CHAPTER 27

Review of financial ratio analysis

27.1 Introduction

The main purpose of this chapter is to provide an overview of the use of ratios in the analysis of the statements of comprehensive income and financial position.

Objectives

By the end of the chapter, you should be able to:

- calculate operating, liquidity and activity ratios from an annual report;
- discuss the implication of the ratios;
- describe and draft a report using inter-firm and industry comparative ratios;
- critically discuss the strengths and weaknesses of ratio analysis;
- calculate EBITDA and EBITDA margins for management control purposes.

27.2 Initial impressions

27.2.1 Impressions formed before referring to the annual report

Often, even before looking at the annual report and accounts, analysts have some preconceived ideas and expectations based on global economic conditions and the specific economic conditions affecting the sector. For example, we have seen in the time of the credit crisis that the professional accounting bodies and enforcement agencies have issued warnings to auditors to be aware of the risk that a company's going concern status might be in jeopardy.

Before even opening the annual report there would be questions already forming in the auditor's and analyst's minds, such as:

(a) What is the likely impact of the overall economic conditions on the entity? For example:
   - liquidity might be under pressure;
   - debt covenants might be broken;
   - segments might be sold to obtain funds to reduce debt with profit/loss arising from forced sales.

(b) What is the likely impact of specific economic conditions affecting the sector? For example, the possibility of:
   - a significant fall in revenue, for example, in the building sector;
   - plant closures in the car making sector;
   - exceptional costs arising from cost reduction and redundancy programmes.

(c) What is the possibility of misrepresentation? For example, by:
- understating liabilities by omitting to record purchase invoices; or
- overstating inventories by not making appropriate allowances for inventory losses through fall in demand, obsolescence and deterioration; or
- overstating trade receivables by recording fictitious sales or not making appropriate allowances for doubtful debts; or
- understating impairment losses on non-current assets to give a better debt to equity ratio.

There has always been a risk of misrepresentation by management tempted to overstate revenues to satisfy performance targets to obtain a bonus. The following is an interesting, although perhaps rather exaggerated, view given by Ian Griffiths who has written a book on creative accounting which questions the reliability of financial statements:

> Every company in the country is fiddling its profits. Every set of published accounts is based on books which have been gently cooked or completely roasted . . . it is the biggest con trick since the Trojan Horse.[1]

27.2.2 Before referring to the financial data in the annual report

It is helpful to take a critical look at the narrative in the report. For example, the following is an extract from the Chief Executive' Review in the 2008 Annual Report of Wienerberger, a major brick making company:

> 2008 marked a clear turning point in the pattern of economic development across the world . . . High write-offs to bank portfolios triggered a loss of confidence in the financial sector and subsequently led to more restrictive lending . . . Companies were forced to cut back on capital expenditure, which in turn led to a loss of jobs and a general decline in consumer confidence . . . We reacted quickly and adjusted our strategy in summer 2008 . . . liquidity has top priority. . . . Our primary task is to reduce fixed costs as quickly as possible.

This indicates that at this time the particular concern was to achieve an adequate, safe cash flow more than expanding revenues.

We should, however, take heed of the warnings from the professional accounting bodies and be open-minded and investigative when confronted by a set of financial statements or, in accounting terms, approach the analysis with a certain degree of scepticism. To quote Griffiths again,

> Whether the differences in accounting treatment and presentation are real or imagined, it is clear that there is scope for tremendous variation in reported figures . . . perhaps the best safeguard is to look upon the annual accounts with a more cynical and jaundiced eye. The myth that the financial statements are an irrefutable and accurate reflection of the company's trading performance for the year must be exploded once and for all. The accounts are little more than an indication of the broad trend.[2]

27.3 What are accounting ratios?

Ratios describe the relationship between different items in the financial statements. Obviously, we could calculate hundreds of ratios from a set of financial statements; the

expertise lies in knowing which ratios provide relevant information. For example, an investor would be interested the statement of comprehensive income and the availability of profits to pay dividends, whereas a credit controller of a supplier would be more interested in a customer's ability to pay and would be concentrating on the statement of financial position and liquidity ratios. The relative usefulness of each ratio depends on what aspects of a company's business affairs are being investigated.

In order to evaluate a ratio, it is customary to make a comparison with the previous year's or industry ratios. It is helpful to bear in mind that:

- A comparison is only valid if the same accounting policies have been applied, for example, both periods or companies using historical cost accounting in reporting their non-current assets.
- The ratios are defined in the same way as the definitions of ratios may vary from source to source as concepts and terminology are not universally defined.[3]
- As a ratio compares two values, changes in either of these underlying values over time may be obscured in the final ratio figure. Let us take the example of Radmand plc:

	Net profit	*Capital employed*	*Return on Capital employed*
	£	£	
20X7	100,000	1,000,000	10%
20X8	150,000	1,500,000	10%
20X9	225,000	2,250,000	10%

Although the return on capital employed (ROCE) remains a constant 10% over the years 20X7–20X9, no assumptions can be made about the underlying figures. As we can see, the net profit increased by 50% in both 20X8 and 20X9, and this trend is not ascertainable in the ROCE ratio. The user should be aware that a ratio is not saying anything about the trends of its individual components – only about the combined effect of both components.

In the following paragraph we will illustrate the pyramid approach used by management to produce ratios that can indicate how effectively an entity is operating and managing its resources.

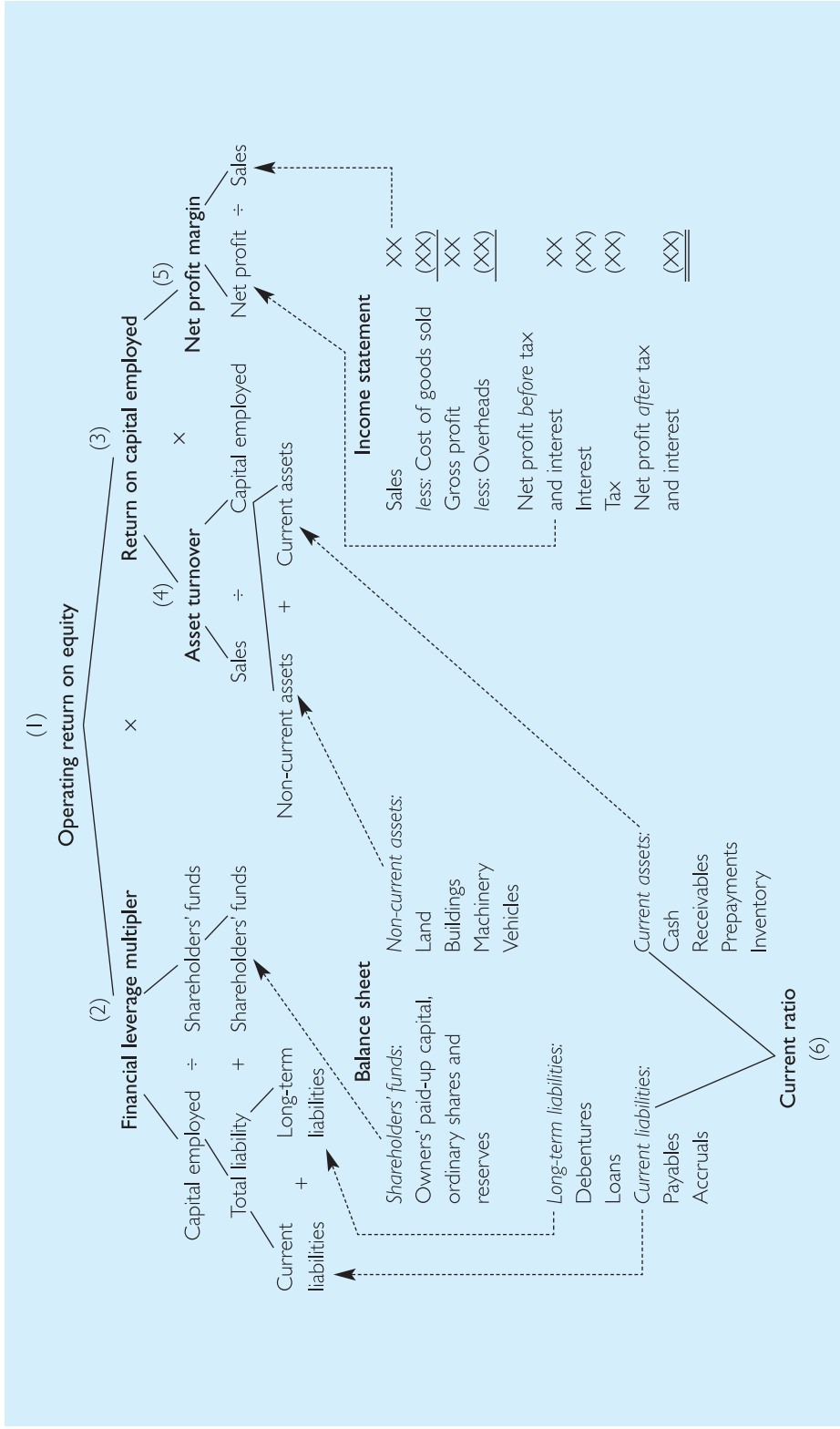
27.4 Six key ratios

In our analysis we identify six key ratios and a number of subsidiary ratios. The key ratios are presented as a pyramid in Figure 27.1. The pyramid illustrates how the constituent parts of each ratio relate to a set of financial statements. It is an approach used by inter-firm comparison organisations to systematically order the ratios that are prepared for members of the scheme.

The key ratios are:

1. Operating return on equity
2. Financial leverage multiplier
3. Return on capital employed (ROCE)
4. Asset turnover
5. Operating margin (operating profit as % of revenue)
6. Current ratio.

Figure 27.1 Pyramid of key ratios



27.4.1 Definition of the key ratios

The ratios have been defined in this text as follows:

Primary investment level ratios

1 Primary investment ratio **(operating return on equity)**

$$\frac{\text{Operating profit}}{\text{Shareholders' equity}}$$

2 Primary financing ratio **(financial leverage multiplier)**

$$\frac{\text{Capital employed}}{\text{Shareholders' equity}}$$

Primary operative level ratios

3 Primary operating ratio **(return on capital employed)**

$$\frac{\text{Operating profit}}{\text{Capital employed}}$$

4 Primary utilisation ratio **(asset turnover)**

$$\frac{\text{Revenue}}{\text{Capital employed}}$$

5 Primary efficiency ratio **(operating margin)**

$$\frac{\text{Operating profit}}{\text{Revenue}}$$

6 Primary liquidity ratio **(current ratio)**

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

27.4.2 Ratios might be defined differently

It is important to be aware that there is no standard definition of ratios and the make-up of both the numerator and denominator might vary between companies. For example, consider ROCE where both the numerator (operating profit) and the denominator (capital employed) might be defined differently by companies, even in the same sector:

(a) The operating profit used might be before or after interest and before or after income tax.

