

*Financial Statements  
And Analysis*

**INSTRUCTOR'S RESOURCES**

**Overview**

This chapter examines the key components to the stockholders' report: the income statement, balance sheet, statement of retained earnings, 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 (FASB No. 52) 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.

***PMF Tutor: Financial Ratios***

This section of the Gitman Tutor generates problems to give the student practice calculating liquidity, activity, debt, profitability, and market ratios.

***PMF Problem-Solver: Financial Ratios***

This module allows the student to compute all the financial ratios described in the text. There are three options: all ratios, families of ratios, and individual ratios.

# Principles of Managerial Finance Solution

Lawrence J. Gitman

## ***PMF Templates***

Spreadsheet templates are provided for the following problems:

<u>Problem</u>	<u>Topic</u>
Problem 2-4	Calculation of EPS and retained earnings
Problem 2-5	Balance sheet preparation
Problem 2-6	Impact of net income on a firm's balance sheet
Problem 2-8	Statement of retained earnings
Problem 2-15	Debt analysis

## ***Study Guide***

Suggested *Study Guide* examples for classroom presentation:

<u>Example</u>	<u>Topic</u>
1	Basic ratio calculation
2	Common-size income statement
3	Evaluating ratios

ANSWERS TO REVIEW QUESTIONS

2-1 The purpose of each of the 4 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 Retained Earnings* - This statement reconciles the net income earned during the year, and any cash dividends paid, with the change in retained earnings during the year.

*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, investment, and financing.

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 *Financial Accounting Standards Board Statement No. 52* describes the rules for consolidating a company's foreign and domestic financial statements. It requires U.S.-based companies to translate foreign-currency-denominated assets and liabilities into U.S. dollars using the current rate (translation) method. This method uses the exchange rate prevailing on the date the fiscal year ends (the current rate). Income statement items can be translated using either the current rate or an average exchange rate for the period covered by the statement. Equity accounts are converted at the exchange rate on the date of the investment. In the retained earnings account any gains and losses from currency fluctuations are stated separately in an equity reserve account—the *cumulative translation adjustment account*—and not realized until the parent company sells or closes the foreign operations.

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. Stockholders 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 recognize that stockholders and creditors must see good ratios in order to keep the stock price up and 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 favorable. 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 and preferred stock.
- 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** The owners 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 stockholders' equity.
- 2-15** The *price-earnings ratio (P/E)* is the market price per share of common stock 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 per of common stock 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 come 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 are doing in terms of return and risk.

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

- 2-17** The analyst may approach a complete ratio analysis on either a cross-sectional or time-series basis by summarizing the ratios into their five key areas: liquidity, activity, debt, profitability, and market. Each of the key areas could then be summarized, 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: Reviewing Basic Financial Statements**

**Income statement:** In this one-year summary of the firm's operations, Technica, Inc. showed a net profit for 2003 and the ability to pay cash dividends to its stockholders.

**Balance sheet:** The financial condition of Technica, Inc. at December 31, 2002 and 2003 is shown as a summary of assets and liabilities. Technica, Inc. has an excess of current assets over current liabilities, demonstrating liquidity. The firm's fixed assets represent over one-half of total assets (\$270,000 of \$408,300). The firm is financed by short-term debt, long-term debt, common stock, and retained earnings. It appears that it repurchased 500 shares of common stock in 2003.

**Statement of retained earnings:** Technica, Inc. earned a net profit of \$42,900 in 2003 and paid out \$20,000 in cash dividends. The reconciliation of the retained earnings account from \$50,200 to \$73,100 shows the net amount (\$22,900) retained by the firm.

**2-2 LG 1: Financial Statement Account Identification**

<u>Account Name</u>	<b>a.</b> <u>Statement</u>	<b>b.</b> <u>Type of Account</u>
Accounts payable	BS	CL
Accounts receivable	BS	CA
Accruals	BS	CL
Accumulated depreciation	BS	FA*
Administrative expense	IS	E
Buildings	BS	FA
Cash	BS	CA
Common stock (at par)	BS	SE
Cost of goods sold	IS	E
Depreciation	IS	E
Equipment	BS	FA
General expense	IS	E
Interest expense	IS	E
Inventories	BS	CA
Land	BS	FA
Long-term debt	BS	LTD
Machinery	BS	FA
Marketable securities	BS	CA
Notes payable	BS	CL
Operating expense	IS	E
Paid-in capital in excess of par	BS	SE
<u>Account Name</u>	<b>a.</b> <u>Statement</u>	<b>b.</b> <u>Type of Account</u>
Preferred stock	BS	SE
Preferred stock dividends	IS	E
Retained earnings	BS	SE
Sales revenue	IS	R
Selling expense	IS	E

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Taxes	IS	E
Vehicles	BS	FA

\* This is really not a fixed asset, but a charge against a fixed asset, better known as a contra-asset.

