chapter 3

Fundamental interpretations made from financial statement data

learning objectives

After studying this chapter you should be able to:

1. Explain why financial statement ratios are important.
2. Explain the importance of and calculate the return on assets (ROA).
3. Calculate and interpret margin and turnover using the adapted DuPont model.
4. Explain the significance of and calculate the return on equity (ROE).
5. Explain the meaning and importance of liquidity.
6. Calculate working capital, the current ratio, and the quick ratio and explain their significance.
7. Demonstrate how trend analysis can be used most effectively.

Chapter 2 presented an overview of the financial statements that result from the financial accounting process. At this stage, you are able to preview some of the interpretations made by financial statement users to support their decisions and informed judgments. Understanding the uses of accounting information will make development of that information more meaningful. Current and potential shareholders are interested in making their own assessments about management's stewardship of the resources made available by the owners. For example, judgments about profitability will affect the investment decision. Creditors assess the entity's ability to repay loans and pay for products and services. These assessments about profitability and debt-paying ability involve interpreting the relationships between amounts reported in the financial statements. Most of these relationships will be developed further in subsequent chapters. They are introduced now to illustrate how management's financial objectives for the firm are quantified, so that you can begin to understand what the numbers mean. Likewise, these concepts will prepare you to understand better the impact of alternative accounting methods on financial statements, when accounting alternatives are explained in later chapters.

This chapter introduces some financial statement analysis concepts. Chapter 10, 'Financial statement analysis', is a comprehensive, capstone explanation of how to use financial statement data to analyse financial condition and results of operations. You will better understand topics in that chapter after you have studied the financial accounting material in Chapters 5 through 9. Peter Drucker (manager of excellence) wrote on the state of managers, 'Executives have become computer literate … But not many executives are information literate. They know how to get the data. But most still have to learn how to use the data'. This chapter is a starting point.

LEARNING OBJECTIVE 1

Explain why financial statement ratios are important.

Financial ratios and trend analysis

The large dollar amounts reported on the financial statements of many companies, and the varying sizes of companies, make ratio analysis the only sensible method of evaluating the various financial characteristics of a company. Students are frequently awed by the number of ratio measurements commonly used in financial management and are sometimes intimidated by the mere thought of calculating a ratio. However, the arithmetic skills of addition, subtraction, multiplication and division are all that is required. A ratio is simply the relationship between two numbers; the name of virtually every financial ratio describes the numbers to be related and, usually, how the ratio is calculated. As you study this material, concentrate on understanding why the ratio is considered important and work to understand the meaning of the ratio. If you do these things, you should avoid much of the stress associated with understanding financial ratios.

In most cases, a single ratio does not describe very much about the company whose statements are being studied. Much more meaningful analysis is accomplished when the *trend* of a particular ratio over several time periods is examined. Of course, consistency in financial reporting and in

defining the ratio components is crucial if the trend is to be meaningful. Consider a single test result. How meaningful is a mark alone, say 10? You need to know the total marks available and the weighting of the assessment to appreciate the full impact of the mark. Also, you look to a friend's paper (or your competition) to benchmark or compare it, before digesting the actual result. Comparison with the average mark also gives your mark more meaning. This human response to performance evaluation is what happens when a company's performance (trading result) is evaluated using ratio analysis.

Most industry and trade associations publish industry average ratios based on aggregated data compiled by the association from reports submitted by association members. Comparison of an individual company's ratio with the comparable industry ratio is frequently made as a means of assessing a company's relative standing in its industry. However, a comparison of a company with its industry, based on a single observation, may not be very meaningful, because the company may use a financial accounting alternative that is different from that used by the rest of the industry. **Trend analysis** results in a much more meaningful comparison because, even though the data used in the ratio may have been developed under different financial accounting alternatives, internal consistency within each of the trends will permit useful trend comparisons.

Trend analysis is described later in this chapter, but this brief example illustrates the process: Suppose that a student's grade point average for last semester was 2.8 on a 4.0 scale. That GPA may be interesting, but it says little about the student's work. However, suppose you learn that this student's GPA was 1.9 four semesters ago, 2.3 three semesters ago, and 2.6 two semesters ago. The upward trend of grades suggests that the student is working 'smarter and harder'. This conclusion would be reinforced if you knew that the average GPA for all students in this person's class was 2.6 for each of the four semesters. You still don't know everything about the individual student's academic performance, but the comparative trend data do let you make a more informed judgment than was possible with just the grades from one semester.

What Does It Mean ?

1 What does it mean to state that the trend of data is frequently more important than the data itself?

Return on assets

2 LEARNING OBJECTIVE

Explain the importance of and calculate the return on assets (ROA).

Imagine that you are presented with two investment alternatives. Each investment will be made for a period of one year, and each investment is equally risky. At the end of the year, you will get your original investment back, plus income of $75 from investment A and $90 from investment B. Which investment alternative would you choose? The answer seems so obvious that you believe the question is loaded, so you hesitate to answer—a sensible response. But why is this a trick question? A little thought should make you think of a question to which you need an answer before you can select between investment A and investment B. Your question? 'How much money would I have to invest in either alternative?' If the amount to be invested is the same, for example, $1 000 then, clearly, you would select investment B because your income would be greater than that earned on investment A for the same amount invested. If

the amount to be invested in investment B is more than that required for investment A, you would have to calculate the **rate of return** on each investment in order to choose the more profitable alternative.

Rate of return is calculated by dividing the amount of return (the income of $75 or $90 in the above example) by the amount of the investment. For example, using an investment of $1 000 for each alternative:

Investment A:

$$\text{Rate of return} = \frac{\text{Amount of return}}{\text{Amount invested}} = \frac{\$75}{\$1\ 000} = 7.5\%$$

Investment B:

$$\text{Rate of return} = \frac{\text{Amount of return}}{\text{Amount invested}} = \frac{\$90}{\$1\ 000} = 9\%$$

Your intuitive selection of Investment B as the better investment is confirmed by the fact that its rate of return is higher than that of Investment A.

The example situation assumed that the investments would be made for one year. Remember, that unless otherwise specified, rate of return calculations assume that the time period of the investment and return is one year.

The rate of return calculation is derived from the interest calculation that you probably learned many years ago. Recall that:

$$\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time}$$

Interest is the income or expense from investing or borrowing money.
Principal is the amount invested or borrowed.
Rate is the **interest rate** per year expressed as a percentage.
Time is the length of time the funds are invested or borrowed, expressed in years or fractions of a year.

Note that, when time is assumed to be one year, the term of the equation becomes 1/1 or 1, and it disappears. Thus, the rate of return calculation is simply a rearranged interest calculation that solves for the annual interest rate.

Return to the example situation and assume that the amounts necessary to be invested are $500 for investment A and $600 for investment B. Now, which alternative would you select on the basis of rate of return? You should have made these calculations:

Investment A:

$$\text{Rate of return} = \frac{\text{Amount of return}}{\text{Amount invested}} = \frac{\$75}{\$500} = 15\%$$

Investment B:

$$\text{Rate of return} = \frac{\text{Amount of return}}{\text{Amount invested}} = \frac{\$90}{\$600} = 15\%$$

All other things being equal (and they seldom are except in textbook illustrations), you would be indifferent with respect to the alternatives available to you because each has a rate of return of 15 per cent (per year).

Rate of return and riskiness related to an investment go hand in hand. **Risk** relates to the *range of possible outcomes* from an activity: the wider the range of possible outcomes, the greater the risk. An investment in a bank savings account is less risky than an investment in the shares of a company, because the investor is virtually assured of receiving her or his principal and interest from the savings account, but the market value of shares may fluctuate widely, even over a short period of time. Thus, the investor anticipates a higher rate of return from the share investment than from the savings account, as compensation for taking on additional risk. Yet, the greater risk of the share investment means that the actual rate of return earned could be considerably less (even negative) or much greater than the interest earned on the savings account. Market prices for products and commodities, as well as share prices, reflect this basic risk/reward relationship. For now, understand that *the higher the rate of return of one investment relative to another, the greater the risk associated with the higher return investment.*

Rate of return is a universally accepted measure of profitability. Because it is a ratio, profitability of unequal investments can be compared, and risk/reward relationships can be evaluated. Bank advertisements for certificates of deposit feature the interest rate, or rate of return, that will be earned by the depositor. All investors evaluate the profitability of an investment by making a rate of return calculation.

Return on assets (ROA) is the label usually assigned to the rate of return calculation made using data from financial statements. This ratio is sometimes referred to as the *return on investment* (in assets). There are many ways of defining both the amount of return and the amount invested. We use profit from operations (or earnings before interest and tax) as the amount of return and use average total assets during the year as the amount invested. It is not appropriate to use total assets as reported on a single year-end balance sheet, because that is the total at one point in time: the balance sheet date. Net profit was earned during the entire financial year, so it should be related to the assets that were used during the entire year. Average assets used during the year are usually estimated by averaging the assets reported at the beginning of the year (the prior year-end balance sheet total) and assets reported at the end of the year. Recall from Chapter 2 that the income statement for the year is the link between the beginning and ending balance sheets. If seasonal fluctuations in total assets are significant (the materiality concept) and if quarter-end or month-end balance sheets are available, a more refined average asset calculation may be made.