(b) (i) If the operating profit figure is *before* interest, the capital employed might be variously defined as:

- the book value of the *closing* figure for total assets; or
- the book value of the net assets plus the net debt; or
- the *average* of the opening and closing figures for total assets; or
- the current value of the assets as at the date of the statement of financial position.

This is a method required by some inter-firm comparison schemes in order to make a valid comparison when comparing the ROCE of scheme members.

(ii) If the operating profit figure is *after* interest, the capital employed might be variously taken as:

- the book value of the closing figure for *net* assets; or
- the *average* of the opening and closing figures for net assets; or
- the current value of the net assets as at the date of the statement of financial position.

27.4.3 Discussing the use of the key ratios

1 Primary investment ratio (operating return on equity)

The operating return on equity represents the operating profit before tax as a percentage of the book value of the shareholders' equity. This ratio is at the apex of the ratio pyramid. It is the product of the financial leverage multiplier and the ROCE.

2 Primary financing ratio (financial leverage multiplier)

The financial leverage multiplier expresses how many times bigger the capital employed is than the shareholders' equity. This multiplier demonstrates that assets funded by sources other than the owners will increase the profit or loss of the company relative to shareholders' equity.

3 Primary operating ratio (return on capital employed)

ROCE is a popular indicator of management efficiency and for strategic planning.

Management efficiency

A comparison of the operating profit generated by a company with the total book value of the non-current and current assets indicates how many dollars of profit are obtained from every dollar of resource under management's control. It is useful when making inter-period comparisons for a company.

Strategic planning

ROCE is also used for strategic planning. For example, the following is an extract from the Government Shareholder Executive reporting on the performance of the Royal Mint:[4]

> **Commentary**
> The Royal Mint's financial performance improved for the second consecutive year in 2007–08, with a pre-exceptional operating profit of £9.6m. This compared to £8.7m and £1.1m in the two previous years . . . The return on capital employed of 11.5% was substantially above the financial ministerial target of 7.2%.

We have used total (rather than net) assets on the basis that the management are responsible for the use they make of all the assets under their control and operating profit *before* tax. However, as mentioned above there are other definitions. For example, the following is an extract from the 2009 Annual Report of Tesco plc:

> **Return on capital employed (ROCE)**
> ROCE is calculated as profit before interest less tax divided by the average of net assets plus net debt plus dividend creditor less net assets held for sale. ROCE is a relative profit measurement that not only incorporates the funds shareholders have invested, but also funds invested by banks and other lenders, and therefore shows the productivity of the assets of the Group.

Note that Tesco has defined capital employed as including net assets plus net debt and for profit as profit less tax but before interest. It is before interest in order that the numerator reflects the resources included in the denominator which includes net debt.

4 Primary utilisation ratio (asset turnover)

The asset turnover ratio measures the number of times that one dollar of assets results in a dollar of revenue. An initial view might be that the more frequently a dollar of revenue is produced the better. Although this ratio can act as a good guide to company performance, it needs to be looked at carefully to establish the reason for any change. If asset turnover increases, then either the total value of revenue is increasing or the capital asset base is decreasing, or both.

If it is because sales are increasing, this is positive if there has been no change in either the sales mix or selling prices. However, the increase might have been achieved at the expense of the profit margin with discounting.

If it is because the capital asset base is reduced, this needs further investigation. For example, it could be caused by a failure to maintain non-current assets with the risk that operating efficiency is affected. This risk is addressed in the following extract from the 2008 Wienerberger Annual Report:

> Maintenance capex was also reduced . . . less than 40% of depreciation. However, these measures in no way endanger the operating performance of our plants.

5 Primary efficiency ratio (operating profit margin)

Operating profit before tax as a percentage of revenue is another widely used ratio in the assessment of company performance and in comparisons with other companies.

The percentage achieved depends on the type of industry a company is operating within (e.g. high-volume/low-margin), the company pricing policies, the sales volumes and cost structure. Any change in the percentage would be investigated to establish the reason. For example, has there been a change in the sales mix, the selling prices, the cost of materials or labour?

6 Primary liquidity ratio (current ratio)

The current ratio is a short-term measure of a company's liquidity position comparing current assets with current liabilities. There is no rule of thumb measure, such as 2:1, that can be applied. The appropriate ratio depends on the industry sector and each individual company's experience. This can be assessed by referring to the times series summaries, as shown in this extract from the 2008 Annual Report of Barloworld, a South African conglomerate:

	2008	*2007*	*2006*	*2005*
Current ratio	1.4	1.5	1.6	1.7

The company has set its own target of >1. The actual ratios indicate that the company's current ratio for 20X8 is within its own normal range and exceeds the company's own target. Whether a current ratio is appropriate depends on the company's financial structure, e.g. is it able to finance the current assets without causing liquidity problems? It is customary to prepare projected cash flows to assess the ability to obtain or convert the assets into cash at a rate that is appropriate to meeting its liabilities on time.

What if the current ratio increases beyond the normal range?

This may arise for a number of reasons, some beneficial, others unwelcome.

Beneficial reasons

- A build-up of inventory in order to support increased sales following an advertising campaign or increasing popular demand as for, say, a PlayStation. Management action will be to establish from a cash budget that the company will not experience liquidity problems from holding such inventory, e.g. there may be sufficient cash in hand or from operations, a short-term loan, extended credit or bank overdraft.
- A permanent expansion of the business which will require continuing higher levels of inventory. Management action will be to consider existing cash resources, future cash flows from operations or arrange additional finance, e.g. equity or long-term borrowings to finance the increased working capital.

Unwelcome reasons

- Operating losses may have eroded the working capital base. Management action will vary according to the underlying problem, e.g. implementing a cost reduction programme, disposing of underperforming segments, arranging a sale of assets or inviting a takeover.
- Inefficient control over working capital, e.g. poor inventory or accounts receivable control allowing a build up of slow moving inventories or doubtful trade receivables.
- Adverse trading conditions, e.g. inventory becoming obsolete or introduction of new models by competitors.

We will see when we discuss subsidiary ratios below that the current ratio is further analysed in terms of its constituent parts i.e. inventory, receivables, payables and cash.

27.5 Illustrating the calculation of the six key ratios

To illustrate we are using the accounts of JD Wetherspoon plc. The company's principal activities are the development and management of public houses.[5] JD Wetherspoon's profit and loss account and statement of financial position for 2002 and 2003 are reproduced in Figure 27.2.

27.5.1 Calculating the six key ratios for JD Wetherspoon

Calculation of the six key ratios

1 Operating return on equity

2003 $\frac{74{,}983}{318{,}628} = 23.5\%$ 2002 $\frac{70{,}085}{310{,}133} = 22.6\%$

2 Financial leverage multiplier

2003 $\frac{816{,}250}{318{,}628} = 2.56$ times 2002 $\frac{783{,}366}{310{,}133} = 2.53$ times

3 Return on capital employed

2003 $\frac{74{,}983}{318{,}628} = 9.19\%$ 2002 $\frac{70{,}085}{783{,}366} = 8.95\%$

4 Asset turnover

2003 $\frac{730{,}913}{816{,}350} = 0.9$ times 2002 $\frac{601{,}295}{783{,}366} = 0.77$ times

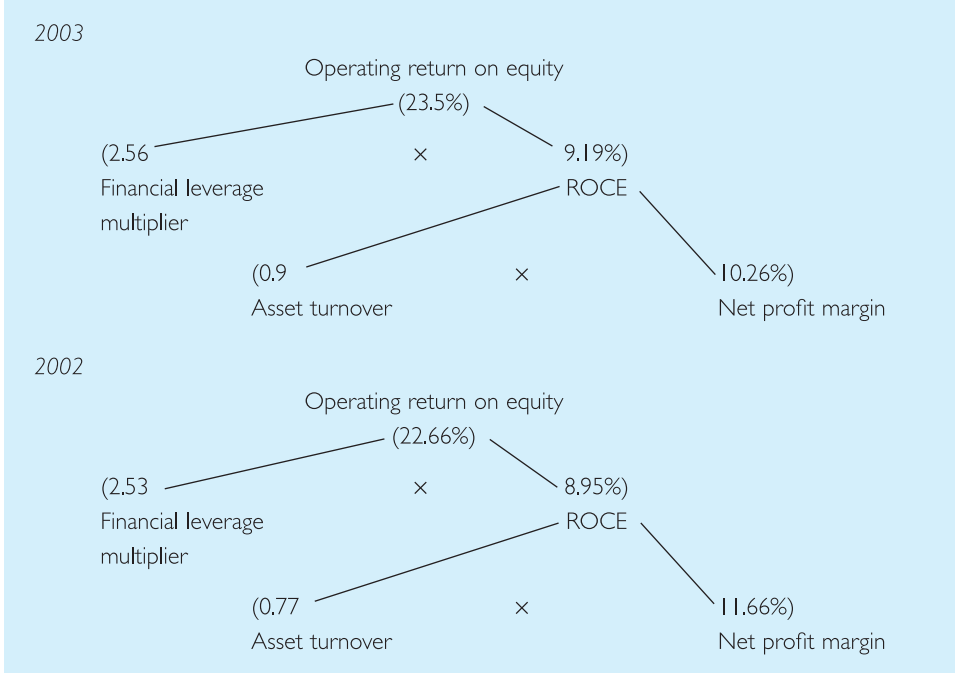
Figure 27.2 JD Wetherspoon consolidated profit and loss account for year ended 31 July 2003

	2003 £000	*2002* £000
Turnover from continuing operations	730,913	601,295
Cost of sales	(621,894)	(503,699)
Gross profit	109,019	97,596
Administrative expenses	(34,036)	(27,511)
Operating profit	74,983	70,085
Net interest payable	(18,844)	(16,517)
Profit on ordinary activities before tax	56,139	53,568
Tax on profit on ordinary activities	(19,744)	(18,152)
Profit on ordinary activities after tax	36,395	35,416
Dividends	(7,434)	(6,902)
Retained profit for the year	28,961	28,514

