

CHAPTER 14

DISCUSSION QUESTIONS

1. One purpose of financial statement analysis is to evaluate the performance of a company with an eye toward identifying problem areas. Another purpose of financial statement analysis is to use the past performance of a company to predict how it will do in the future.
2. Disagree. An analysis of a company's financial ratios usually does not provide detailed information about what the causes of a company's problems are, but it does identify areas in which more detailed data should be gathered.
3. The usefulness of financial ratios is greatly enhanced when they are compared with past values for the same company and with values for other firms in the same industry.
4. A vertical financial statement is a financial statement with all numbers for a given year divided by sales for the year. Thus, all amounts for a given year are shown as a percentage of sales for that year. A horizontal financial statement determine whether the specific figures on the financial statements change by comparing the amount with the base period amount. Vertical financial statements make it possible to make comparisons even when the size of companies is different. In addition, vertical financial statements allow comparison of a company's numbers to equivalent numbers in prior years when the sales level may have been much different. Horizontal financial statement can capture the trend of financial data of a company
5. If an analysis of vertical financial statements suggests that a company has problems, the way to find out what is causing these problems is to gather information from outside the financial statements—ask management, read press releases, talk to financial analysts who follow the firm, read industry newsletters, and dig into the notes to the financial statements.
6. The most informative section of the common-size balance sheet is the asset section. This section can be used to determine how efficiently a company is using its assets.
7. Current ratio is a measure of a company's liquidity, which is the company's ability to pay its debts in the short run.
8. The inventory turnover ratio indicates how long inventory is being held before it is sold. Holding other things constant, the inventory turnover ratio can provide a preliminary indication of how well the organization is managing its inventory.
9. Fixed asset turnover is computed as sales divided by average property, plant, and equipment (fixed assets) and is interpreted as the number of dollars in sales generated by each dollar of fixed assets.
10. The debt-to-equity ratio is calculated by dividing total liabilities by total equity. It reflects the amount of a company's borrowing relative to its stockholder investment.
11. From the standpoint of a lender, a high times interest earned ratio is more attractive than a low times interest earned ratio. The magnitude of the times interest earned ratio indicates how much cushion a company has in making its interest payments; the higher the ratio, the less likely the company will be unable to make its interest payments.
12. It is impossible to tell whether Company A's return on sales of 6% is high or low. The return on sales value must be analyzed in light of the appropriate industry. For example, a normal return on sales for supermarkets is around 1% or 2%, whereas the return on sales for a high-tech company such as Microsoft can be in excess of 20%.
13. The price-earnings ratio differs from most other financial ratios in that it is not the ratio of two financial statement numbers. Instead, the PE ratio is a comparison of a financial statement number to a market value number.
14. The requirement that companies provide a cash flow statement is relatively recent. Because of this, cash flow ratios often do not get the emphasis they deserve in financial analysis models.

15. Accrual accounting involves making assumptions in order to adjust the raw cash flow data into a better measure of economic performance called net income. For companies entering phases where it is critical that reported earnings look good, such as a firm that is preparing to make an application for a large loan, those accounting assumptions and adjustments can be stretched. Accordingly, cash flow from operations, which is not impacted by accrual assumptions, provides an excellent reality check for reported earnings.
16. When the value of a company's cash flow adequacy ratio is less than one, that company is not generating enough cash from operations to pay for all new plant and equipment purchases. Accordingly, the company has no cash left over to repay loans or to distribute to investors.
17. The DuPont framework provides a systematic approach to identifying general factors causing ROE to deviate from normal. The DuPont system also provides a framework for computation of financial ratios to yield more in-depth analysis of a company's areas of strength and weakness.
18. With the DuPont framework, ROE is broken out into three components—profitability, efficiency, and leverage. The ratios summarizing a company's performance in each area are as follows:
 - *Profitability:* Return on sales = Net income/ Net Sales
 - *Efficiency:* Asset turnover = Net Sales/Average Total Assets
 - *Leverage:* Assets-to-equity ratio = Average Total Assets/ Average Total Equity
19. If a DuPont analysis suggests problems in any of the three ROE components, further ratios, specific to each area, can be computed to shed more light on the exact nature of the problem. For example, a common-size income statement can shed further light on the cause of a profitability problem.
20. Comparability among financial statements is reduced when companies classify items differently in the financial statements and when companies use different accounting practices. In addition, when a company is composed of a variety of divisions, each operating in a different line of business, it is difficult to find appropriate industry comparison values with which to benchmark the company's ratios.
21. One danger in focusing a financial analysis solely on the data found in the historical financial statements is that one might then tend to focus on the company's past performance and ignore current-year information.

PRACTICE EXERCISES

PE 14–1 (LO1) What Is a Financial Ratio?

The correct answer is B.

PE 14–2 (LO1) Usefulness of Financial Ratios

The correct answer is C.

PE 14–3 (LO2) Vertical Analysis of Statement of Comprehensive Income

| | | |
|----------------------------------|------------------------|---------------------|
| Sales..... | \$150,000 | 100.0% |
| Cost of goods sold..... | <u>80,000</u> | <u>53.3</u> |
| Gross profit..... | <u>\$70,000</u> | <u>46.7%</u> |
| Operating expenses: | | |
| Sales and marketing | \$6,000 | 4.0% |
| General and administrative | <u>16,000</u> | <u>10.7</u> |
| Total operating expenses | <u>22,000</u> | <u>14.7</u> |
| Operating income..... | <u>\$48,000</u> | <u>32.0%</u> |
| Interest expense..... | <u>8,000</u> | <u>5.3</u> |
| Income before income taxes | <u>\$40,000</u> | <u>26.7%</u> |
| Income tax expense | <u>7,000</u> | <u>4.7</u> |
| Net income..... | <u><u>\$33,000</u></u> | <u><u>22.0%</u></u> |

PE 14–4 (LO2) Vertical and Horizontal Analyses of Statement of Comprehensive Income

| | Year 2 | | Year 1 | |
|---|------------------|-----------------|-----------------|---------------|
| | Amount | % | Amount | % |
| Sales..... | \$100,000 | 100.0% | \$80,000 | 100.0% |
| Cost of goods sold..... | 70,000 | 70.0 | 50,000 | 62.5 |
| Gross profit | \$ 30,000 | 30.0% | \$30,000 | 37.5% |
| Operating expenses..... | 25,000 | 25.0 | 20,000 | 25.0 |
| Operating income..... | \$ 5,000 | 5.0% | \$10,000 | 12.5% |
| Interest expense..... | 2,000 | 2.0 | 2,000 | 2.5 |
| Income before income taxes | \$ 3,000 | 3.0% | \$ 8,000 | 10.0% |
| Income tax expense | 1,200 | 1.2 | 2,400 | 3.0 |
| Net income..... | \$ 1,800 | 1.8% | \$ 5,600 | 7.0% |
| | Year 2 | Year 1 | | |
| | | | Amount | % |
| Sales..... | \$100,000 | \$80,000 | \$20,000 | 25 |
| Cost of goods sold..... | 70,000 | 50,000 | 20,000 | 40 |
| Gross profit | \$ 30,000 | \$30,000 | 0 | 0 |
| Operating expenses..... | 25,000 | 20,000 | 5,000 | 25 |
| Operating income..... | \$ 5,000 | \$10,000 | (5,000) | (50) |
| Interest expense..... | 2,000 | 2,000 | 0 | 0 |
| Income before income taxes | \$ 3,000 | \$ 8,000 | (5,000) | (62.5) |
| Income tax expense | 1,200 | 2,400 | (1,200) | (50) |
| Net income..... | \$ 1,800 | \$ 5,600 | (3,800) | (67.9) |

3. The main reason for the decline in the return on sales from 7.0% in year 1 to 1.8% in year 2 is the decline in the gross profit as a percentage of sales, from 37.5% in year 1 to 30.0% in year 2. Interest expense as a percentage of sales actually declined in year 2; it appears that the company was able to increase its sales (from \$80,000 to \$100,000) without borrowing any additional money. Income tax expense as a percentage of sales also declined in year 2, but this news is not as good as it first appears. The reason that income tax expense is down is that income before income taxes is down. You may note that the income tax rate (income tax expense divided by income before income taxes) actually increases in year 2—from 30% in year 1 (\$2,400/\$8,000) to 40% in year 2 (\$1,200/\$3,000).

