

PEARSON



CHAPTER 2

Financial Statements and Analysis

SOLUTIONS MANUAL

Overview

This chapter examines the key components to the shareholders' report: the income statement, balance sheet and the statement of cash flows. On the income statement and balance sheet, the major accounts/balances are reviewed for the student. The rules for consolidating a company's foreign and domestic financial statements are described. Following the financial statement coverage the chapter covers the evaluation of financial statements using the technique of ratio analysis. Ratio analysis is used by prospective shareholders, creditors and the firm's own management to measure the firm's operating and financial health. Three types of comparative analysis are defined: cross-sectional analysis, time-series analysis and combined analysis. The ratios are divided into five basic categories: liquidity, activity, debt, profitability and market. Each ratio is defined and calculated using the financial statements of the Bartlett Company. A brief explanation of the implications of deviation from industry standard ratios is offered, with a complete (cross-sectional and time-series) ratio analysis of Bartlett Company ending the chapter. The DuPont system of analysis is also integrated into the example.



SUGGESTED ANSWERS TO CRITICAL THINKING QUESTIONS

Focus on Ethics – Back to school on ethics

- Study white-collar crime stories and the ethical matters arising.
- Discuss with business executives how they deal with ethical problems.
- Students self-assess their ethical views on common problems.
- Discuss with international students ethical variations in their home countries.
- Examine how other disciplines (e.g. Marketing) deal with ethical issues.

Focus on Practice – Fair value accounting – fair?

Changes will occur as lobby groups, investor representatives and the fund's industry experience inconsistencies and unreliable profit reporting. Also check the *Australian Financial Review* for stories featuring demands for changes in fair value accounting.

Focus on Practice – Another profit figure, EBITDA

Do you believe there are judgmental outcomes in the cost of goods sold figure reported above?

Although the use of EBITDA removes many judgmental issues, there are many that remain in the calculation of this figure. For example, cost of goods sold and operating expenses are still used in the calculation of EBITDA, and accounting standards still require the use of judgment in calculating these expenses.

For example, cost of goods sold is calculated as opening inventory, plus purchases during the period, minus closing inventory. Hence, the inventory needs to be valued twice – at the beginning and end of the period – and judgment is often required in such a valuation. For example, judgments are made regarding the value of raw materials, the value of work in progress, the value of finished goods that have not yet been sold, and what, if any, raw materials and goods must be written off as obsolete or unable to be sold.



Focus on Practice – For bankers, cash flow upstages earnings

Do you agree that cash-flow-based measures supply better insights into a firm's performance?

There are a number of advantages and disadvantages to both cash-flow-based and earnings-based performance measures. Accounting profit is based on techniques designed to match income and expenses in different periods, to reflect as accurately as possible the profitability of a firm in each period. A profitable firm may experience short-term cash flow difficulties that are not necessarily a problem in the long term.

Sometimes cash-flow-based performance measures are preferred because of the judgment that is often exercised in calculating profit, and the possibility of 'window dressing' or outright fraud to improve the appearance of financial statements. These phenomena are less likely to occur when cash-flow-based measures are used.

At the end of the day, no matter how profitable a firm is in terms of accounting profit, if it has insufficient cash to meet its obligations it may be considered insolvent and may be liquidated by its creditors. This is why cash-flow-based measures are often favoured by banks, because the ability of a firm to service its debts is the primary concern of lenders.



ANSWERS TO REVIEW QUESTIONS

2-1 The purpose of each of the three major financial statements are:

Income statement – the purpose of the income statement is to provide a financial summary of the firm’s operating results during a specified time period. It includes both the sales for the firm and the costs incurred in generating those sales. Other expenses, such as taxes, are also included on this statement.

Balance sheet – the purpose of the balance sheet is to present a summary of the assets owned by the firm, the liabilities owed by the firm and the net financial position of the owners as of a given point in time. The assets are often referred to as investments and the liabilities and owners’ equity as financing.

Statement of cash flows – this statement provides a summary of the cash inflows and the cash outflows experienced by the firm during the period of concern. The inflows and outflows are grouped into the cash flow areas of operations, investing and financing.

Until June 2005, financial reports were prepared in accordance with Australian Generally Accepted Accounting Principles (AGAAP). Since then, the full financial reports and concise annual reports of Australian companies have been prepared in accordance with Australian equivalents to International Financial Reporting Standards (AIFRS), which differ in certain respects from AGAAP. Some of the main impacts of this change involve the calculation of book values on the balance sheet, the amortisation of goodwill expense and the calculation of some financial ratios.

2-2 The notes to the financial statements are important because they provide detailed information not directly available in the financial statements. The footnotes provide information on accounting policies, procedures, calculation and transactions underlying entries in the financial statements.

2-3 *Asset impairment accounting* leads to asset write-downs, reduced equity (where liabilities are unchanged), reduction of profits and possibly dividend reduction. Impairment write-downs are non-cash items and do not impact on cash flow performance in the period of the write-downs.

2-4 Current and prospective shareholders place primary emphasis on the firm’s current and future level of risk and return as measures of profitability, while creditors are more concerned with short-term liquidity measures of debt. Shareholders are,



therefore, most interested in income statement measures, and creditors are most concerned with balance sheet measures. Management is concerned with all ratio measures, since they recognise that shareholders and creditors must see good ratios in order to keep the share price up and retain the ability to raise new funds.

- 2-5** *Cross-sectional* comparisons are made by comparing similar ratios for firms within the same industry, or to an industry average, as of some point in time. *Time-series* comparisons are made by comparing similar ratios for a firm measured at various points in time. *Benchmarking* is the term used to describe this cross-sectional comparison with competitor firms.

- 2-6** The analyst should devote primary attention to any significant deviations from the norm, whether above or below. Positive deviations from the norm are not necessarily favourable. An above-normal inventory turnover ratio may indicate highly efficient inventory management but may also reveal excessively low inventory levels resulting in stock outs. Further examination into the deviation would be required.

- 2-7** Comparing financial statements from different points in the year can result in inaccurate and misleading analysis due to the effects of seasonality. Levels of current assets can fluctuate significantly, depending on a company's business, so statements from the same month or year end should be used in the analysis to ensure valid comparisons of performance.

