

Financial Statement Analysis

LEARNING OBJECTIVES

After you have mastered the material in this chapter, you will be able to:

- 1 Describe factors associated with communicating useful information.
- 2 Differentiate between horizontal and vertical analysis.
- 3 Explain ratio analysis.
- 4 Calculate ratios for assessing a company's liquidity.
- 5 Calculate ratios for assessing a company's solvency.
- 6 Calculate ratios for assessing company management's effectiveness.
- 7 Calculate ratios for assessing a company's position in the stock market.
- 8 Explain the limitations of financial statement analysis.



CHAPTER OPENING

Expressing financial statement information in the form of ratios enhances its usefulness. Ratios permit comparisons over time and among companies, highlighting similarities, differences, and trends. Proficiency with common financial statement analysis techniques benefits both internal and external users. Before beginning detailed explanations of numerous ratios and percentages, however, we consider factors relevant to communicating useful information.

The *Curious* Accountant

On May 14, 2007, **DaimlerChrysler** (DC) and **Cerberus** announced that Cerberus, a private-equity firm, was buying 80 percent of the Chrysler Group from DaimlerChrysler. The sale closed on August 3, 2007. Some analysts claimed the “sale” actually involved DaimlerChrysler paying Cerberus to take Chrysler off its hands. After the sale, DaimlerChrysler planned to rename itself Daimler AG and focus its efforts on its production of commercial trucks and its Mercedes brand of cars.

Three other groups in addition to Cerberus also made offers to buy Chrysler, but in the end Cerberus was the winner. The question some might ask is why would anyone have wanted to buy Chrysler? It had lost money in several years prior to the sale, including a \$1.6 billion loss in 2006. Additionally, like **Ford** and **GM**, it is at a costing disadvantage to its main competitors from Japan. Some analysts estimate that when all benefits are included, American car manufacturers pay an average of \$30 per hour more to their workers than do **Toyota** and **Honda**. Also, as part of the deal Cerberus agreed to assume \$18 billion of liabilities related to Chrysler’s pension and health-care commitments.

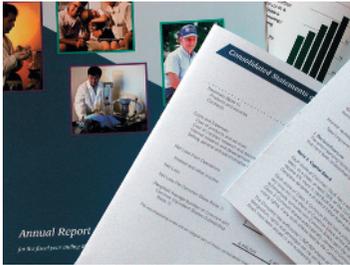
Why would Cerberus be so anxious to buy Chrysler? What types of analysis would the company use to make this decision? (Answers on page 679.)



FACTORS IN COMMUNICATING USEFUL INFORMATION

LO 1

Describe factors associated with communicating useful information.



The primary objective of accounting is to provide information useful for decision making. To provide information that supports this objective, accountants must consider the intended users, the types of decisions users make with financial statement information, and available means of analyzing the information.

The Users

Users of financial statement information include managers, creditors, stockholders, potential investors, and regulatory agencies. These individuals and organizations use financial statements for different purposes and bring varying levels of sophistication to understanding business activities. For example, investors range from private individuals who know little about financial statements to large investment brokers and institutional investors capable of using complex statistical analysis techniques. At what level of user knowledge should financial statements be aimed? Condensing and reporting complex business transactions at a level easily understood by nonprofessional investors is increasingly difficult. Current reporting standards target users that have a reasonably informed knowledge of business, though that level of sophistication is difficult to define.

The Types of Decisions

Just as the knowledge level of potential users varies, the information needs of users varies, depending on the decision at hand. A supplier considering whether or not to sell goods on account to a particular company wants to evaluate the likelihood of getting paid; a potential investor in that company wants to predict the likelihood of increases in the market value of the company's common stock. Financial statements, however, are designed for general purposes; they are not aimed at any specific user group. Some disclosed information, therefore, may be irrelevant to some users but vital to others. Users must employ different forms of analysis to identify information most relevant to a particular decision.

Financial statements can provide only highly summarized economic information. The costs to a company of providing excessively detailed information would be prohibitive. In addition, too much detail leads to **information overload**, the problem of having so much data that important information becomes obscured by trivial information. Users faced with reams of data may become so frustrated attempting to use it that they lose the value of *key* information that is provided.

Information Analysis

Because of the diversity of users, their different levels of knowledge, the varying information needs for particular decisions, and the general nature of financial statements, a variety of analysis techniques has been developed. In the following sections, we explain several common methods of analysis. The choice of method depends on which technique appears to provide the most relevant information in a given situation.

METHODS OF ANALYSIS

LO 2

Differentiate between horizontal and vertical analysis.

Financial statement analysis should focus primarily on isolating information useful for making a particular decision. The information required can take many forms but usually involves comparisons, such as comparing changes in the same item for the same company over a number of years, comparing key relationships within the same year, or comparing the operations of several different companies in the same industry. This chapter discusses three categories of analysis methods: horizontal, vertical, and ratio. Exhibits 13.1 and 13.2 present comparative financial statements for Milavec Company. We refer to these statements in the examples of analysis techniques.