### 2-3 LG 1: Income Statement Preparation

a.

Cathy Chen, CPA  
Income Statement  
for the Year Ended December 31, 2003

Sales revenue		\$180,000
Less: Operating expenses		
Salaries	90,000	
Employment taxes and benefits	17,300	
Supplies	5,200	
Travel & entertainment	8,500	
Lease payment	16,200	
Depreciation expense	<u>7,800</u>	
Total operating expense		<u>145,000</u>
Operating profits		\$ 35,000
Less: Interest expense		<u>7,500</u>
Net profits before taxes		\$ 27,500
Less: Taxes (30%)		<u>8,250</u>
Net profits after taxes		<u>\$ 19,250</u>

b. In her first year of business, Cathy Chen covered all her operating expenses and earned a net profit of \$19,250 on revenues of \$180,000.

### 2-4 LG 1: Calculation of EPS 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: Preferred stock dividends	<u>32,000</u>
Earnings available to common stockholders	<u>\$ 98,800</u>

**Earnings per share:**

$$\frac{\text{Earning available to common stockholders}}{\text{Total shares outstanding}} = \frac{\$98,800}{85,000} = \$1.162$$

b. **Amount to retained earnings:**

85,000 shares x \$0.80 = \$68,000 common stock dividends

Earnings available to common shareholders	\$98,800
Less: Common stock dividends	<u>68,000</u>

To retained earnings \$30,800

**2-5 LG 1: Balance Sheet Preparation**

Owen Davis Company  
Balance Sheet  
December 31, 2003

**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

Gross fixed assets

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

Total gross fixed assets \$1,080,000

Less: Accumulated depreciation 265,000

Net fixed assets \$ 815,000

Total assets \$1,930,000

**Liabilities and stockholders' equity**

Current liabilities:

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

Total current liabilities \$ 750,000

Long-term debt 420,000

Total liabilities \$1,170,000

Stockholders' equity

Preferred stock	\$ 100,000
Common stock (at par)	90,000
Paid-in capital in excess of par	360,000
Retained earnings	<u>210,000</u>

Total stockholders' equity \$ 760,000

Total liabilities and stockholders' equity \$1,930,000

**2-6 LG 1: Impact of Net Income on a Firm's Balance Sheet**

	Account	Beginning Value	Change	Ending Value
<b>a.</b>	Marketable securities	\$ 35,000	+ \$1,365,000	\$1,400,000
	Retained earnings	\$1,575,000	+ \$1,365,000	\$2,940,000
<b>b.</b>	Long-term debt	\$2,700,000	- \$ 865,000	\$1,835,000

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	Retained earnings	\$1,575,000	+ \$ 865,000	\$2,440,000
<b>c.</b>	Buildings	\$1,600,000	+ \$ 865,000	\$2,465,000
	Retained earnings	\$1,575,000	+ \$ 865,000	\$2,440,000
<b>d.</b>	No net change in any accounts			

**2-7 LG 1: Initial Sale Price of Common Stock**

$$\text{Initial sales price} = \frac{(\text{Par value of common stock} + \text{Paid in capital in excess of par})}{\text{Number of common shares outstanding}}$$
$$\text{Initial sales price} = \frac{\$225,000 + \$2,625,000}{300,000} = \$9.50 \text{ per share}$$

**2-8 LG 1: Statement of Retained Earnings**

a. Cash dividends paid on common stock = Net profits after taxes - preferred dividends - change in retained earnings

$$= \$377,000 - \$47,000 - (1,048,000 - \$928,000)$$

$$= \$210,000$$

Hayes Enterprises  
Statement of Retained Earnings  
for the Year Ended December 31, 2003

Retained earnings balance (January 1, 2003)	\$928,000
Plus: Net profits after taxes (for 2003)	377,000
Less: Cash dividends (paid during 2003)	
Preferred stock	(47,000)
Common stock	<u>(210,000)</u>
Retained earnings (December 31, 2003)	<u>\$1,048,000</u>

b. Earnings per share =  $\frac{\text{Net profit after tax} - \text{Preferred dividends (EACS*)}}{\text{Number of common shares outstanding}}$

$$\text{Earnings per share} = \frac{\$377,000 - \$47,000}{140,000} = \$2.36$$

\* Earnings available to common stockholders

c. Cash dividend per share =  $\frac{\text{Total cash dividend}}{\text{\# shares}}$

$$\text{Cash dividend per share} = \frac{\$210,000 \text{ (from part a)}}{140,000} = \$1.50$$