JD Wetherspoon
Group statement of financial position at 31 July 2003

	2003 £000	*2002* £000
Fixed assets		
Tangible assets	773,823	745,041
	773,823	745,041
Current assets		
Stocks	9,601	8,594
Debtors due after more than one year	8,448	7,682
Debtors due after less than one year	9,017	8,237
Investments	301	203
Cash	15,160	13,609
	42,527	38,325
Creditors due within one year	(135,361)	(122,919)
Net current liabilities	(92,834)	(84,594)
Total assets less current liabilities	680,989	660,447
Creditors due after one year	(299,942)	(292,915)
Provisions for liabilities and charges	(62,419)	(57,399)
	318,628	310,133
Capital and reserves		
Called-up share capital	4,149	4,292
Share premium account	126,739	124,819
Capital redemption reserve	165	
Revaluation reserve	22,439	23,386
Profit and loss account	165,136	157,636
Equity shareholders' funds	318,628	310,133

Figure 27.3 Pyramid of ratios



5 Net profit margin

2003 $\frac{74{,}983}{730{,}913} = 10.26\%$ 2002 $\frac{70{,}085}{601{,}295} = 11.66\%$

6 Current ratio

2003 $\frac{42{,}527}{135{,}361} = 0.31{:}1$ 2002 $\frac{38{,}325}{122{,}919} = 0.31{:}1$

Five of these key ratios are shown in the pyramid structure in Figure 27.3.

27.5.2 Interpreting the six key ratios – JD Wetherspoon

There are a number of areas of the business in which further investigations should be carried out. To begin with, the operating return on equity has improved from 22.6% to 23.5%. Disaggregating this ratio we can see that the improvement is due to both an increase in the financial leverage multiplier (2.53 to 2.56) and an increase in the ROCE (8.95% to 9.19%).

The increase in the financial leverage multiplier means that there has been an increased proportion of total liabilities within the capital employed figure. Looking at the statement of financial position, it is evident that long-term loans have risen by nearly £7 million (from £292,915,000 to £299,942,000).

The increase in the ROCE is driven by an improved asset turnover (from 0.77 to 0.9), despite a drop in the net margin (11.66% to 10.26%). The improved asset turnover means that each £ of capital employed (or total assets) produces a higher level of sales. If the decline in net margin is investigated further it is evident that the main cause has been a decline in the gross margin (gross profit/sales) from 16.2% to 14.9%. The declining gross margin

might be due to a decline in sales prices or higher cost of sales (which, according to the Wetherspoon annual report, is the main reason).

However, the ratios are calculated on results before exceptional items and the accounts showed an exceptional loss of £2,251,000 arising principally from the sale of 18 pubs. The current ratio is constant at 0.31:1 with the current liabilities much higher than the current assets. Although this appears low, one would need to compare this with the industry average which for brewers is below 0.5:1. The notes to the accounts (not reproduced here) show that trade creditors (accounts payable) have fallen from £54.4 million to £53 million.

27.6 Description of subsidiary ratios

Subsidiary ratios are prepared to support the key ratios. These are set out in Figure 27.4 and provide further ratios for:

Figure 27.4 Subsidiary ratios

Gearing ratios

$$\text{Gearing ratio} = \frac{\text{Total liability} - \text{Current liability}}{\text{Capital employed}}$$

$$\text{Shareholders' ratio} = \frac{\text{Shareholders' funds}}{\text{Capital employed}}$$

$$\text{Interest cover} = \frac{\text{Net profit before interest and tax}}{\text{Interest}}$$

Liquidity ratios

$$\text{(6) Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

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

Investment ratios

Earnings per share =

$$\frac{\text{Net profit after tax} - \text{Preference dividends}}{\text{Number of ordinary shares}}$$

$$\text{Price/earnings ratio} = \frac{\text{Share price}}{\text{Earnings per share}}$$

Dividend cover (ordinary shares) =

$$\frac{\text{Net profit after tax} - \text{Preference dividends}}{\text{Dividends on ordinary shares}}$$

$$\text{Dividend yield} = \frac{\text{Dividend on ordinary shares}}{\text{Market value of ordinary shares}}$$

Asset utilisation ratios (turnover ratios)

$$\frac{\text{Sales}}{\text{Non-current assets}}$$

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

$$\frac{\text{Sales}}{\text{Working capital}}$$

$$\frac{\text{Cost of sales}}{\text{Inventory}}$$

$$\frac{\text{Sales}}{\text{Accounts receivable}}$$

$$\frac{\text{Cost of sales}^{a}}{\text{Trade payables}}$$

[a]Ideally cost of materials used should be used.

Profitability ratios

$$\frac{\text{Gross profit}}{\text{Sales}}$$

$$\frac{\text{Cost of sales}}{\text{Sales}}$$

$$\frac{\text{Total overheads}}{\text{Sales}}$$

$$\frac{\text{Cost of materials}}{\text{Cost of sales}}$$

$$\frac{\text{Cost of labour}}{\text{Cost of sales}}$$

- capital and income gearing;
- liquidity;
- asset utilisation;
- investment ratios; and
- profitability.

27.6.1 Statement of financial position ratios – capital gearing ratios

Gearing is the relationship between the amounts provided by shareholders and other creditors. The relationship can be expressed using a number of different formulae. For the capital gearing there are two approaches: (a) relate liabilities to total assets or equity and (b) relate equity to total assets:

(a) Relating liabilities to total assets may be variously defined as:

- long-term debt to total assets;
- the debt ratio (total debt/total assets);
- total liabilities to total assets;
- (total liabilities – provisions) to total assets;
- the debt-to-equity ratio (net debt/total equity);
- the debt equity ratio (total debt/total equity).

(b) the equity ratio;

- equity/assets.

For the purposes of illustration in this chapter, we are defining gearing as long-term debt to capital employed. A number of companies report the debt/equity ratio as their preferred choice and include total debt rather than long-term debt if a company relies heavily on overdraft facilities.

27.6.2 Statement of income ratios – income gearing

Most companies have borrowings and are committed to paying interest. The security of their interest payment is normally measured by the income gearing ratio which is calculated as the number of times the interest could be paid out of the operating profit. The ratio may be expressed in different ways. For example:

- Earnings before interest, tax, depreciation and amortisation (EBITDA) which emphasises the cash generated from normal operations.
- Operating profit (EBIT) excluding exceptional items.
- Profit before interest – including exceptional items.

The leverage effect

We saw that if capital employed is funded by sources other than equity, then there is a financial leverage impact on the ROCE (refer to section 27.5.1 for an illustration of this by the analysis of JD Wetherspoon's Annual Report with the ROCE of 9.19% being lifted by financial leverage to produce an operating return on equity of 23.5%).

In reviewing the 23.5% we would need to consider whether the assets in the statement of financial position are a fair indication of current values. If the current value of the assets were, say, 10% higher (£897,875) then the operating return on equity would fall by more than 20% from 23.5% to 18.73% (£74,983/£400,235 × 100).

As far as the equity shareholders are concerned, it might appear that the higher the financial leverage the better. However:

- If borrowings are high, it might be difficult to obtain additional loans to take advantage of new opportunities. For example, HSBC raised £12.5 billion by a rights issue on the basis that this would give the bank a competitive advantage over its rivals by restoring its position as having the strongest statement of financial position, i.e. high borrowings limit a company's flexibility.
- Interest has to be paid even in bad years with the risk that loan creditors could put the company into administration if interest is not paid.

How should a potential investor decide on an acceptable level of gearing?

This is initially influenced by the political and economic climate of the time. We have seen that prior to the credit crisis arising in 2007 high gearing was not seen by many as risky and there was a general feeling that borrowing was good, leverage was respectable, and capital gains were inevitable. This might have reduced the importance of questions that would normally have been asked. The questions were:

- If gearing has increased, what were the funds used for? Was it to:
  - restructure debt following inability to meet current repayment terms;
  - finance new maintenance/expansion capex;
  - improve liquid ratios.
- Are the values in the statement of financial position reasonably current? If too low the gearing ratio is overstated.
- How does the gearing compare to other companies in the same sector?
- Is the gearing ratio constant or has it increased over time with heavier borrowing? If higher:
  - further borrowing might be difficult;
  - it might indicate that there has been investment that will lead to higher profits so details are needed as to how the funds borrowed have been used.
- How variable is the rate of interest that is being charged on the borrowings? If rates are falling then equity shareholders benefit but if rates rise then expenses are higher.
- How many times does the earnings before tax cover the interest? A highly geared company is more at risk if the business cycle moves into recession because the company has to continue to service the debts even if sales fall substantially.
- How many times does the cash flow from operations currently cover the interest? This is a useful ratio if profits are not converted into cash, e.g. they might be reinvested in non-current assets.
- How variable is the company's cash flow from operations? A company with a stable cash flow is less at risk so the trend is important.
- What covenants are in place and what is the risk that they might be breached? A breach could lead to a company going into administration or liquidation.
- What is the likely effect of contingent liabilities if they crystallise on the debt ratio? Could it have a significant adverse impact?

A company's attitude to leverage may vary over time

The following is an interesting article in *Management Today*:[6]

> The statement of financial position of British business has passed through a truly remarkable transformation over the past two years . . . in every sector and at every level, from giant household names down to modest seven-figure enterprises, all confirm the pattern: gearing levels radically reduced, businesses managing their cash-flow more intelligently than ever before, and deep-seated reluctance to borrow afresh . . . Bank of England statistics show that industrial and commercial companies have been repaying debt steadily since the beginning of 1993 . . . New financing was provided instead by a combination of capital issues (£16 billion) and retained earnings . . . A survey by accountants KPMG of 133 quoted companies in the West Midlands shows the average debt/equity ratio falling between 1992/93 and 1993/94 from 32% to 23% . . . According to Kevin Jennings, director of commercial marketing at National Westminster Bank, there has been a 'major shift in business literacy', in which managers have learned to run higher levels of turnover on lower levels of short-term finance by much more rigorous attention to stocks, debtors and creditors . . . There is, of course, another side to the story. Demand for borrowing may be under control, but what of supply? In the last boom it was undeniably true that banks poured fuel onto the flames by their very aggressive lending policies, driven by the need to fill their own statements of financial position in order to show an adequate return on capital. More recently, the talk has been of a 'flight to quality' . . . a willingness to shrink the lending business in order to stay within acceptable parameters of risk.