PE 14–5 (LO2) Vertical Analysis of Balance Sheet

| | Assets | |
|----------------------------------|-----------------|-------------|
| Current assets: | | |
| Cash | \$ 2,400 | 8.2% |
| Accounts receivable | 4,650 | 15.8 |
| Inventory..... | 3,000 | 10.2 |

| | | |
|---|------------------------|----------------------|
| Total current assets | \$10,050 | 34.2% |
| Property, plant, and equipment (net)..... | 16,500 | 56.1 |
| Goodwill | 2,850 | 9.7 |
| Total assets | <u>\$29,400</u> | <u>100.0%</u> |
| Liabilities and Equity | | |
| Current liabilities: | | |
| Accounts payable | \$ 3,600 | 12.2% |
| Unearned revenue..... | 1,900 | 6.5 |
| Total current liabilities | <u>\$5,500</u> | <u>18.7%</u> |
| Long-term debt..... | <u>9,000</u> | <u>30.6</u> |
| Total liabilities | <u>\$14,500</u> | <u>49.3%</u> |
| Capital stock..... | 7,500 | 25.5 |
| Retained earnings | 7,400 | 25.2 |
| Total liabilities and equity | <u>\$29,400</u> | <u>100.0%</u> |

PE 14–6 (LO3) Financial Ratios Defined

- Debt ratio = Total liabilities / Total assets
- Current ratio = Current assets / Current liabilities
- Return on sales = Net income / Net sales
- Asset turnover = Net sales / Average total assets
- Return on equity = (Net income – preference dividends) / Average total equity
- Price-earnings ratio = Market values of shares / Net income
- Acid-test (quick) ratio = (Cash + short-term investments + receivables (net)) / Current liabilities

PE 14–7 (LO3) Debt Ratio

Debt ratio: Total liabilities / Total assets = \$84,800 / \$182,400 = 4.6%

Total liabilities = \$7,000 + \$10,400 + \$3,400 + \$64,000 = \$84,800

Total assets = \$4,200 + \$12,000 + \$8,200 + \$28,000 + \$130,000 = \$182,400

PE 14–8 (LO3) Current Ratio

Current ratio = Current assets / Current liabilities = \$24,400 / \$20,800 = 1.17

Current assets = \$4,200 + \$12,000 + \$8,200 = \$24,400

Current liabilities = \$7,000 + \$10,400 + \$3,400 = \$20,800

PE 14–9 (LO3) Return on Sales

Return on sales = Net income / Net sales = \$20,000 / \$210,000 = 9.5%

PE 14–10 (LO3) Asset Turnover

Asset turnover = Net sales / Average total assets = \$210,000 / \$211,200 = 0.99

Average total assets = (\$182,400 + \$240,000) / 2 = \$211,200

PE 14–11 (LO3) Return on Equity

**Return on equity = (Net income – preference dividends) / Average total equity
= (\$20,000 – 0) / \$106,000 = 18.9%**

Average total equity = (\$96,600 + \$115,400) / 2 = \$106,000

PE 14–12 (LO3) Price-Earnings Ratio

PE ratio = Market values of shares / Net income = \$206,000 / \$20,000 = 10.3

PE 14–13 (LO3) Acid-Test (Quick) Ratio

Acid-test ratio = (Cash + short-term investments + receivables (net)) / Current liabilities = (\$4,200 + 0 + \$12,000) / \$21,800 = 0.74

PE 14–14 (LO3) Accounts Receivable Turnover

$$\begin{aligned} \text{A/R turnover} &= \frac{\text{Sales revenue}}{\text{Average accounts receivable}} \\ &= \frac{\$1,300,000}{(\$104,000 + \$120,000)/2} = 11.61 \text{ times} \end{aligned}$$

PE 14–15 (LO3) Average Collection Period

$$\text{Average collection period} = \frac{365}{\text{Accounts receivable turnover}} = \frac{365}{11.61^*} = 31.4 \text{ days}$$

*The accounts receivable turnover of 11.61 was calculated in PE 14–14 by dividing sales by the average accounts receivable.

PE 14–16 (LO3) Inventory Turnover

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}} = \frac{\$171,000}{(\$37,000 + \$41,000)/2} = 4.38 \text{ times}$$

PE 14–17 (LO3) Number of Days' Sales in Inventory

$$\text{Number of days' sales in inventory} = \frac{365}{\text{Inventory turnover}} = \frac{365}{4.38^*} = 83.3 \text{ days}$$

*For computation of inventory turnover, refer to PE 14–16.

PE 14–18 (LO3) Fixed Asset Turnover

$$\begin{aligned}\text{Fixed asset turnover} &= \frac{\text{Sales}}{\text{Average fixed assets}} \\ &= \frac{\$1,520,000}{(\$680,000 + \$600,000)/2} = 2.38 \text{ times}\end{aligned}$$

PE 14–19 (LO3) Debt Ratio

$$\text{Debt ratio} = \frac{\text{Total liabilities}}{\text{Total assets}} = \frac{\$123,750}{\$271,425} = 45.6\%$$

PE 14–20 (LO3) Debt-to-Equity Ratio

$$\text{Debt-to-equity ratio} = \text{Total liabilities / Total equity} = \frac{\$123,750}{\$147,675^*} = 0.838$$

*Total equity = Total assets – Total liabilities (\$5271,425 – \$123,750 = \$147,675).

PE 14–21 (LO3) Times Interest Earned Ratio

$$\text{Times interest earned ratio} = \frac{\text{Income before interest and taxes}}{\text{Annual interest expense}} = \frac{\$31,015}{\$2,602}$$

=11.92 times

PE 14–22 (LO3) Earnings Per Share

$$\text{EPS} = (\text{Net income} - \text{preference dividends}) / \text{Weighted-average common shares outstanding} = (\$37,500 - \$1,500) / 18,000 = \$2$$

PE 14–23 (LO3) When Operating Cash Flow Information Is Particularly Valuable

The correct answer is D.

- a. True. A company preparing for an initial public offering will work hard to make earnings look good, and cash flow data can provide a good reality check for such companies.
- b. True. A company experiencing rapid growth may have large earnings but have difficulty paying short-term obligations.
- c. True. Large noncash expenses can provide a worse-than-justified picture of a company, so cash flow data can show the company's ability to continue to thrive in the short term despite the negative earnings.
- d. False. For a company with high asset turnover (or low asset turnover, for that matter), there is no reason to think that net income won't give an accurate reflection of economic performance.
- e. True. Same rationale as (a).

PE 14–24 (LO3) Cash Flow-to-Net Income Ratio

| | |
|----------------------------|------------------|
| Total revenues | \$ 600,000 |
| Cash expenses | (230,000) |
| Noncash expenses..... | (320,000) |
| Net income..... | <u>\$ 50,000</u> |
| Cash from operations | \$ 70,000 |

$$\text{Cash-flow-to-net-income ratio} = \frac{\text{Cash from operations}}{\text{Net income}} = \frac{\$70,000}{\$50,000} = 1.4$$

PE 14–25 (LO3) Cash Flow Adequacy Ratio

$$\text{Cash flow adequacy ratio} = \frac{\text{Cash from operations}}{\text{Cash paid for capital expenditures}}$$

$$= \frac{\$70,000}{\$120,000} = 0.58$$

PE 14–26 (LO4) DuPont Framework Defined

1. **Return on equity = Profitability × Efficiency × Leverage**

= Return on sales × Asset turnover × Assets-to-equity ratio

= (Net income / Net sales) × (Net sales / Average total assets) × (Average total asset / Average total equity)

2. a. ***Return on sales*** is the number of pennies in profit generated from each dollar of sales.
- b. ***Asset turnover*** is the number of dollars in sales generated by each dollar of assets.
- c. ***Assets-to-equity ratio*** is the number of dollars of assets acquired for each dollar invested by stockholders.

PE 14–27 (LO4) Computation of Return on Equity Using the DuPont Framework

Return on sales × Asset turnover × Assets-to-equity ratio = Return on equity

| | | | | | | | |
|---------|-------|---|------|---|------|---|-------|
| Year 3: | 20.7% | × | 0.64 | × | 1.12 | = | 14.8% |
| Year 2: | 19.6% | × | 0.61 | × | 1.08 | = | 13.0% |
| Year 1: | 18.9% | × | 0.56 | × | 1.07 | = | 11.3% |

PE 14–28 (LO4) Analysis of Return on Equity Using the DuPont Framework

Overall, the company's return on equity increased from 11.3% in year 1 to 14.8% in year 3 (see the solution to PE 14–27). The profitability of the company, as measured by return on sales, increased from year 1 to year 3. In year 1, each dollar of sales generated 19 cents of profit, and by year 3 each dollar of sales generated 21 cents of profit. In addition to profitability, efficiency, as measured by asset turnover, increased from 0.56 in year 1 to 0.64 in year 3. An increase in asset turnover indicates an increase in the number of dollars in sales generated by each dollar of assets; or, stated differently, the company is using its assets more efficiently to generate sales. The company's leverage, as measured by the assets-to-equity ratio, also increased from 1.07 in year 1 to 1.12 in year 3, meaning that by year 3 the company had put into use \$1.12 in assets for every dollar invested

by stockholders. Of course, these observations indicate only the areas in which to ask questions with respect to understanding the company's improvement in performance.

