratios

Price/earnings ratio:

$$\frac{\text{Current market price per share}}{\text{Earnings per share}} = \frac{1,022\text{¢}}{119.5\text{¢}} = 8.6$$

Profit retention ratio:

$$\frac{\text{Profit after dividends}}{\text{Profit before dividends}} \times 100 = \frac{317}{717} \times 100 = 44.2\%$$

Dividend payout rate:

$$\frac{\text{Cash dividend per share}}{\text{Earnings per share}} \times 100 = \frac{66.7\text{¢}}{119.5\text{¢}} \times 100 = 55.8\%$$

Dividend yield:

$$\frac{\text{Dividend per share}}{\text{Market price per share}} \times 100 = \frac{66.7\text{¢}}{1,022\text{¢}} \times 100 = 6.5\%$$

Dividend cover:

$$\frac{\text{Earnings per share}}{\text{Dividends per share}} = \frac{119.5\text{¢}}{66.7\text{¢}} = 1.79 \text{ times}$$

Book value per share

$$\frac{\text{Shareholders' funds}}{\text{No. of equity shares in issue at the balance sheet date}} = \frac{1,732}{600} = \$2.89$$

14.7 Analysing the cash flow statement

The cash flow of an entity is regarded by many users as being of primary importance in understanding the operations of the business. After all, a business that cannot generate sufficient cash will, sooner or later, fail. The cash flow statement provides valuable information for the analysis of a business's operations and position. Students should note that the analysis of cash flow statements is examinable in *Financial Management*.

IAS 7 requires that all entities include a cash flow statement as an integral part of the financial statements. Chapter 6 of this *Learning System* explained in detail how to prepare a cash flow statement for a group of companies, and so the techniques of preparation will not be explained further in this chapter. It should be remembered that the IAS 7 cash flow statement categorises cash flow under three principal headings: cash flows from operating activities, investing activities and financing activities. As well as comparing these totals from year to year, various useful ratios can also be calculated. These will be illustrated using the example of a relatively simple, single entity, business operation.

Example 14.D

BC is an entity trading in high specification computer equipment. Its income statement and cash flow statement for the year ended 31 March 20X6 and its statement of financial position at that date are presented below:

<i>Income statement</i>	\$'000	\$'000
Revenue		896
Cost of sales		(554)
Gross profit		342
Distribution costs	76	
Administrative expenses	<u>142</u>	
Profit from operations		<u>(218)</u>
Finance cost		124
		<u>(3)</u>
		121
Income tax expense		<u>(32)</u>
Profit for the period		<u>89</u>

Note: the dividend for the year was \$30,000.

<i>Statement of financial position</i>		\$'000	\$'000
Assets			
Non-current assets			
Property, plant and equipment			174
Current assets			
Inventories	79		
Trade receivables	96		
Cash and cash equivalents	—		
			<u>175</u>
Total assets			<u>349</u>
Equity And Liabilities			
Capital and reserves			
Issued capital (\$1 shares)	40		
Retained earnings	<u>165</u>	205	
Non-current liabilities			
Deferred tax			26
Current liabilities (including bank overdraft of \$33,000)			
			<u>118</u>
Total equity and liabilities			<u>349</u>
Statement of cash flows			
	\$'000		\$'000
Cash flows from operating activities			
Adjustments for:			124
Depreciation			<u>14</u>
Operating profit before working capital changes			138
Increase in inventories	(43)		
Increase in trade receivables	(61)		
Increase in trade payables	<u>41</u>		
			<u>(63)</u>
Cash generated from operations			<u>75</u>
Interest paid			(3)
Income taxes paid			<u>(15)</u>
Net cash from operating activities			<u>57</u>
Cash flows from investing activities			
Purchase of property, plant and equipment	(94)		
Proceeds from sale of equipment	<u>4</u>		
Net cash used in investing activities			(90)
Cash flows from financing activities			
Dividends paid			(24)
Net decrease in cash and cash equivalents			(57)
Cash and cash equivalents at the beginning of the period			<u>24</u>
Cash and cash equivalents at the end of the period			<u>(33)</u>

Certain important features are evident from only a brief scrutiny. The business started the year with \$24,000 in the bank, but ends with an overdraft of \$33,000. This is despite generating a positive operating profit. We can also easily see that there has been a substantial investment in working capital, financed partly by an increase in trade payables. Equally, it is clear that the business has made a large investment in property, plant and equipment, although it has not obtained long-term financing for this.