- 2-8** The current ratio proves to be the better liquidity measure when all of the firm's current assets are reasonably liquid. The quick ratios would prove to be the superior measure if the inventory of the firm is considered to lack the ability to be easily converted into cash.

- 2-9** Additional information is necessary to assess how well a firm collects receivables and meets payables. The average collection period of receivables should be compared to a firm's own credit terms. The average payment period should be compared to the creditors' credit terms.

- 2-10** *Financial leverage* is the term used to describe the magnification of risk and return introduced through the use of fixed-cost financing, such as debt.

- 2-11** The debt ratio and the debt-equity ratio may be used to measure the firm's degree of indebtedness. The times-interest-earned and the fixed-payment coverage ratios can be used to assess the firm's ability to meet fixed payments associated with debt.



- 2-12** Three ratios of profitability found on a common-size income statement are: (1) the gross profit margin, (2) the operating profit margin and (3) the net profit margin.
- 2-13** Firms that have high gross profit margins and low net profit margins have high levels of expenses other than cost of goods sold. In this case, the high expenses more than compensate for the low cost of goods sold (i.e. high gross profit margin) thereby resulting in a low net profit margin.
- 2-14** Members of the investing public are probably most interested in the *return on equity (ROE)* since it indicates the rate of return they earn on their investment in the firm. ROE is calculated by taking net profits after taxes and dividing by shareholders' equity.
- 2-15** The *price/earnings ratio (P/E)* is the market price per share divided by the earnings per share. It indicates the amount the investor is willing to pay for each dollar of earnings. It is used to assess the owner's appraisal of the value of the firm's earnings. The level of the P/E ratio indicates the degree of confidence that investors have in the firm's future. The *market/book (M/B)* ratio is the market price divided by the firm's book value per share. Firms with high M/B ratios are expected to perform better than firms with lower relative M/B values.
- 2-16** *Liquidity ratios* measure how well the firm can meet its current (short-term) obligations when they are due.

Activity ratios are used to measure the speed with which various accounts are converted (or could be converted) into cash or sales.

Debt ratios measure how much of the firm is financed with other people's money and the firm's ability to meet fixed charges.

Profitability ratios measure a firm's return with respect to sales, assets or equity (overall performance).

Market ratios give insight into how well investors in the marketplace feel the firm is doing in terms of return and risk.

The liquidity and debt ratios are most important to present and prospective creditors.



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- 2-17** The analyst may approach a complete ratio analysis on either a cross-sectional or time-series basis by summarising the ratios into their five key areas: liquidity, activity, debt, profitability and market. Each of the key areas could then be summarised, highlighting specific ratios that should be investigated.
- 2-18** The *DuPont system of analysis* combines profitability (the net profit margin), asset efficiency (the total asset turnover) and leverage (the debt ratio). The division of ROE among these three ratios allows the analyst to segregate the specific factors that are contributing to the ROE into profitability, asset efficiency or the use of debt.



SOLUTIONS TO PROBLEMS

2-1 LG 1: Preparing income statement

Name of Company	
Income statement (\$000)	
for the year ended XXX	
Sales revenue	\$345.0
Less: Cost of goods sold	<u>255.0</u>
Gross profits	\$90.0
Less: Operating expenses	
Selling expense	\$18.0
General and administrative expenses	22.0
Lease expense	4.0
Depreciation expense	<u>25.0</u>
Total operating expense	<u>\$69.0</u>
Operating profits (EBIT)	\$21.0
Less: Interest expense	<u>3.0</u>
Net profit before taxes	\$18.0
b. Less: Taxes (rate = 35%)	<u>6.3</u>
Net profits after taxes	\$11.7
Less preference stock dividend	<u>0.0</u>
Earnings available for shareholders	<u>\$11.7</u>
c. Earnings per share (EPS) ¹	\$2.75
Dividend per share(DPS)	<u>\$1.10</u>

¹ Assumes 4.25 thousand shares issued

2-2 LG 1: Explaining statements

The statement may disclose a profit or loss outcome from a firm's operations.

Balance signifies equality, $A = L + E$. The accounting system generates financial data so that both sides will balance. In computerised systems they balance automatically.

2-3 LG 1: Calculating retained earnings

<p>Cooper Industries Retained earnings (\$000) for the year ended 31 December 2010</p>



Retained earnings balance (1 January 2010)		\$25,320
Plus: Net profits after taxes (for 2010)		5,150
Less: Cash dividends (paid during 2010)		
Preference	750	
Ordinary	<u>3,850</u>	
Total dividends paid		<u>4,600</u>
Retained earnings balance (31 December 2010)		\$25,870

2-4 LG 1: Reviewing basic financial statements

Income statement: In this one-year summary of the firm's operations, Technica showed a net profit for 2010 and the ability to pay cash dividends to its shareholders.

Balance sheet: The financial condition of Technica Limited as at 31 December 2010 and 2009 is shown as a summary of assets and liabilities. Technica has an excess of current assets over current liabilities, demonstrating liquidity. The firm's non-current assets represent over half of total assets (\$270,000 of \$408,300). The firm is financed by short-term debt, long-term debt, shares and retained earnings.

Statement of retained earnings: Technica earned a net profit of \$42,900 in 2010 and paid out \$20,000 in cash dividends. The reconciliation of the retained earnings account from \$50,200 to \$63,300 shows the net amount retained by the firm.

2-5 LG 1: Financial statement account identification

<u>Account Name</u>	<u>(1) Statement</u>	<u>(2) Type of Account</u>
Accounts payable	BS	CL
Accounts receivable	BS	CA
Accruals	BS	CL
Accumulated depreciation	BS	NA*
Administrative expense	IS	E
Buildings	BS	NA
Cash	BS	CA
Cost of goods sold	IS	E
Depreciation	IS	E
Equipment	BS	NA
General expense	IS	E
Interest expense	IS	E
Inventories	BS	CA



Land	BS	NA
Non-current debts	BS	ND
Machinery	BS	NA
Marketable securities	BS	CA
Notes payable	BS	CL
Operating expense	IS	E
Ordinary shares	BS	SE
Preference shares	BS	SE
Preference share dividends	IS	E
Retained earnings	BS	SE
Sales revenue	IS	R
Selling expense	IS	E
Taxes	IS	E
Vehicles	BS	NA

* This is a charge against a non-current asset, better known as a contra-asset.