It is also not appropriate to use net profit as the amount of the return, since the total assets could have been financed by a variety of sources, some tax deductible and others not. EBIT (earnings before interest and tax) is the total return to all providers of finance without the complications of tax.

The ROA of a firm is significant to most financial statement readers, because it describes the rate of return management was able to earn on the assets that it had available to use during the year. Investors, especially, will make decisions and informed judgments about the quality of management and the relative profitability of a company based on ROA. Many financial analysts, these authors included, believe that ROA is the most meaningful measure of a company's profitability. Knowing net profit alone is not enough; an informed judgment about the firm's profitability requires relating net profit to the assets used to generate that net profit. This is like assessing performance based on outcomes as well as potential.

exhibit 3-1 CONDENSED BALANCE SHEETS AND INCOME STATEMENT OF CRUISERS LTD

exhibit

CRUISERS LTD
Comparative Condensed Balance Sheets
30 September 2006 and 2005

	2006 $	2005 $
Current assets:		
Cash	22 286	16 996
Accounts receivable	42 317	39 620
Inventories	53 716	48 201
Total current assets	118 319	104 817
Other assets	284 335	259 903
Total assets	402 654	364 720
Current liabilities	57 424	51 400
Other liabilities	80 000	83 000
Total liabilities	137 424	134 400
Owners' equity	265 230	230 320
Total liabilities and owners' equity	402 654	364 720

CRUISERS LTD
Condensed Income Statement
For the Year Ended
30 September 2006

	$
Net sales	611 873
Cost of goods sold	428 354
Gross profit	183 519
Operating expenses	122 183
Profit from operations	61 336
Interest expense	6 400
Profit before tax	54 936
Income tax	20 026
Net profit	34 910
Earnings per share	1.21

The condensed balance sheets and income statement of Cruisers Ltd, a hypothetical company, are presented in Exhibit 3-1. Using these data, the company's ROA calculation is illustrated below.

	$
From the firm's balance sheets:	
Total assets, 30 September 2005	364 720
Total assets, 30 September 2006	402 654
From the firm's income statement for the year ended 30 September 2006:	
Profit from operations (EBIT)	61 336

$$\text{Return on assets} = \frac{\text{Profit from operations}}{\text{Average total assets}}$$

$$= \frac{61\,336}{(364\,720 + 402\,654)/2}$$

$$= 16\%$$

Individual analysts may make adjustments to arrive at the amounts used in the ROA calculation. For example, many exclude depreciation and goodwill amortisation and use EBITDA (earnings before interest, tax, depreciation and amortisation) as the numerator in the calculation of ROA. Others will use net profit (after tax and interest) as the numerator. Consistency in the definition of terms is more important than the definition itself, because the trend of ROA will be more significant for decision making than the absolute result of the ROA calculation for any one year. However, it is necessary to understand the definitions used in any ROA results that you see.

2 What does it mean to express economic performance as a rate of return?
3 What does it mean to say that return on assets (ROA) is one of the most meaningful measures of financial performance?

What ? Does It Mean

COULD I GET BY WITHOUT A KNOWLEDGE OF ACCOUNTING?

The Insider's View

BILL DOWNEY

A reasonable knowledge of accounting (that is, the theory and system of setting up and maintaining an information system which records, classifies and summarises the financial details of an organisation, expressed in terms of money) is essential for this position. As a scientist, I was often reminded of the statement made by Lord Kelvin more than a century ago.

> *When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre, unsatisfactory kind.*

Kelvin was referring to the need to make scientific measurements of the natural world in terms of fundamental physical properties such as mass, length, time etc. However, the statement is almost directly transferable to financial accounting.

At this point, however, it is worth making the observation that 'knowing the numbers' often isn't enough. Numbers generally require context and interpretation. For example, if I said the maximum temperature for Sydney today will be 25^0 C, you might well observe that this statement would have more meaning if one knew what time of the year we are talking about and how unusual a 25^0 C temperature is.

In reading a balance sheet or operating statement, a similar principle applies. An organisation might have a small amount of cash at bank but very large amounts of convertible assets. In a given year the profit of a commercial enterprise may be small, but this could be as a result of large investment in infrastructure.

Bill Downey
Bureau of Meteorology

The DuPont model, an expansion of the ROA calculation

3 LEARNING OBJECTIVE

Calculate and interpret margin and turnover using the adapted DuPont model.

Financial analysts at E I DuPont de Nemours & Co are credited with developing the **DuPont model**, an expansion of the basic ROA calculation, in the late 1930s. They reasoned that profitability from sales and utilisation of assets to generate sales revenue were both important factors to be considered when evaluating a company's overall profitability. One popular adaptation of their model introduces total sales revenue into the ROA calculation as follows:

$$\text{Return on assets} = \frac{\text{EBIT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average total assets}} = \text{Operating margin} \times \text{Turnover}$$

The first term, operating income/sales, is **margin**. The second term, sales/average total assets, is **asset turnover** or, simply, **turnover**. Of course, the sales quantities cancel out algebraically, but they are introduced to this version of the ROA model because of their significance. *Margin* emphasises that, from every dollar of sales revenue, some amount must work its way to the bottom line, net profit, if the company is to be profitable. *Turnover* relates to the efficiency with which the firm's assets are used in the revenue-generating process.[1]

[1] DuPont originally defined 'return' as net profit and used the term 'ROI' (return on investment) in his model. For consistency of development of thought and the language of this book, we have adapted the original model.

Another quick quiz will illustrate the significance of turnover. Many of us look forward to a 40-hour-per-week job, generally thought of as five 8-hour days. Imagine a company's factory operating on such a schedule—one shift per day, five days per week. The question: What percentage of the available time is that factory operating? You may have answered 33 per cent, or one-third of the time, because eight hours is one-third of a day. But what about Saturday and Sunday? In fact, there are 21 shifts available in a week (7 days, 3 shifts per day), so a factory operating 5 shifts per week is only being used 5/21 of the time—less than 25 per cent! The factory is idle more than 75 per cent of the time! And, as you can imagine, many of the occupancy costs (rent, water and electricity costs, insurance) are incurred whether or not the plant is in use. This explains why many firms operate their plant on a two-shift, three-shift, or even seven-day basis, rather than build additional plants—it allows them to increase their level of production and thereby expand sales volume without expanding their investment in assets. The higher costs associated with multiple-shift operations (e.g. late-shift premiums for workers and additional transportation costs relative to delivering from multiple locations closer to customers) will increase the company's operating expenses, thereby lowering net profit and decreasing margin. Yet, the multiple-shift company's overall ROA will be higher, if turnover is increased proportionately, more than margin is reduced, which is likely to be the case.

Calculation of ROA using the DuPont model is illustrated below, using data from the financial statements of Cruisers Ltd in Exhibit 3-1:

From the firm's balance sheets:	$
Total assets, 30 September 2005	364 720
Total assets, 30 September 2006	402 654
From the firm's income statement for the year ended 30 September 2005:	
Net sales	611 873
Profit from operations (EBIT)	61 336

$$\text{Return on assets} = \frac{\text{Profit from operations}}{\text{Average total assets}}$$

$$= \frac{61\,336}{(364\,720 + 402\,654)/2}$$

$$= 16\%$$

$$\text{Return on assets} = \text{operating margin} \times \text{turnover}$$

$$= \frac{\text{Operating Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average total assets}}$$

$$= \frac{61\,336}{611\,873} \times \frac{611\,873}{(\$364\,720 + \$402\,654)/2}$$

$$= 10\% \times 1.6$$

$$= 16\%$$

The significance of the DuPont model is that it has led senior management in many organisations to consider utilisation of assets, including keeping investment in assets as low as feasible, to be just as important to overall performance as generating profit from sales.

A rule of thumb useful for putting ROA in perspective is that, for most global merchandising and manufacturing companies, average ROA, based on net profit, normally ranges between 8 and 12 per cent. Average ROA, based on operating income (earnings before interest and tax) for the same set of firms, is typically between 10 and 15 per cent. Average margin, based on net income, ranges from about 5 to 10 per cent. Using operating income, average margin tends to range from 10 to 15 per cent. Asset turnover is usually about 1.0 to 1.5, but often ranges as high as 3.0, depending upon the operating characteristics of the firm and its industry. The ranges given here are very wide and are intended to suggest only that a firm with ROA and component values consistently beyond these ranges is exceptional.

As a rule of thumb, do not place much reliance on rules of thumb! Do not try to memorise them! Instead, you should understand that ratio comparisons are often difficult to make. Firms within a given industry may vary considerably over time in terms of their relative scale of operations, life-cycle stage of development, market segmentation strategies, cost and capital structures, selected accounting methods, or other economic factors—cross-industry ratio comparisons are even more problematic. Thus, the rules of thumb provided in this chapter are intended merely to serve as points of reference; they are not based on empirical evidence, unless otherwise indicated.