PE 14–29 (LO5) Potential Pitfalls of Financial Statement Analysis

The correct answer is E.

- a. False. Although the financial statements can summarize many aspects of a company's business, the financial statements can certainly not summarize *all* aspects of business.
- b. False. Companies have some leeway in exactly how they classify items in their financial statements. As such, financial statements for different companies can often be very difficult to compare.
- c. False. Most companies that have problems have a host of small problems rather than one big, easily identified problem.
- d. False. Although ratio analysis can help provide a good overview of the company, it is not a substitute for current-year information on the company.
- e. True. Financial statement analysis is the starting point for determining the financial health of a company, and it should be followed by further investigation into current trends of a company.

EXERCISES

E 14–1(LO2) Vertical and Horizontal Analyses of Statement of Comprehensive Income

1.

| | <u>2018</u> | <u>%</u> | <u>2017</u> | <u>%</u> |
|------------------------------------|--------------------------|---------------------|--------------------------|---------------------|
| Sales..... | \$1,770,000 | 100.0 | \$1,090,000 | 100.0 |
| Cost of goods sold..... | <u>(1,140,000)</u> | <u>(64.4)</u> | <u>(610,000)</u> | <u>(56.0)</u> |
| Gross profit on sales | \$ 630,000 | 35.6 | \$ 480,000 | 44.0 |
| Selling and general expenses | <u>(212,000)</u> | <u>(12.0)</u> | <u>(168,000)</u> | <u>(15.4)</u> |
| Operating income..... | \$ 418,000 | 23.6 | \$ 312,000 | 28.6 |
| Interest expense..... | <u>(70,000)</u> | <u>(4.0)</u> | <u>(40,000)</u> | <u>(3.7)</u> |
| Income before income tax..... | \$ 348,000 | 19.7* | \$ 272,000 | 25.0* |
| Income tax expense | <u>(104,000)</u> | <u>(5.9)</u> | <u>(82,000)</u> | <u>(7.5)</u> |
| Net income..... | <u><u>\$ 244,000</u></u> | <u><u>13.8*</u></u> | <u><u>\$ 190,000</u></u> | <u><u>17.4*</u></u> |

*Difference due to rounding.

2.

| | <u>2018</u> | <u>2017</u> | <u>Amount</u> | <u>%</u> |
|------------------------------------|--------------------------|--------------------------|-------------------------|--------------------|
| | | | <u>Change</u> | <u>Change</u> |
| Sales..... | \$1,770,000 | \$1,090,000 | \$340,000 | 62.4 |
| Cost of goods sold..... | <u>(1,140,000)</u> | <u>(610,000)</u> | <u>(530,000)</u> | 86.9 |
| Gross profit on sales | \$ 630,000 | \$ 480,000 | \$ 150,000 | 31.3 |
| Selling and general expenses | <u>(212,000)</u> | <u>(168,000)</u> | <u>(44,000)</u> | 26.2 |
| Operating income..... | \$ 418,000 | \$ 312,000 | 106,000 | 34.0 |
| Interest expense..... | <u>(70,000)</u> | <u>(40,000)</u> | <u>(30,000)</u> | 75.0 |
| Income before income tax..... | \$ 348,000 | \$ 272,000 | 76,000 | 28.0 |
| Income tax expense | <u>(104,000)</u> | <u>(82,000)</u> | <u>(22,000)</u> | 26.8 |
| Net income..... | <u><u>\$ 244,000</u></u> | <u><u>\$ 190,000</u></u> | <u><u>\$ 54,000</u></u> | <u><u>28.4</u></u> |

3. Return on sales for Queen Engineering in 2018 is 13.8% compared to 17.4% in 2017. The cause of the decrease in the return on sales is that cost of goods sold as a percentage of sales is much higher in 2018 (64.4%) compared to 2017 (56.0%). This increase is partially offset by lower selling and general expenses, and lower income tax expense in 2018.

E 14–2 (LO2) Vertical Analysis of Balance Sheet

| | <u>2018</u> | <u>%</u> | <u>2017</u> | <u>%</u> |
|--------------------------------------|-------------------|--------------|------------------|--------------|
| Cash | \$ 68,000 | 14.4 | \$ 50,000 | 16.7 |
| Accounts receivable | 86,000 | 18.2 | 80,000 | 26.7 |
| Inventories | 136,000 | 28.8 | 60,000 | 20.0 |
| Property, plant, and equipment | 182,000 | 38.6 | 110,000 | 36.7 |
| Total assets | <u>\$ 472,000</u> | <u>100.0</u> | <u>\$300,000</u> | <u>100.0</u> |

E 14–3 (LO2) Vertical and Horizontal Analyses of Statement of Comprehensive Income
1. Vertical analysis

| | <u>2018</u> | <u>%</u> | <u>2017</u> | <u>%</u> |
|-----------------------------------|-------------------|--------------|-----------------|--------------|
| Sales..... | \$800,000 | 100.0 | \$450,000 | 100.0 |
| Cost of goods sold..... | 510,000 | 63.8 | 240,000 | 53.3 |
| Gross profit | \$ 290,000 | 36.3* | \$210,000 | 46.7 |
| Selling and admin. expenses | 100,000 | 12.5 | 80,000 | 17.8 |
| Operating income..... | \$ 190,000 | 23.8 | \$130,000 | 28.9 |
| Interest expense..... | 40,000 | 5.0 | 30,000 | 6.7 |
| Income before taxes..... | \$ 150,000 | 18.8 | \$100,000 | 22.2 |
| Income tax expense | 45,000 | 5.6 | 30,000 | 6.7 |
| Net income | <u>\$ 105,000</u> | <u>13.1*</u> | <u>\$70,000</u> | <u>15.6*</u> |

*Difference due to rounding.

Horizontal analysis

| | <u>2018</u> | <u>2017</u> | <u>Amount Change</u> | <u>% Change</u> |
|-----------------------------------|-------------------|-----------------|----------------------|-----------------|
| Sales..... | \$800,000 | \$ 450,000 | \$350,000 | 77.8 |
| Cost of goods sold..... | 510,000 | 240,000 | 270,000 | 112.5 |
| Gross profit | \$ 290,000 | \$210,000 | \$80,000 | 38.1 |
| Selling and admin. expenses | 100,000 | 80,000 | 20,000 | 25.0 |
| Operating income..... | \$ 190,000 | \$130,000 | \$60,000 | 46.2 |
| Interest expense..... | 40,000 | 30,000 | 10,000 | 33.3 |
| Income before taxes..... | \$ 150,000 | \$100,000 | \$50,000 | 50.0 |
| Income tax expense | 45,000 | 30,000 | \$15,000 | 50.0 |
| Net income | <u>\$ 105,000</u> | <u>\$70,000</u> | <u>\$ 35,000</u> | <u>50.0</u> |

2. The profit margin for Candy in 2018 is 13.1% compared to 15.6% in 2017. The cause of the decrease in the profit margin is that cost of goods sold as a percentage of sales is much higher in 2018 (63.8%) than in 2017 (53.3%). This increase is partially offset by lower (as a percentage of sales) selling and

administrative expenses, lower interest expense, and lower income tax expense in 2018.

E 14–4 (LO2) Statement of Comprehensive Income Analysis

1. Gross profit = Sales × Gross profit percentage
= \$1,000,000 × 25%
= \$250,000

Cost of goods sold = Sales – Gross profit
= \$1,000,000 – \$250,000
= \$750,000

2. Net income = Sales × Return on sales
= \$1,000,000 × 10%
= \$100,000

3. Operating expenses = Sales × 12%
= \$1,000,000 × 0.12
= \$120,000

4. Sales – Cost of goods sold – Operating expenses – Income taxes = Net income
\$1,000,000 – \$750,000 – \$120,000 – Income taxes = \$100,000
Income taxes = \$30,000