EXHIBIT 13.1

MILAVEC COMPANY		
Income Statements and Statements of Retained Earnings		
For the Years Ending December 31		
	2010	2009
Sales	\$900,000	\$800,000
Cost of goods sold		
Beginning inventory	43,000	40,000
Purchases	637,000	483,000
Goods available for sale	680,000	523,000
Ending inventory	70,000	43,000
Cost of goods sold	610,000	480,000
Gross margin	290,000	320,000
Operating expenses	248,000	280,000
Income before taxes	42,000	40,000
Income taxes	17,000	18,000
Net income	25,000	22,000
Plus: Retained earnings, beginning balance	137,000	130,000
Less: Dividends	0	15,000
Retained earnings, ending balance	\$162,000	\$137,000

EXHIBIT 13.2

MILAVEC COMPANY		
Balance Sheets		
As of December 31		
	2010	2009
Assets		
Cash	\$ 20,000	\$ 17,000
Marketable securities	20,000	22,000
Notes receivable	4,000	3,000
Accounts receivable	50,000	56,000
Merchandise inventory	70,000	43,000
Prepaid expenses	4,000	4,000
Property, plant, and equipment (net)	340,000	310,000
Total assets	\$508,000	\$455,000
Liabilities and Stockholders' Equity		
Accounts payable	\$ 40,000	\$ 38,000
Salaries payable	2,000	3,000
Taxes payable	4,000	2,000
Bonds payable, 8%	100,000	100,000
Preferred stock, 6%, \$100 par, cumulative	50,000	50,000
Common stock, \$10 par	150,000	125,000
Retained earnings	162,000	137,000
Total liabilities and stockholders' equity	\$508,000	\$455,000

Horizontal Analysis

Horizontal analysis, also called **trend analysis**, refers to studying the behavior of individual financial statement items over several accounting periods. These periods may be several quarters within the same fiscal year or they may be several different years. The analysis of a given item may focus on trends in the absolute dollar amount of the item or trends in percentages. For example, a user may observe that revenue increased from one period to the next by \$42 million (an absolute dollar amount) or that it increased by a percentage such as 15 percent.

Absolute Amounts

The **absolute amounts** of particular financial statement items have many uses. Various national economic statistics, such as gross domestic product and the amount spent to replace productive capacity, are derived by combining absolute amounts reported by businesses. Financial statement users with expertise in particular industries might evaluate amounts reported for research and development costs to judge whether a company is spending excessively or conservatively. Users are particularly concerned with how amounts change over time. For example, a user might compare a pharmaceutical company's revenue before and after the patent expired on one of its drugs.

Comparing only absolute amounts has drawbacks, however, because *materiality* levels differ from company to company or even from year to year for a given company. The **materiality** of information refers to its relative importance. An item is considered material if knowledge of it would influence the decision of a reasonably informed user. Generally accepted accounting principles permit companies to account for *immaterial* items in the most convenient way, regardless of technical accounting rules. For example, companies may expense, rather than capitalize and depreciate, relatively inexpensive long-term assets like pencil sharpeners or waste baskets even if the assets have useful

lives of many years. The concept of materiality, which has both quantitative and qualitative aspects, underlies all accounting principles.

It is difficult to judge the materiality of an absolute financial statement amount without considering the size of the company reporting it. For reporting purposes, **Exxon Corporation's** financial statements are rounded to the nearest million dollars. For Exxon, a \$400,000 increase in sales is not material. For a small company, however, \$400,000 could represent total sales, a highly material amount. Meaningful comparisons between the two companies' operating performance are impossible using only absolute amounts. Users can surmount these difficulties with percentage analysis.

EXHIBIT 13.3

MILAVEC COMPANY
Comparative Income Statements
For the Years Ending December 31

	2010	2009	Percentage Difference
Sales	\$900,000	\$800,000	+12.5%*
Cost of goods sold	610,000	480,000	+27.1
Gross margin	290,000	320,000	-9.4
Operating expenses	248,000	280,000	-11.4
Income before taxes	42,000	40,000	+5.0
Income taxes	17,000	18,000	-5.6
Net income	\$ 25,000	\$ 22,000	+13.6

* $(\$900,000 - \$800,000) \div \$800,000$; all changes expressed as percentages of previous totals.

Percentage Analysis

Percentage analysis involves computing the percentage relationship between two amounts. In horizontal percentage analysis, a financial statement item is expressed as a percentage of the previous balance for the same item. Percentage analysis sidesteps the materiality problems of comparing different size companies by measuring changes in percentages rather than absolute amounts. Each change is converted to a percentage of the base year. Exhibit 13.3 presents a condensed version of Milavec's income statement with horizontal percentages for each item.

The percentage changes disclose that, even though Milavec's net income increased slightly more than sales, products may be

underpriced. Cost of goods sold increased much more than sales, resulting in a lower gross margin. Users would also want to investigate why operating expenses decreased substantially despite the increase in sales.

Whether basing their analyses on absolute amounts, percentages, or ratios, users must avoid drawing overly simplistic conclusions about the reasons for the results. Numerical relationships flag conditions requiring further study. Recall that a change that appears favorable on the surface may not necessarily be a good sign. Users must evaluate the underlying reasons for the change.

CHECK Yourself 13.1

The following information was drawn from the annual reports of two retail companies (amounts are shown in millions). One company is an upscale department store; the other is a discount store. Based on this limited information, identify which company is the upscale department store.

	Jenkins Co.	Horn's, Inc.
Sales	\$325	\$680
Cost of goods sold	130	408
Gross margin	\$195	\$272

Answer Jenkins' gross margin represents 60 percent ($\$195 \div \325) of sales. Horn's gross margin represents 40 percent ($\$272 \div \680) of sales. Since an upscale department store would have higher margins than a discount store, the data suggest that Jenkins is the upscale department store.