2-6 LG 1: Income statement preparation

a.

Cathy Chen, CPA
Income statement
for the year ended 31 December 2010

Sales revenue		\$160,000
Less: Operating expenses		
Salaries	80,000	
Employment taxes and benefits	15,800	
Supplies	4,800	
Travel & entertainment	7,500	
Lease payments	15,000	
Depreciation expense	<u>7,200</u>	
Total operating expense		<u>130,300</u>
Operating profits		\$ 29,700
Less: Interest expense		<u>7,500</u>
Net profits before taxes		\$ 22,200
Less: Taxes (30%)		<u>6,660</u>
Net profits after taxes		<u>\$ 15,540</u>

b. One of the most popular measures of cash flow from operations is EBITDA (earnings before interest, tax, depreciation and amortisation). In this case, it can be



found by taking operating profit and adding back the depreciation expense. Hence, $29,700 + 7,200 = \$36,900$.

- c. In her first year of business, Cathy Chen covered all her operating expenses and earned a net profit of \$15,540 on revenues of \$160,000. This represents a net profit margin of 9.7%.

2-7 LG 1: Income statement preparation

a.	Income	Salaries	\$75,000	
		Interest	500	
		Dividends	<u>150</u>	75,650
	Expenses	Mortgage	14,000	
		Utilities	3,200	
		Groceries	2,200	
		Car	3,300	
		Home insurance	700	
		Car insurance	600	
		Medical	1,500	
		Rates	1,659	
		Income tax	13,000	
		Clothes	2,000	
		Petrol	2,100	
		Entertainment	<u>2,000</u>	46,309
		Cash Surplus		<u>29,341</u>

- b. They had a cash surplus.

2-8 LG 1: Calculation of earnings per share and retained earnings

a.	Earnings per share:	
	Net profit before taxes	\$218,000
	Less: Taxes at 40%	<u>87,200</u>
	Net profit after tax	\$130,800
	Less: Preference share dividends	<u>32,000</u>
	Earnings available	<u>\$ 98,800</u>

Earnings per share:



$$\frac{\text{Earnings available}}{\text{Total shares}} = \frac{\$98,800}{85,000} = \$1.16$$

b. Amount to retained earnings:

85,000 shares × \$0.80 = \$68,000 ordinary dividends

Earnings available	\$98,800
Less: Ordinary dividends	<u>68,000</u>
To retained earnings	<u>\$30,800</u>

2-9 LG 1: Balance sheet preparation

Owen Davis Company
Balance Sheet
31 December 2010

Assets

Current assets:

Cash	\$ 215,000
Marketable securities	75,000
Accounts receivable	450,000
Inventories	<u>375,000</u>

Total current assets \$1,115,000

Non-current assets

Land and buildings	\$ 325,000
Machinery and equipment	560,000
Furniture and fixtures	170,000
Vehicles	<u>25,000</u>

Total non-current assets \$1,080,000

Less: Accumulated depreciation 265,000

Net non-current assets \$ 815,000

Total assets \$1,930,000

Liabilities and shareholders' equity

Current liabilities:

Accounts payable	\$ 220,000
Notes payable	475,000
Accruals	<u>55,000</u>

Total current liabilities \$ 750,000

Non-current debts 420,000



Total liabilities	\$1,170,000
Shareholders' equity	
Preference shares	\$ 100,000
Ordinary shares	450,000
Retained earnings	<u>210,000</u>
Total shareholders' equity	<u>\$ 760,000</u>
Total liabilities and shareholders' equity	<u>\$1,930,000</u>

2-10 LG 1: Impact of net income on a firm's balance sheet

	Account	Beginning Value	Change	Ending Value
a.	Marketable securities	\$ 35,000	+ \$1,365,000	\$1,400,000
	Retained earnings	\$1,575,000	+ \$1,365,000	\$2,940,000
b.	Non-current debt	\$2,700,000	- \$ 865,000	\$1,835,000
	Retained earnings	\$1,575,000	+ \$ 865,000	\$2,440,000
c.	Buildings	\$1,600,000	+ \$ 865,000	\$2,465,000
	Retained earnings	\$1,575,000	+ \$ 865,000	\$2,440,000
d.	No net change in any accounts			

2-11 LG 1: Balance sheet preparation

Adams
Balance sheet
31 December 2010

a.	Assets		Liabilities and Net Worth	
		\$		\$
	Liquid assets	5,700	Current liabilities	2,400
	Investments	4,000	Long term liabilities	<u>111,000</u>
	Real estate	150,000	Total liabilities	113,400
	Personal Property	<u>30,700</u>	Net worth	<u>76,500</u>
	Total assets	<u>189,000</u>	Total liabilities and net worth	<u>189,000</u>

b. Must be equal to its debt plus the net worth.

2-12 LG 1: Financial statement preparation



a. Rogers Industries
Income statement
for the year ended 31 December 2010

Sales	\$1,200,000
Less: Cost of goods sold	<u>720,000</u>
Gross profit	\$ 480,000
Less: Operating expenses	<u>180,000</u>
Operating profits	\$ 300,000
Less: Interest expense	<u>35,000</u>
Net profits before taxes	\$ 265,000
Less: Taxes at 40%	<u>106,000</u>
Net profits after taxes	\$ 159,000
Less: Preference dividends	<u>4,000</u>
Earnings available to ordinary shareholders	<u>\$ 155,000</u>
Earnings per share (EPS)	\$1.9375

b. Rogers Industries
Balance sheet
31 December 2010

Assets	
Current assets:	
Cash	\$ 40,000
Marketable securities	10,000
Accounts receivable	96,000
Inventories	<u>120,000</u>
Total current assets	<u>\$ 266,000</u>
Total non-current assets	\$ 920,000
Less: Accumulated depreciation	<u>260,000</u>
Net non-current assets	<u>\$ 660,000</u>
Total assets	<u>\$ 926,000</u>
Liabilities and shareholders' equity:	
Current liabilities:	
Accounts payable	\$ 60,000
Notes payable	80,000
Accruals	<u>10,000</u>
Total current liabilities	<u>\$150,000</u>
Non-current debt	<u>270,000</u>