E 14–5 (LO3) Computation of Ratios

1. Debt ratio = \$102,000/\$252,000 = 40.5%

2. Current ratio = \$72,000/\$56,000 = 1.29

3. Acid-test ratio = (\$30,000 + \$42,000) / \$56,000 = 1.29

4. Return on sales = \$34,000/\$600,000 = 5.7%

5. Asset turnover = \$600,000/[(\$252,000 + \$268,000) / 2] = 2.31

6. Return on equity = (\$34,000 – 0) / [(\$150,000 + \$140,000)/2] = 23.4%

7. Price-earnings ratio = \$360,000/\$34,000 = 10.6

E 14–6 (LO3) Ratios and Computing Missing Values

b. Current ratio = Total current assets/Total current liabilities
1.2 = (b)/\$160,000; (b) = \$192,000

a. Cash + Accounts receivable = Total current assets
(a) + \$110,000 = \$192,000; (a) = \$82,000

c. Total assets = Current assets + Long-term assets

- (c) = \$192,000 + \$70,000 + \$240,000 = \$502,000
- d. Total current liabilities = Accounts payable + Income taxes payable
\$160,000 = \$128,000 + (d); (d) = \$32,000
- f. Debt ratio = Total liabilities/Total assets
0.50 = (f)/\$502,000; (f) = \$251,000
- e. Total liabilities = Current liabilities + Long-term liabilities
\$251,000 = \$160,000 + (e); (e) = \$91,000
- i. Total liabilities and equity = Total assets
(i) = \$502,000
- h. Total liabilities and equity = Total liabilities + Total equity
\$502,000 = \$251,000 + (h); (h) = \$251,000
- g. Total equity = Paid-in capital + Retained earnings
\$251,000 = (g) + \$157,000; (g) = \$94,000

In order, the answers are:

- | | | |
|--------------|--------------|--------------|
| a. \$82,000 | d. \$32,000 | g. \$94,000 |
| b. \$192,000 | e. \$91,000 | h. \$251,000 |
| c. \$502,000 | f. \$251,000 | i. \$502,000 |

E 14–7 (LO3) Computations Using Ratios

1. Total assets

Debt ratio = Total liabilities/Total assets

0.40 = \$50,000/Total assets

Total assets = \$125,000

2. Sales

Asset turnover = Net sales/Average total assets

2.0 = Net sales/ [(\$125,000 + \$100,000) / 2]

Net sales = \$225,000

3. Net income

Return on sales = Net income/ Net sales

0.10 = Net income/\$225,000

Net income = \$22,500

4. Price-earnings ratio

Price-earnings ratio = Market value/Net income

Price-earnings ratio = \$300,000/\$22,500

Price-earnings ratio = 13.3

E 14–8 (LO3) Statement of Comprehensive Income and Balance Sheet Analysis

1. **Return on equity = Net income / Average total Equity**
 $\text{Return on equity} = \$144,000 / [(\$1,820,000 + \$1,900,000) / 2] = 7.7\%$
2. **The current ratio at the beginning of 2018 was 1.58, while at the end of 2018 it was 1.09. The current ratio decreased by 0.49.**
 $1.58 = \$586,000/\$370,000$ $1.09 = \$648,000/\$592,000$
3. **Given: Total liabilities + Equity = \$1,500,000**
Hence: Total assets = \$1,500,000
Given: Current assets = 40% of total assets
 $= \$1,500,000 \times 40\%$
 $= \$600,000$
(a) Given: Current ratio = 2.0
That is: (Current assets/Current liabilities) = 2.0
Current liabilities= Current assets/2.0 = \$600,000/2.0= \$300,000
(b) Given: Equity/Total liabilities= 3
Equity = $3 \times$ Total liabilities
Also: Equity + Total liabilities = \$1,500,000
Or: $3 \times$ Total liabilities + Total liabilities= \$1,500,000
Total liabilities = \$375,000
Debt ratio = $\$375,000/\$1,500,000 = 25\%$

E 14–9 (LO3) Financial Statement Analysis

The easiest way to approach this exercise is to prepare the income statement.

Jacob Company
Statement of Comprehensive Income
For the Year Ended December 31, 2018

| | |
|---|--------------------|
| Sales..... | \$1,580,000 |
| Cost of goods sold..... | 970,000 |
| Gross profit on sales..... | \$610,000 |
| Operating expenses: | |
| Other operating expenses..... | \$393,000 |
| General and administrative expenses..... | 160,000 |
| Total operating expenses | 553,000 |
| Income from operations | \$ 57,000 |
| Other expenses: | |
| Interest expense | 17,000 |
| Income before taxes..... | \$ 40,000 |
| Taxes | 16,000 |
| Net income | \$ 24,000 |

Answers to specific questions:

1. **Gross profit = \$610,000**
2. **Income from operations = \$57,000**
3. **Other operating expenses = \$393,000**
Amount needed to make total operating expenses = \$553,000
4. **Gross profit percentage = \$610,000/\$1,580,000 = 38.61%**
5. **Average total assets = \$24,000/0.04 = \$600,000**
6. **Average total equity = \$24,000/0.08 = \$300,000**
7. **Return on sales = \$24,000/\$1,580,000 = 1.52%**
8. **Income tax rate = \$16,000/\$40,000 = 40%**

E 14–10 (LO3) Accounts Receivable Efficiency**1. Accounts Receivable Turnover**

| | <u>Formula</u> | <u>Year 3</u> | <u>Year 2</u> |
|------------------------|---|---|---|
| Paul Enterprises, Inc. | $\frac{\text{Sales revenue}}{\text{Average accounts receivable}}$ | \$30,000 (\$6,000 + \$7,500)/2 = 4.44 times | \$32,000 (\$7,500 + \$7,600)/2 = 4.24 times |
| Bob, Inc. | $\frac{\text{Sales revenue}}{\text{Average accounts receivable}}$ | \$52,000 (\$17,000 + \$18,000)/2 = 2.97 times | \$44,000 (\$18,000 + \$20,000)/2 = 2.32 times |

Average collection period

| | | |
|------------------------|------------------------------|------------------------------|
| Paul Enterprises, Inc. | $365 \div 4.44 = 82.2$ days | $365 \div 4.24 = 86.1$ days |
| Bob Inc. | $365 \div 2.97 = 122.9$ days | $365 \div 2.32 = 157.3$ days |

2. Paul Enterprises, Inc., appears to be managing its accounts receivable more efficiently. Its turnover is higher and its average collection period is shorter than Boulder's.

E 14–11 (LO3) Inventory Ratios

Allen **Inventory turnover:** $\$375,000/\$27,500 = 13.64$ times
Number of days' sales in inventory: $365/13.64 = 26.8$ days

Benson **Inventory turnover:** $\$500,000/\$53,750 = 9.30$ times
Number of days' sales in inventory: $365/9.30 = 39.2$ days

Allen Computers is managing its inventory more efficiently, as shown by its higher inventory turnover and its lower days' sales in inventory.

E 14–12 (LO3) Fixed Asset Turnover

| | <u>2018</u> | <u>2017</u> |
|-----------------------------|--------------------|--------------------|
| Land..... | \$ 600,000 | \$ 560,000 |
| Buildings..... | 1,600,000 | 1,320,000 |
| Equipment..... | 300,000 | 220,000 |
| Total PP&E | \$2,500,000 | \$2,100,000 |

Fixed asset turnover = **Sales/Average fixed assets**
 $= \$6,400,000/[(\$2,500,000 + \$2,100,000)/2] = 2.78$

E 14–13 (LO3) Efficiency Ratio**1. Accounts receivable efficiency**

ExxonMobil = \$259,488/\$23,942 = 10.84 times

Chevron = \$129,925/\$14,798 = 8.78 times

2. Average collection period

ExxonMobil = 365/10.84 times = 33.67 days

Chevron = 365/8.78 times = 41.57 days

3. Inventory efficiency

ExxonMobil = \$130,003/\$16,462 = 7.90 times

Chevron = \$69,751/\$6,420 = 10.86 times

4. Number of days' sales in inventory

ExxonMobil = 365/7.90 times = 46.20 days

Chevron = 365/10.86 times = 33.61 days

5. Fixed asset turnover

ExxonMobil = \$259,488/\$252,137 = 1.03 times

Chevron = \$129,925/\$185,785 = 0.70 times

Chapter 14

E 14–14 (LO3) Leverage Ratios

1. Debt-to-equity ratio

ExxonMobil = $\$159,948 / \$176,810 = 0.90$

Chevron = $\$112,217 / \$153,886 = 0.73$

2. Debt ratio

ExxonMobil = $\$159,948 / \$336,758 = 0.47$

Chevron = $\$112,217 / \$266,103 = 0.42$

3. Times interest earned ratio

ExxonMobil = $\$22,277 / \$311 = 71.63 \text{ times}$

Chevron = $\$4,842 / \0
= -- times

E 14–15 (LO3) Cash Flow Ratios

| | <u>2018</u> | <u>2017</u> |
|---|-------------|-------------|
| 1. Cash flow-to-net income ratio..... (CFO/Net income) | 0.78 | 3.07 |
| 2. Cash flow adequacy ratio (CFO/Cash paid for purchase of fixed assets) | 0.86 | 0.96 |