Useful ratios which can be calculated include the following:

Return on capital employed: cash

$$\frac{\text{Cash generated from operations}}{\text{Capital employed}} \times 100$$

$$\frac{75}{205 + 26 + 33} \times 100 = 28.4\%$$

Note that the overdraft is included as part of capital employed in this calculation. Also, the deferred tax provision is included. We could also include the current tax provision, but it is not identified in the information given. For many external users, cash is a more significant indicator than profit, and this ratio should be calculated where the information is available.

Cash generated from operations to total debt

$$\frac{\text{Cash generated from operations}}{\text{Total long-term borrowings}}$$

This gives an indication of an entity's ability to meet its long-term obligations. The inverse ratio can also be calculated:

$$\frac{\text{Total long-term borrowings}}{\text{Cash generated from operations}}$$

This provides an indication of how many years it would take to repay the long-term borrowings if all of the cash generated from operations were to be used for this purpose.

We cannot calculate these ratios for BC because the business has no long-term borrowings.

Net cash from operating activities to capital expenditure

This is calculated as follows:

$$\frac{\text{Net cash from operating activities}}{\text{Net capital expenditure}} \times 100$$

In the case of BC:

$$\frac{57}{90} \times 100 = 63.3\%$$

This gives some idea of the extent to which the business can finance its capital expenditure out of cash flows from operating activities. If it cannot meet its capital expenditure from this source, then some kind of longer-term financing is likely to be required. However, this ratio could be misleading unless calculated and compared for several years. In the case of BC the current level of capital expenditure may not be typical. The business appears to be expanding fast (judging by the greatly increased levels of investment in working capital), and it may be that levels of operating profit and cash flow have yet to catch up with the investment.

14.8 Using ratios in the exam

When answering a *Financial Management* question it is important to be able to calculate ratios with a fair degree of accuracy from the information provided. However, students should bear in mind the following points:

- Only a proportion of the marks will be awarded for calculation, and this proportion may be relatively small. Generally, the majority of the marks will be awarded for the analysis and interpretation of data given in the question. Therefore, it is important not to get too absorbed in the calculations themselves; they are a means to an end. This chapter has been an introduction to the calculations; the next following two chapters will provide much more detailed guidance as to the interpretation and analysis of financial statements.
- Where a question asks for calculation of, say, 'relevant ratios', it is best to be fairly selective. Calculating the full range of ratios, as given in this chapter, may be inappropriate for the circumstances of the question. Time can be wasted in calculating ratios that are really not very useful.

- Some ratios may be of limited use, or may even be misleading in the context of service businesses. For example, care should be taken in respect of return on capital ratios in businesses with a low level of conventional non-current assets but a high level of unrecognised intellectual capital 'assets'.
- It is usually appropriate to round to no more than one or two decimal places.

Exam candidates should always read recent Post-Examination Guides (PEGs). The analysis learning outcomes for F2 are similar to those of its predecessor, P8 and so many of the comments about the analysis and interpretation of financial statement are valid. The PEG following the November 2006 examination made the following comments about analysis and interpretation questions:

While the general standard of analysis and interpretation has tended to improve since the first sitting of the Paper 8, many candidates produce very poor answers. One of the markers submitted the following comment: 'Some candidates displayed an inability to calculate basic ratios. The problem with ROCE persists but asset turnover was also a problem. They appear to have a lack of understanding of what they are trying to do and seem to calculate and interpret on a formulaic approach rather than demonstrating that they can apply ratio analysis as a useful tool. They do not appear to really understand what ratios can tell them and what they cannot. There seems to be a rote-learning approach as opposed to full understanding of the uses and limitations of ratio analysis.'

Please note and act upon the above!

14.9 Summary

This chapter has examined part of one learning outcome: to interpret a full range of accounting ratios. In order to interpret ratios we must appreciate how they are calculated and understand the figures behind the ratios and what the ratios can tell us about the business activities. More detailed analysis is developed in the forthcoming chapters. Calculation of accounting ratios is a key analytic tool, but it is just a means to an end. The important part is to be able to analyse the information and draw conclusions about the entity's performance and position.

Revision Questions

14

The first two questions are not of exam standard, they are included so as to allow students to practice the calculations of ratios. The calculation of ratios is usually an integral part of a question requiring interpretation of financial statements (covered in more depth in the next chapter). The third question is of exam standard and can be answered using the knowledge gained from studying this chapter.