2-13 LG 1: Calculating retained earnings

- Hayes Enterprises
Statement of retained earnings
for the year ended 31 December 2010

b. Earnings per share:

c. Cash dividend per share:

$$\frac{\text{Total cash dividends}}{\text{Number of shares}} = \frac{\$210,000}{140,000} = \$1.50$$



2-14 LG 3: Ratio comparisons

The trend shown by these ratios is a growth in illiquidity (reduced quick ratio) and over-investment in current assets (increasing current ratio). Reduced ability to pay current debts and excessive investment in current assets signal a company facing higher cost with a threat to profits. This is certainly not a lean company.

2-15 LG 2, 3, 4, 5: Ratio comparisons

- a. The four companies are in very different industries. The operating characteristics of firms across different industries vary significantly resulting in very different ratio values.
- b. The explanation for the lower current and quick ratios most likely rests on the fact that these two industries operate primarily on a cash basis. Their accounts receivable balances are going to be much lower than for the other two companies.
- c. High level of debt can be maintained if the firm has a large, predictable and steady cash flow. Utilities tend to meet these cash flow requirements. The software firm will have very uncertain and changing cash flow. The software industry is subject to greater competition resulting in more volatile cash flow.
- d. Although the software industry has potentially high profits and investment return performance, it also has a large amount of uncertainty associated with the profits. Also, by placing all of the money in one company, the benefits of reduced risk associated with diversification are lost.

2-16 LG 3: Liquidity management

- a. Since net working capital is the difference between current assets and current liabilities, the value of current liabilities can be found by subtracting net working capital from current assets.

	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>
Total current assets	\$16,950	\$21,900	\$22,500	\$27,000
Net working capital	\$7,950	\$9,300	\$9,900	\$9,600
Total current liabilities	\$9,000	\$12,600	\$12,600	\$17,400
Current ratio	1.88	1.74	1.79	1.55
Quick ratio	1.22	1.19	1.24	1.14
Net working capital	\$7,950	\$9,300	\$9,900	\$9,600



The time series of net working capital increases over time, the quick ratio fluctuates but shows a downward trend, and the current ratio shows a clear downward trend.

- b. Although net working capital is increasing over time, the current and quick ratios can be more useful in that they show the liquidity position in proportional terms. The pattern based on these ratios indicates a deteriorating liquidity position.
- c. The low inventory turnover suggests that liquidity is even worse than the declining liquidity measures indicate. Slow inventory turnover may indicate obsolete inventory.

2-17 LG 3: Liquidity management

- a.

Year	Current ratio	Quick ratio
2010	1.84	1.16
2009	1.88	1.22
2008	1.73	1.19
2007	1.70	1.21
2006	1.55	1.14
- b. Net working capital has reduced over the period and apart from 2010, there was an improving liquidity position 2006 to 2009.
- c. The higher turnover indicates that Gulf's position is relatively strong liquidity wise and stronger than what measures in (a) indicate. There is a danger of stock shortages when turnover is high.

2-18 LG 3: Inventory management

- a.

Sales	\$4,000,000	100%
Cost of goods sold	<u>?</u>	60%
Gross profit	\$1,600,000	40%
CGS	\$2,400,000	

Average inventory	=	\$650,000	
Inventory turnover	=	\$2,400,000 ÷ \$650,000	= 3.69 times
Average age of inventory	=	365 ÷ 3.69	= 98.9 days



- b. The Ello Manufacturing inventory turnover ratio significantly exceeds the industry. Although this may represent efficient inventory management, it may also represent low inventory levels resulting in stock outs.

2-19 LG 3: Accounts receivable management

- a. $\text{Average collection period} = \text{Accounts receivable} \div \text{Average sales per day}$
 $= \$300,000 \div (\$2,400,000 \div 365) = 46 \text{ days}$

Since the average age of receivables is 16 days beyond the net date, attention should be directed to accounts receivable management.

- b. This may explain the lower turnover and higher average collection period. The December accounts receivable balance of \$300,000 may not be a good measure of the average accounts receivable, thereby causing the calculated average collection period to be overstated. It also suggests the November figure (0-30 days overdue) is not a cause for great concern. However, 13 per cent of all accounts receivable (those arising in July, August and September) are sixty days or more overdue and may be a sign of poor receivables management.

2-20 LG 3: Interpreting liquidity and activity ratios

- a. Oscar appears to be holding excess inventory relative to the industry. This fact is supported by the low inventory turnover and the low quick ratio, even though the current ratio is above the industry average. This excess inventory could be due to slow sales relative to production or possibly from carrying obsolete inventory.
- b. The accounts receivable of Oscar appears to be high due to the large number of days of sales outstanding (73 versus the industry average of 52 days). An important question for internal management is whether the company's credit policy is too lenient or customers are just paying slowly – or potentially not paying at all.
- c. Since the firm is paying its accounts payable in 31 days versus the industry norm of 40 days, Oscar may not be taking full advantage of credit terms extended to them by their suppliers. By having the receivables collection period over twice as long as the payables payment period, the firm is financing a significant amount of current assets, possibly from long-term sources.
- d. The desire is that management will be able to curtail the level of inventory either by reducing production or encouraging additional sales through a stronger sales



program or discounts. If the inventory is obsolete, then it must be written off to gain the income tax benefit. The firm must also push to try to get their customers to pay earlier. Payment timing can be increased by shortening credit terms or providing a discount for earlier payment. Slowing down the payment of accounts payable would also reduce financing costs.

Carrying out these recommendations may be difficult because of the potential loss of customers due to stricter credit terms. The firm would also not want to increase their costs of purchases by delaying payment beyond any discount period given by their suppliers.