E 14–16 (LO4) DuPont Framework Computations

$$\begin{aligned}\text{Return on equity} &= \text{Return on sales} \times \text{Asset turnover} \times \text{Assets-to-equity ratio} \\ &= (\$50,000 / \$500,000) \times (\$500,000 / \$300,000) \times (\$300,000 / \$135,000) \\ &= 10.0\% \quad \times \quad 1.67 \quad \times \quad 2.22 \\ &= \$50,000 / \$135,000 = 37.0\%\end{aligned}$$

$$\begin{aligned}\text{Average total assets} &= (\$280,000 + \$320,000) / 2 = \$300,000 \\ \text{Average total equity} &= (\$140,000 + \$130,000) / 2 = \$135,000\end{aligned}$$

E 14–17 (LO4) DuPont Framework

| | <u>2018</u> | <u>2017</u> |
|---------------------------------|-------------|-------------|
| 1. Return on equity..... | 63.6% | 34.0% |
| 2. Return on sales | 7.0% | 4.3% |
| 3. Asset turnover..... | 5 | 4.21 |
| 4. Assets-to-equity ratio | 1.82 | 1.90 |

E 14–18 (LO4) DuPont Framework

1.

| | <u>Frank</u> | <u>Bill</u> |
|--------------------------------------|------------------|-------------------|
| Cash | \$ 70 | \$ 250 |
| Accounts receivable | 450 | 1,370 |
| Inventory | 1,100 | 3,050 |
| Property, plant, and equipment | 900 | 3,150 |
| Total assets | <u>\$ 2,520</u> | <u>\$ 7,820</u> |
| Total assets (average)..... | \$ 3,000 | \$ 7,500 |
| Total liabilities (average) | \$ 1,875 | \$ 6,000 |
| Total equity (average) | 1,125 | 1,500 |
| Sales..... | \$6,000 | \$22,500 |
| Cost of goods sold..... | (3,825) | (16,050) |
| Wage expense | (650) | (2,100) |
| Other expenses | <u>(1,470)</u> | <u>(3,880)</u> |
| Net income..... | <u>\$ 55</u> | <u>\$ 470</u> |

| | <u>ROE</u> | <u>Return on Sales</u> | <u>Asset Turnover</u> | <u>Assets/Equity</u> |
|-------|--------------------------|--------------------------|----------------------------|---------------------------|
| Frank | 4.9% (\$55/\$1,125) | 0.9% (\$55/\$6,000) | 2.00 (\$6,000/\$3,000) | 2.67 (\$3,000/\$1,125) |
| Bill | 31.3% (\$470/\$1,500) | 2.1% (\$470/\$22,500) | 3.00 (\$22,500/\$7,500) | 5.00 (\$7,500/\$1,500) |

2. Frank's return on equity of 4.9% is lower than Bill's return on equity of 31.3% because Frank is less profitable than is Bill. Frank's return on sales is only 0.9%, compared to 2.1% for Bill, indicating that each dollar in sales is less profitable for Frank. The level of leverage for Frank and Bill is the same. Frank is also less efficient than Bill at using its assets to generate sales.

E 14–19 (LO4) DuPont Framework

| | <u>2018</u> | <u>2017</u> |
|---------------------------------|-------------|-------------|
| 1. Return on equity..... | 42.1% | 25.0% |
| 2. Profit margin..... | 5.0% | 3.3% |
| 3. Asset turnover..... | 4.44 | 3.53 |
| 4. Assets-to-equity ratio | 1.89 | 2.13 |

E 14–20 (LO4) DuPont Framework for Analyzing Financial Statements

$$\text{Profitability} \times \text{Efficiency} \times \text{Leverage} = \text{Return on equity}$$

Profit margin × Asset turnover × Assets-to-equity = Return on equity

$$(\$238,000/\$640,000) \times (\$640,000/\$900,000) \times (\$900,000/\$750,000) = \\ = 37.2\% \times 0.71 \times 1.2 = (\$238,000/\$750,000) = 31.7\%$$

E 14–21 (LO4) DuPont Framework

1. **Return on assets = Net income/ Average total assets**
 $= (\text{Net income}/\text{Net sales}) \times (\text{Net sales}/\text{Average total assets})$
= Return on sales × Asset turnover

| | <u>Return on Sales</u> | <u>Asset Turnover</u> | <u>Return on Assets</u> |
|----------------------------------|----------------------------|---------------------------|-----------------------------|
| Retail jewelry stores | 6.0% | 1.274 | 7.6% |
| Retail grocery stores..... | 1.7 | 4.630 | 7.8 |
| Electric service companies | 8.3 | 0.415 | 3.4 |
| Legal services firms..... | 10.0 | 2.945 | 29.5 |

2. **Return on equity = Net income/ Average total equity**
 $= (\text{Net income}/\text{Net sales}) \times (\text{Net sales}/\text{Average total assets})$
 $\times (\text{Average total assets}/\text{Average total equity})$
= Return on sales × Asset turnover × Assets-to-equity ratio

| | <u>Return on Sales</u> | <u>Asset Turnover</u> | <u>Assets- to- Equity</u> | <u>Return on Equity</u> |
|----------------------------------|--------------------------------|---------------------------|-----------------------------------|---------------------------------|
| Retail jewelry stores | 6.0% | 1.274 | 1.578 | 12.1% |
| Retail grocery stores..... | 1.7 | 4.630 | 1.832 | 14.4 |
| Electric service companies | 8.3 | 0.415 | 2.592 | 8.9 |
| Legal services firms..... | 10.0 | 2.945 | 1.708 | 50.3 |

E 14–22 (LO2, LO3, LO4) Comprehensive Comparison

- 1.(e) 2.(b) 3.(a) 4.(d) 5.(f) 6.(c)

E 14–23 (LO5) Pitfalls of Financial Analysis

The correct answer is D.

PROBLEMS

P 14–1 (LO2) Vertical and Horizontal Analyses of Statement of Comprehensive Income

1.

Janice Company
Vertical Statement of Comprehensive Incomes
For the Years Ended December 31, 2018 and 2017

| | 2018 | | 2017 | |
|-----------------------------------|--------------------------|--------------------|-------------------------|------------------|
| | Amount | Percent | Amount | Percent |
| Net sales | \$300,000 | 100% | \$280,000 | 100% |
| Cost of goods sold..... | <u>215,000</u> | <u>72</u> | <u>150,000</u> | <u>54</u> |
| Gross profit on sales | <u>\$85,000</u> | <u>28%</u> | <u>\$130,000</u> | <u>46%</u> |
| Selling and general expenses | <u>65,000</u> | <u>22</u> | <u>75,000</u> | <u>27</u> |
| Operating income..... | <u>\$ 20,000</u> | <u>7%*</u> | <u>\$ 55,000</u> | <u>20%*</u> |
| Interest expense..... | <u>25,000</u> | <u>8</u> | <u>22,500</u> | <u>8</u> |
| Income (loss) before income tax | <u>\$ (5,000)</u> | <u>(2)%*</u> | <u>\$ 32,500</u> | <u>12%</u> |
| Income tax (refund)..... | <u>1,500</u> | <u>(1)</u> | <u>10,000</u> | <u>4</u> |
| Net income (loss) | <u><u>\$ (3,500)</u></u> | <u><u>(1)%</u></u> | <u><u>\$ 22,500</u></u> | <u><u>8%</u></u> |

*Difference due to rounding.

Janice Company
Horizontal Statement of Comprehensive Incomes
For the Years Ended December 31, 2018 and 2017

| | 2018 | | 2017 | | Amount Change | % Change |
|-----------------------------------|--------------------------|-------------------------|--------------------------|-----------------------|------------------|-------------|
| | 2018 | 2017 | 2018 | 2017 | | |
| Net sales | \$300,000 | \$280,000 | \$ 20,000 | 7.1 | | |
| Cost of goods sold..... | <u>215,000</u> | <u>150,000</u> | <u>65,000</u> | <u>43.3</u> | | |
| Gross profit on sales | <u>\$85,000</u> | <u>\$130,000</u> | <u>(\$45,000)</u> | <u>(34.6)</u> | | |
| Selling and general expenses | <u>65,000</u> | <u>75,000</u> | <u>(10,000)</u> | <u>(13.3)</u> | | |
| Operating income..... | <u>\$ 20,000</u> | <u>\$ 55,000</u> | <u>(\$35,000)</u> | <u>(63.6)</u> | | |
| Interest expense..... | <u>25,000</u> | <u>22,500</u> | <u>2,500</u> | <u>11.1</u> | | |
| Income (loss) before income tax | <u>\$ (5,000)</u> | <u>\$32,500</u> | <u>(\$37,500)</u> | <u>(115.4)</u> | | |
| Income tax (refund)..... | <u>(1,500)</u> | <u>10,000</u> | <u>(1,1500)</u> | <u>(115.0)</u> | | |
| Net income (loss) | <u><u>\$ (3,500)</u></u> | <u><u>\$ 2,2500</u></u> | <u><u>(\$26,000)</u></u> | <u><u>(115.6)</u></u> | | |

2. Janice Company is having a severe problem with its cost of goods sold. The decrease in gross profit percentage from 46% to 28% is a significant drop. If Janelle is a manufacturing company, there may be excess spoilage or quality problems in production. As a result of the cost problem, Janelle experienced a net loss in 2018 as opposed to significant net income in 2017. A detailed examination of cost of goods sold is necessary to complete this evaluation.