Answers to The *Curious* Accountant

Obviously **Cerberus** agreed to purchase **Chrysler** believing it could make a profit on its investment. In its public comments it did not explain

exactly how it planned to make the company profitable when DaimlerChrysler could not. As a private-equity company it is not obligated to make public disclosures about how well its businesses are doing or what its plans are, unlike companies whose stock is publicly traded. Many analysts believe that getting the workers to grant concessions on wages and/or benefits is essential if Cerberus is to have success with Chrysler.

Cerberus does have other opportunities to cut costs. Before buying Chrysler, Cerberus had purchased the **General Motors Acceptance Corporation** (GMAC), which finances automobiles and home mortgages. Chrysler Financial is the arm of Chrysler that also finances auto purchases, so there is the potential to merge some of its operations with GMAC, though Cerberus did not disclose any plans of doing this. Cerberus also owns some automotive parts supply companies, so the opportunity for vertical integration exists.

Cerberus' optimism about its purchase of Chrysler does not guarantee that the investment will be successful. Remember that Daimler was optimistic when it purchased Chrysler through a merger in 1998 for \$36 billion. Less than 10 years later it was sold to Cerberus for what has to be considered a substantial loss. However the deal turns out, we can be sure that Cerberus' team of analysts, lawyers, accountants, and investment bankers put thousands of hours into analyzing every aspect of the deal. But then, so did Daimler's in 1998.

The point here is that financial analysis techniques can help managers make decisions, but these tools cannot guarantee success. Before tools such as ratios and trend analysis can be used, the decision maker must understand the business being evaluated and he or she must make assumptions about future events. Only the future will tell us whether Cerberus made a wise investment in Chrysler, but we can be sure that a lot of ratio analysis and capital budgeting computations were made before the deal was done.

Sources: DaimlerChrysler's filings with the SEC; "Chrysler Deal Heralds New Direction for Detroit," *The Wall Street Journal*, May 15, 2007, pp. A-1 and A-14; and "After Pact to Shed Chrysler, Daimler Turns Focus to Other Challenges," *The Wall Street Journal*, May 15, 2007, p. A-14.

When comparing more than two periods, analysts use either of two basic approaches: (1) choosing one base year from which to calculate all increases or decreases or (2) calculating each period's percentage change from the preceding figure. For example, assume Milavec's sales for 2007 and 2008 were \$600,000 and \$750,000, respectively.

	2010	2009	2008	2007
Sales	\$900,000	\$800,000	\$750,000	\$600,000
Increase over 2007 sales	50.0%	33.3%	25.0%	—
Increase over preceding year	12.5%	6.7%	25.0%	—

Analysis discloses that Milavec's 2010 sales represented a 50 percent increase over 2007 sales, and a large increase (25 percent) occurred in 2008. From 2008 to 2009, sales increased only 6.7 percent but in the following year increased much more (12.5 percent).

Vertical Analysis

Vertical analysis uses percentages to compare individual components of financial statements to a key statement figure. Horizontal analysis compares items over many time periods; vertical analysis compares many items within the same time period.

Vertical Analysis of the Income Statement

Vertical analysis of an income statement (also called a *common size* income statement) involves converting each income statement component to a percentage of sales. Although vertical analysis suggests examining only one period, it is useful to compare common size income statements for several years. Exhibit 13.4 presents Milavec's income statements, along with vertical percentages, for 2010 and 2009. This analysis discloses that cost of goods sold increased significantly as a percentage of sales. Operating expenses and income taxes, however, decreased in relation to sales. Each of these observations indicates a need for more analysis regarding possible trends for future profits.

EXHIBIT 13.4

MILAVEC COMPANY				
Vertical Analysis of Comparative Income Statements				
	2010		2009	
	Amount	Percentage* of Sales	Amount	Percentage* of Sales
Sales	\$900,000	100.0%	\$800,000	100.0%
Cost of goods sold	610,000	67.8	480,000	60.0
Gross margin	290,000	32.2	320,000	40.0
Operating expenses	248,000	27.6	280,000	35.0
Income before taxes	42,000	4.7	40,000	5.0
Income taxes	17,000	1.9	18,000	2.3
Net income	\$ 25,000	2.8%	\$ 22,000	2.8%

*Percentages may not add exactly due to rounding.

Vertical Analysis of the Balance Sheet

Vertical analysis of the balance sheet involves converting each balance sheet component to a percentage of total assets. The vertical analysis of Milavec's balance sheets in Exhibit 13.5 discloses few large percentage changes from the preceding year. Even small individual percentage changes, however, may represent substantial dollar increases. For example, inventory constituted 9.5% of total assets in 2009 and 13.8% in 2010. While this appears to be a small increase, it actually represents a 62.8% increase in the inventory account balance ($[\$70,000 - \$43,000] \div \$43,000$) from 2009 to 2010. Careful analysis requires considering changes in both percentages *and* absolute amounts.

RATIO ANALYSIS

Ratio analysis involves studying various relationships between different items reported in a set of financial statements. For example, net earnings (net income) reported on the income statement may be compared to total assets reported on the balance sheet. Analysts calculate many different ratios for a wide variety of purposes. The remainder of this chapter is devoted to discussing some of the more commonly used ratios.

LO 3

Explain ratio analysis.