2-21 LG 4: Debt analysis

Ratio	Definition	Calculation	Creek	Ind.
Debt	$\frac{\text{Debt}}{\text{Total assets}}$	$\frac{\$36,500}{\$50,000}$	0.73	0.51
Times Interest earned	$\frac{\text{EBIT}}{\text{Interest}}$	$\frac{\$3,000}{\$1,000}$	3.00	7.30
Fixed Payment Coverage	$\frac{\text{EBIT} + \text{Lease payment}}{\text{Interest} + \text{Lease payments} + \{[(\text{Principal} + \text{Preference dividends})] \times [1 \div (1-t)]\}}$	$\frac{\$3,000 + \$200}{\$1,000 + \$200 + \{[(\$800 + \$100)] \times [1 \div (1 - 0.4)]\}}$	1.19	1.85

Because Creek Enterprises has a much higher degree of indebtedness and much lower ability to service debt than the average firm in the industry, the loan should be rejected.

2-22 LG5: Calculating cash ratios

	2009	2010
Total debt coverage	14%	11%
Current debt coverage	21%	15%
Expense coverage	14%	16%

In the period 2009–2010 debt coverage had deteriorated whilst expense coverage improved. Debt coverage might reflect a growth in debt to finance expansion or to cover credit difficulties. Coverage of expenses is a positive indicator.



2-23 LG 5: Common-size statement analysis

Creek Enterprises
Common-size income statement
for the years ended 31 December 2009 and 2010

	<u>2010</u>	<u>2009</u>
Sales revenue	100.0%	100.0%
Less: Cost of goods sold	<u>70.0%</u>	<u>65.9%</u>
Gross profits	30.0%	34.1%
Less: Operating expenses:		
Selling	10.0%	12.7%
General	6.0%	6.3%
Lease expense	0.7%	0.6%
Depreciation	<u>3.3%</u>	<u>3.6%</u>
Operating profits	20.0%	23.2%
Less: Interest expense	<u>3.3%</u>	<u>1.5%</u>
Net profits before taxes	6.7%	9.4%
Less: Taxes	<u>2.7%</u>	<u>3.8%</u>
Net profits after taxes	<u>4.0%</u>	<u>5.6%</u>

Sales have declined and cost of goods sold has increased as a percentage of sales, probably due to a loss of productive efficiency. Operating expenses have decreased as a percentage of sales; this appears favourable unless this decline has contributed toward the fall in sales. The level of interest as a percentage of sales has increased significantly; this is verified by the high debt measures in problem 2-18 and suggests that the firm has too much debt.

Further analysis should be directed at the increased cost of goods sold and the high debt level.



2-24 LG 4, 5: The relationship between financial leverage and profitability

a. (i)

$$\text{Debt ratio} = \frac{\text{Total liabilities}}{\text{Total assets}}$$

$$\text{Debt ratio}_{\text{Pelican}} = \frac{\$1,000,000}{\$10,000,000} = .10 = 10\%$$

$$\text{Debt ratio}_{\text{Timberland}} = \frac{\$5,000,000}{\$10,000,000} = .50 = 50\%$$

(ii)

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

$$\text{Times interest earned}_{\text{Pelican}} = \frac{\$6,250,000}{\$100,000} = 62.5$$

$$\text{Times interest earned}_{\text{Timberland}} = \frac{\$6,250,000}{\$500,000} = 12.5$$

Timberland has a much higher degree of financial leverage than does Pelican. As a result Timberland's earnings will be more volatile, causing the ordinary shareholders to face greater risk. This additional risk is supported by the significantly lower times interest earned ratio of Timberland. Pelican can face a very large reduction in net income and still be able to cover its interest expense.

b. (i)

$$\text{Operating profit margin} = \frac{\text{Operating profit}}{\text{Sales}}$$

$$\text{Operating profit margin}_{\text{Pelican}} = \frac{\$6,250,000}{\$25,000,000} = .25 = 25\%$$

$$\text{Operating profit margin}_{\text{Timberland}} = \frac{\$6,250,000}{\$25,000,000} = .25 = 25\%$$

(ii)

$$\text{Net profit margin} = \frac{\text{Net income}}{\text{Sales}}$$

$$\text{Net profit margin}_{\text{Pelican}} = \frac{\$3,690,000}{\$25,000,000} = .1476 = 14.76\%$$

$$\text{Net profit margin}_{\text{Timberland}} = \frac{\$3,450,000}{\$25,000,000} = .138 = 13.80\%$$



(iii)

$$\begin{aligned}\text{Return on assets} &= \frac{\text{Net profit after taxes}}{\text{Total assets}} \\ \text{Return on assets}_{\text{Pelican}} &= \frac{\$3,690,000}{\$10,000,000} = .369 = 36.9\% \\ \text{Return on assets}_{\text{ST}^{\text{r}} \text{ land}} &= \frac{\$3,450,000}{\$10,000,000} = .345 = 34.5\%\end{aligned}$$

(iv)

$$\begin{aligned}\text{Return on equity} &= \frac{\text{Net profit after taxes}}{\text{Shareholders equity}} \\ \text{Return on equity}_{\text{Pelican}} &= \frac{\$3,690,000}{\$9,000,000} = .41 = 41.0\% \\ \text{Return on equity}_{\text{T}^{\text{r}} \text{ land}} &= \frac{\$3,450,000}{\$5,000,000} = .69 = 69.0\%\end{aligned}$$

Pelican is more profitable than Timberland, as shown by the higher operating profit margin, net profit margin and return on assets. However, the return on equity for Timberland is higher than that of Pelican.

- (c) Even though Pelican is more profitable, Timberland has a higher ROE than Pelican due to the additional financial leverage risk. The lower profits of Timberland are due to the fact that interest expense is deducted from EBIT. Timberland has \$500,000 of interest expense to Pelican's \$100,000. Even after the tax shield from the interest tax deduction ($\$500,000 \times 0.40 = \$200,000$) Timberland's profits are less than Pelican's by \$240,000. Since Timberland has a higher relative amount of debt, the shareholders' equity is proportionally reduced resulting in the higher return to equity than that obtained by Pelican. The higher ROE is at the expense of higher levels of financial risk faced by Timberland equity holders.