P 14–2 (LO2) Vertical and Horizontal Analyses of Balance Sheet
**Hamburger Corporation
Balance Sheet
For 2018 and 2017**

| <u>Assets</u> | <u>2018</u> | <u>Percent</u> | <u>2017</u> | <u>Percent</u> | <u>Percent</u> |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|
| Plant assets | \$ 1,640 | 55% | \$1,500 | 54% | 9% |
| Current assets | 1,360 | 45% | 1,300 | 46 | 5% |
| Total assets | <u>\$3,000</u> | <u>100%</u> | <u>\$2,800</u> | <u>100%</u> | 7% |
| <u>Equity and liabilities</u> | | | | | |
| Share capital – ordinary | \$ 350 | 12% | \$280 | 10% | 25% |
| Retained earnings | 1,260 | 42 | 1,240 | 44 | 2% |
| Non-current liabilities | 240 | 8 | 160 | 6 | 50% |
| Current liabilities | <u>1,150</u> | <u>38</u> | <u>1,120</u> | <u>40</u> | <u>3%</u> |
| Total equity and liabilities | <u>\$3,000</u> | <u>100%</u> | <u>\$2,800</u> | <u>100%</u> | 7% |

P 14–3 (LO2) Vertical and Horizontal Financial Statements Analysis

1.

**Wong Company
Vertical Financial Statements
For 2018 and 2017**

| | <u>2018</u> | | <u>2017</u> | |
|------------------------------------|----------------|---------------|---------------|---------------|
| | <u>Amount</u> | <u>%</u> | <u>Amount</u> | <u>%</u> |
| Cash | \$ 28 | 2.8 | \$ 20 | 2.6 |
| Receivables | 70 | 7.0 | 54 | 7.1 |
| Inventory | 460 | 46.0 | 306 | 40.3 |
| Property, plant, and equipment .. | <u>442</u> | <u>44.2</u> | <u>380</u> | <u>50.0</u> |
| Total assets | <u>\$1,000</u> | <u>100.0</u> | <u>\$ 760</u> | <u>100.0</u> |
| | | | | |
| Accounts payable | \$ 212 | 21.2 | \$ 158 | 19.5 |
| Long-term debt..... | 323 | 43.4 | 434 | 57.1 |
| Total liabilities | <u>\$ 636</u> | <u>64.6</u> | <u>\$ 582</u> | <u>76.6</u> |
| | | | | |
| Paid-in capital..... | \$ 226 | 22.6 | \$ 100 | 13.2 |
| Retained earnings | <u>128</u> | <u>12.8</u> | <u>78</u> | <u>10.2</u> |
| Total liabilities and equity | <u>\$1,000</u> | <u>100.0</u> | <u>\$ 760</u> | <u>100.0</u> |
| | | | | |
| Sales..... | \$2,000 | 100.0 | \$1,400 | 100.0 |
| Cost of goods sold..... | (1,400) | (70.0) | (1,000) | (71.4) |
| Gross profit | \$ 600 | 30.0 | \$ 400 | 28.6 |
| Operating expenses | <u>(480)</u> | <u>(24.0)</u> | <u>(320)</u> | <u>(22.9)</u> |

| | | | | |
|---------------------------|--------------|------------|--------------|------------|
| Operating profit..... | \$ 120 | 6.0 | \$ 80 | 5.7 |
| Interest expense..... | (44) | (2.2) | (44) | (3.1) |
| Income before taxes | \$ 76 | 3.8 | \$ 36 | 2.6 |
| Income tax expense | (26) | (1.3) | (12) | (0.9) |
| Net income | <u>\$ 50</u> | <u>2.5</u> | <u>\$ 24</u> | <u>1.7</u> |

Wong Company
Horizontal Financial Statements
For 2018 and 2017

| | <u>2018</u> <u>Amount</u> | <u>2017</u> <u>Amount</u> | <u>Amount</u> <u>Change</u> | <u>%</u> <u>Change</u> |
|------------------------------------|------------------------------|------------------------------|--------------------------------|---------------------------|
| Cash | \$ 28 | \$ 20 | \$ 8 | 40.0 |
| Receivables | 70 | 54 | 16 | 29.6 |
| Inventory | 460 | 306 | 154 | 50.3 |
| Property, plant, and equipment .. | 442 | 380 | 62 | 16.3 |
| Total assets | <u>\$1,000</u> | <u>\$ 760</u> | <u>\$240</u> | <u>31.6</u> |
| Accounts payable | \$ 212 | \$ 148 | \$ 64 | 43.2 |
| Long-term debt..... | 234 | 434 | 0 | 0.0 |
| Total liabilities | <u>\$ 646</u> | <u>\$ 582</u> | <u>\$ 64</u> | <u>11.0</u> |
| Paid-in capital..... | \$ 226 | \$ 100 | \$ 126 | 126.0 |
| Retained earnings | 128 | 78 | 50 | 64.1 |
| Total liabilities and equity | <u>\$1,000</u> | <u>\$760</u> | <u>\$240</u> | <u>31.6</u> |
| Sales..... | \$2,000 | \$1,400 | \$600 | 42.9 |
| Cost of goods sold..... | (1,400) | (1,000) | (400) | 40.0 |
| Gross profit | \$ 600 | \$400 | \$200 | 50.0 |
| Operating expenses | (480) | (320) | (160) | 50.0 |
| Operating profit..... | \$ 120 | \$ 80 | \$ 40 | 50.0 |
| Interest expense..... | (44) | (44) | 0 | 0.0 |
| Income before taxes | \$ 76 | \$ 36 | \$ 40 | 111.1 |
| Income tax expense | (26) | (12) | (14) | 116.7 |
| Net income | <u>\$ 50</u> | <u>\$ 24</u> | <u>\$ 26</u> | <u>108.3</u> |

2. Wong did better in 2018 than it did in 2017. Wong is more profitable in 2018 than it was in 2017. The return on sales has increased from 1.7% to 2.5%. The primary cause of this improvement is a reduction in cost of goods sold, evidenced in the increase in the gross profit percentage from 28.6% to 30.0%. In addition, Wong financed its expansion in 2018 without any additional interest-bearing debt, lowering the interest expense as a percentage of sales.

P 14–4 (LO2)**Prepare Vertical Analysis and Comment on Profitability**

(a)

Vertical Financial Statements
For 2018 and 2017

| | Lion Company | | Billy Company | |
|-----------------------------------|---------------------|----------------|----------------------|----------------|
| | Pounds | Percent | Pounds | Percent |
| Net sales | £1,549,035 | 100.0% | £339,038 | 100.0% |
| Cost of goods sold | 1,053,345 | 68.0% | 237,325 | 70.0% |
| Gross profit | 495,690 | 32.0% | 101,713 | 30.0% |
| Operating expenses | 263,336 | 17.0% | 77,979 | 23.0% |
| Income from operations | 232,354 | 15.0% | 23,734 | 7.0% |
| Interest expense | 7,745 | .5% | 2,034 | .6% |
| Income before income taxes | 224,609 | 14.5% | 21,700 | 6.4% |
| Income tax expense | 61,960 | 4.0% | 8,476 | 2.5% |
| Net income | £ 162,649 | 10.5% | £ 13,224 | 3.9% |

(b) Lion Company appears to be more profitable. It has higher relative

gross profit, income from operations, income before taxes, and net income

Lion's return on assets of 16.6% ($\text{£162,649}/\text{£981,067}$)^a is higher than Billy's return on assets of 6.6% ($\text{£14,580}/\text{£220,400}$)^b. Also, Lion's return on ordinary shareholders' equity of 19.9% ($\text{£162,649}/\text{£817,556}$)^c is higher than Billy's return on ordinary shareholders' equity of 7.7% ($\text{£13,224}/\text{£188,914}$).^d

P 14–5 (LO3) Computing and Using Common Ratios

| | Miller | Grand |
|--|---------------|--------------|
| 1. Current ratio (Current assets/Current liabilities) | 2.50 | 1.25 |
| 2. Debt ratio (Total liabilities/Total assets) Total liabilities = Current liabilities + Long-term liabilities Total assets = Current assets + Long-term assets | 46.7% | 88.4% |

Chapter 14

| | | | |
|----|--|-------|-------|
| 3. | Return on sales (Net income/Net sales) | 2.0% | 1.2% |
| 4. | Asset turnover..... (Net sales/Average total assets) | 3.27 | 3.70 |
| 5. | Return on equity..... (Net income/ Average total equity) Total equity = Total assets – Total liabilities | 12.4% | 66.7% |
| 6. | Price-earnings ratio..... (Market value of shares/Net income) Market value = Price per share × Number of shares | 28.1 | 13.8 |
| 7. | EPS..... ((Net income – preference dividends)/weighted-average common shares outstanding) | 0.53 | 3.64 |

P 14–6 (LO3) Working Backwards Using Common Ratios

1. Return on equity = Net income/ Average total equity
= \$82,000/\$300,000
= 27.3%

2. Total assets

If debt ratio (Total liabilities/Total assets) is 80%, then the ratio (Equity/Total assets) is 20% since total assets is the sum of total liabilities and equity.