**2-9 LG 1: Changes in Stockholders' Equity**

a. Net income for 2003 = change in retained earnings + dividends paid

$$\text{Net income for 2003} = (\$1,500,000 - \$1,000,000) + \$200,000 = \$700,000$$

b. New shares issued = outstanding share 2003 – outstanding shares 2002

$$\text{New shares issued} = 1,500,000 - 500,000 = 1,000,000$$

c. Average issuance price =  $\frac{\Delta \text{Paid-in-capital} + \Delta \text{Common stock}}{\Delta \text{ shares outstanding}}$

$$\text{Average issuance price} = \frac{\$4,000,000 + \$1,000,000}{1,000,000} = \$5.00$$

**d.**

$$\text{Original issuance price} = \frac{\text{Paid - in - capital} + \text{Common stock}}{\text{Number of shares issued}}$$

$$\text{Original issuance price} = \frac{\$500,000 + \$500,000}{500,000} = \$2.00$$

**2-10 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 stock, the benefits of reduced risk associated with diversification are lost.

**2-11 LG 3: Liquidity Management**

<b>a</b>		<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>
	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

- b.** The pattern 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.

**2-12 LG 3: Inventory Management**

<b>a.</b>	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
	Inventory Turnover	= 3.69 times	
	Average Age of Inventory	= 360 ÷ 3.69	
	Average Age of Inventory	= 97.6 days	

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

**2-13 LG 3: Accounts Receivable Management**

- a.** Average Collection Period = Accounts Receivable ÷ Average Sales per Day

$$45 \text{ Days} = \$300,000 \div (\$2,400,000 \div 360)$$

Since the average age of receivables is 15 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 percent 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.

**2-14 LG 3: Interpreting Liquidity and Activity Ratios**

- a.** Bluegrass 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 Bluegrass 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, Bluegrass 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.

**2-15 LG 4: Debt Analysis**

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Ratio	Definition	Calculation	Creek	Industry
Debt	<u>Debt</u>	<u>\$36,500,000</u>	.73	.51
	Total Assets	\$50,000,000		
Times Interest Earned	<u>EBIT</u>	<u>\$ 3,000,000</u>	3.00	7.30
	Interest	\$ 1,000,000		
Fixed Payment Coverage				
	<u>EBIT + Lease Payment</u>	<u>\$3,000,000 + \$200,000</u>	1.19	1.85
	Interest + Lease Payments	\$1,000,000 + \$200,000 +		
	+ {[(Principal + Preferred Stock Dividends)] x [1÷ (1-t)]}	{[((\$800,000 + \$100,000)] x [1÷ (1-.4)]}		

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.

### 2-16 LG 5: Common-Size Statement Analysis

#### Creek Enterprises Common-Size Income Statement for the Years Ended December 31, 2002 and 2003

	<u>2003</u>	<u>2002</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	.7%	.6%
Depreciation	<u>3.3%</u>	<u>3.6%</u>
Operating profits	10.0%	10.9%
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 percent of sales; this appears favorable 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 2-15 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.

### 2-17 LG 4, 5: The Relationship Between Financial leverage and Profitability

**a. (1)**

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

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

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

**(2)**

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

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

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

Timberland has a much higher degree of financial leverage than does Pelican. As a result Timberland's earnings will be more volatile, causing the common stock owners 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. (1)**

$$\text{Operating profit margin} = \frac{\text{operating profit}}{\text{sales}}$$

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

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

**(2)**

$$\text{Net profit margin} = \frac{\text{net income}}{\text{sales}}$$

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

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

**(3)**

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$$\text{Return on assets} = \frac{\text{net profit after taxes}}{\text{total assets}}$$

$$\text{Return on assets}_{\text{Pelican}} = \frac{\$3,690,000}{\$10,000,000} = .369 = 36.9\%$$

$$\text{Return on assets}_{\text{Timberland}} = \frac{\$3,450,000}{\$10,000,000} = .345 = 34.5\%$$

(4)

$$\text{Return on equity} = \frac{\text{net profit after taxes}}{\text{stockholders equity}}$$

$$\text{Return on equity}_{\text{Pelican}} = \frac{\$3,690,000}{\$9,000,000} = .41 = 41.0\%$$

$$\text{Return on equity}_{\text{Timberland}} = \frac{\$3,450,000}{\$5,000,000} = .69 = 69.0\%$$

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 ( $\$500,000 \times .40 = \$200,000$ ) Timberland's profits are less than Pelican's by \$240,000. Since Timberland has a higher relative amount of debt, the stockholders' 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.