2-25 LG 6: Ratio proficiency

a.

$$\begin{aligned}\text{Gross profit} &= \text{sales} \times \text{gross profit margin} \\ &= \$40,000,000 \times .8 = \$32,000,000\end{aligned}$$

b.

$$\begin{aligned}\text{Cost of goods sold} &= \text{sales} - \text{gross profit} \\ &= \$40,000,000 - \$32,000,000 = \$8,000,000\end{aligned}$$



c.

$$\begin{aligned}\text{Operating profit} &= \text{sales} \times \text{operating profit margin} \\ &= \$40,000,000 \times .35 = \$14,000,000\end{aligned}$$

d.

$$\begin{aligned}\text{Operating expenses} &= \text{gross profit} - \text{operating profit} \\ &= \$32,000,000 - \$14,000,000 = \$18,000,000\end{aligned}$$

e.

$$\text{Net profit} = \text{sales} \times \text{net profit margin} = \$40,000,000 \times .08 = \$3,200,000$$

f.

$$\text{Total assets} = \frac{\text{sales}}{\text{total asset turnover}} = \frac{\$40,000,000}{2} = \$20,000,000$$

g.

$$\text{Total equity} = \frac{\text{net income}}{\text{ROE}} = \frac{\$3,200,000}{.20} = \$16,000,000$$

h.

$$\begin{aligned}\text{Accounts receivable} &= \text{average collection period} \times \frac{\text{sales}}{365} \\ &= 62.2 \text{ days} \times \frac{\$40,000,000}{360} = 62.2 \times \$111,111 = \$6,911,104\end{aligned}$$

2-26 LG 6: Ratio application

Pick Ltd Balance Sheet

Assets		Equities	
	\$		\$
Cash	15,000	Accounts payable	50,000
Accounts receivable	65,000	Notes payable	40,000
Inventory	96,000	Accruals	10,000
Non-current assets	<u>124,000</u>	Non-current debts	120,000
		Shareholder's equity	<u>8,000</u>
Total	<u>300,000</u>	Total	<u>189,000</u>



2-27 LG 6: DuPont calculation

$$\text{ROE} = 4.5\% \times 0.72 \times 1.43 = 4.63\%$$

The advantage of using the DuPont system to calculate ROE over the direct calculation of earnings available for shareholders is that ROE, the most common measure for shareholders, is broken into three distinct components. Starting at the right we see how financial leverage has increased assets over the owners' original equity. Next, moving to the left, we see how efficiently the firm used its assets to generate sales. Finally, the net profit margin shows the measure of profitability on sales. Each component can be compared with industry standards to see if the firm is underperforming or over-performing in any one of the three areas.

2-28 LG 6: Cross-sectional ratio analysis

a.

Technica Ltd Ratio analysis

	Industry Average	Actual
	2010	2010
Current ratio	2.35	1.84
Quick ratio	0.87	0.75
Inventory turnover	4.55 times	5.61 times
Average collection period*	35.3 days	20.7 days
Total asset turnover	1.09	1.47
Debt ratio	0.30	0.55
Times interest earned	12.3	8.0
Gross profit margin	0.202	0.233
Operating profit margin	0.135	0.133
Net profit margin	0.091	0.072
Return on total assets (ROA)	0.099	0.105
Return on equity (ROE)	0.167	0.234
Earnings per share	\$3.10	\$2.15

* based on a 365-day year

Liquidity: The current and quick ratios show a weaker position relative to the industry average.

Activity: All activity ratios indicate a faster turnover of assets compared to the industry. Further analysis is necessary to determine whether the firm is in a weaker



or stronger position than the industry. A higher inventory turnover ratio may indicate low inventory, resulting in stock outs and lost sales. A shorter average collection period may indicate extremely efficient receivables management, an overly zealous credit department, or credit terms that prohibit growth in sales.

Debt: The firm uses more debt than the average firm, resulting in higher interest obligations which could reduce its ability to meet other financial obligations.

Profitability: The firm has a higher gross profit margin than the industry, indicating either a higher sales price or a lower cost of goods sold. The operating profit margin is in line with the industry, but the net profit margin is lower than industry, an indication that expenses other than cost of goods sold are higher than the industry. Most likely, the damaging factor is high interest expenses due to a greater than average amount of debt. The increased leverage, however, magnifies the return the owners receive, as evidenced by the superior ROE.

- b. Technica Limited needs improvement in its liquidity ratios and possibly a reduction in its total liabilities. The firm is more highly leveraged than the average firm in its industry and therefore has more financial risk. The profitability of the firm is lower than average but is enhanced by the use of debt in the capital structure, resulting in a superior ROE.

2-29 LG 6: Financial statement analysis

a.

Ratio Analysis OZ Industries

	Industry Average	Actual 2009	Actual 2010
Current ratio	1.80	1.84	1.04
Quick ratio	0.70	0.78	0.38
Inventory turnover	2.50	2.59	2.33
Average collection period	37 days	36 days	57 days
Debt ratio	65%	67%	61.3%
Times interest earned	3.8	4.0	2.8
Gross profit margin	38%	40%	34%
Net profit margin	3.5%	3.6%	4.1%
Return on investment	4.0%	4.0%	4.4%
Return on equity	9.5%	8.0%	11.3%
Market/book ratio	1.1	1.2	1.3



b.

- (i) **Liquidity:** OZ Industries' liquidity position has deteriorated from 2009 to 2010 and is inferior to the industry average. The firm may not be able to satisfy short-term obligations as they come due.
- (ii) **Activity:** OZ Industries' ability to convert assets into cash has deteriorated from 2009 to 2010. Examination into the cause of the 21-day increase in the average collection period is warranted. Inventory turnover has also decreased for the period under review and is fair compared to industry. The firm may be holding slightly excessive inventory.
- (iii) **Debt:** OZ Industries' long-term debt position has improved since 2009 and is below average. OZ Industries' ability to service interest payments has deteriorated and is below industry.
- (iv) **Profitability:** Although OZ Industries' gross profit margin is below its industry average, indicating high cost of goods sold, the firm has a superior net profit margin in comparison to average. The firm has lower than average operating expenses. The firm has a superior return on investment and return on equity in comparison to the industry and shows an upward trend.
- (v) **Market:** OZ Industries' increase in their market price relative to their book value per share indicates that the firm's performance has been interpreted as more positive in 2010 than in 2009 and it is a little higher than the industry.