EXHIBIT 13.5

MILAVEC COMPANY				
Vertical Analysis of Comparative Balance Sheets				
	2010	Percentage* of Total	2009	Percentage* of Total
Assets				
Cash	\$ 20,000	3.9%	\$ 17,000	3.7%
Marketable securities	20,000	3.9	22,000	4.8
Notes receivable	4,000	0.8	3,000	0.7
Accounts receivable	50,000	9.8	56,000	12.3
Merchandise inventory	70,000	13.8	43,000	9.5
Prepaid expenses	4,000	0.8	4,000	0.9
Total current assets	<u>168,000</u>	<u>33.1</u>	<u>145,000</u>	<u>31.9</u>
Property, plant, and equipment	<u>340,000</u>	<u>66.9</u>	<u>310,000</u>	<u>68.1</u>
Total assets	<u>\$508,000</u>	<u>100.0%</u>	<u>\$455,000</u>	<u>100.0%</u>
Liabilities and Stockholders' Equity				
Accounts payable	\$ 40,000	7.9%	\$ 38,000	8.4%
Salaries payable	2,000	0.4	3,000	0.7
Taxes payable	4,000	0.8	2,000	0.4
Total current liabilities	<u>46,000</u>	<u>9.1</u>	<u>43,000</u>	<u>9.5</u>
Bonds payable, 8%	<u>100,000</u>	<u>19.7</u>	<u>100,000</u>	<u>22.0</u>
Total liabilities	<u>146,000</u>	<u>28.7</u>	<u>143,000</u>	<u>31.4</u>
Preferred stock 6%, \$100 par	50,000	9.8	50,000	11.0
Common stock, \$10 par	150,000	29.5	125,000	27.5
Retained earnings	<u>162,000</u>	<u>31.9</u>	<u>137,000</u>	<u>30.1</u>
Total stockholders' equity	<u>362,000</u>	<u>71.3</u>	<u>312,000</u>	<u>68.6</u>
Total liabilities and stockholders' equity	<u>\$508,000</u>	<u>100.0%</u>	<u>\$455,000</u>	<u>100.0%</u>

*Percentages may not add exactly due to rounding.

Objectives of Ratio Analysis

As suggested earlier, various users approach financial statement analysis with many different objectives. Creditors are interested in whether a company will be able to repay its debts on time. Both creditors and stockholders are concerned with how the company is financed, whether through debt, equity, or earnings. Stockholders and potential investors analyze past earnings performance and dividend policy for clues to the future value of their investments. In addition to using internally generated data to analyze operations, company managers find much information prepared for external purposes useful for examining past operations and planning future policies. Although many of these objectives are interrelated, it is convenient to group ratios into categories such as measures of debt-paying ability and measures of profitability.

MEASURES OF DEBT-PAYING ABILITY

Liquidity Ratios

Liquidity ratios indicate a company's ability to pay short-term debts. They focus on current assets and current liabilities. The examples in the following section use the financial statement information reported by Milavec Company.

LO 4

Calculate ratios for assessing a company's liquidity.

Working Capital

Working capital is current assets minus current liabilities. Current assets include assets most likely to be converted into cash in the current operating period. Current liabilities represent debts that must be satisfied in the current period. Working capital therefore measures the excess funds the company will have available for operations, excluding any new funds it generates during the year. Think of working capital as the cushion against short-term debt-paying problems. Working capital at the end of 2010 and 2009 for Milavec Company was as follows.

	2010	2009
Current assets	\$168,000	\$145,000
– Current liabilities	<u>46,000</u>	<u>43,000</u>
Working capital	<u>\$122,000</u>	<u>\$102,000</u>

Milavec's working capital increased from 2009 to 2010, but the numbers themselves say little. Whether \$122,000 is sufficient or not depends on such factors as the industry in which Milavec operates, its size, and the maturity dates of its current obligations. We can see, however, that the increase in working capital is primarily due to the increase in inventories.

Current Ratio

Working capital is an absolute amount. Its usefulness is limited by the materiality difficulties discussed earlier. It is hard to draw meaningful conclusions from comparing Milavec's working capital of \$122,000 with another company that also has working capital of \$122,000. By expressing the relationship between current assets and current liabilities as a ratio, however, we have a more useful measure of the company's debt-paying ability relative to other companies. The **current ratio**, also called the **working capital ratio**, is calculated as follows.

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

To illustrate using the current ratio for comparisons, consider Milavec's current position relative to Laroque's, a larger firm with current assets of \$500,000 and current liabilities of \$378,000.

	Milavec	Laroque
Current assets (a)	\$168,000	\$500,000
– Current liabilities (b)	<u>46,000</u>	<u>378,000</u>
Working capital	<u>\$122,000</u>	<u>\$122,000</u>
Current ratio (a ÷ b)	3.65:1	1.32:1

The current ratio is expressed as the number of dollars of current assets for each dollar of current liabilities. In the above example, both companies have the same amount of working capital. Milavec, however, appears to have a much stronger working capital position. Any conclusions from this analysis must take into account the circumstances of the particular companies; there is no single ideal current ratio that suits all companies. In recent years the average current ratio of the 30 companies that constitute the Dow Jones Industrial Average was around 1.21:1. The individual company ratios, however, ranged from .40:1 to 2.20:1. A current ratio can be too high. Money invested in factories and developing new products is usually more profitable than money held as large cash balances or invested in inventory.