Question 1

The following balances were extracted from the books of B, a listed entity, at 30 April 20X8:

	\$m
Sales (all on credit)	300
Cost of sales	<u>200</u>
Gross profit	<u>100</u>
Closing inventory	15
Trade receivables	36
Trade payables	28

- (a) Calculate the receivables days for B for the year ended 30 April 20X8.
(b) Calculate the working capital cycle for B for the year ended 30 April 20X8.

Tutorial note: a figure for purchases is not available, so use cost of sales instead. This gives a less reliable result, but in practice, a purchases figure is often not disclosed.

B has 100,000,000 issued ordinary shares with a par value of 20¢ each. There were no movements of issued share capital during the year. B had the following results for the year ended 30 April 20X8:

	\$m
Profit before tax	50
Income tax expense	10
Profit for the year	40

The dividend for the year was \$20 million

The quoted price of B shares on 30 April 20X8 was \$1.50.

- (c) Calculate the P/E ratio of B at 30 April 20X8.

(5 marks)

Question 2

The income statement, statement of changes in equity and cash flow statement for DE for the year ended 31 March 20X2 and its statement of financial position at that date are given below:

<i>Income statement</i>		
	\$'000	\$'000
Revenue		3,920
Cost of sales		<u>(2,743)</u>
Gross profit		1,177
Distribution costs	(184)	
Administrative expenses	<u>(308)</u>	
		(492)
Profit from operations		685
Income from investments	31	
Finance cost	<u>(191)</u>	
		(160)
Profit before tax		525
Income tax expense		<u>(110)</u>
		<u>415</u>
<i>Summarised statement of changes in equity</i>		
		\$'000
Equity at start of year		1,586
Revaluation		989
Profit for the period		415
Dividends paid		(320)
Share issue		<u>1,575</u>
Equity at end of year		<u>4,245</u>
<i>Statement of financial position</i>		
	\$'000	\$'000
Assets		
Non-current assets		
Intangible assets	550	
Tangible assets	3,260	
Investments	<u>400</u>	
		4,210
Current assets		
Inventories	515	
Trade receivables	1,000	
Investments	315	
Bank	<u>650</u>	
		<u>2,480</u>
Total assets		<u>6,690</u>
Equity And Liabilities		
Capital and reserves		
Issued capital (\$1 shares)	325	
Share premium	2,300	
Revaluation reserve	1,339	
Retained earnings	<u>281</u>	
		4,245
Non-current liabilities		
10% loan notes 2003/2006		251

Current liabilities		
Trade payables	784	
Other payables	460	
Bank loans and overdrafts	<u>950</u>	
		<u>2,194</u>
Total equity and liabilities		<u>6,690</u>
<i>Cash flow statement</i>		
	\$'000	\$'000
Cash flows from operating activities		
Profit from operations		685
Adjustments for:		
Depreciation		<u>480</u>
Operating profit before working capital changes		1,165
Increase in inventories	(155)	
Increase in trade receivables	(50)	
Increase in trade and other payables	<u>158</u>	
		<u>(47)</u>
Cash generated from operations		1,118
Interest paid		(191)
Income taxes paid		<u>(71)</u>
Net cash from operating activities		856
Cash flows from investing activities		
Purchase of non-current assets and investment	(1,556)	
Interest received	<u>31</u>	
Net cash used in investing activities		(1,525)
Cash flows from financing activities		
Proceeds from issuance of share capital	1,575	
Repayment of long-term borrowings	(728)	
Dividends paid	<u>(320)</u>	
		<u>527</u>
Net decrease in cash and cash equivalents		(142)
Cash and cash equivalents at the beginning of the period		(158)
Cash and cash equivalents at the end of the period		<u>(300)</u>

Note

1. all sales are on credit;
2. purchases for the year were \$2,555,000;
3. earnings per share for the year is 180¢;
4. the current market price of one share at 31 March 20X2 is \$15.76;
5. dividend per share is 98.5¢.

Requirement

Calculate as many accounting ratios as possible from the information provided.