4 What does it mean when the straightforward ROA calculation is expanded by using *margin* and *turnover*?

Return on equity

Explain the significance of and calculate the return on equity.

Recall that the balance sheet equation is:

$$\text{Assets} = \text{Liabilities} + \text{Owners' Equity}$$

The **return on asset** (ROA) calculation relates operating profit (adjusted for interest and income tax) to assets. Assets represent the amount invested to generate earnings. As the balance sheet equation indicates, the investment in assets can result either from amounts borrowed from creditors (liabilities) or amounts invested by the owners. Owners (and others) are interested in expressing the profits of the firm as a rate of return on the amount of owners' equity; this is called **return on equity (ROE)**, and it is calculated as follows:

$$\text{Return on equity} = \frac{\text{Net profit}}{\text{Average owners' equity}}$$

Return on equity is calculated using average owners' equity during the period for which the net profit was earned, for the same reason that average assets is used in the ROA calculation; net profit is earned over a period of time, so it should be related to the owners' equity over that same period of time.

Calculation of ROE is illustrated below, using data from the financial statements of Cruisers Ltd in Exhibit 3-1:

From the firm's balance sheets:	$
Total owners' equity, 30 September 2005	230 320
Total owners' equity, 30 September 2006	265 230
From the firm's income statement for the year ended 30 September 2006:	
Net profit	34 910

$$\text{Return on equity} = \frac{\text{Net profit}}{\text{Average owners' equity}}$$

$$= \frac{\$34\,910}{(\$230\,320 + \$265\,230)/2}$$

$$= \$34\,910 \div \$247\,775$$

$$= 14.1\%$$

ROA and ROE cannot easily be related to each other, since one is a before-tax calculation and the other an after-tax calculation. The trends of each, however, can be usefully compared.

A rule of thumb for putting ROE in perspective is that average ROE for most global merchandising and manufacturing companies historically has ranged from 10 to 15 per cent. However, ROE results improved dramatically throughout the 1990s, due to post-war economic boom.

Keep in mind that return on equity is a special-case application of the rate of return concept. ROE is important to current shareholders and prospective investors because it relates earnings to owners' investment, that is, the owners' equity in the assets of the entity. Adjustments to both net profit and average owners' equity are sometimes made in an effort to improve the comparability of ROE results between firms, and some of these will be explained later in the text. For now, you should understand that both return on assets and return on equity are fundamental measures of the profitability of a firm and that the data for making these calculations come from the firm's financial statements.

LEARNING OBJECTIVE 5

Explain the meaning and importance of liquidity.

Working capital and measures of liquidity

Liquidity refers to a firm's ability to meet its current obligations and is measured by relating its current assets and current liabilities, as reported on the balance sheet. **Working capital** is the excess of a firm's current assets over its current liabilities. Current assets are cash and other assets that are likely to be converted to cash within a year (principally accounts receivable and inventories). Current liabilities are those obligations that are expected to be paid within a year, including loans, accounts payable, and other accrued liabilities (such as wages payable, interest payable, and rent payable). Most financially healthy firms have positive working capital. Even though a firm is not likely to have cash on hand at any point in time equal to its current liabilities, it will expect to collect accounts receivable or sell merchandise inventory and then collect the resulting accounts receivable in time to pay the liabilities when they are scheduled for payment. Of course, in the process of converting inventories to cash, the firm will be purchasing additional merchandise for its inventory, and the suppliers will want to be assured of collecting the amounts due according to the previously agreed-upon provisions for when payment is due.

Liquidity is measured in three principal ways:

1. Working Capital = Current Assets – Current Liabilities
2. $$\text{Current ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$
3. $$\text{Quick ratio} = \frac{\text{Cash (including temporary cash investments)} + \text{Accounts Receivable}}{\text{Current Liabilities}}$$

The dollar amount of a firm's working capital is not as significant as the ratio of its current assets to current liabilities, because the amount can be misleading unless it is related to another quantity (e.g. how large is large?). Therefore, it is the *trend* of a company's **current ratio** that is most useful in judging its current bill-paying ability. The **quick ratio**, also known as the *acid test*, is a more conservative short-term measure of liquidity, because inventories are excluded from the calculation. This ratio provides information about an almost worst-case situation—the firm's ability to meet its current obligations, even if none of the inventory can be sold.

The liquidity measure calculations below use 30 September 2006 data from the financial statements of Cruisers Ltd in Exhibit 3-1:

6 LEARNING OBJECTIVE

Calculate working capital, the current ratio and the quick ratio, and explain their significance.

$$\begin{aligned}
\text{Working capital} &= \text{Current assets} - \text{Current liabilities} \\
&= \$118\,319 - \$57\,424 \\
&= \$60\,895 \\
\text{Current ratio} &= \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$118\,319}{\$57\,424} = 2.1 \text{ times} \\
\text{Quick ratio} &= \frac{\text{Cash (including temporary cash investments)} + \text{Accounts Receivable}}{\text{Current Liabilities}} \\
&= \frac{\$22\,286 + \$42\,317}{\$57\,424} \\
&= 1.1 \text{ times}
\end{aligned}$$

When recording a current ratio of 2.1 times (or 2.1:1), understand that this means that the current liabilities are covered 2.1 times by the current assets. Similarly, a quick ratio of 1.1 times (or 1.1:1) means the current liabilities are covered 1.1 times.

As a general rule, a current ratio of 2.0 times and a quick ratio of 1.0 times are considered indicative of adequate liquidity. From these data, it can be concluded that Cruisers Ltd has a high degree of liquidity; it should not have any trouble meeting its current obligations as they become due.

In terms of debt-paying ability, the higher the current ratio, the better. Yet an overly high current ratio sometimes can be a sign that the company has not made the most productive use of its assets. In recent years, many large, well-managed corporations have made efforts to streamline operations by reducing their current ratios to the 1.0 – 1.5 range, or even lower, with corresponding reductions in their quick ratios. Investments in cash, accounts receivable, and inventories are minimised, because these current assets tend to be the least productive assets employed by the company. For example, what kind of ROA is earned on accounts receivable or inventory? Very little, if any! Money freed up by reducing the investment in working capital items can be used to purchase new production equipment or to expand marketing efforts for existing product lines.

Remember, however, that judgments based on the results of any of these calculations using data from a single balance sheet are not as meaningful as the **trend** of the results over several periods. It is also important to note the composition of working capital and to understand the impact on the ratios of equal changes in current assets and current liabilities. As the following illustration shows, if a short-term bank loan were repaid just before the balance sheet date, working capital would not change (because current assets and current liabilities would each decrease by the same amount), but the current ratio (and the quick ratio) would change.

	Before loan repayment	After $20 000 loan repaid
	$	$
Current assets	200 000	180 000
Current liabilities	100 000	80 000
Working capital	100 000	100 000
Current ratio	2.0:1 times	2.25:1 times

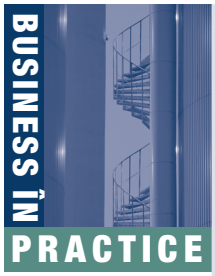
If a new loan were taken out just after the balance sheet date, the level of the firm's liquidity at the balance sheet date, as expressed by the current ratio, would have been overstated. Thus, liquidity measures should be viewed with a healthy dose of scepticism, since the timing of short-term borrowings and repayments is entirely within the control of management.

Measures of liquidity are used primarily by potential creditors, who are seeking to make a judgment regarding their prospects of being paid promptly if they enter into a creditor relationship with the firm whose liquidity is being analysed (see Business in Practice—Establishing a Credit Relationship).

The statement of cash flows is also useful in assessing the reasons for a firm's liquidity (or lack of liquidity). Recall that this financial statement identifies the reasons for the change in a firm's cash during the period (usually a year) by reporting the cash flow changes during the period in the other balance sheet items.

What ? Does It Mean

5 What does it mean to say that the financial position of the firm is liquid?



ESTABLISHING A CREDIT RELATIONSHIP

Most transactions between businesses, and many transactions between individuals and businesses, are credit transactions. That is, the sale of the product or provision of the service is completed some time before payment is made by the purchaser. Usually, before delivering the product or service, the seller wants to have some assurance that the bill will be paid when due. This involves determining that the buyer is a good **credit risk**.

Individuals usually establish credit by submitting to the potential creditor a completed credit application, which includes information about employment, salary, bank accounts, liabilities, and other credit relationships (e.g. charge accounts) established. Most credit grantors are looking for a good record of timely payments on existing credit accounts; this is why an individual's first credit account is usually the most difficult to obtain. Potential credit grantors also may check an individual's credit record as maintained by the credit bureau in the city in which the applicant lives or has lived.

Businesses seeking credit may follow a procedure similar to that used by individuals.