We now see the same scenario having been played out ten years later – aggressive lending policies followed by a flight to quality resulting in it being more difficult for companies to obtain loans and a resulting requirement for more new equity funding.

27.6.3 Liquidity ratios

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

The acid test or quick ratio indicates the company's ability to repay immediate commitments using cash or near-cash. It excludes inventory in order to show the immediate solvency of the company.

The following is an extract from the 2008 Annual Report of Barloworld:

	2008	*2007*	*2006*	*2005*
Quick ratio	0.9	1.0	1.2	1.1

This indicates that the company's quick (or acid test) ratio is within its own normal range and exceeds its own target of >0.5.

27.6.4 Asset utilisation ratios: non-current assets

In order to identify the rate at which revenue is generated from the assets under management's control, we calculate ratios that are referred to as activity ratios. The first of these, which looks at the use of capital employed (defined here as total assets), is the asset turnover ratio where we divide the turnover from the statement of comprehensive income by the capital employed from the statement of financial position. However, before we draw any conclusions from the ratio, we need to review (a) the make-up of the non-current assets when assessing consolidated accounts to see the division between intangible and tangible (b) how the tangible assets have been valued and (c) the age of the assets.

(a) The make-up of non-current assets

This is important because some groups rely on organic growth and have little goodwill, whilst others have achieved growth through material acquisitions. For example, The Kier Group, a building and civil engineering company, relies on organic growth. The following is an extract from its 2008 annual report:

Non-current assets	£176.1m
Goodwill	£5.2m
Revenue	£2,374.2
Asset turnover (including goodwill)	13.5 times
Asset turnover (excluding goodwill)	13.9 times

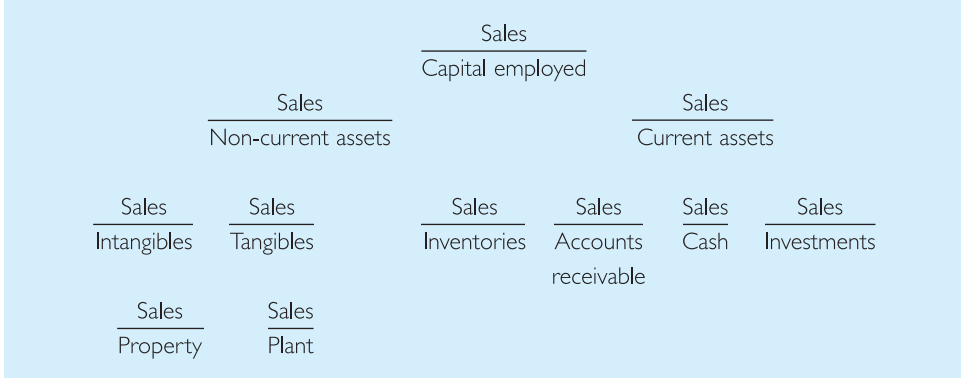
Compare this with Syskoplan, a software integrator and consultancy company, where goodwill is a significant part of its non-current assets, as shown in the following extract from its 2007 annual report:

Non-current assets	€19.8m
Goodwill	€12.4m
Revenue	€57.5m
Asset turnover (including goodwill)	2.9 times
Asset turnover (excluding goodwill)	7.8 times

Which assets to include in the ratio?

There is an argument that the operational management is only responsible for the effective use of the tangible assets. It could be argued that it is the board that is responsible for the total of the intangible and tangible assets on the basis that it was responsible for the acquisitions which gave rise to the goodwill. This is the reason for the separate calculation for tangible and intangible asset turnover shown in Figure 27.5. If intangible assets are not included, look at any change in ratio of R&D to sales separately.

Figure 27.5 Asset turnover ratio



(b) How the tangible assets have been valued

If using the asset turnover ratio to make comparisons with other companies, consider whether valuation is on the same basis, i.e. historical cost or revaluation, the age of the assets if at cost which can be estimated by the amount of accumulated depreciation in relation to the cost figure, and the depreciation policies that have been adopted.

(c) The age of the assets

If assets are heavily depreciated, the ratio will be higher. It is important to read the narrative to check if there are plans for future capital investment and to confirm that the capital base is being maintained. Delaying the replacement of capacity may be chosen or forced on the business in times of recession so it is useful to check if there is a high or low capital expenditure/depreciation ratio.

27.6.5 Asset utilisation ratios: current assets

The activity ratios relating to current assets are broken down into (a) inventory turnover, (b) trade receivables turnover, and (c) trade payables turnover. We will now consider each of these.

(a) Inventory turnover ratio

Inventory control is concerned with minimising the cost of holding inventory. The cost would have been determined by a management accountant taking into account the cost of placing an order, the cost of holding inventory based on the interest rate and the cost of being out of inventory. This is a balancing act with the company trying to avoid tying up too much capital in inventory, yet maintaining sufficient to meet customer demand and maintain continuous production.

In calculating and interpreting the inventory turnover ratio, attention is directed towards, first, assessing whether the level is appropriate by comparing with competitors in the same sector and, secondly, by comparing with previous periods to identify whether there has been any change.

The ratio can be expressed as the number of times inventory turns over:

$$\text{Inventory turnover} = \frac{\text{Sales}}{\text{Inventory}} \text{ or } \frac{\text{Cost of sales}}{\text{Average inventory}} \text{ or more usually } \frac{\text{Cost of sales}}{\text{Closing inventory}}$$

Or as the number of days inventory has been held:

$$\frac{\text{Closing inventory}}{\text{Cost of sales}} \times 365$$

Any change in this ratio must be investigated to determine exactly why the change has occurred. It could be as a result of a proactive business decision, a reaction to economic circumstances or misrepresentation.

(a) Proactive business decision

An example of a planned increase is seen in the following extract from the 1999 Annual Report of Schering AG:

> **Good balance-sheet ratios maintained**
> The balance-sheet ratios demonstrate the healthy financial state of the Schering Group. Inventories and receivable rose to 41% of the balance-sheet total. Among other things, this was due to a build-up of stocks to keep the market supplied during implementation of our European Production Concept and to cater for any problems that might have arisen in connection with Y2K.

(b) Reaction to change in economic circumstances

An example is seen where there has been a decline in demand in the following extract from the 2007 Annual Report of ThyssenKrupp Steel:

> The European steel industry expects business to stabilize at a high level in the coming year. In the short term, however, the inventory overhangs in the market are expected to dampen demand, initially, with possible effects on production.

This has two implications. One is that ThyssenKrupp customers are holding higher inventories which could, in turn, have an effect on ThyssenKrupp's own inventory. This is supported by the figures reported in the ThyssenKrupp 2007 Annual Report:

	2006	*2007*	*% change*
	€m	*€m*	
Sales	47,125	51,723	9.8%
Inventories	8,069	9,480	17.5%
Inventory turnover ratio (times)	5.8	5.5	

(c) Possibility of misrepresentation

One must be aware of the risk of fraud if the economic climate in which the company is operating has falling profits. For example, what is the temptation to overvalue inventory? A possible sign could be an increase in inventory with a corresponding increase in the gross profit percentage. One reason could be a fraud that has often occurred in the past where a simple accounting entry is made to debit inventory and credit the cost of sales – this should, of course, be detected by normal audit procedures.

Importance of referring to narrative

The ratios are based on the figures in the financial statements. It helps, however, to look beyond the figures to the narrative in the business review for further clues, as in the Cisco Annual Report 2001 *Financial Review – Management's Discussion and Analysis:*

> Inventory purchases and commitments are based upon future demand forecasts. To mitigate the component supply constraints that have existed in the past, we built inventory levels for certain components with long lead times and entered into commitments for certain components. Due to a sudden and significant decrease in demand for our products, inventory levels exceeded our estimated requirements based on demand forecasts.

(b) Trade receivables turnover – collection period

When preparing a cash budget we need to know when, after a credit sale has been made, cash will be received. We would expect it be received within the normal agreed credit period of, say, 30 days. At the period end the number of days that trade receivables have been outstanding is calculated and normally expressed as the number of days of collection period. The turnover ratio is calculated as:

$$\frac{\text{Accounts receivable}}{\text{Sales}} \times 365$$

Before drawing conclusions from the ratio, we need to consider the business climate. In times of recession, access to bank finance becomes more difficult and businesses seeks more trade credit whilst at the same time delaying settling their accounts. The implication is that there could be an increase in the suppliers' accounts of trade receivables and a

corresponding increase in trade payables in the purchasers' accounts. This means that there could be both an increase in the volume of trade receivables and an extension of the collection period. Research by Creditsafe (www1.creditsafeuk.com/?id=975&cid=1426&Year=2008) has shown that late payment is a problem in the UK:

> In Britain late payments is a problem which is endemic in businesses of all sizes. 53% of sole traders complain that they suffer from late payments, a figure which rises to over 95% (96.8%) of companies surveyed of between 50 and 250 employees.

Some changes in the collection period could be the result of economic conditions. However, we should also consider other possible reasons for (i) a reduction and (ii) an increase in the collection period.

A reduction in the collection period could arise from beneficial reasons such as improved credit control, prompt payment by customers to receive a cash discount, heavy discounting because the business has cash flow problems or to achieve sales targets and factoring of the debts. There might also be unwelcome reasons such as bad debts written-off and restriction of credit due to cash flow problems which could possibly lead to a reduction in sales.

An increase in the collection period could be due to poor credit control with credit extended to unreliable customers, late payment with the risk that these turn into bad debts, disputed debts with risk of non-payment, or fictitious sales with fictitious customer balances.

(c) Trade payables turnover – payment period

This indicates the rate at which creditors settle their accounts with suppliers. Ideally the ratio would be calculated as:

$$\text{Accounts payable turnover} = \frac{\text{Total supplier purchases}}{\text{Average accounts payable}}$$

However, working from published financial statements, the purchases figure is not available and the ratio can therefore, be calculated as:

$$\text{Payables turnover} = \frac{\text{Sales}}{\text{Accounts payable}} \text{ or more usually } \frac{\text{Cost of sales}}{\text{Accounts payable}}$$

Expressed in terms of the payment period (in days) the ratio is:

$$\frac{\text{Accounts payable}}{\text{Sales}} \times 365 \text{ or more usually } \frac{\text{Accounts payable}}{\text{Cost of sales}} \times 365$$

This ratio indicates the outstanding credit allowed to a company by its suppliers. Any changes in the payment period might be due to suppliers altering credit terms (either being more or less generous), the company taking advantage of early payment incentives or delaying payment beyond the agreed credit period.