? Question 3

BSP, a listed entity, supplies, installs and maintains burglar alarm systems for business clients. As a response to increased competition and falling margins in the burglar alarm market, the entity's directors decided, towards the end of 20X5, to extend its operations

into the provision of fire alarm and sprinkler systems. A training programme for staff was undertaken in the early months of 20X6 at a cost of around \$200,000. An aggressive marketing campaign, costing \$250,000, was launched at the same time. Both costs were incurred and settled before the 31 March 20X6 year end. BSP commenced its new operation with effect from the beginning of its financial year on 1 April 20X6.

BSP's cash resources were at a low level in early 20X6, so, in order to finance the costs of the new operation and the necessary increase in working capital to fund the new operations, BSP made a new issue of shares. The issue took place in May 20X6. During March 20X7, BSP disposed of its two overseas subsidiaries in order to concentrate on operations in its home market. Both were profitable businesses and therefore sold for an amount substantially in excess of carrying value. These subsidiaries accounted for almost 10% of group sales during the 20X6/20X7 financial year.

As the finance director's assistant you have been responsible for the preparation of the draft financial statements, which have been circulated to the directors in advance of a board meeting to be held later this week.

The marketing director, who as appointed in June 20X6, has sent you the following e-mail:

'When I did my university course in marketing I studied a module in finance and accounting, which covered the analysis of financial statements. Unfortunately, it was a long time ago, and I've forgotten quite a lot about it.

I'm puzzled by the statement of cash flows, in particular. The income statement shows a loss, which is obviously bad news, especially as the budget showed a profit for the year. However, the cash resources of the business have actually increased by quite a large amount between March 20X6 and March 20X7. It is said that "cash is king", So I'm assuming that the poor profitability is a short-term problem while the new operation settles down.

As you know, we almost managed to achieve our sales targets in both the fire and burglar alarm sectors for the year, (although of course we did have to offer some customers special discounts and extended credit as inducements). I'm assuming, therefore, that the lack of profitability is a problem of cost control.

It would be really helpful if you could provide me with a brief report, in advance of this week's meeting, which tells me what this statement of cash flows means. You could include ratios, provided that you show how they are calculated.'

The consolidated statement of cash flows for the year ended 31 March 20X7 (with comparative figures for 20X6) is as follows:

BSP: Consolidated statement of cash flows for the year ended 31 March 20X7

	20X7	20X7	20X6	20X6
	\$000	\$000	\$000	\$000
Cash flows from operating activities				
(Loss)/profit before tax	(453)		306	
Adjustments for:				
Depreciation	98		75	
Foreign exchange loss	22		37	
Profit on sale of investments	(667)		–	
Interest expense	<u>161</u>		<u>45</u>	
		(839)		463
Increase in inventories		(227)		(65)
Increase in receivables		(242)		(36)
Increase in payables		<u>62</u>		<u>12</u>
Cash (outflow)/inflow from operations		(1,246)		374
Interest paid		(157)		(42)

Tax paid		<u>(38)</u>	<u>(55)</u>
<i>Net cash (outflow)/inflow from operating activities</i>		(1,441)	277
Cash flows from investing activities			
Proceeds from sale of investments	2,320	–	
Purchase of property, plant and equipment	(661)	(425)	
Income from associates	<u>23</u>	<u>26</u>	
<i>Net cash inflow/(outflow) from financing activities</i>		1,682	(399)
Cash flows from financing activities			
Proceeds from issue of share capital	850	–	
Dividends paid	<u>–</u>	<u>(200)</u>	
<i>Net cash inflow/(outflow) from financing activities</i>		<u>850</u>	<u>(200)</u>
Net increase/(decrease) in cash		1,091	(322)
Cash at start of period		<u>27</u>	<u>349</u>
Cash at end of period		<u>1,118</u>	<u>27</u>

Additional information:

Revenue in the 20X5/X6 financial year was \$12.11 million. In the 20X6/X7 financial year, total revenue was \$12.32 million, \$10.93 million of which arose in respect of the sale of burglar alarms.

Inventories at the start of the 20X5/X6 financial year were \$591,000, and receivables were \$1,578,000. There was no increase in long-term borrowings throughout the two year period covered by the cash flow statement above.