Alternatively, they may provide financial statements and names of firms with which a credit relationship has been established. A newly organised firm may have to pay for its purchases in advance or on delivery (**COD**) until it has been in operation for several months, and then the seller may set a relatively low credit limit for sales on credit. Once a record is established of having paid bills when due, the credit limit will be raised. After a firm has been in operation for a year or more, its credit history may be reported by the Dun and Bradstreet credit reporting service—a type of national credit bureau to which many companies subscribe. Even after a credit relationship has been established, it is not unusual for a firm to continue providing financial statements to its principal creditors.

Illustration of trend analysis

Trend analysis of return on assets, return on equity, and working capital and liquidity measures is illustrated in the following tables and exhibits. The data in these illustrations come primarily from the financial statements of Primary Health Care Ltd.

The data in Exhibit 3-2 has been compiled from annual reports. Unlike some companies, Primary Health Care Ltd does not give a table of previous years' financial highlights. The data in this exhibit are presented graphically in Exhibits 3-3 through 3-5. Note that the sequence of the years in the table is opposite from that of the years in the graphs. Tabular data are frequently presented so the most recent year is closest to the line descriptions. Graphs of time series data usually flow from left to right. In any event, it is necessary to notice and understand the labels of both tables and graphs.

exhibit 3-2 **PRIMARY HEALTH CARE LTD (PROFITABILITY* AND LIQUIDITY† DATA, 2003–1999)**

	2003	2002	2001	2000	1999
Margin (net profit/net revenues)	7%	5.6%	7%	7.8%	11.2%
Turnover (net revenues/average total assets)	0.63 times	0.45 times	0.47 times	0.56 times	0.59 times
ROA (EBT/average total assets)	9.1%	6.5%	7.9%	8.7%	12.8%
ROE (net profit/average shareholders' equity)	7%	4.5%	5.7%	6.9%	11.4%
Year-end position (in millions):					
Current assets	$22 113	$66 407	$54 070	$23 855	$8 684
Current liabilities	16 464	18 158	15 022	19 249	18 850
Working capital	$5 649	$48 249	$39 048	$ 4 606	($10 166)
Current ratio	1.34:1 times	3.66:1 times	3.6:1 times	1.24:1 times	0.46:1 times

* Profitability calculations were made from the data presented in the individual annual reports.
† Liquidity calculations were made from the data presented in the individual annual reports.
Source: Primary Health Care Ltd, *Annual Reports 2003–1999.*

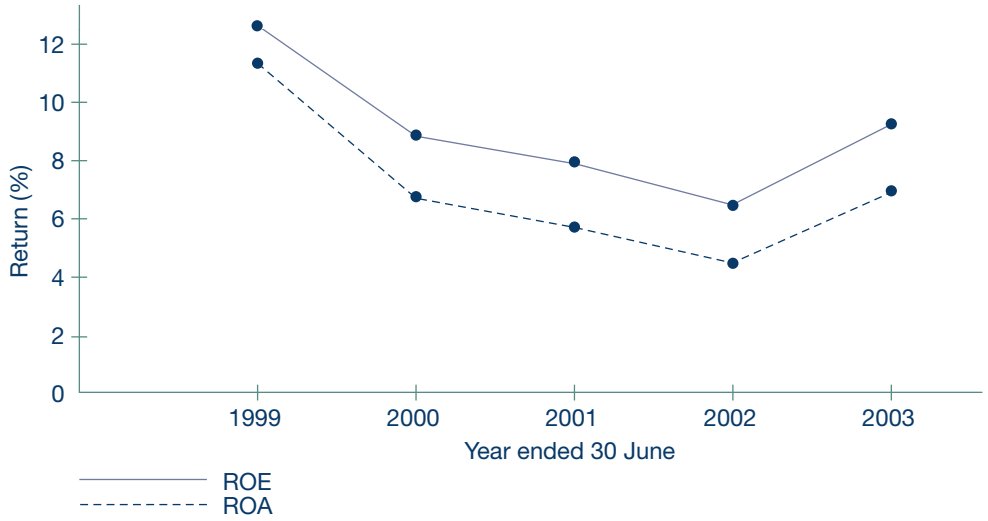
7 LEARNING OBJECTIVE

Demonstrate how trend analysis can be used most effectively.

exhibit

exhibit 3-3 PRIMARY HEALTH CARE LTD, RETURN ON ASSETS (ROA) AND RETURN ON EQUITY (ROE), 1999–2003

exhibit



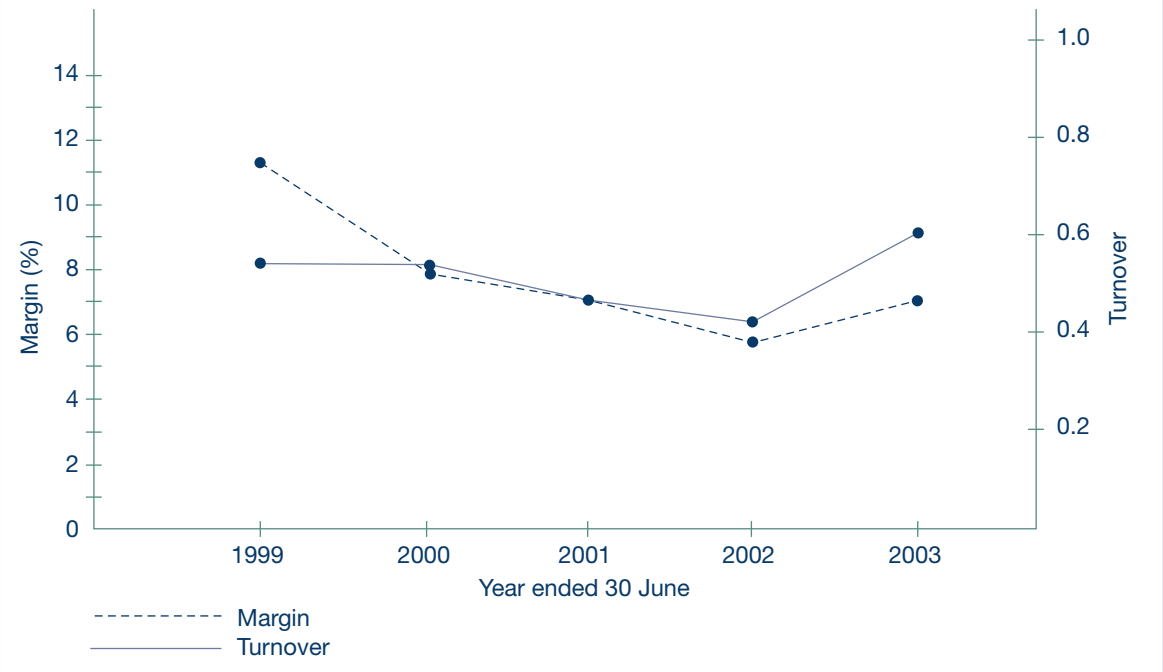
The graph in Exhibit 3-3 illustrates that both ROA and ROE declined from 1999, interestingly, in the year after the company went public. The performance continued to decline but at a less dramatic rate until 2002, when the first improvement was recorded. The 'big picture' is that Primary Health Care's ROA and ROE declined steadily during this period and the recovery in 2003 has not yet brought the company into the returns experienced in that first year as a listed public company. When compared to the profitability of other companies in the health care industry, for example, Mayne Group, Ramsay Health Care and Pearl Health Care, Primary Health Care's performance was fairly standard, reflecting the rising costs facing most players in the field and the heavy reliance on new technology to be at the cutting edge.

Exhibit 3-4 illustrates that PHC's turnover fell steadily in a near-linear pattern from 0.59 to 0.45, from 1999 to 2002. Margin fell slowly over this same time, before rising sharply in 2003. At first glance, the margin 'picture' appears more gentle. Keep in mind, however, that the scale selected can influence the visual image conveyed by a graph. For instance, what would happen to the slope of the margin graph in Exhibit 3-4 if the horizontal scale were to be compressed to half of its current size, to accommodate 10 years of data? Yes, you've got it. The peaks and valleys would become even more pronounced! In fact, the total difference (or spread) between the high in 2000 of 11.2 per cent to the low in 2001 of 5.6 per cent is 5.6 per cent! While much can be made of these results, the overall profitability trends are clearly downward until 2003. Notice that the margin and turnover trends shown in Exhibit 3-4 are consistent with the ROA and ROE trends shown in Exhibit 3-3, as is to be expected.