27.6.6 Investment ratios

Investment ratios such as earnings per share (EPS), price/earnings ratio (PE ratio) and dividend cover are of great interest to investors.

Earnings per share

EPS indicates the amount of profit after tax, interest and dividends to preference shares has been earned for each ordinary share. Its importance is recognised by some managers who

use the EPS as part of their strategic planning; e.g. the 2005 Annual Report of Gamma Holding NV states:

> **Financial targets**
> Gamma Holdings strives for an average annual growth of earnings per share of at least 10% over a number of years. This growth is related to the net result of the company, excluding restructuring, in 2004.

The company also targets profit to sales %, ROCE and statement of financial position ratios:

> In addition, the company strives for an operating result of at least 8% of turnover for the Gamma Technologies sector and at least 9% of turnover for the Gamma Comfort & Style sector. For each of these sectors Gamma strives for a return on capital employed of at least 15%. With a view to a healthy statement of financial position, the company aims for a solvency percentage of at least 30% and gearing (ratio of total interest-bearing liabilities to total equity) of at most 1. It is the company's policy that net debt should not exceed 2.5 times EBITDA.

PE ratio

The ratio is calculated using the current share price and current earnings. It is a measure of market confidence in the shares of a company. However, the market price also takes into account anticipated changes in the earnings arising from their assessment of macro events such as political factors, e.g. imposition of trade embargoes and sanctions; economic factors, e.g. the downturn in manufacturing activity; and market conditions as in the following extract from the Sepracor 2003 Annual Report:

> The price of our common stock historically has been volatile, which could cause you to lose part of your investment. The market price of our stock, like that of the common stock of many other pharmaceutical and biotechnology companies, may be highly volatile. In addition, the stock market has experienced extreme price and volume fluctuations. This volatility has significantly affected the market price . . . For reasons unrelated to or disproportionate to the operating performance of the specific companies. Prices . . . may be influenced by many factors, including variations in our financial results and investors' perceptions of us, changes in recommendations by securities analysts as well as their perceptions of general economic, industry and market conditions.

It is also, of course, influenced by company-related events, for example, the possibility of reconstruction, organic or acquired growth.

Dividend cover

Dividend cover is ascertained by comparing EPS to dividend per share. It indicates the cushion that exists to meet dividends in the future if earnings were to deteriorate. The cover is expressed as number of times or, in some annual reports, as a payout ratio. Dividend yield expresses dividend as a percentage of the share price.

27.6.7 Profitability ratios

Profitability ratios allow a more specific analysis of profit margin, e.g. expressing individual expenses as a proportion of sales or cost of sales. These ratios will identify any irregularities or changes in specific expenses from year to year. A list of these is set out in Figure 27.4.

27.6.8 Comparing current ratios with those of the previous year

It is normal practice for the financial director to make a comparison with the previous year's ratios to identify, investigate significant changes and make a report to the board. In approaching this there could be some preconceived ideas as to the reason based on local knowledge of the company. For students and those taking examinations, the task may be to consider what questions to ask in the absence of this local company knowledge. For example, consider the scenario where the inventory turnover rate has increased significantly. This should give rise to questions such as:

- Has the sales increased significantly? If so, is this from a one-off contract or is it likely to be a permanent increase? If a permanent increase, is there any risk of overtrading where there is insufficient capital to maintain inventory at a level which does not affect liquidity or a risk of stock-outs?
- Has the inventory level fallen? If so, is this because there is a restriction of credit and if so, why has that occurred? Have there been significant write-downs? If due to obsolescence, what is the possible affect on the reported inventory? Is the company experiencing liquidity problems and reducing inventory levels? Has there been a change in staff resulting in improved inventory control. Has the company divested itself of a segment late in the year whereby revenues have been achieved during the year and some inventory has been part of the disposal?

In addition to making comparisons with the previous year, many companies make comparisons with another competitor company, a selected peer group and industry sector averages.

27.7 Comparative ratios: inter-firm comparisons and industry averages

We have seen that financial ratios provide management with the means to question any significant changes arising during the financial year. They are also a convenient way of assessing the current financial health and performance of a company relative to similar companies in the same industrial sector. This enables a company to be judged directly against its competitors, rather than merely against its own previous performance. Provided that each company uses exactly the same bases in calculating ratios, inter-firm comparisons provide an objective means of evaluation. Every company is subject to identical economic and market conditions in the given review period, allowing a much truer comparison than a single company's fluctuating results over several years.

Inter-firm comparisons are ideal for identifying the strengths and weaknesses of a company relative to its immediate competitors and the industrial sector. These comparisons can be analysed by both internal users (management can take the necessary actions to maintain strengths and rectify weaknesses) and external users (lenders, creditors, investors, etc.). There are numerous sources of inter-firm information, but the organisations providing it can be divided into those which gather their data from external published accounts and those which collect the data directly from the surveyed companies on a strictly confidential basis.

27.7.1 Data collected from external published accounts

Organisations that prepare inter-firm comparisons from external published accounts face all the limitations associated with company accounts. These limitations include the following:

- The comparative ratios that can be included in an inter-firm comparison are limited to the information content of a set of published accounts. The inadequacies of compulsory

disclosure restrict the amount of useful information and make it impossible to prepare every desirable ratio, for example, not all companies publish their gross profit percentage.

- There may be different accounting policies. For example, historical cost or revaluation of non-current assets, straight-line or reducing balance depreciation methods, and inventory valued at FIFO or average rate.
- The timeliness of any inter-firm comparison is dependent on the timeliness of published accounts. Companies may have different year ends and there will be a time lag in the publication of inter-firm comparison information.

Although these drawbacks affect the reliability and completeness of survey results, such agencies have several advantages:

- The scope of an inter-firm comparison is extremely wide as it can include an analysis of any firm that produces published accounts.
- The quality of ratio analysis is improved because survey organisations attempt to standardise the bases of every ratio in the survey. This increases the uniformity and comparability of the ratio information.
- The survey information is easy to access and available at a relatively low cost.

What organisations provide inter-firm comparisons prepared from external published accounts?

Useful sources for inter-firm ratio comparisons include *Company REFS*,[7] *Handbook of Market Leaders*,[8] Dun & Bradstreet's *Key Business Ratios: The Guide to British Business Performance*,[9] *The Company Guide*[10] and the online and CD-ROM computer services, including Datastream, OneSource,[11] Fame and Extel Financial Workstation. In addition, the World Wide Web provides an excellent source for corporate information.

27.7.2 Data collected direct from member companies of the private inter-firm comparison scheme

These inter-firm comparisons are prepared on a confidential basis and the analysed information is usually available only to the participating companies.

The advantages of private schemes are that inter-firm comparisons consist of a comprehensive analysis of every firm in the scheme, and a higher degree of reliability can be attached to their findings than if external published accounts alone were used.

The drawbacks of private schemes are as follows:

- There are onerous requirements concerning the quality of information that companies contribute to private schemes. All information must comply with strict uniformity requirements.
- The cost of these schemes may be relatively high.

The advantages of private schemes are that inter-firm comparisons consist of a comprehensive analysis of every firm in the scheme, and a higher degree of reliability can be attached to their findings than if external published accounts alone were used.

What organisations provide private schemes?

Numerous organisations co-ordinate private inter-firm comparison schemes for the majority of different trade groups and industrial sectors. One of the best known is the Centre for Interfirm Comparison, which was founded by the British Institute of Management.

27.7.3 Ensuring valid inter-firm comparisons

The necessity for comparing like with like has been stressed throughout this chapter. For valid comparisons, we must ensure not only that the bases of ratios are identical, but that a company is compared with companies in the same industrial sector and with similar principal activities. If it is compared with a company in a different industrial sector, the results might be interesting, but they might not be suitable for any decision-useful analysis. Of course, when using any published inter-company comparison data, it is essential to understand how the ratios are calculated. Most publications define key terms, how ratios are computed and the methodologies used.

As stressed before, ratio definitions are not 'set in stone'. Different publications and inter-company comparison schemes will use different definitions of seemingly identical ratios. For instance, when using FAME's profit margin, we would need to ascertain what measure of profit is used (e.g. has other income and/or interest received been included?).

There are a number of subscription databases available on CD-rom or online which provide annual reports and ratios with excellent search facilities e.g. FAME, Amadeus and OneSource.

FAME (Financial Analysis Made Easy) (www.bvdep.com)

FAME displays annual consolidated accounts, and performs company comparisons (Peer Analysis), as well as market sector reports (Statistical Analysis). The detailed information includes Company profile including subsidiaries and directors, Accounting and financial information including company turnover, Ratios and trends, Complete lists of holding companies and shareholder details, and the latest company news.

Search can be on a single criterion or over 100 criteria with results displayed or printed in various formats, e.g. text, charts or graphs, and exported to other applications, e.g. word processors, databases, Excel spreadsheets. The index supplies information on live and dissolved companies, which is particularly helpful for tracing old, new and very small companies. It also includes share prices from mid-2000 for quoted companies.

Amadeus (www.bvdep.com)

Amadeus is a comprehensive, pan-European database containing financial information on public and private companies. It provides standardised company accounts for up to ten years for European companies with twenty-five standard ratios. As with FAME, it is modular, with data for the top 200,000 companies, the top 1 million or all 5 million companies.

OneSource (www.onesource.com)

OneSource is a user-friendly database that can be accessed on line. It integrates business content from over 2,500 leading sources worldwide to provide world-class company and industry profiles, executive biographies, financial data, analyst reports, and business press coverage. OneSource gathers in-depth data on more than 100 major industries, including detailed SIC code-level information. Users can search to find companies that match their criteria – search by size, location or line of business or via a large selection of variables and get detailed financial information and analysts' reports. In addition to financial data it records key executive contacts and board members by name, location, line of business, job function or biographical details, news and articles.