Quick Ratio

The **quick ratio**, also known as the **acid-test ratio**, is a conservative variation of the current ratio. The quick ratio measures a company's *immediate* debt-paying ability. Only cash, receivables, and current marketable securities (*quick assets*) are included in the numerator. Less liquid current assets, such as inventories and prepaid expenses, are omitted. Inventories may take several months to sell; prepaid expenses reduce otherwise necessary expenditures but do not lead eventually to cash receipts. The quick ratio is computed as follows.

$$\text{Quick ratio} = \frac{\text{Quick assets}}{\text{Current liabilities}}$$

Milavec Company's current ratios and quick ratios for 2010 and 2009 follow.

	2010	2009
Current ratio	168,000 ÷ 46,000 3.65:1	145,000 ÷ 43,000 3.37:1
Quick ratio	94,000 ÷ 46,000 2.04:1	98,000 ÷ 43,000 2.28:1

The decrease in the quick ratio from 2009 to 2010 reflects both a decrease in quick assets and an increase in current liabilities. The result indicates that the company is less liquid (has less ability to pay its short-term debt) in 2010 than it was in 2009.

Accounts Receivable Ratios

Offering customers credit plays an enormous role in generating revenue, but it also increases expenses and delays cash receipts. To minimize bad debts expense and collect cash for use in current operations, companies want to collect receivables as quickly as possible without losing customers. Two relationships are often examined to assess a company's collection record: *accounts receivable turnover* and *average days to collect receivables (average collection period)*.

Accounts receivable turnover is calculated as follows.

$$\text{Accounts receivable turnover} = \frac{\text{Net credit sales}}{\text{Average accounts receivable}}$$

Net credit sales refers to total sales on account less sales discounts and returns. When most sales are credit sales or when a breakdown of total sales between cash sales and credit sales is not available, the analyst must use total sales in the numerator. The denominator is based on *net accounts receivable* (receivables after subtracting the allowance for doubtful accounts). Since the numerator represents a whole period, it is preferable to use average receivables in the denominator if possible. When comparative statements are available, the average can be based on the beginning and ending balances. Milavec Company's accounts receivable turnover is computed as follows.

	2010	2009
Net sales (assume all on account) (a)	<u>\$900,000</u>	<u>\$800,000</u>
Beginning receivables (b)	\$ 56,000	\$ 55,000*
Ending receivables (c)	<u>50,000</u>	<u>56,000</u>
Average receivables (d) = (b + c) ÷ 2	<u>\$ 53,000</u>	<u>\$ 55,500</u>
Accounts receivable turnover (a ÷ d)	16.98	14.41

*The beginning receivables balance was drawn from the 2008 financial statements, which are not included in the illustration.

The 2010 accounts receivable turnover of 16.98 indicates Milavec collected its average receivables almost 17 times that year. The higher the turnover, the faster the collections. A company can have cash flow problems and lose substantial purchasing power if resources are tied up in receivables for long periods.

Average days to collect receivables is calculated as follows.

$$\text{Average days to collect receivables} = \frac{365 \text{ days}}{\text{Accounts receivable turnover}}$$

This ratio offers another way to look at turnover by showing the number of days, on average, it takes to collect a receivable. If receivables were collected 16.98 times in 2010, the average collection period was 21 days, $365 \div 16.98$ (the number of days in the year divided by accounts receivable turnover). For 2009, it took an average of 25 days ($365 \div 14.41$) to collect a receivable.

Although the collection period improved, no other conclusions can be reached without considering the industry, Milavec's past performance, and the general economic environment. In recent years the average time to collect accounts receivable for the 25 nonfinancial companies that make up the Dow Jones Industrial Average was around 49 days. (Financial firms are excluded because, by the nature of their business, they have very long collection periods.)

Inventory Ratios

A fine line exists between having too much and too little inventory in stock. Too little inventory can result in lost sales and costly production delays. Too much inventory can use needed space, increase financing and insurance costs, and become obsolete. To help analyze how efficiently a company manages inventory, we use two ratios similar to those used in analyzing accounts receivable.

Inventory turnover indicates the number of times, on average, that inventory is totally replaced during the year. The relationship is computed as follows.

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

The average inventory is usually based on the beginning and ending balances that are shown in the financial statements. Inventory turnover for Milavec was as follows.

	2010	2009
Cost of goods sold (a)	\$610,000	\$480,000
Beginning inventory (b)	\$ 43,000	\$ 40,000*
Ending inventory (c)	70,000	43,000
Average inventory (d) = (b + c) ÷ 2	\$ 56,500	\$ 41,500
Inventory turnover (a ÷ d)	10.80	11.57

*The beginning inventory balance was drawn from the company's 2008 financial statements, which are not included in the illustration.

Generally, a higher turnover indicates that merchandise is being handled more efficiently. Trying to compare firms in different industries, however, can be misleading. Inventory turnover for grocery stores and many retail outlets is high. Because of the nature of the goods being sold, inventory turnover is much lower for appliance and jewelry stores. We look at this issue in more detail when we discuss return on investment.