Requirement

Analyse and interpret the information given, and produce a report to the marketing director. The report should explain the difference between cash and profit, and should discuss the business's profitability and working capital position. It should also discuss, to the extent possible from the information given, the prospects for BSP's future. **(25 marks)**

Solutions to Revision Questions

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Solution 1

(a)
$$\frac{\text{Trade receivables}}{\text{Sales}} \times 365 = \frac{36}{300} \times 365 = 43.8 \text{ days}$$

(b) Working capital cycle:

$$\frac{\text{Trade receivables}}{\text{Sales}} \times 365 = \frac{36}{300} \times 365 = 43.8 \text{ days}$$

$$\frac{\text{Trade payables}}{\text{Cost of sales}} \times 365 = \frac{28}{200} \times 365 = (51.1 \text{ days})$$

$$\frac{\text{Inventory}}{\text{Cost of sales}} \times 365 = \frac{15}{200} \times 365 = 27.4 \text{ days}$$

$$\text{Working capital cycle} \qquad \qquad \qquad \underline{\underline{20.1 \text{ days}}}$$

(c)
$$\begin{aligned} \text{Earnings per share} &= \frac{\text{profit for the year available to ordinary shareholders}}{\text{number of ordinary shares in issue}} \\ &= \frac{\$40,000,000}{100,000,000} = 40\text{¢ per share} \end{aligned}$$

$$\text{P/E ratio is} = \frac{150\text{¢}}{40\text{¢}} = 3.75$$

Solution 2

Performance: profitability ratios

Gross profit margin:

$$\frac{\text{Gross profit}}{\text{Revenue}} \times 100 = \frac{1,177}{3,920} \times 100 = 30\%$$

Operating profit margin:

$$\frac{\text{Operating profit}}{\text{Revenue}} \times 100 = \frac{685}{3,920} \times 100 = 17.5\%$$

Net profit margin:

$$\frac{\text{Net profit}}{\text{Revenue}} \times 100 = \frac{415}{3,920} \times 100 = 10.6\%$$

Performance: activity ratios

Asset turnover:

$$\frac{\text{Revenue}}{\text{Total assets}} = \frac{3,920}{6,690} = 0.59$$

Non-current asset turnover:

$$\frac{\text{Revenue}}{\text{Non-current assets}} = \frac{3,920}{4,210} = 0.93$$

Inventory turnover:

Note that in this case it is possible to derive opening inventory by using information in the cash flow statement. Closing inventory was \$515,000, an increase of \$155,000 over the previous year end. Opening inventory was, therefore, \$360,000, so the average figure for the year is:

$$\frac{\$515,000 + 360,000}{2} = \$437,500$$

$$\frac{\text{Cost of sales}}{\text{Average inventory}} = \frac{2,743}{437.5} = 6.3 \text{ times}$$

$$\frac{\text{Average inventory}}{\text{Cost of sales}} \times 365 = \frac{437.5}{2,743} \times 365 = 58.2 \text{ days}$$

Performance: return on capital ratios

Return on capital employed:

$$\frac{\text{Profit}}{\text{Capital employed}^*} \times 100 = \frac{685}{4,245 + 251 + 950} \times 100 = 12.5\%$$

*Capital employed is calculated as issued capital + retained earnings + interest-bearing borrowings + overdraft.

Return on assets:

$$\frac{\text{Operating Profit}}{\text{Total assets}} \times 100 = \frac{685}{6,690} \times 100 = 10.2\%$$

Liquidity ratios: short term liquidity

Current ratio:

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{2,480}{2,194} = 1.13:1$$

Quick ratio:

$$\frac{\text{Current assets less inventory}}{\text{Current liabilities}} = \frac{2,480 - 515}{2,194} = 0.90:1$$

Liquidity ratios: the working capital cycle

Trade receivables days:

As for inventory, we can calculate an opening figure for receivables, so it is possible to work out average receivables. Opening receivables was: \$1,000,000 - 50,000 = 950,000. The average for the year is \$975,000.

$$\frac{\text{Average receivables}}{\text{Credit sales}} \times 365 = \frac{975}{3,920} \times 365 = 90.8 \text{ days}$$

Trade payables days:

$$\frac{\text{Closing trade payables}}{\text{Credit sales}} \times 365 = \frac{784}{2,555} \times 365 = 112 \text{ days}$$

Working capital cycle:

Inventories days	58.2
+ Receivables days	90.8
- Trade payables days	<u>(112.0)</u>
	<u>37.0</u>

Analysis of capital structure: performance effects

Interest cover:

$$\frac{\text{Profit before interest and tax}}{\text{Interest expense}} = \frac{685 + 31}{191} = 3.75 \text{ times}$$