What ? Does It Mean

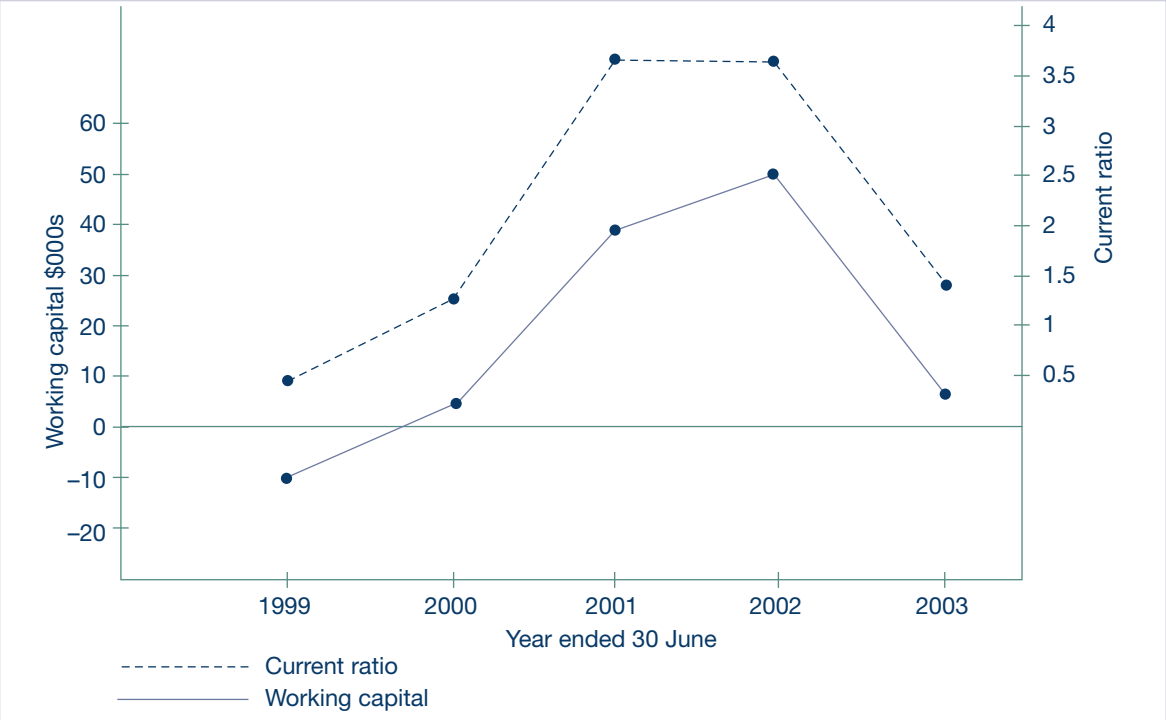
6 What does it mean when the trend of a company's ROE is consistently higher by an approximately equal amount than the trend of ROE for the industry of which the company is a part?

exhibit 3-4 PRIMARY HEALTH CARE LTD, MARGIN AND TURNOVER, 1999–2003



exhibit

exhibit 3-5 PRIMARY HEALTH CARE LTD, WORKING CAPITAL AND CURRENT RATIO, 1999–2003



exhibit

All of the graphs presented in this chapter use an arithmetic vertical scale. This means that the distance between values shown on the vertical axis is the same. So, if the data being plotted increase at a constant rate over the period of time shown on the horizontal scale, the plot will be a line that curves upward more and more steeply. Many analysts prefer to plot data that will change significantly over time (a company's sales, for example) on a graph that has a logarithmic vertical scale. This is called a **semi-logarithmic graph**, because the horizontal scale is still arithmetic. The intervals between years, for example, will be equal. The advantage of a semi-logarithmic presentation is that a constant rate of growth results in a straight-line plot.

The Insider's View

JANICE CARPENTER

COULD I GET BY WITHOUT A KNOWLEDGE OF ACCOUNTING?

Accounting and financial management have always been part of my set of understandings—what I can bring to a business situation. It always astounds me to see people in areas like marketing and sales trying to function without an understanding of accounting. For instance, how would you know if you are being snowed by the accountants? They might tell you that the 'cost' of a new product you are going to launch is, say $30 per unit. But what has gone into that cost? Asking the right questions might uncover that the $30 includes a profit contribution for the factory, and it might be that element that is making the product not viable in the market place.

Peter Rix
Neomat Pty Ltd

In terms of financial ratios the debt ratios (interest cover, debt to gross cash flow and debt to equity) are crucial as they tend to be the primary indicators of imminent catastrophe. Enterprise Value/EBITDA is a crucial valuation measure in that it provides a useful business-to-business comparison ignoring the individual capital structures of the businesses.

Other ratios tend to be more industry specific. Inventory turnover is clearly a key ratio for retailers, whilst Listed Investment Companies are valued almost solely on their NTA (given that we have confidence in the management; and if we didn't we would be unlikely to invest at any discount).

Janice Carpenter
Ethical Investment Services Pty Ltd

SO WHAT DO YOU THINK ?

The discussion here is a continuation from the 'So what do you think? section in Chapters 1 and 2.

This chapter has introduced some fundamental interpretations that could be made from financial statement information. David has provided financial statements for three years to Marie and Dorothy. The following section discusses how Marie and Dorothy, as potential investors, could make use of the information in the statements.

Examine the following ratios and discuss how they are relevant to Marie and Dorothy. The first ratio has been done for you as an example of the depth and scope intended for the current discussion.

1. *Rate of return on assets*: ROA is operating income divided by average assets. Since this is an operating performance ratio, income before interest and tax (EBIT) is used (since interest is of a financial nature and tax is not an item that the entity has discretion over).

Depending on the actual financial figures, ROA could be 8 per cent, 12 per cent, 7.2 per cent etc. What does it mean? Not much by itself, as ratios can only be used meaningfully when compared to something. It may be compared with the expected rate of return of similar retail CD and DVD stores in general, and then an inference might be made as to how well Davis's store has performed relative to the performance of other similar types of business. Since statements for three years are available, the trend of returns could be analysed. An appropriate question to ask is whether the rate of return has been stable, or has it been increasing or decreasing over time? A follow-up question is, what is the cause underlying the trend? Is it due to an increase or decrease in sales, in new service contracts, in expenses or average assets? Another important area to consider is the risk of the venture, when analysing the rate of return. Would Marie and Dorothy be happy with the rate of return for such a venture, taking into consideration the relevant risk?

2 *Rate of return on equity*: The numerator for this ratio is net profit and not EBIT. Why? How does ROE compare with ROA? What does ROE mean to Marie and Dorothy as potential investors?

3 *Current ratio*: What does this ratio tell us? Why would Marie and Dorothy be interested in this ratio? How would they find out more about what it means for them?

There are two other ratios (not covered in this chapter) that are of interest to Marie and Dorothy. They are the *inventory turnover* and *accounts receivable turnover* ratios. What could these ratios tell them and why would they be interested?

Both inventory turnover and accounts receivable turnover are discussed in Chapter 10.

Turn to Appendix 4, page 558 to compare your answers with our views.

Recap

Financial statement users express financial statement data in ratio format to facilitate making informed judgments and decisions. Users are especially interested in the trend of a company's ratios over time and the comparison of the company's ratio trends with those of its industry as a whole.

The rate of return on assets is a universally accepted measure of profitability. Rate of return is calculated by dividing the amount of return, or profit, by the amount invested. Rate of return is expressed as an annual percentage rate.

Return on assets (ROA) is one of the most important measures of profitability, because it relates the income earned during a period to the assets that were invested to generate those earnings. The DuPont model for calculating ROA expands the basic model by introducing sales to calculate margin (operating income/sales) and asset turnover (sales/average assets); ROA equals margin *times* turnover. *Margin* describes the operating profit from each dollar of sales, and *turnover* expresses the sales-generating capacity (utilisation efficiency) of the firm's assets.

Return on equity (ROE) relates net profit earned for the year to the average owners' equity for the year. This rate of return measure is important to current and prospective owners because it relates earnings to the owners' investment.

Creditors are interested in an entity's liquidity, that is, its ability to pay its liabilities when due. The amount of working capital, the current ratio and the quick ratio are measures of liquidity. These calculations are made using the amounts of current assets and current liabilities reported on the balance sheet.

When ratio trend data are plotted graphically, it is easy to determine the significance of ratio changes and to evaluate a firm's performance. However, it is necessary to pay attention to how graphs are constructed, because the scales used can influence the visual image presented.

Key Terms

Online Learning Centre with MAXMARK and POWERWEB

Students can visit this comprehensive site for resources directly related to the text.

MaxMARK Maximise your marks!

There are 30 interactive questions on *Fundamental interpretations made from financial statement data* waiting online at **www.mhhe.com/au/marshall**. The questions are written with additional feedback for incorrect answers, and text excerpts with page references for follow-up study.

POWERWEB International articles related to this topic are available on the Online Learning Centre at **www.mhhe.com/au/marshall**.

Exercises

E3.1 Compare investment alternatives. Two acquaintances have approached you about investing in business activities in which each is involved. Julie is seeking $560 and Sam needs $620. One year from now, your original investment will be returned, along with $50 income from Julie, or with $53 income from Sam. You can make only one investment.

Required:

(a) Which investment would you prefer? Why?

(b) What other factors should be considered before making either investment?

2 LEARNING OBJECTIVE

EASY ●○○

Analytical skills of:
- identifying
- finding
- evaluating
- organising
- managing information and evidence.

E3.2 Compare investment alternatives. A friend has $1 200 that has been saved from her part-time job. She will need her money, plus any interest earned on it, in six months and has asked for your help in deciding whether to put the money in a bank savings account at 5.5 per cent interest or to lend it to Judy. Judy has promised to repay $1 240 after six months.

Required:

(a) Calculate the interest earned on the savings account for six months.