Average days to sell inventory is determined by dividing the number of days in the year by the inventory turnover as follows.

$$\text{Average days to sell inventory} = \frac{365 \text{ days}}{\text{Inventory turnover}}$$

The result approximates the number of days the firm could sell inventory without purchasing more. For Milavec, this figure was 34 days in 2010 ($365 \div 10.80$) and 32 days in 2009 ($365 \div 11.57$). In recent years it took around 72 days, on average, for the companies in the Dow Jones Industrial Average that have inventory to sell their inventory. The time it took individual companies to sell their inventory varied by industry, ranging from 10 days to 292 days.

Solvency Ratios

Solvency ratios are used to analyze a company's long-term debt-paying ability and its financing structure. Creditors are concerned with a company's ability to satisfy outstanding obligations. The larger a company's liability percentage, the greater the risk that the company could fall behind or default on debt payments. Stockholders, too, are concerned about a company's solvency. If a company is unable to pay its debts, the owners could lose their investment. Each user group desires that company financing choices minimize its investment risk, whether the investment is in debt or stockholders' equity.

LO 5

Calculate ratios for assessing a company's solvency.

Debt Ratios

The following ratios represent two different ways to express the same relationship. Both are frequently used.

Debt to assets ratio. This ratio measures the percentage of a company's assets that are financed by debt.

Debt to equity ratio. As used in this ratio, *equity* means stockholders' equity. The debt to equity ratio compares creditor financing to owner financing. It is expressed as the dollar amount of liabilities for each dollar of stockholders' equity.

These ratios are calculated as follows.

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

$$\text{Debt to equity} = \frac{\text{Total liabilities}}{\text{Total stockholders' equity}}$$

Applying these formulas to Milavec Company's results produces the following.

	2010	2009
Total liabilities (a)	\$146,000	\$143,000
Total stockholders' equity (b)	362,000	312,000
Total equities (liabilities + stockholders' equity) (c)	\$508,000	\$455,000
Debt to assets (a \div c)	29%	31%
Debt to equity ratio (a \div b)	0.40:1	0.46:1

Each year less than one-third of the company's assets were financed with debt. The amount of liabilities per dollar of stockholders' equity declined by 0.06. It is difficult to judge whether the reduced percentage of liabilities is favorable. In general, a lower level of liabilities provides greater security because the likelihood of bankruptcy is reduced. Perhaps, however, the company is financially strong enough to incur more liabilities and benefit from financial leverage. The 25 nonfinancial companies that make up the Dow Jones Industrial Average report around 33 percent of their assets, on average, are financed through borrowing.

Number of Times Interest Is Earned

This ratio measures the burden a company's interest payments represent. Users often consider times interest is earned along with the debt ratios when evaluating financial risk. The numerator of this ratio uses *earnings before interest and taxes (EBIT)*, rather

than net earnings, because the amount of earnings *before* interest and income taxes is available for paying interest.

$$\text{Number of times interest is earned} = \frac{\text{Earnings before interest and taxes expense}}{\text{Interest expense}}$$

Dividing EBIT by interest expense indicates how many times the company could have made its interest payments. Obviously, interest is paid only once, but the more times it *could* be paid, the bigger the company's safety net. Although interest is paid from cash, not accrual earnings, it is standard practice to base this ratio on accrual-based EBIT, not a cash-based amount. For Milavec, this calculation is as follows.

	2010	2009
Income before taxes	\$42,000	\$40,000
Interest expense (b)	8,000	8,000*
Income before taxes and interest (a)	<u>\$50,000</u>	<u>\$48,000</u>
Times interest earned (a ÷ b)	6.25 times	6 times

*Interest on bonds: $\$100,000 \times .08 = \$8,000$.

Any expense or dividend payment can be analyzed this way. Another frequently used calculation is the number of times the preferred dividend is earned. In that case, the numerator is net income (after taxes) and the denominator is the amount of the annual preferred dividend.

CHECK Yourself 13.2

Selected data for Riverside Corporation and Academy Company follow (amounts are shown in millions).

	Riverside Corporation	Academy Company
Total liabilities (a)	\$650	\$450
Stockholders' equity (b)	300	400
Total liabilities + stockholders' equity (c)	<u>\$950</u>	<u>\$850</u>
Interest expense (d)	\$ 65	\$ 45
Income before taxes (e)	140	130
Income before taxes and interest (f)	<u>\$205</u>	<u>\$175</u>

Based on this information alone, which company would likely obtain the less favorable interest rate on additional debt financing?

Answer Interest rates vary with risk levels. Companies with less solvency (long-term debt-paying ability) generally must pay higher interest rates to obtain financing. Two solvency measures for the two companies follow. Recall:

$$\text{Total assets} = \text{Liabilities} + \text{Stockholders' equity}$$

	Riverside Corporation	Academy Company
Debt to assets ratio (a ÷ c)	68.4%	52.9%
Times interest earned (f ÷ d)	3.15 times	3.89 times

Since Riverside has a higher percentage of debt and a lower times interest earned ratio, the data suggest that Riverside is less solvent than Academy. Riverside would therefore likely have to pay a higher interest rate to obtain additional financing.

Plant Assets to Long-Term Liabilities

Companies often pledge plant assets as collateral for long-term liabilities. Financial statement users may analyze a firm's ability to obtain long-term financing on the strength of its asset base. Effective financial management principles dictate that asset purchases should be financed over a time span about equal to the expected lives of the assets. Short-term assets should be financed with short-term liabilities; the current ratio, introduced earlier, indicates how well a company manages current debt. Long-lived assets should be financed with long-term liabilities, and the *plant assets to long-term liabilities* ratio suggests how well long-term debt is managed. It is calculated as follows.

$$\text{Plant assets to long-term liabilities} = \frac{\text{Net plant assets}}{\text{Long-term liabilities}}$$

For Milavec Company, these ratios follow.