Analysis of capital structure: statement of financial position gearing

Gearing ratio:

$$\frac{\text{Total long-term debt}}{\text{Shareholders' funds}} \times 100 = \frac{251}{4,245} \times 100 = 5.9\%$$

Debt to total assets ratio:

$$\frac{\text{Total long-term debt}}{\text{Total assets}} \times 100 = \frac{251}{6,690} \times 100 = 3.7\%$$

Investor ratios

Price/earnings ratio:

$$\frac{\text{Current market price per share}}{\text{Earnings per share}} = \frac{1,576¢}{180¢} = 8.7$$

Profit retention ratio:

$$\frac{\text{Profit after dividends}}{\text{Profit before dividends}} \times 100 = \frac{415 - 320}{415} \times 100 = 22.9\%$$

Dividend payout rate:

$$\frac{\text{Cash dividend per share}}{\text{Earnings per share}} \times 100 = \frac{98.5\text{¢}}{180\text{¢}} \times 100 = 54.7\%$$

Dividend yield:

$$\frac{\text{Dividend per share}}{\text{Market price per share}} \times 100 = \frac{98.5\text{¢}}{1,576\text{¢}} \times 100 = 6.3\%$$

Dividend cover:

$$\frac{\text{Earnings per share}}{\text{Dividends per share}} = \frac{180\text{¢}}{98.5\text{¢}} = 1.82 \text{ times}$$

Statement of financial position ratio: book value per share

$$\frac{\text{Shareholders' funds}}{\text{No. of equity shares in issue at the balance sheet date}} = \frac{4,245}{325} = \$13.06$$

Return on capital employed: cash

$$\frac{\text{Cash generated from operations}}{\text{Capital employed}} \times 100 = \frac{1,118}{5,446^*} \times 100 = 20.5\%$$

* Same as used in the ROCE calculation earlier.

Cash generated from operations to total debt

$$\frac{\text{Cash generated from operations}}{\text{Total debt}} = \frac{1,118}{251} = 4.5$$

Net cash from operating activities to capital expenditure:

$$\frac{\text{Net cash from operating activities}}{\text{Net capital expenditure}} \times 100 = \frac{856}{1,556} \times 100 = 55\%$$



Solution 3

To: Marketing Director of BSP

From: Assistant to Finance Director

Report on draft statement of cash flows for the financial year ended 31 March 20X7

Note: The appendix to this report contains some ratio and other relevant calculations.

1. The difference between cash and profit

Because of the use of the accruals basis in financial accounting, it is often the case that profit or loss differs significantly from the cash flows arising during an accounting period. This is not necessarily a problem, unless significant cash shortages affect the viability of the business, but it does mean that the statement of cash flows should be interpreted with some caution. An apparently healthy cash balance can disguise underlying problems.

In the case of BSP's statement of cash flows, there is, indeed, a significant amount of cash at 31 March 20X7. However, upon closer examination, it can be seen that the cash inflows have arisen from investing and financing activities, rather than from operating activities which produced negative cash flows. A total of \$3,170,000 (i.e. \$2,320,000 from the sale of the subsidiaries and \$850,000 from the issue of share capital) was received in cash during the year. While some of this (approximately one-third) remained in the statement of financial position at 31 March 20X7, most of it had been absorbed by the major cash outflow from operations and the acquisition of property, plant and equipment.

2. Profit and loss

BSP's profit before tax has declined sharply between 20X6 and 20X7. The decline is even more marked if unusual items are taken into account. Towards the end of the 20X6 financial year, the business incurred \$450,000 in costs of training and marketing associated with the new product line. Profit before these items was \$756,000. The loss before tax in the year ended 31 March 20X7 was mitigated substantially by the profit on disposal of the foreign subsidiaries. If this profit is excluded, the loss from operations is \$1,120,000. Using these adjusted figures, net profitability (measured on a pre-tax basis) was 6.2% in the 20X6 financial year, whereas the loss in 20X7 represented 9.1% of revenue.

1. Working capital

The operating section of the statement of cash flows includes adjustments for increases and decreases in working capital. Both inventories and receivables increased by a substantial amount in the year ended 31 March 20X7. Inventories increased by 10.9% in 20X6 and by 34.6% in 20X7. Some increase in inventories is consistent with the move into a new area of operations, but the increase of 34.6% does appear very high.