### 2-18 LG 6: Ratio Proficiency

- a.  
Gross profit = sales  $\times$  gross profit margin  
Gross profit =  $\$40,000,000 \times .8 = \$32,000,000$
- b.  
Cost of goods sold = sales - gross profit  
Cost of goods sold =  $\$40,000,000 - \$32,000,000 = \$8,000,000$
- c.  
Operating profit = sales  $\times$  operating profit margin  
Operating profit =  $\$40,000,000 \times .35 = \$14,000,000$
- d.  
Operating expenses = gross profit - operating profit  
Operating expenses =  $\$32,000,000 - \$14,000,000 = \$18,000,000$
- e.

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

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.

$$\text{Accounts receivable} = \text{average collection period} \times \frac{\text{sales}}{365}$$

$$\text{Accounts receivable} = 62.2 \text{ days} \times \frac{\$40,000,000}{360} = 62.2 \times \$111,111 = \$6,911,104$$

### 2-19 LG 6: Cross-Sectional Ratio Analysis

a.

#### Fox Manufacturing Company Ratio Analysis

	Industry Average <u>2003</u>	Actual <u>2003</u>
Current ratio	2.35	1.84
Quick ratio	.87	.75
Inventory turnover	4.55 times	5.61 times
Average collection period	35.3 days	20.5 days
Total asset turnover	1.09	1.47
Debt ratio	.30	.55
Times interest earned	12.3	8.0
Gross profit margin	.202	.233
Operating profit margin	.135	.133
Net profit margin	.091	.072
Return on total assets (ROA)	.099	.105
Return on common equity (ROE)	.167	.234
Earnings per share	\$3.10	\$2.15

**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 stockouts and lost sales. A shorter average collection period may indicate extremely efficient receivables management, an overly zealous credit department, or credit terms which 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.

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**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. Fox Manufacturing Company 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.

**2-20 LG 6: Financial Statement Analysis**

a. Ratio Analysis  
Zach Industries

	<u>Industry Average</u>	<u>Actual 2002</u>	<u>Actual 2003</u>
Current ratio	1.80	1.84	1.04
Quick ratio	.70	.78	.38
Inventory turnover	2.50	2.59	2.33
Average collection period	37 days	36 days	56 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 total assets	4.0%	4.0%	4.4%
Return on common equity	9.5%	8.0%	11.3%
Market/book ratio	1.1	1.2	1.3

- b.
- (1) **Liquidity:** Zach Industries' liquidity position has deteriorated from 2002 to 2003 and is inferior to the industry average. The firm may not be able to satisfy short-term obligations as they come due.
  - (2) **Activity:** Zach Industries' ability to convert assets into cash has deteriorated from 2002 to 2003. 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.
  - (3) **Debt:** Zach Industries' long-term debt position has improved since 2002 and is below average. Zach Industries' ability to service interest payments has deteriorated and is below industry.
  - (4) **Profitability:** Although Zach 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

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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.

- (5) **Market:** Zach 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 2003 than in 2002 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.

**2-21 LG 6: Integrative–Complete Ratio Analysis**

Ratio Analysis  
Sterling Company

Ratio	Actual	Actual	Actual	Industry	TS: Time-series CS: Cross-sectional
	<u>2001</u>	<u>2002</u>	<u>2003</u>	Average <u>2003</u>	
Current ratio	1.40	1.55	1.67	1.85	TS: Improving CS: Fair
Quick ratio	1.00	.92	.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	28.8 days	35 days	TS: Improving CS: Good

Ratio	Actual	Actual	Actual	Industry	TS: Time-series CS: Cross-sectional
	<u>2001</u>	<u>2002</u>	<u>2003</u>	Average <u>2003</u>	
Average payment period	58.5 days	60.8 days	52.3 days	45.8 days	TS: Unstable CS: Poor
Total asset turnover	0.74	0.80	.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

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	2001	2002	2003	2004	TS:	CS:
Operating profit margin	0.12	0.12	0.13	0.10	Improving	Good
Net profit margin	0.067	0.067	0.066	0.058	Stable	Good
Return on total assets (ROA)	0.049	0.054	0.055	0.043	Improving	Good
Return on common Equity (ROE)	0.066	0.073	0.085	0.072	Improving	Good
Earnings per share (EPS)	\$1.75	\$2.20	\$3.05	\$1.50	Improving	Good
Price/earnings (P/E)	12.0	10.5	9.0	11.2	Deteriorating	Poor
Market/book ratio (M/B)	1.20	1.05	1.16	1.10	Deteriorating	Good

**Liquidity:** Sterling Company's overall liquidity as reflected by the current ratio, net working capital, and acid-test 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 2001, although the firm is still paying more slowly than the average company.