27.8 Limitations of ratio analysis

Ratios are useful flags but there may be limitations that the reader needs to bear in mind relating to external factors, internal factors and problems specific to consolidated accounts.

27.8.1 External factors

There are a number of external factors that need to be understood. These include:

- Ratios need to be interpreted bearing in mind the political context within which a business has been operating as, for example, when governments adopt protectionist measures that can impact on a company's sales. For example, in 2009 the Argentine Production Ministry announced new anti-dumping measures to combat what it regarded as unfair competition and restricted foreign imports from a number of countries covering a range of imports such as metal cutlery, air conditioners and terminals.
- Ratios need to be interpreted bearing in mind the economic context within which a business has been operating by considering any changes that have occurred in the accounting period that could impact on:
  - non-current assets, e.g. tax incentives to invest;
  - inventories, e.g. a downturn in the economy leading to holding excessive amounts of inventory;
  - trade receivables, e.g. credit restrictions leading to a longer collection period;
  - costs affecting the gross profit, e.g. raw material shortages leading to inflated prices as with gas and oil supplies and wage increases due to a rise in minimum wage rates; and
  - costs affecting the profit before tax, e.g. increased bad debts and interest rate increases.

27.8.2 Internal factors

There are internal factors to consider:

- Ratios need to be interpreted in conjunction with reading the narrative and notes in the annual reports. The narrative could be helpful in explaining changes in the ratios, e.g. whether an inventory buildup is in anticipation of sales or a fall in demand. The notes could be helpful in corroborating the narrative, e.g. if the narrative explains that the increase in inventory is due to anticipated further production and sales, check whether the non-current assets have increased or whether there is a note about future capital expenditure.
- Whether confident that the financial statements give a true and fair view:
  - Whether there is a risk of fraudulent misrepresentation which can affect even major companies as, for example, in the case of Xerox.[12] The fraud was that Xerox overstated its true equipment revenues by at least $3 billion and its true earnings by approximately $1.5 billion during a four-year period. When Xerox finally restated its financial results for 1997–2000, it restated $6.1 billion in equipment revenues and $1.9 billion in pre-tax earnings – the largest restatement in US history up to that point.
  - Whether there is a risk of window dressing, e.g. dispatching goods at the end of the period knowing them to be defective so that they appear in the current year's sales and accepting that they will be returned later in the next period.

  - Have the accounts been subject to fundamental uncertainty which could affect the going concern concept? There might be full disclosure in the notes but ratios might not be accurate predictors of earnings and solvency.
  - Have liabilities been omitted, e.g. use of off balance sheet finance such as structuring the terms of a lease to ensure that it is treated as an operating lease and not a finance lease and special-purpose enterprises to keep debts off the statement of financial position?
- Ratios might be distorted because they are based on period-end figures:
  - The end of year figures are static and might not be a fair reflection of normal relationships such as when a business is seasonal, e.g. an arable farm might have no inventory until the harvest and a toy manufacturer might have little inventory after supplying wholesalers in the lead up to Christmas. Any ratios based on the inventory figure such as inventory turnover could be misleading if calculated at, say, a 31 December year-end.
  - Similarly, a decline in the rate of inventory turnover might have arisen from the management decision to stockpile scarce raw materials which will allow the company to meet customer demand when competitors are out of stock.
- Factors that could invalidate inter-company comparisons, such as:
  - use of different measurement bases with non-current assets reported at historical cost or revaluation and revaluations carried out at different dates;
  - use of different commercial practices, e.g. factoring trade receivables so that cash is increased – a perfectly normal transaction but one that could cause the comparative ratio of days' credit allowed to be significantly reduced;
  - applying different accounting policies: e.g. adopting different depreciation methods such as straight-line and reducing balance; adopting different inventory valuation methods such as FIFO and weighted average; or assuming different degrees of optimism/pessimism when making judgement-based adjustments to non-current and current assets, e.g.:
    - on the impairment review of intangible and tangible non-current assets;
    - on R&D spend (an interesting research study[13] looking at 243 initial public offerings from 1986 to 1990 found that there was a reduction by managers in R&D spending to increase current earnings and a manipulation of discretionary current accruals. One explanation might be that potential investors attach greater weight to current earnings and this could benefit insiders on the sale of their pre-offering shareholding);
  - having different definitions for ratios, e.g.:
    - the numerator for ROCE could be operating profit, profit before interest and tax, profit before interest, profit after tax, etc.;
    - the denominator for ROCE could be total assets, total assets less intangibles, net assets, average total assets, etc.;
  - the use of norms can be misleading, e.g.:
    - a current ratio of 2:1 might be totally inappropriate for a company like Tesco which does not have long inventory turnover periods and as its sales are for cash it would not produce trade receivable collection period ratios;

- making the appropriate choice of comparator companies for benchmarking by finding companies with the same mix of products and markets and deciding on appropriate criteria, e.g. deciding if it should be the industry average ratios. However, these may be based on many companies of different size regarding the amounts of capital employed, turnover, number of employees, etc. The choice of benchmark is important as it affects the conclusions that are made but it is difficult to get an exact fit.

27.8.3 Problems when using consolidated accounts

Certain limitations need to be recognised when analysing a consolidated statement of financial position, making inter-company comparisons and forming a judgement on distributable profits based on the consolidated statement of comprehensive income. These are as follows:

- The consolidated statement of financial position aggregates the assets and liabilities of the parent company and its subsidiaries. The current and liquidity ratios that are extracted to indicate to creditors the security of their credit and the likelihood of the debt being settled will be valid only if all creditors have equal rights to claim against the aggregated assets. This may be the case if there are cross-guarantees from each company, but it is more likely that the creditors will need to seek payment from the individual group company to which it allowed the credit. One needs to be aware that the consolidated accounts are prepared for the shareholders of the parent company and that they may be irrelevant to the needs of creditors. This is not a criticism of consolidation, merely a recognition of the purpose for which the accounts are relevant.
- The consolidated statement of comprehensive income does not give a true picture of the profits immediately available for distribution by the holding company to its shareholders. It shows the group profit that could become available for distribution if the holding company were to exercise its influence and control, and require all its subsidiary companies and associated companies to declare a dividend of 100% of their profits for the year. Legally, it is possible for the company to exercise its voting power to achieve the passing up to it of the subsidiary companies' profits – although commercially this is highly unlikely. The position of the associated companies is less clear: the holding company only has influence and does not have the voting power to guarantee that the profit disclosed in the consolidated statement of comprehensive income is translated into dividends for the holding company shareholders.

27.9 Earnings before interest, tax, depreciation and amortisation (EBITDA) used for management control purposes

We have so far discussed the preparation of ratios based on the information reported in the published accounts. For example, we have used Operating profit before interest and tax in calculating the ROCE as a measure of the effective use of resources by management. Another measure is based on **EBITDA** – earnings before interest, tax, depreciation and amortisation.

EBITDA reflects the cash effect of earnings by adding back depreciation and amortisation charges to the operating profit. If this is not separately disclosed, the figure can be derived by adding back the depreciation disclosed in the statement of cash flows.

27.9.1 Why use EBITDA?

By taking earnings before depreciation we eliminate differences due to different ages of plant and equipment when making inter-period comparisons of performance and also differences arising from the use of different depreciation methods when making inter-firm comparisons.

This information is useful where a company has a number of segments. It allows performance to be compared by calculating the EBITDA for each segment which provides a figure that is independent of the age structure of the non-current assets. This is illustrated in the following extract from the 2008 Wienerberger Annual Report. The EBITDA for the Group showed a 20% reduction and the analysis of geographic segments (reported under IFRS 8) showed wide variations, as follows:

Operating EBITDA	*2007*	*2008*	*Change*
	€m	*€m*	*%*
Central-East Europe	282.8	262.0	–7
Central-West Europe	76.5	42.5	–44
North-West Europe	183.7	144.0	–22
North America	35.3	15.1	–57
Investment and Other	–27.1	–23.5	–13
Wienerberger Group	551.2	440.1	–20

The financial review dealt with each change. For example, noting that the housing market in North America, where there had been a 57% change, had not recovered with a resulting fall in the demand for bricks.

The EBITDA margin was also reported for the Group and segments, as follows:

Profitability ratios	*2007*	*2008*
	%	*%*
Gross profit to revenues	39.0	34.8
Administrative expenses to revenue	6.0	6.1
Selling expenses to revenue	18.4	19.3
Operating EBITDA margin	22.3	18.1
Operating EBIT margin	14.5	9.9

This shows a decline in EBITDA from 22.3% to 18.1% which is explained as arising from the fall due to lower sales volumes, cost inflation and more flexible pricing policies in some countries as well as the costs related to plant standstills and idle capacity.

27.9.2 What other ratios may be produced based on EBITDA?

We have seen that EBITDA shows the cash impact of earnings. It differs from the Cash flow from operations reported in the Cash flow statement in that it is before adjusting for working capital changes. Other ratios commonly produced are:

- net debt/EBITDA to show the number of years that it would take to pay off the net debt;
- debt service coverage ratio defined as EBITDA/annual debt repayments and interest; and
- EBITDA/interest to show the times interest cover.

Summary

Financial ratio analysis is integral to the assessment and improvement of company performance. Financial ratios help to direct attention to the areas of the business that need additional analysis. In particular, they provide some measure of the profitability and cash position of a company.

Financial ratios can be compared against preceding period's ratios, budgeted ratios for the current period, ratios of other companies in the same industry and the industry sector averages. This comparison is meaningful and decision-useful only when like is compared with like. Users of financial ratios must ensure that the composition of ratios is clearly defined and agreed.

The problem of lack of uniformity in company reports is being progressively addressed by the IASB and FASB with a drive towards global standards.

Ratios are useful only if they are used properly. They are a starting point for further investigations and should be used in conjunction with other sources of information and other analytical techniques. Financial reports are only one of many sources of information available about an enter-prise; others include international, national and industrial statistics and projections, trade association reports, market and consumer surveys, and reports prepared by professional analysts.

Analysts and shareholders who have the full annual report are able to brief themselves by close reading of the narrative in the financial review and notes. In a student situation, the key is to raise relevant questions from the ratios that you have calculated.

In Chapter 28 we consider some additional techniques that complement the pyramid approach to ratio analysis.

REVIEW QUESTIONS

1 Explain how the reader of an annual report prepared for a group might become aware if any subsidiary or associated company was experiencing:

(a) solvency problems;

(b) profitability problems.[14]

2 (a) Explain the uses and limitations of ratio analysis when used to interpret the published financial accounts of a company.