0.20 = Total equity/Total assets
0.20 = \$300,000/Total assets
Total assets = \$1,500,000

3. Net sales

Asset turnover = Net sales/ Average total assets
0.75 = Sales/\$1,500,000
Sales = \$1,125,000

4. Return on sales = Net income/ Net sales
= \$82,000/\$1,125,000
= 7.3%

5. Current ratio = Current assets/Current liabilities
Total assets = Current assets + Long-term assets
\$750,000 = Current assets + \$560,000
Current assets = \$940,000
Current ratio = \$940,000/\$270,000
= 3.48

6. Total market value of shares

PE ratio = Market value of shares/Net income
39.0 = Market value of shares/\$82,000
Market value = \$3,198,000

P 14–7 (LO3) Ratio Analysis

| Ratios | <u>2018</u> |
|---------------------------|--------------------|
| a. Current ratio | 5.2 |
| b. Debt ratio | 67.0% |
| c. Asset turnover | 1.44 |
| d. Return on sales | 9.7% |
| e. Return on equity | 43.1% |

Calculations

- | | |
|--|---|
| a. Current ratio 2018: \$538,000/\$104,000 | d. Return on sales 2018: \$90,000/\$926,000 |
| b. Debt ratio 2017: \$454,000/\$678,000 | e. Return on equity 2018: \$90,000/\$209,000 |
| c. Asset turnover 2018: \$926,000/\$642,000 | |

P 14–8(LO3) Ratio Analysis

| 1. Ratios | <u>2019</u> | <u>2018</u> |
|---------------------------|--------------------|--------------------|
| a. Current ratio | 1.36 | 0.80 |
| b. Debt ratio | 38.6% | 37.5% |
| c. Asset turnover | 3.15 | 2.67 |
| d. Return on sales | 7.4% | 6.3% |
| e. Return on equity | 37.5% | 28.0% |

Calculations

- | | |
|---|--|
| a. Current ratio 2019: \$120,000/\$88,000 2018: \$80,000/\$100,000 | d. Return on sales 2019: \$78,000/\$1,060,000 2018: \$56,000/\$896,000 |
| b. Debt ratio 2019: \$136,000/\$352,000 2018: \$120,000/\$320,000 | e. Return on equity 2019: \$78,000/\$208,000 2018: \$56,000/\$200,000 |
| c. Asset turnover 2019: \$1,060,000/\$336,000 2018: \$896,000/\$335,000 | |

2. There is improvement. Many of the ratios have improved from 2018 to 2019. In particular, both profitability and efficiency increased from 2018 to 2019, combining to increase overall return on assets. There may be some concern about the increasing amount of leverage. However, the level of debt still appears to be low.

P 14–9 (LO3) Analysis of Accounts Receivable Management

There is some cause for alarm in the data because Roger's average collection period has increased dramatically:

| | <u>2018</u> | <u>2017</u> |
|---|-------------|-------------|
| 365 | | |
| (Sales Revenue/Average Accounts Receivable) | 143.1 days | 125.1 days |

This increase in the average collection period is quite troubling and merits further investigation.

P 14–10 (LO3) Calculating and Interpreting Inventory Ratios

1.

| | <u>Inventory Turnover</u> | <u>Number of Days' Sales in Inventory</u> |
|------------------------------|---|---|
| Captain Geech Boating | $\frac{\$3,156M}{\$924M+\$1,306M/2} = 2.83 \text{ times}$ | $\frac{365}{2.83} = 129 \text{ days}$ |
| Merchant Marine | $\frac{\$2,200M}{\$240M+\$180M/2} = 10.48 \text{ times}$ | $\frac{365}{10.48} = 35 \text{ days}$ |

2. The results of the ratios show that Captain Geech Boating has more than a third of the year's inventory on hand, while Merchant Marine has just over one month's inventory on hand. Captain Geech could be holding inventory longer because it is selling expensive boats, or the company could be carrying too much inventory. Both ratios show that Merchant Marine is managing its inventory more efficiently with a smaller amount of money tied up in inventory.

P 14–11 (LO3) Fixed Asset Turnover Ratio

1.

| | 2018 | 2017 |
|-------------------------|------------------|------------------|
| Land..... | \$ 150,000 | \$ 100,000 |
| Buildings..... | 400,000 | 300,000 |
| Equipment..... | 200,000 | 150,000 |
| Total cost | \$750,000 | \$550,000 |

Fixed asset turnover: $\$4,000,000/[(\$750,000 + \$550,000)/2] = 3.08$

2. Fair value of fixed assets: Fair value of total assets – Cash – Accounts receivable – Inventory (at fair value) = Fair value of fixed assets

Note: The fair value adjustments for the inventory relate to current assets instead of long-term assets. Also, it is reasonable to assume that the fair value of cash and accounts receivable are close to their carrying amounts.

2018: $\$1,750,000 - \$20,000 - \$250,000 - \$350,000 - \$50,000 = \$1,080,000$

2017: $\$1,250,000 - \$15,000 - \$200,000 - \$250,000 - \$25,000 = \$760,000$

Fixed asset turnover: $\$2,000,000/[(\$1,080,000 + \$760,000)/2] = 2.17$

3. It is difficult to tell whether Waston is more or less efficient than Handy Corner at using its fixed assets. Based on the reported financial numbers, Waystation's fixed asset turnover is 3.08 whereas the ratio for Handy Corner is only 2.8. However, as shown in part (2), this difference may be because of a difference between book value and fair value of reported long-term assets. If Handy Corner has relatively new fixed assets, for which the book value is quite close to the fair value, then Waystation's 2.17 fixed asset turnover ratio, based on fair values, is worse than the 2.8 ratio value for Handy Corner.

P 14–12 (LO3) Computation of Debt-Related Financial Ratios

1. **Debt ratio:** (Total liabilities/Total assets) = $\$980,000/\$1,700,000 = 57.6\%$
2. **Debt-to-equity:** (Total liabilities/Total equity) = $\$980,000/\$720,000 = 1.36$
3. **Times interest earned:** (Earnings before interest and taxes/Interest)
 $\$156,000/\$100,000 = 1.56$ times
Earnings before interest and taxes is computed as **earnings before income taxes plus interest expense.**
4. Of the three ratios presented, the times interest earned ratio is probably the single most useful value in this case. This ratio shows that Walker Company is currently generating just enough operating profit to be able to pay existing interest expense, with a small cushion. This low ratio value means that there is a real chance that operating profit in future years might not be enough to cover interest expense. The other ratio values in this case can really be interpreted meaningfully only by seeing values for similar companies in the same industry.

P14-13(LO3) Computing Amounts from Financial Ratios

1. **Inventory turnover** = 3.6

$$3.6 \times \$950,000 = \text{Cost of goods sold}$$

$$\text{Cost of goods sold} = \$3,420,000.$$

2. **Accounts receivable turnover** = 8.6

$$8.6 \times \$49,750 = \text{Net sales (credit)} = \$427,850.$$

3. **Return on equity** = 20% = $\frac{\text{net income}}{(200,000+67,000+200,000+61,000)^2}$
 $.20 \times \$264,000 = \text{Net income} = \$52,800.$

4. **Return on assets** = 25% = $\frac{52,800}{\text{average assets}}$

$$\text{Average assets} = \frac{52,800}{0.25} = \$211,200$$

$$\frac{\text{total assets (Dec. 31, 2017)} + 325,000}{2} = \$211,200$$

Total assets (Dec. 31, 2017) = 97,400

P 14–14 (LO3) Cash Flow Analysis

1.

| | <u>2018</u> | <u>2017</u> |
|--|-------------|-------------|
| a. Return on sales | 8.4% | 6.9% |
| b. Return on equity | 35.2% | 21.6% |
| c. Cash flow-to-net income ratio | 1.27 | 2.74 |
| d. Cash flow adequacy ratio..... | 1.37 | 2.31 |
2. According to the traditional accrual accounting measures, Monica performed better in 2018—return on sales, assets, and equity are all higher in 2018 than in 2017. However, using the cash flow ratios, Monica performed better in 2017. From an operating cash flow perspective, Monica's performance deteriorated significantly in 2018.