**Debt:** The firm's debt ratios have increased from 2001 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 2002 and 2003. The P/E ratio indicates a decreasing degree of investor confidence in the firm's future earnings potential, perhaps due to the increased debt load and higher servicing requirements.

**Market:** The firm's price to earnings ratio was good in 2001 but has fallen significantly over 2002 and 2003. The ratio is well below industry average. The market to book ratio initially showed signs of weakness in 2002 but recovered some strength in 2003. The markets 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.

**2-22 LG 6: Dupont System of Analysis**

**a.**

<u>2003</u>	Margin(%)	x	Turnover	=	ROA(%)	x	FL Multiple	=	ROE(%)
Johnson	4.9	x	2.34	=	11.47	x	1.85	=	21.21
Industry	4.1	x	2.15	=	8.82	x	1.64	=	14.46

2002

Johnson	5.8	x	2.18	=	12.64	x	1.75	=	22.13
Industry	4.7	x	2.13	=	10.01	x	1.69	=	16.92

2001

Johnson	5.9	x	2.11	=	12.45	x	1.75	=	21.79
Industry	5.4	x	2.05	=	11.07	x	1.67	=	18.49

**b. Profitability:** Industry net profit margins are decreasing; Johnson's net profit margins have fallen less.

**Efficiency:** Both industry's and Johnson's asset turnover have increased.

**Leverage:** Only Johnson shows an increase in leverage from 2002 to 2003, while the industry has had less stability. Between 2001 and 2002, leverage for the industry increased, while it decreased between 2002 and 2003.

As a result of these changes, the ROE has fallen for both Johnson and the industry, but Johnson has experienced a much smaller decline in its ROE.

**c.** Areas which require further analysis are profitability and debt. Since the total asset turnover is increasing and is superior to that of the industry, Johnson is generating an appropriate sales level for the given level of assets. But why is the net profit margin falling for both industry and Johnson? Has there been increased competition causing downward pressure on prices? Is the cost of raw materials, labor, or other expenses rising? A common-size income statement could be useful in determining the cause of the falling net profit margin.

Note: Some management teams attempt to magnify returns through the use of leverage to offset declining margins. This strategy is effective only within a narrow range. A high leverage strategy may actually result in a decline in stock price due to the increased risk.

**2-23 LG 6: Complete Ratio Analysis, Recognizing Significant Differences**

**a.**

Home Health, Inc.

Ratio	2002	2003	Difference	Proportional Difference
Current ratio	3.25	3.00	.25	7.69%
Quick ratio	2.50	2.20	.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	-.60	-42.86%
Debt ratio	.45	.62	-.17	-37.78%
Times interest earned	4.00	3.85	.15	3.75%

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Gross profit margin	68%	65%	3%	4.41%
Operating profit margin	14%	16%	-2%	-14.29%
Net profit margin	8.3%	8.1%	.2%	2.41%
Return on total assets	11.6%	16.2%	-4.6%	-39.65%
Return on common 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%

**b.**

Ratio	Proportional Difference	Company's favor
Quick ratio	12.00%	Yes
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	-39.65%	Yes
Return on equity	-101.90%	Yes
Market/book ratio	10.71	Yes

**c.** The most obvious relationship is associated with the increase in the Return on equity value. The increase in this ratio is connected with the increase in the 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.

## Chapter 2 Case

### Assessing Martin Manufacturing's Current Financial Position

Martin Manufacturing Company is an integrative 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.

**a. Ratio Calculations**

Financial Ratio	2003
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)	$\$805,556 \div (\$5,075,000 \div 360) = 57$
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	$\$36,000 \div \$1,343,750 = 2.7\%$

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Historical Ratios

Martin Manufacturing Company

Ratio	Actual 2001	Actual 2002	Actual 2003	Industry Average
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	57	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	0.89	1.2

- b. 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 unfavorable 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 minimize 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.

**Profitability:** The gross profit margin is stable and quite favorable 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 common stock 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.

- c.** 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.