Overall, the firm maintains superior profitability at the risk of illiquidity. Investigation into the management of accounts receivable and inventory is warranted.



2-30 LG 6: Integrated–complete ratio analysis

Ratio Analysis Sterling Company

<u>Ratio</u>	<u>Actual 2008</u>	<u>Actual 2009</u>	<u>Actual 2010</u>	<u>Industry Average 2010</u>	TS: Time-series CS: Cross-sectional
Current ratio	1.40	1.55	1.67	1.85	TS: Improving CS: Fair
Quick ratio	1.00	0.92	0.88	1.05	TS: Deteriorating CS: Poor
Inventory turnover	9.52	9.21	7.89	8.60	TS: Deteriorating CS: Fair
Average collection period	45.0 days	36.4 days	29.2 days	35.0 days	TS: Improving CS: Good
Average payment period	58.5 days	60.8 days	53.0 days	45.8 days	TS: Unstable CS: Poor
Total asset turnover	0.74	0.80	0.83	0.74	TS: Improving CS: Good
Debt ratio	0.20	0.20	0.35	0.30	TS: Increasing CS: Fair
Times interest earned	8.2	7.3	6.5	8.0	TS: Deteriorating CS: Poor
Fixed payment coverage ratio	4.5	4.2	2.7	4.2	TS: Deteriorating CS: Poor
Gross profit margin	0.30	0.27	0.25	0.25	TS: Deteriorating CS: Good
Operating profit margin	0.12	0.12	0.13	0.10	TS: Improving CS: Good
Net profit margin	0.067	0.067	0.066	0.058	TS: Stable CS: Good
Return on total assets (ROA)	0.049	0.054	0.055	0.043	TS: Improving CS: Good
Return on equity (ROE)	0.066	0.073	0.085	0.072	TS: Improving CS: Good
Earnings per share (EPS)	\$1.75	\$2.20	\$3.05	\$1.50	TS: Improving CS: Good
Price/earnings (P/E) ratio	12.0	10.5	12.95	11.2	TS: Unstable CS: Good
Market/book (M/B) ratio	1.20	1.05	1.16	1.10	TS: Unstable CS: Good



Liquidity: Sterling Company's overall liquidity as reflected by the current ratio, net working capital and quick ratio appears to have remained relatively stable but is below the industry average.

Activity: The activity of accounts receivable has improved, but inventory turnover has deteriorated and is currently below the industry average. The firm's average payment period appears to have improved from 2009, although the firm is still paying more slowly than the average company.

Debt: The firm's debt ratios have increased from 2009 and are very close to the industry averages, indicating currently acceptable values but an undesirable trend. The firm's fixed payment coverage has declined and is below the industry average figure, indicating a deterioration in servicing ability.

Profitability: The firm's gross profit margin, while in line with the industry average, has declined, probably due to higher cost of goods sold. The operating and net profit margins have been stable and are also in the range of industry averages. Both the return on total assets and return on equity appear to have improved slightly and are better than the industry averages. Earnings per share made a significant increase in 2009 and 2010.

Market: The P/E ratio fell in 2009, indicating a decreasing degree of investor confidence in the firm's future earnings potential, perhaps due to the increased debt load and higher servicing requirements, but the share price has increased in 2010, indicating stronger investor confidence. The market-to-book ratio initially showed signs of weakness in 2009. The market's interpretation of Sterling's earning ability indicates a lot of uncertainty. The fluctuation in the M/B ratio also shows signs of uncertainty.

In summary, the firm needs to attend to inventory and accounts payable and should not incur added debts until its leverage and fixed-charge coverage ratios are improved. Other than these indicators, the firm appears to be doing well – especially in generating return on sales. The market seems to have some lack of confidence in the stability of Sterling's future.



2-31 LG 6: Complete ratio analysis, recognising significant differences

a.

Ratio	Home Health			Proportional Difference
	2009	2010	Difference	
Current ratio	3.25	3.00	-0.25	-7.69%
Quick ratio	2.50	2.20	-0.30	-12.00%
Inventory turnover	12.80	10.30	-2.50	-19.53%
Average collection period	42 days	31 days	-11 days	-26.19%
Total asset turnover	1.40	2.00	+0.60	+42.86%
Debt ratio	0.45	0.62	+0.17	+37.78%
Times interest earned	4.00	3.85	-0.15	-3.75%
Gross profit margin	68%	65%	-3%	-4.41%
Operating profit margin	14%	16%	+2%	+14.29%
Net profit margin	8.3%	8.1%	-0.2%	-2.41%
Return on total assets	11.6%	16.2%	+4.6%	+39.66%
Return on equity	21.1%	42.6%	+21.5%	+101.90%
Price/earnings ratio	10.7	9.8	-0.9	-8.41%
Market/book ratio	1.40	1.25	-0.15	-10.71%

Note: There is a typographical error in the question. The correct way to calculate the difference between the figures is to subtract the 2006 figures from the 2007 figures. This results in a positive difference when the figures have gone up, and vice versa. This is the approach used in the above solution.

b. Ratio	Proportional Difference	Company's Favour
Quick ratio	-12.00%	No
Inventory turnover	-19.53%	No
Average collection period	-26.19%	Yes
Total asset turnover	+42.86%	Yes
Debt ratio	+37.78%	No
Operating profit margin	+14.29%	Yes
Return on total assets	+39.66%	Yes
Return on equity	+101.90%	Yes
Market/book ratio	-10.71	No



- c. The most obvious relationship is associated with the increase in return on equity. The increase in this ratio is connected with the increase in return on assets. The higher return on assets is partially attributed to the higher total asset turnover (as reflected in the DuPont model). The return on equity increase is also associated with the slightly higher level of debt as captured by the higher debt ratio.

2-32 Ethics problem

Cash-flow-based measures (CFM) with both cross-sectional and time-series benchmarking reveal cash outflow patterns. CFM can be manipulated, however, by management via disclosure and timing decisions that may bias the cash flow picture to align with management preferences. However CFM when benchmarked and analysed via trend analysis are more likely to reduce the incidence of misrepresentation. Profit calculations have more scope to mislead investors.