	2010	2009
Net plant assets (a)	\$340,000	\$310,000
Bonds payable (b)	100,000	100,000
Plant assets to long-term liabilities (a ÷ b)	3.4:1	3.1:1

MEASURES OF PROFITABILITY

Profitability refers to a company's ability to generate earnings. Both management and external users employ **profitability ratios** to assess a company's success in generating profits and how these profits are used to reward investors. Some of the many ratios available to measure different aspects of profitability are discussed in the following two sections.

Measures of Managerial Effectiveness

The most common ratios used to evaluate managerial effectiveness measure what percentage of sales results in earnings and how productive assets are in generating those sales. As mentioned earlier, the *absolute amount* of sales or earnings means little without also considering company size.

Net Margin (or Return on Sales)

Gross margin and *gross profit* are alternate terms for the amount remaining after subtracting the expense cost of goods sold from sales. **Net margin**, sometimes called *operating margin*, *profit margin*, or the *return on sales ratio*, describes the percent remaining of each sales dollar after subtracting other expenses as well as cost of goods sold. Net margin can be calculated in several ways; some of the more common methods only subtract normal operating expenses or all expenses other than income tax expense. For simplicity, our calculation uses net income (we subtract all expenses). Net income divided by net sales expresses net income (earnings) as a percentage of sales, as follows.

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

For Milavec Company, the net margins for 2010 and 2009 were as follows.

	2010	2009
Net income (a)	\$ 25,000	\$ 22,000
Net sales (b)	900,000	800,000
Net margin (a ÷ b)	2.78%	2.75%

LO 6

Calculate ratios for assessing company management's effectiveness.



Milavec has maintained approximately the same net margin. Obviously, the larger the percentage, the better; a meaningful interpretation, however, requires analyzing the company's history and comparing the net margin to other companies in the same industry. The average net margin for the 30 companies that make up the Dow Jones Industrial Average has been around 12 percent in recent years; some companies, such as **Pfizer** with 40 percent, have been much higher than the average. Of course, if a company has a net loss, its net margin for that year will be negative.

Asset Turnover Ratio

The **asset turnover ratio** (sometimes called *turnover of assets ratio*) measures how many sales dollars were generated for each dollar of assets invested. As with many ratios used in financial statement analysis, users may define the numerator and denominator of this ratio in different ways. For example, they may use total assets or only include operating assets. Since the numerator represents a whole period, it is preferable to use average assets in the denominator if possible, especially if the amount of assets changed significantly during the year. We use average total assets in our illustration.

$$\text{Asset turnover} = \frac{\text{Net sales}}{\text{Average total assets}}$$

For Milavec, the asset turnover ratios were as follows.

	2010	2009
Net sales (a)	<u>\$900,000</u>	<u>\$800,000</u>
Beginning assets (b)	<u>\$455,000</u>	<u>\$420,000*</u>
Ending assets (c)	<u>508,000</u>	<u>455,000</u>
Average assets (d) = (b + c) ÷ 2	<u>\$481,500</u>	<u>\$437,500</u>
Asset turnover (a ÷ d)	1.87	1.83

*The beginning asset balance was drawn from the 2008 financial statements, which are not included in the illustration.

As with most ratios, the implications of a given asset turnover ratio are affected by other considerations. Asset turnover will be high in an industry that requires only minimal investment to operate, such as real estate sales companies. On the other hand, industries that require large investments in plant and machinery, like the auto industry, are likely to have lower asset turnover ratios. The asset turnover ratios of the companies that make up the Dow Jones Industrial Average have averaged around 0.90 in recent years. This means that annual sales have averaged 90 percent of their assets.

Return on Investment

Return on investment (ROI), also called **return on assets** or *earning power*, is the ratio of wealth generated (net income) to the amount invested (average total assets) to generate the wealth. ROI can be calculated as follows.¹

$$\text{ROI} = \frac{\text{Net income}}{\text{Average total assets}}$$

¹Detailed coverage of the return on investment ratio is provided in Chapter 9. As discussed in that chapter, companies frequently manipulate the formula to improve managerial motivation and performance. For example, instead of using net income, companies frequently use operating income because net income may be affected by items that are not controllable by management such as loss on a plant closing, storm damage, and so on.

For Milavec, ROI was as follows.

2010

$$\$25,000 \div \$481,500^* = 5.19\%$$

2009

$$\$22,000 \div \$437,500^* = 5.03\%$$

*The computation of average assets is shown above.

In general, higher ROIs suggest better performance. The ROI of the large companies that make up the Dow Jones Industrial Average had averaged around 9 percent in 2007. These data suggest that Milavec is performing below average, and therefore signals a need for further evaluation that would lead to improved performance.

Return on Equity

Return on equity (ROE) is often used to measure the profitability of the stockholders' investment. ROE is usually higher than ROI because of financial leverage. Financial leverage refers to using debt financing to increase the assets available to a business beyond the amount of assets financed by owners. As long as a company's ROI exceeds its cost of borrowing (interest expense), the owners will earn a higher return on their investment in the company by using borrowed money. For example, if a company borrows money at 8 percent and invests it at 10 percent, the owners will enjoy a return that is higher than 10 percent. ROE is computed as follows.

$$\text{ROE} = \frac{\text{Net income}}{\text{Average total stockholders' equity}}$$

If the amount of stockholders' equity changes significantly during the year, it is desirable to use average equity rather than year-end equity in the denominator. The ROE figures for Milavec Company were as follows.