(b) State and express two ratios that can be used to analyse each of the following:

(i) profitability;

(ii) liquidity;

(iii) management control.

(c) Explain briefly points which are important when using ratios to interpret accounts under each of the headings in (b) above.

3 Discuss the importance of the disclosure of exceptional items to the users of the annual report in addition to the operating profit.

4 'Unregulated segmental reporting is commercially dangerous to companies making disclosures.'[15] Discuss.

5 Explain how a reader of the accounts might be able to assess whether the non-current asset base is being maintained.

6 Discuss why a company might decide to report EBITDA in addition to operating profit.

7 Explain in what circumstances an increase in the revenue to current assets might be an indication of a possible problem.

8 Explain in what circumstances a decrease in the rate of non-current asset turnover might be a positive indicator.

9 Discuss why an increasing current ratio might not be an indicator of better working capital management.

10 The management of Alpha plc calculate ROCE using profit before interest and tax as a percentage of net closing assets. Discuss how this definition might be improved.

11 Explain why shareholders might prefer to use Net profit after tax (rather than before tax) when calculating the ROCE.

12 The current ratio has doubled since the previous year. Explain the questions that you would have in mind when reviewing the accounts.

13 The asset turnover rate has increased by 50% over the previous year. Explain the questions you would have in mind and what other ratios would you review?

14 The finance director has proposed that the company buy back its debt, which is 20% below par value, in order to avoid the business showing a loss with this gain on the buyback exceeding the operating loss. Discuss how this would be reflected in the ratios.

EXERCISES

An outline solution is provided on the Companion Website (www.pearsoned.co.uk/elliott-elliott) for exercises marked with an asterisk (*).

Question 1

Belt plc and Braces plc were in the same industry. The following information appeared in their 20X9 accounts:

	Belt	*Braces*
	€m	*€m*
Revenue	200	300
Total operating expenses	180	275
Average total assets during 20X9	150	125

Required:

(a) Calculate the following ratios for each company and show the numerical relationship between them:
   (i) Their rate of return on the average total assets.
   (ii) The net profit percentages.
   (iii) The ratio of revenue to average total assets.

(b) Comment on the relative performance of the two companies.

(c) State any additional information you would require as:
   (i) A potential shareholder.
   (ii) A potential loan creditor.

Question 2

Saddam Ltd is considering the possibility of diversifying its operations and has identified three firms in the same industrial sector as potential takeover targets. The following information in respect of the companies has been extracted from their most recent financial statements.

	Ali Ltd	*Baba Ltd*	*Camel Ltd*
ROCE before tax %	22.1	23.7	25.0
Net profit %	12.0	12.5	3.75
Asset turnover ratio	1.45	1.16	3.73
Gross profit %	20.0	25.0	10.0
Sales/non-current assets	4.8	2.2	11.6
Sales/current assets	2.1	5.2	5.5
Current ratio	3.75	1.4	1.5
Acid test ratio	2.25	0.4	0.9
Average number of weeks' receivables outstanding	5.6	6.0	4.8
Average number of weeks' inventory held	12.0	19.2	4.0
Ordinary dividend %	10.0	15.0	30.0
Dividend cover	4.3	5.0	1.0

Required:

(a) Prepare a report for the directors of Saddam Ltd, assessing the performance of the three companies from the information provided and identifying areas which you consider require further investigation before a final decision is made.

(b) Discuss briefly why a firm's statement of financial position is unlikely to show the true market value of the business.

Question 3

(a) The following ratios have been extracted from an analysis of the consolidated accounts of three companies – North, South and East:

	North	*South*	*East*
Profit/Sales × 100	5%	4%	3%
Asset turnover	5 times	3 times	4 times
Financial leverage	2	4	5

Required:

Comment on the respective performance of each of the three companies.

(b) 'The consolidation of financial statements hides rather than provides information.' Discuss.

* Question 4

The following are the accounts of Bouncy plc, a company that manufactures playground equipment, for the year ended 30 November 20X6.

Statements of comprehensive income for years ended 30 November

	20X6	*20X5*
	£000	*£000*
Profit before interest and tax	2,200	1,570
Interest expense	170	150
Profit before tax	2,030	1,420
Taxation	730	520
Profit after tax	1,300	900
Dividends paid	250	250
Retained profit	1,050	650

Statements of financial position as at 30 November 20X6

	20X6	*20X5*
	£000	*£000*
Non-current assets (written-down value)	6,350	5,600
Current assets		
Inventories	2,100	2,070
Receivables	1,710	1,540
	10,160	9,210
Creditors: amounts due within one year		
Trade payables	1,040	1,130
Taxation	550	450
Bank overdraft	370	480
Total assets less current liabilities	8,200	7,150
Creditors: amounts due after more than one year		
10% debentures 20X7/20X8	1,500	1,500
	6,700	5,650
Capital and reserves		
Share capital: ordinary shares of 50p fully paid up	3,000	3,000
Share premium	750	750
Retained earnings	2,950	1,900
	6,700	5,650

The directors are considering two schemes to raise £6,000,000 in order to repay the debentures and finance expansion estimated to increase profit before interest and tax by £900,000. It is proposed to make a dividend of 6p per share whether funds are raised by equity or loan. The two schemes are:

1 an issue of 13% debentures redeemable in 30 years;

2 a rights issue at £1.50 per share. The current market price is £1.80 per share (20X5: £1.50; 20X4: £1.20).

Required:

(a) Calculate the return on equity and any three investment ratios of interest to a potential investor.

(b) Calculate three ratios of interest to a potential long-term lender.

(c) Report briefly on the performance and state of the business from the viewpoint of a potential shareholder and lender using the ratios calculated above and explain any weaknesses in these ratios.

(d) Advise management which scheme they should adopt on the basis of your analysis above and explain what other information may need to be considered when making the decision.

Question 5

You are informed that the non-current assets totalled €350,000, current liabilities €156,000, the opening retained earnings totalled €103,000, the administration expenses totalled €92,680 and that the available ratios were the current ratio 1.5, the acid test ratio 0.75, the trade receivables collection period was six weeks, the gross profit was 20% and the net assets turned over 1.4 times.

Required:
Prepare the statement of financial position from the above information.

* Question 6

Liz Collier runs a small delicatessen. Her profits in recent years have remained steady at around £21,000 per annum. This type of business generally earns a uniform rate of net profit on sales of 20%.

Recently, Liz has found that this level of profitability is insufficient to enable her to maintain her desired lifestyle. She is considering three options to improve her profitability.

Option 1 Liz will borrow £10,000 from her bank at an interest rate of 10% per annum, payable at the end of each financial year. The whole capital sum will be repaid to the bank at the end of the second year. The money will be used to hire the services of a marketing agency for two years. It is anticipated that turnover will increase by 40% as a result of the additional advertising.

Option 2 Liz will form a partnership with Joan Mercer, who also runs a local delicatessen. Joan's net profits have remained at £12,000 per annum since she started in business five years ago. The sales of each shop in the combined business are expected to increase by 20% in the first year and then remain steady. The costs of the amalgamation will amount to £6,870, which will be written off in the first year. The partnership agreement will allow each partner a partnership salary of 2% of the revised turnover of their own shop. Remaining profits will be shared in the ratio of Liz 3/5, Joan 2/5.

Option 3 Liz will reduce her present sales by 80% and take up a franchise to sell Nickson's Munchy Sausage. The franchise will cost £80,000. This amount will be borrowed from her bank. The annual interest rate will be 10% flat rate based on the amount borrowed. Sales of Munchy Sausage yield a net profit to sales percentage of 30%. Sales are expected to be £50,000 in the first year, but should increase annually at a rate of 15% for the following three years then remain constant.

Required:
(a) Prepare a financial statement for Liz comparing the results of each option for each of the next two years.
(b) Advise Liz which option may be the best to choose.
(c) Discuss any other factors that Liz should consider under each of the options.

Question 7

Sally Gorden seeks your assistance to decide whether she should invest in Ruby plc or Sapphire plc. Both companies are quoted on the London Stock Exchange. Their shares were listed on 20 June 20X4 as Ruby 475p and Sapphire 480p.

The performance of these two companies during the year ended 30 June 20X4 is summarised as follows:

	Ruby plc	*Sapphire plc*
	£000	*£000*
Operating profit	588	445
Interest and similar charges	(144)	(60)
	444	385
Taxation	(164)	(145)
Profit after taxation	280	240
Interim dividend paid	(30)	(40)
Preference dividend proposed	(90)	—
Ordinary dividend proposed	(60)	(120)
Retained earnings for the year	100	80

The companies have been financed on 30 June 20X4 as follows:

	Ruby plc	*Sapphire plc*
	£000	*£000*
Ordinary shares of 50p each	1,000	1,500
15% preference shares of £1 each	600	—
Share premium account	60	—
Retained earnings	250	450
17% debentures	800	—
12% debentures	—	500
	2,710	2,450

On 1 October 20X3 Ruby plc issued 500,000 ordinary shares of 50p each at a premium of 20%. On 1 April 20X4 Sapphire plc made a 1 for 2 bonus issue. Apart from these, there has been no change in the issued capital of either company during the year.