(b) Calculate the rate of return if the money is loaned to Judy.

(c) Which alternative would you recommend? Explain your answer.

2 LEARNING OBJECTIVE

EASY ●○○

Analytical skills of:
- identifying
- finding
- evaluating
- organising
- managing information and evidence.

E3.3 Compare investment alternatives. You have two investment opportunities. One will have a 10 per cent rate of return on an investment of $500; the other will have an 11 per cent rate of return on principal of $700. You would like to take advantage of the higher yielding investment, but have only $500 available.

Required:

What is the maximum rate of interest that you would pay to borrow the $200 needed to take advantage of the higher yield?

2 LEARNING OBJECTIVE

MEDIUM ●●○

Analytical skills of:
- identifying
- finding
- evaluating
- organising
- managing information and evidence.

E3.4 Compare investment alternatives. You have accumulated $800 and are looking for the best rate of return that can be earned over the next year. A bank savings account will pay 6 per cent. A one-year bank certificate of deposit will pay 8 per cent, but the minimum investment is $1 000.

Required:

(a) Calculate the amount of return you would earn if the $800 were invested for one year at 6 per cent.

(b) Calculate the net amount of return you would earn if $200 was borrowed at a cost of 15 per cent, and then $1 000 was invested for one year at 8 per cent.

(c) Calculate the net rate of return on your investment of $800 if you accept the strategy of Part (b).

(d) In addition to the amount of investment required and the rate of return offered, what other factors would you normally take into consideration before making an investment decision such as the one described in this exercise?

2 LEARNING OBJECTIVE

MEDIUM ●●○

Analytical skills of:
- identifying
- finding
- evaluating
- organising
- managing information and evidence.

LEARNING OBJECTIVE 3

MEDIUM ●●○

Analytical skills of:
- interpreting data and reports.

E3.5 ROA analysis using adapted DuPont model.

(a) Firm A has an operating margin of 12 per cent, sales of $600 000, and ROA of 18 per cent. Calculate the firm's average total assets.

(b) Firm B has operating income of $78 000, asset turnover of 1.3, and average total assets of $950 000. Calculate the firm's sales, operating margin, and ROA.

(c) Firm C has operating income of $132 000, asset turnover of 2.1, and ROA of 7.37 per cent. Calculate the firm's margin.

LEARNING OBJECTIVE 3

MEDIUM ●●○

Analytical skills of:
- interpreting data and reports.

E3.6 ROA analysis using adapted DuPont model.

(a) Firm D has operating income of $27 900, sales of $930 000, and average total assets of $465 000. Calculate the firm's operating margin, asset turnover, and ROA.

(b) Firm E has operating income of $75 000, sales of $1 250 000, and ROA of 15 per cent. Calculate the firm's asset turnover and average total assets.

(c) Firm F has ROA of 12.6 per cent, average total assets of $1 730 159, and asset turnover of 1.4. Calculate the firm's sales, operating margin, and operating income.

LEARNING OBJECTIVE 4

MEDIUM ●●○

Analytical skills of:
- identifying
- finding
- evaluating
- organising
- managing information and evidence.

E3.7 Calculate ROE. At the beginning of the year, the net assets of Carby Co were $346 800. The only transactions affecting owners' equity during the year were net profit of $42 300 and dividends of $12 000.

Required:

Calculate Carby Co's return on equity (ROE) for the year.

LEARNING OBJECTIVES 3, 4

MEDIUM ●●○

Analytical skills of:
- identifying
- finding
- evaluating
- organising
- managing information and evidence.

E3.8 Calculate margin, net profit, and ROE. For the year ended 31 December, Ebanks Ltd earned an ROA of 12 per cent. Sales for the year were $12 million, and average asset turnover was 2.4. Average owners' equity was $3 million. Ignore interest and tax.

Required:

(a) Calculate Ebanks Ltd's margin and net profit.

(b) Calculate Ebanks Ltd's return on equity.

LEARNING OBJECTIVE 6

MEDIUM ●●○

Analytical skills of:
- identifying
- finding
- evaluating
- organising
- managing information and evidence.

E3.9 Effect of transactions on working capital and current ratio. Management of Rivers Co anticipates that its year-end balance sheet will show current assets of $12 639 and current liabilities of $7 480, but is considering paying $3 850 of accounts payable before year-end, even though payment is not due until later.

Required:

(a) Calculate the firm's working capital and current ratio under each situation. Would you recommend early payment of the accounts payable? Why?

(b) Assume that Rivers Co had negotiated a short-term bank loan of $5 000 that can be drawn down either before or after the end of the year. Calculate working capital and the current ratio at year-end under each situation, assuming that early payment of accounts payable is not made. When would you recommend that the loan be taken? Why?

E3.10 **Effect of transactions on working capital and current ratio.** Evans Ltd had current liabilities at 30 November of $68 700. The firm's current ratio at that date was 1.8.

3, 4, 6 LEARNING OBJECTIVES

EASY ●○○

Analytical skills of:
- interpreting data and reports.

Required:

(a) Calculate the firm's current assets and working capital at 30 November.

(b) Assume that management paid $15 300 of accounts payable on 29 November. Calculate the current ratio and working capital at 30 November as if the 29 November payment had not been made.

(c) Explain the changes, if any, to working capital and the current ratio that would be caused by the 29 November payment.

Problems

P3.11 **Calculate profitability and liquidity measures.** Look at the annual financial statements of Primary Health Care Ltd reproduced in Appendix 1 and determine the following information:

6 LEARNING OBJECTIVE

MEDIUM ●●○

Analytical skills of:
- identifying
- finding
- evaluating
- organising
- managing information and evidence.

(a) Calculate ROA for 2003.

(b) Calculate ROE for 2003.

(c) Calculate working capital at 30 June 2003 and 2002.

(d) Calculate the current ratio at 30 June 2003 and 2002.

(e) Calculate the quick ratio at 30 June 2003 and 2002.

(f) Assume that, on 30 June 2003, the treasurer of Primary Health Care Ltd decided to pay $15 000 of accounts payable. Explain what impact, if any, this payment will have on the answers you calculated for Parts (a)–(d) above (i.e. increase, decrease, or no effect).

(g) Assume that, instead of paying $15 000 of accounts payable on 30 June 2003, Primary Health Care Ltd collected $15 000 of accounts receivable. Explain what impact, if any, this receipt will have on the answers you calculated for Parts (a)–(d) above (i.e. increase, decrease, or no effect).

P3.12 **Calculate profitability and liquidity measures.** Presented below are the comparative balance sheets of Hames Ltd at 31 December 2006 and 2005. Sales for the year ended 31 December 2006 totalled $580 000.

3, 4, 6 LEARNING OBJECTIVES

EASY ●○○

Analytical skills of:
- interpreting data and reports.

HAMES LTD
Balance Sheets at 31 December 2006 and 2005

	2006 $	2005 $
Assets		
Cash	21 000	19 000
Accounts receivable	78 000	72 000
Inventory	103 000	99 000
Total current assets	202 000	190 000
Land	50 000	40 000
Plant and equipment	125 000	110 000
Less: Accumulated depreciation	(65 000)	(60 000)
Total assets	312 000	280 000

Continued...

	2006 $	2005 $
Liabilities		
Short-term borrowings	18 000	17 000
Accounts payable	56 000	48 000
Other accrued liabilities	20 000	18 000
Total current liabilities	94 000	83 000
Long-term borrowings	22 000	30 000
Total liabilities	116 000	113 000
Owners' equity		
Contributed capital		
40 000 and 25 000 shares issued, respectively	74 000	59 000
Retained earnings		
Beginning balance	108 000	85 000
Net profit for the year	34 000	28 000
Dividends for the year	(20 000)	(5 000)
Ending balance	122 000	108 000
Total owners' equity	196 000	167 000
Total liabilities and owners' equity	312 000	280 000

Note

Net profit for the current year is after interest and tax amounting to $52 000 (last year interest and tax amounted to $45 000). Use profit as a surrogate measure for Earnings before interest and tax.

Required:

(a) Calculate ROA for 2006.

(b) Calculate ROE for 2006.

(c) Calculate working capital at 31 December 2006.

(d) Calculate the current ratio at 31 December 2006.

(e) Calculate the quick ratio at 31 December 2006.

(f) Assume that on 31 December 2006, the treasurer of Hames Ltd decided to pay $10 000 of accounts payable. Explain what impact, it any, this payment will have on the answers you calculated for Parts (a)–(d) above (i.e. increase, decrease, or no effect).

(g) Assume that instead of paying $10 000 of accounts payable on 31 December 2006, Hames Ltd collected $10 000 of accounts receivable. Explain what impact, if any, this receipt will have on the answers you calculated for Parts (a)–(d) above (i.e. increase, decrease, or no effect).

LEARNING OBJECTIVE 6

EASY ●○○

Analytical skills of:
- interpreting data and reports.

P3.13 Calculate and analyse liquidity measures. Following are the current asset and current liability sections of the balance sheets for Freedom Ltd at 31 January 2006 and 2005 (in millions).