P 14-15 (LO3) Computing Missing Information Using Given Financial Ratio

$$\text{Accounts receivable turnover} = 7.5 = \frac{21,000,000}{\text{average accounts receivable}}$$

$$\text{Average net accounts receivable} = \frac{21,000,000}{7.5} = €2,800,000$$

$$\text{Net accounts receivable } 12/31/18 + €2,100,000 = €5,600,000$$

$$\text{Net accounts receivable } 12/31/18 = €3,500,000$$

$$\text{Profit margin} = 15\% = 0.15 = \frac{\text{gross profit}}{21,000,000}$$

$$\text{Net income} = €21,000,000 \times .15 = €3,150,000$$

$$\text{Income before income taxes} = €3,150,000 + €1,100,000 = 4,250,000$$

$$\text{Return on assets} = 20\% = .20 = \frac{3,150,000}{\text{average assets}}$$

$$\text{Total Average assets} = €3,150,000 \div .20 = €15,750,000$$

$$\text{Total Assets (12/31/18)} = €16,500,000$$

$$\text{Total current assets} = €16,500,000 - €6,240,000 = €10,260,000$$

$$\text{Inventory} = €10,260,000 - €960,000 - €3,500,000 = €5,800,000$$

$$\text{Total liabilities and equity} = €16,500,000$$

$$\text{Total liabilities} = €16,500,000 - €6,800,000 = €9,700,000$$

$$\text{Current ratio} = 3 = \frac{10,260,000}{\text{current liability}}$$

$$\text{Current liabilities} = €10,260,000 \div 3 = $3,420,000$$

$$\text{Long-term notes payable} = €9,700,000 - $3,420,000 = €6,280,000$$

$$\text{Inventory turnover} = 3 = \frac{\text{cost of goods sold}}{(5,800,000 + 3,440,000)/2}$$

Cost of goods sold = €4,620,000 X 3 = €13,860,000

Gross profit = €21,000,000 – €13,860,000 = €7,140,000

Income from operations = €7,140,000 – €3,000,000 = €4,140,000

Interest expense = €4,140,000 – €900,000-3,150,000 = €90,000

Chapter 14
P 14–16 (LO4) DuPont Analysis

1. a. **Return on sales = Net income/Net sales**

| <u>Company A</u> | <u>Company B</u> | <u>Company C</u> |
|---------------------------------------|------------------------------------|------------------------------------|
| $\frac{\$4,800}{\$30,000} = 16.000\%$ | $\frac{\$925}{\$14,000} = 6.607\%$ | $\frac{\$180}{\$10,500} = 1.714\%$ |

- b. **Asset turnover = Net sales/Average total assets**

| | | |
|-------------------------------------|-------------------------------------|------------------------------------|
| $\frac{\$30,000}{\$77,700} = 0.386$ | $\frac{\$14,000}{\$10,750} = 1.302$ | $\frac{\$10,500}{\$1,600} = 6.563$ |
|-------------------------------------|-------------------------------------|------------------------------------|

- c. **Assets-to-equity ratio = Average total assets/ Average total equity**

| | | |
|-----------------------------------|------------------------------------|-------------------------------|
| $\frac{77,700}{\$30,500} = 2.548$ | $\frac{\$10,750}{\$5,650} = 1.903$ | $\frac{1,600}{\$845} = 1.893$ |
|-----------------------------------|------------------------------------|-------------------------------|

- d. **Return on equity = Net income/ Average total equity**

| | | |
|--------------------------------------|----------------------------------|---------------------------------|
| $\frac{\$4,800}{\$30,500} = 15.74\%$ | $\frac{925}{\$10,750} = 16.37\%$ | $\frac{\$180}{\$845} = 21.30\%$ |
|--------------------------------------|----------------------------------|---------------------------------|

2. **Interpretive Question: The large electric utility is Company A. (The large investment in assets, the low asset turnover, and high return on sales suggest Company A is the utility.)**

The large supermarket is assumed to be Company C. (Company C has a low return on sales and a high asset turnover.)

Therefore, the large department store is Company B.

P 14–17 (LO4) DuPont Analysis

1. **Return on sales = Net income/Net sales**

$$\$50 / \$2,000 = 2.5\%$$

2. **Asset turnover = Net sales/ Average total assets**

$$\$2,000 / \$880 = 2.27$$

3. **Assets-to-equity ratio = Average total assets/ Average total equity**

$$\$880 / \$266 = 3.31$$

4. **Return on equity = Net income/ Average total equity**

$$\$50 / \$266 = 18.8\%$$

ANALYTICAL ASSIGNMENTS

AA 14–1 Evaluating Alternative Investments

Discussion

This case provides an opportunity to discuss the use of financial ratios to evaluate the desirability of an investment.

Hoffman Company:

$$\begin{aligned}\text{Return on average total assets} &= \$126,000 \div \$560,000 = 22.5\% \\ \text{Return on average equity} &= \$126,000 \div \$420,000 = 30\% \\ \text{Earnings per share} &= \$126,000 \div 12,600 = \$10.00 \\ \text{Price-earnings ratio} &= \$100 \div \$10.00 = 10 \\ \text{Book-to-market ratio} &= \$420,000 \div (\$100 \times 12,600) = 0.33\end{aligned}$$

McMahon Company:

$$\begin{aligned}\text{Return on average total assets} &= \$48,750 \div \$250,000 = 19.5\% \\ \text{Return on average equity} &= \$48,750 \div \$200,000 = 24.38\% \\ \text{Earnings per share} &= \$48,750 \div 5,000 = \$9.75 \\ \text{Price-earnings ratio} &= \$78 \div \$9.75 = 8 \\ \text{Book-to-market ratio} &= \$200,000 \div (\$78 \times 5,000) = 0.51\end{aligned}$$

Hoffman Company has a higher return on equity than McMahon Company. However, if Snow purchases the Hoffman Company stock, she must pay 10 times the level of current earnings, compared to only 8 times earnings for McMahon. Of course, other factors may affect the decision, such as the existence of preferred stock, differences in dividends paid, and the nature of the two businesses.

The efficient market hypothesis suggests that historical accounting data cannot be used to predict future movement in stock prices. However, much research has shown that firms with high book-to-market ratios have higher future returns. This would suggest that Snow should purchase the shares of McMahon Company.

AA 14–2 You Decide: Could We See Enron Coming?

Judgment Call

Issues to be discussed with this question are:

1. Over time, this ratio would likely be close to zero and maybe even negative since depreciation, amortization, and some other items are added back to arrive at cash flow from operations.
2. The large, positive amounts during the first three quarters occurred because Enron was manipulating revenues and net income during the first three quarters but was moving all the losses, debt, and other problems to nonconsolidated SPEs (special-purpose entities—now called variable interest entities).
3. When all the bad things were moved out of the company, the ratio looked pretty normal for the year as a whole, when the company would be audited.

AA 14–3 Does the Bonus Plan Reward the Right Thing?

Ethics

The underlying problem here is that the bonus plan rewards the wrong thing. Investors care about the overall return on their investment, and one measure of this is return on equity. Return on sales is only one component of return on equity, but because of the bonus plan, this is the component on which management is focusing. The real solution to this problem is to redesign the bonus plan to reward managers based on return on equity, not return on sales.

But redesigning the bonus plan is not going to happen within the next two weeks, so what do you do in the meantime? You must present your findings to the chief financial officer. The last thing you should do is keep your boss in the dark about your findings. It would be embarrassing for top management if this proposal were to go forward to the board of directors as a great plan to increase return on sales, only to have one of the board members ask about the impact of the machine acquisition on total return on equity. Top managers have two weeks to decide what they should do; your responsibility is to present your findings to your boss now to give the top managers time to reevaluate the project.

At the same time that you present your return on equity calculations to the chief financial officer, you would also do well to offer some alternative plans of action. In this case, one alternative is to finance the machine acquisition with debt instead of with stockholder investment. The increased interest expense will hurt return on sales (and management bonuses), but the increased leverage may boost return on equity enough to make the project worthwhile.

SOLUTIONS TO “STOP & THINK”

Stop & Think (p. 640): Can you think of some accrual accounting adjustments that might cause a difference between net income and cash from operations?

A number of accrual accounting adjustments might cause a difference between net income and cash from operations. One of the biggest differences between these two numbers comes from the gradual accrual of depreciation expense, which is a noncash item. Prepaid expenses, unearned revenues, unrecorded receivables, and temporary differences between income tax expense and income tax liability also might cause differences between these numbers.