Required:

(a) **Calculate the earnings per share (EPS) of each company.**

(b) **Determine the price/earnings ratio (PE) of each company.**

(c) **Based on the PE ratio alone, which company's shares would you recommend to Sally?**

(d) **On the basis of appropriate accounting ratios (which should be calculated), identify three other matters Sally should take account of before she makes her choice.**

(e) **Describe the advantages and disadvantages of gearing.**

Question 8

The statements of financial position, cash flows, income and movements of non-current assets of Dragon plc for the year ended 30 September 20X6 are set out below:

(i) Statement of financial position

	20X5		*20X6*	
	£000	*£000*	*£000*	*£000*
Tangible non-current assets				
Freehold land and buildings, at cost		1,200		1,160
Plant and equipment, at net book value		700		1,700
		1,900		2,860
Current assets				
Inventory	715		1,020	
Trade receivables	590		826	
Short-term investments	52		—	
Cash at bank and in hand	15		47	
	1,372		1,893	
Current liabilities				
Trade payables	520		940	
Taxation payable	130		45	
Dividends payable	90		105	
	740		1,090	
Net current assets		632		803
		2,532		3,663
Long-term liability and provisions				
8% debentures, 20X9		500		1,500
Provisions for deferred tax		100		180
		1,932		1,983
Capital and reserves				
Ordinary shares of £1 each		1,400		1,400
Share premium account		250		250
Retained earnings		282		333
		1,932		1,983

(ii) Statement of income (extract) for the years ended 30 September 20X6

		20X6
EBITDA		1,161
Depreciation		660
Operating profit		501
Interest payable: debentures		150
Profit before taxation		351
Income tax		125
Profit attributable to shareholders		226
Dividends : paid	70	
: proposed	105	175
Retained earnings for year		51
Retained earnings b/f		282
Retained earnings c/f		333

(iii) Statement of cash flows

Net cash flow from operating activities		1,033
Interest paid	(150)	
Income taxes paid	(130)	(280)
Net cash from operating activities		753
Cash flows from investing activities		
Purchase of property, plant and equipment	(1,620)	
Net cash used in investing activities		(1,620)
Cash flows from financing activities		
Proceeds from sale of short-term investments	59	
Proceeds from long-term borrowings	1,000	
Dividends paid	(160)	
Net cash from financing activities		899
Net increase in cash and cash equivalents		32
Cash and cash equivalents at the beginning of the period		15
Cash and cash equivalents at the end of the period		47

(iv) Tangible non-current assets (or PPE)

The movements in the year were as follows:

	Freehold land and buildings £000	*Plant and machinery £000*	*Total £000*
Cost			
At 1 October 20X5	2,000	1,600	3,600
Additions	—	1,620	1,620
At 30 September 20X6	**2,000**	**3,220**	**5,220**
Depreciation			
At 1 October 20X5	800	900	1,700
Charge during the year	40	620	660
At 30 September 20X6	**840**	**1,520**	**2,360**
Net book value			
Beginning of year	1,200	700	1,900
End of year	**1,160**	**1,700**	**2,860**

You are also provided with the following information:

(i) There was a debenture issue on 1 October 20X5 with interest payable on 30 September each year.

(ii) An interim dividend of £70,000 was paid on 1 July 20X6.

(iii) The short-term investment was sold for £59,000 on 1 October 20X5.

(iv) Business activity increased significantly to meet increased consumer demand.

Required:

(a) Prepare a Reconciliation of operating profit to net cash inflow from operating activities.

(b) Discuss the financial developments at Dragon plc during the financial year ended 30 September 20X6 with particular regard to its financial position at the year end and prospects for the following financial year – supported by appropriate financial ratios.

Question 9

Amalgamated Engineering plc makes specialised machinery for several industries. In recent years, the company has faced severe competition from overseas businesses, and its sales volume has hardly changed. The company has recently applied for an increase in its bank overdraft limit from £750,000 to £1,500,000. The bank manager has asked you, as the bank's credit analyst, to look at the company's application.

You have the following information:

(i) Statements of financial position as at 31 December 20X5 and 20X6:

	20X5		*20X6*	
	£000	£000	£000	£000
Tangible non-current assets				
Freehold land and buildings, at cost		1,800		1,800
Plant and equipment, at net book value		3,150		3,300
		4,950		5,100
Current assets				
Inventory	1,125		1,500	
Trade receivables	825		1,125	
Short-term investments	300		—	
	2,250		2,625	
Current liabilities				
Bank overdraft	225		675	
Trade payables	300		375	
Taxation payable	375		300	
Dividends payable	225		225	
	1,125		1,575	
Net current assets		1,125		1,050
		6,075		6,150
Long-term liability				
8% debentures, 20X9		1,500		1,500
		4,575		4,650
Capital and reserves				
Ordinary shares of £1 each		2,250		2,250
Share premium account		750		750
Retained earnings		1,575		1,650
		4,575		4,650

(ii) Statements of comprehensive income for the years ended 31 December 20X5 and 20X6:

	20X5		*20X6*	
	£000	*£000*	*£000*	*£000*
Turnover		6,300		6,600
Cost of sales: materials	1,500		1,575	
: labour	2,160		2,280	
: production: overheads	750		825	
		4,410		4,680
		1,890		1,920
Administrative expenses		1,020		1,125
Operating profit		870		795
Investment income		15		—
		885		795
Interest payable: debentures	120		120	
: bank overdraft	15		75	
		135		195
Profit before taxation		750		600
Taxation		375		300
Profit attributable to shareholders		375		300
Dividends		225		225
Retained earnings for year		150		75

You are also provided with the following information:

(iii) The general price level rose on average by 10% between 20X5 and 20X6. Average wages also rose by 10% during this period.

(iv) The debenture stock is secured by a fixed charge over the freehold land and buildings, which have recently been valued at £3,000,000. The bank overdraft is unsecured.

(v) Additions to plant and equipment in 20X6 amounted to £450,000: depreciation provided in that year was £300,000.

Required:

(a) Prepare a Statement of cash flows for the year ended 31 December 20X6.

(b) Calculate appropriate ratios to use as a basis for a report to the bank manager.

(c) Draft the outline of a report for the bank manager, highlighting key areas you feel should be the subject of further investigation. Mention any additional information you need, and where appropriate refer to the limitations of conventional historical cost accounts.

(d) On receiving the draft report the bank manager advised that he also required the following three cash-based ratios:

  (i) Debt service coverage ratio defined as EBITDA/annual debt repayments and interest.

  (ii) Cash flow from operations to current liabilities.

  (iii) Cash recovery rate defined as ((cash flow from operations proceeds from sale of noncurrent assets)/average gross assets) × 100.

  The director has asked you to explain why the bank manager has requested this additional information given that he has already been supplied with profit-based ratios.

Question 10

The Housing Department of Chaldon District Council has invited tenders for re-roofing 80 houses on an estate. Chaldon Direct Services (CDS) is one of the Council's direct services organisations and it has submitted a tender for this contract, as have several contractors from the private sector.

The Council has been able to narrow the choice of contractor to the four tenderers who have submitted the lowest bids, as follows:

	£
Nutfield & Sons	398,600
Chaldon Direct Services	401,850
Tandridge Tilers Ltd	402,300
Redhill Roofing Contractors plc	406,500

The tender evaluation process requires that the three private tenderers be appraised on the basis of financial soundness and quality of work. These tenderers were required to provide their latest final accounts (year ended 31 March 20X4) for this appraisal; details are as follows:

	Nutfield & Sons	*Tandridge Tilers Ltd*	*Redhill Roofing Contractors plc*
Profit and loss account for year ended 31 March 20X4			
	£	£	£
Turnover	611,600	1,741,200	3,080,400
Direct costs	(410,000)	(1,190,600)	(1,734,800)
Other operating costs	(165,000)	(211,800)	(811,200)
Interest	—	(85,000)	(96,000)
Net profit before taxation	36,600	253,800	438,400
Statement of financial position as at 31 March 20X4			
	£	£	£
Non-current assets (net book value)	55,400	1,542,400	2,906,800
Inventories and work-in-progress	26,700	149,000	449,200
Receivables	69,300	130,800	240,600
Bank	(11,000)	10,400	(6,200)
Payables	(92,600)	(140,600)	(279,600)
Proposed dividend	—	(91,800)	(70,000)
Loan	—	(800,000)	(1,200,000)
	47,800	800,200	2,040,800
Capital	47,800	—	—
Ordinary shares @ £1 each	—	250,000	1,000,000
Reserves	—	550,200	1,040,800
	47,800	800,200	2,040,800

Nutfield & Sons employ a workforce of six operatives and have been used by the Council for four small maintenance contracts worth between £60,000 and £75,000 which they have completed to an appropriate standard. Tandridge Tilers Ltd have been employed by the Council on a contract for the replacement of flat roofs on a block of flats, but there have been numerous complaints about the standard of the work. Redhill Roofing Contractors plc is a company which has not been employed by the Council in the past and, as much of its work has been carried out elsewhere, its quality of work is not known.

CDS has been suffering from the effects of increasing competition in recent years and achieved a return on capital employed of only 3.5% in the previous financial year. CDS's manager has successfully renegotiated more beneficial service level agreements with the Council's central support departments with effect from 1 April 20X4. CDS has also reviewed its non-current asset base which has resulted in the disposal of a depot which was surplus to requirements and in the rationalisation of vehicles and plant. The consequence of this is that CDS's average capital employed for 20X4/X5 is likely to be some 15% lower than in 20X3/X4.

A further analysis of the tender bids is provided below:

	Nutfield & Sons	*Chaldon Direct Services*	*Tandridge Tilers Ltd*	*Redhill Roofing Contractors plc*
	£	*£*	*£*	*£*
Labour	234,000	251,400	303,600	230,400
Materials	140,000	100,000	80,000	140,000
Overheads (including profit)	24,600	50,450	18,700	36,100

The Council's Client Services Committee can reject tenders on financial and/or quality grounds. However, each tender has to be appraised on these criteria and reasons for acceptance or rejection must be justified in the appraisal process.

Required:

In your capacity as accountant responsible for reporting to the Client Services Committee, draft a report to the Committee evaluating the tender bids and recommending to whom the contract should be awarded.

(CIPFA)

Question 11

Chelsea plc has embarked on a programme of growth through acquisitions and has identified Kensington Ltd and Wimbledon Ltd as companies in the same industrial sector, as potential targets. Using recent financial statements of both Kensington and Wimbledon and further information obtained from a trade association, Chelsea plc has managed to build up the following comparability table:

	Kensington	*Wimbledon*	*Industrial average*
Profitability ratios			
ROCE before tax %	22	28	20
Return on equity %	18	22	15
Net profit margin %	11	5	7
Gross profit ratio %	25	12	20
Activity ratios			
Total assets turnover = times	1.5	4.0	2.5
Non-current asset turnover = times	2.3	12.0	5.1
Receivables collection period in weeks	8.0	5.1	6.5
Inventoryholding period in weeks	21.0	4.0	13.0
Liquidity ratios			
Current ratio	1.8	1.7	2.8
Acid test	0.5	0.9	1.3
Debt–equity ratio %	80.0	20.0	65.0

Required:

(a) Prepare a performance report for the two companies for consideration by the directors of Chelsea plc indicating which of the two companies you consider to be a better acquisition.

(b) Indicate what further information is needed before a final decision can be made.

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