CHAPTER 2

Case 1

Evaluating Homestyle Baked Goods' Financial Performance

a.

	2008		2009		2010	
Ratio	Ken	Industry	Ken	Industry	Ken	Industry
Current ratio	2.00	1.90	1.78	1.85	2.05	1.95
Quick ratio	1.00	0.95	0.89	0.95	0.95	0.95
Average collection period	72 days	65 days	93 days	70 days	90 days	71 days
Average payment period	80 days	70 days	117 days	75 days	106 days	75 days
Inventory turnover	3.00	4.00	2.87	3.80	2.62	4.00
Total asset turnover	0.80	0.90	0.69	0.93	0.78	0.95
Debt ratio	0.47	0.47	0.50	0.50	0.49	0.49
Gross profit margin	25%	24%	21%	25%	19%	27%
Operating profit margin	15%	14.8%	12%	14.9%	8.8%	15%
Net profit margin	6.7%	7.0%	5.0%	6.7%	3.5%	6.8%
Return on total assets	5.3%	6.5%	3.5%	6.5%	2.8%	6.4%
Times interest earned	9.0	8.0	5.8	8.0	5.0	8.0

b. Analysis

The overall liquidity of the firm, as shown by the current and quick ratios, appears better than the industry-average performance. The increasing trend in average collection period, which is considerably higher than the industry average, indicates the presence of collection problems. The firm's payables, on average, are being paid beyond the industry-average age and the trend appears to be deteriorating further. The firm's inventory also appears to be mismanaged, because it turns over less frequently than the average firm and has a deteriorating trend. Total asset turnover ratios are well below industry average.



The firm's debt ratio is identical to the industry figures and therefore does not appear to be a problem. The profitability of the firm in relation to sales (i.e. gross profit margin, operating profit margin and net profit margin) along with return on total assets indicate poor profit performance, which seems to be deteriorating with the passage of time. Finally, the firm's problems seem to result from excessive levels of accounts receivable, accounts payable and inventory and from its inability to earn sufficient profits. A trend of rising costs and expenses without corresponding increases in the selling price may explain the declining returns on sales and investment.

Case 2

Assessing Martin Manufacturing's Current Financial Position

Martin Manufacturing Company is an integrated case study addressing financial analysis techniques. The company is a capital-intensive firm which has poor management of accounts receivable and inventory. The industry average inventory turnover can fluctuate from 10 to 100 depending on the market.

1. Ratio calculations

Financial Ratio	2010
Current ratio	$\$1,531,181 \div \$616,000 = 2.5$
Quick ratio	$(\$1,531,181 - \$700,625) \div \$616,000 = 1.3$
Inventory turnover (times)	$\$3,704,000 \div \$700,625 = 5.3$
Average collection period (days)	$\$805,556 \div (\$5,075,000 \div 365) = 58$
Total asset turnover (times)	$\$5,075,000 \div \$3,125,000 = 1.6$
Debt ratio	$\$1,781,250 \div \$3,125,000 = 57\%$
Times interest earned	$\$153,000 \div \$93,000 = 1.6$
Gross profit margin	$\$1,371,000 \div \$5,075,000 = 27\%$
Net profit margin	$\$36,000 \div \$5,075,000 = 0.71\%$
Return on total assets	$\$36,000 \div \$3,125,000 = 1.2\%$
Return on equity	$\$36,000 \div \$1,343,750 = 2.7\%$



Historical Ratios
Martin Manufacturing Company

Ratio	Actual 2008	Actual 2009	Actual 2010	Industry Average 2010
Current ratio	1.7	1.8	2.5	1.5
Quick ratio	1.0	0.9	1.3	1.2
Inventory turnover (times)	5.2	5.0	5.3	10.2
Average collection period (days)	50	55	58	46
Total asset turnover (times)	1.5	1.5	1.6	2.0
Debt ratio	45.8%	54.3%	57%	24.5%
Times interest earned	2.2	1.9	1.6	2.5
Gross profit margin	27.5%	28.0%	27.0%	26.0%
Net profit margin	1.1%	1.0%	0.71%	1.2%
Return on total assets	1.7%	1.5%	1.2%	2.4%
Return on equity	3.1%	3.3%	2.7%	3.2%
Price/earnings ratio	33.5	38.7	34.48	43.4
Market/book	1.0	1.1	0.88	1.2

2. **Liquidity:** The firm has sufficient current assets to cover current liabilities. The trend is upward and is much higher than the industry average. This is an unfavourable position, since it indicates too much inventory.

Activity: The inventory turnover is stable but much lower than the industry average. This indicates the firm is holding too much inventory. The average collection period is increasing and much higher than the industry average. These are both indicators of a problem in collecting payment.

The fixed asset turnover ratio and the total asset turnover ratios are stable but significantly lower than the industry average. This indicates that the sales volume is not sufficient for the amount of committed assets.

Debt: The debt ratio has increased and is substantially higher than the industry average. This places the company at high risk. Typically, industries with heavy capital investment and higher operating risk try to minimise financial risk. Martin Manufacturing has positioned itself with both heavy operating and financial risk. The times-interest-earned ratio also indicates a potential debt service problem. The ratio is decreasing and is far below the industry average.

PEARSON



Profitability: The gross profit margin is stable and quite favourable when compared to the industry average. The net profit margin, however, is deteriorating and far below the industry average. When the gross profit margin is within expectations but the net profit margin is too low, high interest payments may be to blame. The high financial leverage has caused the low profitability.

Market: The market price of the firm's ordinary shares shows weakness relative to both earnings and book value. This result indicates a belief by the market that Martin's ability to earn future profits faces more and increasing uncertainty as perceived by the market.

3. Martin Manufacturing clearly has a problem with its inventory level, and sales are not at an appropriate level for its capital investment. As a consequence, the firm has acquired a substantial amount of debt which, due to the high interest payments associated with the large debt burden, is depressing profitability. These problems are being picked up by investors as shown in their weak market ratios.