Receivables have also increased substantially, by 15% between 20X6 and 20X7. The overall revenue figure has increased very little. The receivables figure at 31 March 20X7 does not include any amounts relating to the two subsidiaries disposed of. The revenue figure for the year has therefore been reduced to 90% of the total, to exclude the revenues relating to these subsidiaries. Using these two figures, receivables days at the year end is approximately 61 days. Receivables days at the previous year end was about 49 days. (It should be noted that these two figures are not directly comparable because the 20X6 revenue and receivables figures include the two subsidiaries.) The policy of offering extended credit as an inducement to customers may very well have paid off in terms of additional sales, but there are some drawbacks.

Compared to inventories and receivables, the movements in the 2 years in payables are relatively minor. In both 20X6 and 20X7 there are increases which offset the outflows on other working capital items.

2. Prospects for the future

Although sales targets for the 20X7 financial year were almost met, the decline in profitability does, as you suggest, indicate that there is a problem in controlling costs. However,

it cannot necessarily be assumed that this is a short-term problem while the new operation settles down; careful cost control will be required if the business, overall, is to return to profitability. Offering discounts in order to attract new business may be effective in increasing revenue, but this practice tends to reduce profitability.

Because the sale of the subsidiaries took place so recently, the revenue figures for 20X7 are not affected. However, these two subsidiaries have accounted for around 10% of the sales, and have been consistently profitable. Therefore, unless there is an improvement in sales and profitability in the remaining group businesses, the 20X8 performance is likely to be even worse than in 20X7. The effect may be mitigated to some extent by lower interest charges. These rose substantially in 20X7, compared to 20X6, but the large cash balance in hand at the beginning of the new financial year should ensure that, for some months at least, there will be no short-term borrowings and hence, no interest payments.

The breakdown of the revenue figure shows that there has been a sharp decline in the sales relating to burglar alarms; sales in 20X7 were only 90.3% of sales in 20X6. The short-fall has been made up by sales of fire alarm systems, which tends to justify the change in business strategy. However, if tough conditions continue in the burglar alarm market, revenues from this source may continue to fall.

A final point relates to dividend. A dividend of \$200,000 was paid in the 20X6 financial year, but there was no dividend in 20X7. Shareholders made a substantial contribution in the form of new capital in 20X7; while they may be content to wait for a return while the new line of business is getting established, they may become impatient if no dividend is forthcoming in 20X8.

3. Conclusion

In conclusion, the statement of cash flows serves to emphasise some worrying trends in the business. The cash balance available at 31 March 20X7 will rapidly disappear unless the losses can be reversed. Working capital management and cost control must be improved. This statement of cash flows shows the more positive side of disposing of two profitable subsidiaries; the negative aspects are likely to make an impact on the 20X8 and subsequent statement of cash flows.

APPENDIX: Calculations

1. (Loss)/profit before tax as a percentage of revenue

$$\begin{array}{cc} \begin{array}{c} 20X7 \\ (453)/12,320 \times 100 = (3.7\%) \end{array} & \begin{array}{c} 20X6 \\ 306/12,110 \times 100 = 2.5\% \end{array} \end{array}$$

2. (Loss)/profit before tax as a percentage of revenue – after adjustment for unusual items

20X6: calculate profit before deduction of unusual items: $\$306 + 200 + 250 = \756

20X7: calculate loss before setting off profit on disposal of subsidiaries: $\$(453) + (667) = (1,120)$

$$\begin{array}{cc} \begin{array}{c} 20X7 \\ (1,120)/12,320 \times 100 = (9.1\%) \end{array} & \begin{array}{c} 20X6 \\ 756/12,110 \times 100 = 6.2\% \end{array} \end{array}$$

3. Inventory movement

	\$	<i>Increase year on year %</i>
At 1 April 20X5	591,000	
At 31 March 20X6 (591 + 65)	656,000	10.9%
At 31 March 20X7 (656 + 227)	883,000	34.6%

4. Receivables movement

	\$	<i>Increase year on year %</i>
At 1 April 20X5	1,578,000	
At 31 March 20X6 (1,578 + 36)	1,614,000	2.3%
At 31 March 20X7 (1,614 + 242)	1,856,000	15%

Receivables days (using year end figures):

$$1,856 / (12,320 \times 90\%) \times 365 = 61.1 \text{ days} \quad \text{20X7}$$

$$1,614 / 12,110 \times 365 = 48.6 \text{ days} \quad \text{20X6}$$