	31 January 2006 $	31 January 2005 $
Current assets		
Cash	5	2
Accounts receivable	3	6
Inventories	6	10
Total current assets	14	18

	31 January 2006	31 January 2005
	$	$
Current liabilities		
Accounts payable	7	4
Other accrued liabilities	2	2
Total current liabilities	9	6

Required:

(a) Calculate the current ratio and working capital at each balance sheet date.

(b) Evaluate the firm's liquidity at each balance sheet date.

(c) Assume that the firm operated at a loss during the year ended 31 January 2006. How could cash have increased during the year?

P3.14 Calculate and analyse liquidity measures. Following are the current asset and current liability sections of the balance sheets for Calketch Ltd at 31 August 2006 and 2005 (in millions).

6 LEARNING OBJECTIVE

EASY ●○○

Analytical skills of:
- interpreting data and reports.

	31 August 2006	31 August 2005
	$	$
Current assets		
Cash	3	6
Marketable securities	7	10
Accounts receivable	13	8
Inventories	18	8
Total current assets	41	32
Current liabilities		
Accounts payable	13	22
Other accrued liabilities	9	7
Total current liabilities	22	29

Required:

(a) Calculate the current ratio and working capital at each balance sheet date.

(b) Describe the change in the firm's liquidity from 2005 to 2006.

P3.15 Applications of ROA using the adapted DuPont model; manufacturing versus service firm. Manyops Ltd is a manufacturing firm that has experienced strong competition in its traditional business. Management is considering joining the trend to the 'service economy' by eliminating its manufacturing operations and concentrating on providing specialised maintenance services to other manufacturers. Management of Manyops Ltd has had a target ROA of 15 per cent on an asset base that has averaged $6 million. To achieve this ROA, average asset turnover of 2 was required. If the company shifts its operations from manufacturing to providing maintenance services, it is estimated that average assets will decrease to $1 million.

3 LEARNING OBJECTIVE

MEDIUM ●●○

Analytical skills of:
- interpreting data and reports.

Required:

(a) Calculate operating income, operating margin and sales required for Manyops Ltd to achieve its target ROA as a manufacturing firm.

(b) Assume that the average operating margin of maintenance service firms is 2.5 per cent, and that the average ROA for such firms is 15 per cent. Calculate the operating income, sales and asset turnover that Manyops Ltd will have if the change to services is made and the firm is able to earn an average operating margin and achieve a 15 per cent ROA.

LEARNING OBJECTIVE 3

MEDIUM/HARD ●●○

Analytical skills of:
- interpreting data and reports
- solving problems
- application of multi-disciplinary perspectives.

P3.16 ROA analysis using the adapted DuPont model. Charlie's Furniture Store has been in business for several years. The firm's owners have described the store as a 'high-price, high-service' operation that provides lots of assistance to its customers. Operating margin has averaged a relatively high 32 per cent per year for several years, but turnover has been a relatively low 0.4, based on average total assets of $800 000. A discount furniture store is about to open in the area served by Charlie's, and management is considering lowering prices in order to compete effectively.

Required:

(a) Calculate current sales and ROA for Charlie's Furniture Store.

(b) Assuming that the new strategy would reduce operating margin to 20 per cent and, assuming that average total assets would stay the same, calculate the sales that would be required to have the same ROA as they currently earned.

(c) Suppose that you presented the results of your analysis in Parts (a) and (b) of this problem to Charlie, and he replied, 'What are you telling me? If I reduce my prices as planned, then I have to practically double my sales volume to earn the same return?' Given the results of your analysis, how would you react to Charlie?

(d) Now suppose that Charlie says, 'You know, I'm not convinced that lowering prices is my only option in staying competitive. What if I were to increase my marketing effort? I'm thinking about kicking off a new advertising campaign after conducting more extensive market research to better identify who my target customer groups are.' In general, explain to Charlie what the likely impact of a successful strategy of this nature would be on operating margin, turnover and ROA.

(e) Think of an alternative strategy that might help Charlie maintain the competitiveness of his business. Explain the strategy and then describe the likely impact of this strategy on operating margin, turnover and ROA.

LEARNING OBJECTIVES 3,4,6,7

MEDIUM/HARD ●●○

Analytical skills of:
- interpreting data and reports.

P3.17 Analysis of liquidity and profitability measures of Coca-Cola Amatil Ltd. The following summarised data (amounts in millions) are taken from 31 December 2001 and 2002 comparative financial statements of Coca-Cola Amatil, the Australian group of companies that has the major share of the bicarbonated soft drink market in this region of the world.

(Amounts expressed in millions)	2002 $	2001 $
For the year ended 31 December:		
Net sales	3 779.1	5 904.4
Manufacturing and other costs of sales	2 022.1	2 181.3
Operating income	425.1	666.6
Net profit	209.4	449.1
At 31 December:		
Assets		
Cash and cash equivalents	205.4	276
Accounts receivable, net	501.5	446.3
Inventories	500.4	432.6
Deferred tax asset	40.7	28.5
Other current assets	147.9	272.7
Property, plant, and equipment, net	1 228.8	1 540.8
Other non-current assets	3 326.2	3 356.5
Total assets	5 950.9	6 353.4

(Amounts expressed in millions)	2002 $	2001 $
Liabilities and owners' equity		
Current portion of long-term borrowings	459.7	1 072.4
Accounts payable	349.2	254.9
Accrued liabilities	416.9	379.5
Long-term borrowings	1 335.4	1 442.9
Other non-current liabilities	174.5	171.7
Contributed equity	1 601.6	1 561.1
Retained earnings	1 646.1	1 541.6
Reserves	(47.8)	(93.6)
Outside equity interest	15.3	22.9
Total liabilities and shareholders' equity	5 950.9	6 353.4

At 31 December 2000, total assets were $8 788.6 million and total shareholders' equity was $4 481.5 million.

(a) Calculate Coca-Cola Amatil's working capital, current ratio and quick ratio at 31 December 2002 and 2001.

(b) Calculate Coca-Cola Amatil's ROE for the years ended 31 December 2002 and 2001.

(c) Calculate Coca-Cola Amatil's ROA, showing margin and turnover, for the years ended 31 December 2002 and 2001.

(d) Evaluate the company's overall liquidity and profitability. Comment specifically on the difficulties you have encountered in evaluating ROA and ROE for 2002.

Optional continuation of Problem 3.17—trend analysis

The following historical data are provided in the Five-Year Financial Summary section of Coca-Cola Amatil's 2002 Annual Report. (It should be noted that past data are not necessarily indicative of the results of future operations.) See **www.ccamatil.com.a**u, then go to Investor Information and find 5-year summary.

	1995	1996	1997	1998	1999
Net profit (loss) as a percentage of sales	7.6%	4.1%	4.0%	(3.3)%	2.6%
Return on average invested capital	16.7%	8.4%	8.4%	(6.2)%	5.5%
Return on average shareholders' equity	20.2%	10.0%	9.4%	(7.6)%	5.9%
Capital expenditures as a percentage of sales	15.6%	10.6%	9.6%	11.0%	8.7%
Research and development expenditures as a percentage of sales	8.1%	8.6%	9.2%	9.8%	11.1%
Year-end employment (in thousands)	142	139	150	133	121

Note: In answering Parts (e)–(h) below, calculations are not required.

(e) Compare the 'Return on average invested capital' for 1998 and 1999 (as reported by CCA) to the results that you calculated for ROA in Part (c) above. What do you suppose accounts for the significant difference in these results?

(f) Now compare your ROE results (from Part (b) above) to those reported by CCA in their five-year financial summary. What might account for the slight differences you've observed?

(g) What other data (trend or otherwise) would you like to have access to prior to making an investment in CCA?

LEARNING OBJECTIVES 3,4,6,7

MEDIUM/HARD ●●○

Analytical skills of:
- interpreting data and reports.

P3.18 Analysis of liquidity and profitability measures of One.Tel Ltd. The following summarised data (amounts in thousands) are taken from the audited financial report at 30 June 2000. The company went into receivership shortly thereafter.

(Amounts expressed in millions)	2002 $	2001 $
For the Year Ended 30 June:		
Sales	653.4	326.9
EBITDA	(263.9)	23.8
Depreciation and amortisation expense	(35.3)	(12.3)
Net Interest revenue (expense)	3.3	(1.6)
Net (loss) profit before tax	(295.9)	9.9
Income tax benefit (expense)	4.8	(2.9)
Net (loss) profit	(291.1)	7
At 30 June:		
Assets		
Cash	335.7	172.6
Accounts receivable, net	218.4	72
Inventory	5.1	2.5
Other current assets	68.9	49.1
Property, plant and equipment, net	155.7	41.0
Intangibles, net	559.8	28
Other non-current assets	91.9	160.8
Total assets	1 435.5	526
Liabilities and Owners' Equity		
Current portion of long-term obligations	92.2	7.2
Accounts payable	277.2	73
Provisions	5.8	4.7
Non-current borrowings	107.3	66.6
Non-current provisions	8.2	15.2
Contributed equity	1 225.7	355.6
Retained earnings (accumulated deficit)	(282.1)	9.1
Reserves	1.2	(5.4)
Total liabilities and shareholders' equity	1 435.5	526

(a) Calculate One.Tel's working capital, current ratio and quick ratio at 30 June 2000 and 1999.
(b) Calculate One.Tel's ROE for the years ended 30 June 2000 and 1999, using year-end balances.
(c) Calculate One.Tel's ROA, showing margin and operating asset turnover, for the years ended 30 June 2000 and 1999. Use year-end figures not average figures.
(d) Evaluate the company's overall liquidity and profitability.
(e) One.Tel did declare and pay dividends during financial 2000 ($100 000) and financial 1999 ($300 000). What do you suppose is the primary reason for this?

Optional continuation of Problem 3.18—trend analysis

wWw

The following historical data were derived from One.Tel's consolidated financial statements. These are available (search One.Tel) on **www.cpaaustralia.com.au**. (It should be noted that past data are not necessarily indicative of the results of future operations.)

	2000	1999	1998	1997
$ thousands	**$**	**$**	**$**	**$**
Net sales	653.4	326.0	207.3	148.3
EBIT (Operating income)	(299.2)	11.5	8.8	5.6
Net profit	(291.1)	7.0	5.9	3.7
Total assets	1 435.5	526	782	50.7
Net current assets	252.9	211.3	14.7	2.4
Non-current liabilities	115.5	81.8	6.6	12.4
Owners' equity	944.8	363.0	2.8	(0.9)

(f) Are the trends expressed in the above data generally consistent with each other?

(g) In your opinion, which of the above trends would be most meaningful to a potential investor in ordinary shares of One.Tel Ltd? Which trend would be least meaningful?

(h) What other data (trend or otherwise) would you like to have access to, prior to making an investment in One.Tel Ltd?

P3.19 Comparative financial ratio analysis—Coles Myer vs. Woolworths. The following summarised data are taken from the comparative financial statements in the 2003 annual reports (and previous annual reports) of Coles Myer Ltd and Woolworths Ltd. (It should be noted that past data are not necessarily indicative of the results of future operations.)

3,4,6,7 LEARNING OBJECTIVES

MEDIUM/HARD●●○

Analytical skills of:
- interpreting data and reports.

COLES MYER LTD AND ITS SUBSIDIARY COMPANIES
Consolidated Income Statements
for the years ended 27 July 2003, 28 July 2002, 29 July 2001

	2003 52 weeks	2002 52 weeks	2001 52 weeks
(Amounts expressed in A$ millions)	**$**	**$**	**$**
Net sales	27 016.6	25 688.7	23 779.6
Cost of sales	(19 618.6)	(19 419.9)	(17 771.3)
Gross profit	7 398.0	6 268.8	6 008.3
Cumulative effect of change in accounting policy for supplier rebates	(76.5)		
Other revenues	268.7	1 048.7	1 038.1
Borrowing costs	(86.9)	(102.9)	(124.7)
Selling and occupancy expenses	(5 702.9)	(5 546.5)	(5 475.6)
Administrative expenses	(1 183.2)	(1 177.1)	(1 237.9)
Income from ordinary activities before income tax expense	617.2	491.0	208.2
Income tax expense	(187.7)	(137.2)	(68.0)
Net profit from ordinary activities after income tax expense	429.5	353.8	140.2

Continued...

(In A$ millions)	2003 $	2002 $	2001 $
ASSETS			
Current Assets:			
Cash and cash equivalents	905.5	866.0	578.1
Accounts and notes receivable, net	346.0	288.7	397.5
Inventories	2 836.8	2 808.9	2 904.2
Prepaid expenses and other current assets	28.1	53.2	66.3
Total current assets	4 116.4	4 016.8	3 946.1
Non-current Assets:			
Property, plant, and equipment, net	3 340.6	3 499.5	3 464.2
Intangible assets, net	494.0	238.2	308.8
Other non-current assets	303.9	285.4	339.2
	4 138.5	4 023.1	4 112.2
Total assets	8 254.9	8 039.9	8 058.3
LIABILITIES AND SHAREHOLDERS' EQUITY			
Current Liabilities:			
Short-term borrowings	10.8	15.3	127.8
Accounts payable	2 476.3	2 270.7	2 164.0
Provisions	554.4	640.6	626.7
Total current liabilities	3 041.5	2 926.6	2 918.5
Non-current Liabilities:			
Long-term borrowing	1 143.3	1 303.3	1 651.6
Other non-current liabilities	293.7	502.4	241.9
	1 437.0	1805.7	1893.5
Total liabilities	4 478.5	4 732.3	4 812.0
Shareholders' Equity:			
Contributed equity	2 210.3	2 032.3	1 973.7
Retained earnings	1 097.3	872.9	866.0
Reserves	468.8	402.4	406.6
	3 776.4	3 307.6	3 246.3
Total liabilities and shareholders' equity	8 254.9	8 039.9	8 058.3

WOOLWORTHS LTD AND SUBSIDIARIES
Consolidated Income Statements
Years ended 29 June 2003, 30 June 2002, 24 June 2001

(In millions A$)	2003 52 weeks $	2002 53 weeks $	2001 52 weeks $
Net operating revenues	26 813.0	24 984.8	21 388.7
Cost of goods sold	(20 196.2)	(18 807.8)	(16 034.6)
Gross profit	6 616.8	6 177.0	5 354.1
Other revenue	139.7	245.0	260.2
Selling, administrative and general expenses	(5 812.4)	(5 589.0)	(4 906.2)
Equity income (loss)	1.6	(0.3)	(1.5)
Operating profit	945.7	832.7	706.6

	2003 52 weeks	2002 53 weeks	2001 52 weeks
(In millions A$)	**$**	**$**	**$**
Interest income	13.3	9.6	10.7
Interest expense	(53.0)	(60.1)	(23.8)
Net profit from ordinary activities before income tax expense	906.0	782.2	693.5
Income tax expense	(255.0)	(218.5)	(217.4)
Net profit from ordinary activities after income tax expense	651.0	563.7	476.1
Net profit attributable to outside equity interests	(0.4)	(0.7)	(0.4)
Net profit attributable to members of Woolworths Ltd	650.6	563.0	475.7

WOOLWORTHS LTD AND SUBSIDIARIES
Consolidated Balance Sheets
at 29 June 2003, 30 June 2002, 24 June 2001

	2003	2002	2001
(In millions A$)	**$**	**$**	**$**
ASSETS			
Current:			
Cash	287.3	295.0	256.0
Accounts receivable, net	242.4	258.6	194.9
Inventories	1 843.1	1 838.4	1 731.8
Property, plant and equipment	133.7	98.3	126.8
Prepaid expenses and other assets	114.1	97.7	79.0
Total current assets	2 620.6	2 588.0	2 388.5
Non-current Assets:			
Investments and other financial assets	189.4	141.5	62.9
Property, plant, and equipment, net	2 348.5	2 267.3	2 130.7
Goodwill and other intangible assets	555.3	545.0	313.4
Deferred tax assets	165.4	105.5	76.0
Total assets	5 879.2	5 647.3	4 971.5
LIABILITIES AND SHAREHOLDERS' EQUITY			
Current:			
Accounts payable	2 078.9	2 000.6	1 666.4
Loans	150.5	34.1	341.7
Provisions	328.2	509.6	427.3
Accruals payable	686.0	553.5	524.0
Total current liabilities	3 243.6	3 097.8	2 959.4
Non-current Liabilities:			
Loans	496.4	498.2	301.9
Provisions	316.0	228.8	184.6
Total liabilities	4 056.0	3 824.8	3 445.9

Continued...

(In millions except share data)	2003 $	2002 $	2001 $
Shareholders' Equity:			
Contributed equity	606.5	593.8	476.2
Reserves	183.7	184.1	182.8
Retained earnings	445.2	457.2	279.9
	1 235.4	1 235.1	938.9
Woolworths income notes	583.0	583.0	583.0
Outside equity interest	4.8	4.4	3.7
Total shareholders' equity	1 823.2	1 822.5	1 525.6
Total liabilities and shareholders' equity	5 879.2	5 647.3	4 971.5

The following information on or near the year ended 2000, was reported (in millions):

	Total Assets millions $	Total Shareholders' Equity $
Coles Myer Ltd and subsidiaries (30 July 2000)	8 136.4	2 778.3
Woolworths Ltd and subsidiaries (25 June 2000)	4 816.8	1 630.9

Required:

(a) Calculate the working capital, current ratio and quick ratio at the 2001, 2002 and 2003 year-ends, for Coles Myer Group and Woolworths Group respectively.

(b) Calculate ROE for the financial years 2001–2003 for both groups.

(c) Calculate ROA, showing margin and turnover, for the financial years 2001–2003 for both groups.

(d) Evaluate the overall profitability and liquidity of Coles Myer versus Woolworths. On this basis, in which company's ordinary shares would you prefer to invest?

(e) What other information would you want to consider before making an investment decision?