	2010	2009
Net income (a)	\$ 25,000	\$ 22,000
Preferred stock, 6%, \$100 par, cumulative	50,000	50,000
Common stock, \$10 par	150,000	125,000
Retained earnings	162,000	137,000
Total stockholders' equity (b)	<u>\$362,000</u>	<u>\$312,000</u>
ROE (a ÷ b)	6.9%	7.1%

The slight decrease in ROE is due primarily to the increase in common stock. The effect of the increase in total stockholders' equity offsets the effect of the increase in earnings. This information does not disclose whether Milavec had the use of the additional stockholder investment for all or part of the year. If the data are available, calculating a weighted average amount of stockholders' equity provides more meaningful results.

We mentioned earlier the companies that make up the Dow Jones Industrial Average had an average ROI of 9 percent. The average ROE for the companies in the Dow was 25 percent, indicating effective use of financial leverage.

Stock Market Ratios

Existing and potential investors in a company's stock use many common ratios to analyze and compare the earnings and dividends of different size companies in different industries. Purchasers of stock can profit in two ways: through receiving dividends and through increases in stock value. Investors consider both dividends and overall earnings performance as indicators of the value of the stock they own.

LO 7

Calculate ratios for assessing a company's position in the stock market.

Earnings per Share

Perhaps the most frequently quoted measure of earnings performance is **earnings per share (EPS)**. EPS calculations are among the most complex in accounting, and more advanced textbooks devote entire chapters to the subject. At this level, we use the following basic formula.

$$\text{Earnings per share} = \frac{\text{Net earnings available for common stock}}{\text{Average number of outstanding common shares}}$$

EPS pertains to shares of *common stock*. Limiting the numerator to earnings available for common stock eliminates the annual preferred dividend ($0.06 \times \$50,000 = \$3,000$) from the calculation. Exhibit 13.1 shows that Milavec did not pay the preferred dividends in 2010. Since the preferred stock is cumulative, however, the preferred dividend is in arrears and not available to the common stockholders. The number of common shares outstanding is determined by dividing the book value of the common stock by its par value per share ($\$150,000 \div \$10 = 15,000$ for 2010 and $\$125,000 \div \$10 = 12,500$ for 2009). Using these data, Milavec's 2010 EPS is calculated as follows.

$$\frac{\$25,000 \text{ (net income)} - \$3,000 \text{ (preferred dividend)}}{(15,000 + 12,500)/2 \text{ (average outstanding common shares)}} = \$1.60 \text{ per share}$$

Investors attribute a great deal of importance to EPS figures. The amounts used in calculating EPS, however, have limitations. Many accounting choices, assumptions, and estimates underlie net income computations, including alternative depreciation methods, different inventory cost flow assumptions, and estimates of future bad debt or warranty expenses, to name only a few. The denominator is also inexact because various factors (discussed in advanced accounting courses) affect the number of shares to include. Numerous opportunities therefore exist to manipulate EPS figures. Prudent investors consider these variables in deciding how much weight to attach to earnings per share.

Book Value

Book value per share is another frequently quoted measure of a share of stock. It is calculated as follows.

$$\text{Book value per share} = \frac{\text{Stockholders' equity} - \text{Preferred rights}}{\text{Outstanding common shares}}$$

Instead of describing the numerator as stockholders' equity, we could have used assets minus liabilities, the algebraic computation of a company's "net worth." Net worth is a misnomer. A company's accounting records reflect book values, not worth. Because assets are recorded at historical costs and different methods are used to transfer asset costs to expense, the book value of assets after deducting liabilities means little if anything. Nevertheless, investors use the term *book value per share* frequently.

Preferred rights represents the amount of money required to satisfy the claims of preferred stockholders. If the preferred stock has a call premium, the call premium amount is subtracted. In our example, we assume the preferred stock can be retired at par. Book value per share for 2010 was therefore as follows.

$$\frac{\$362,000 - \$50,000}{15,000 \text{ shares}} = \$20.80 \text{ per share}$$

Price-earnings Ratio

The **price-earnings ratio**, or *P/E ratio*, compares the earnings per share of a company to the market price for a share of the company's stock. Assume Avalanche Company and Brushfire Company each report earnings per share of \$3.60. For the same year, Cyclone Company reports EPS of \$4.10. Based on these data alone, Cyclone stock may seem to be the best investment. Suppose, however, that the price for one share of stock in each

company is \$43.20, \$36.00, and \$51.25, respectively. Which stock would you buy? Cyclone's stock price is the highest, but so is its EPS. The P/E ratio provides a common base of comparison.

$$\text{Price-earnings ratio} = \frac{\text{Market price per share}}{\text{Earnings per share}}$$

The P/E ratios for the three companies are:

Avalanche	Brushfire	Cyclone
12.0	10.0	12.5

Brushfire might initially seem to be the best buy for your money. Yet there must be some reason that Cyclone's stock is selling at 12½ times earnings. In general, a higher P/E ratio indicates the market is more optimistic about a company's growth potential than it is about a company with a lower P/E ratio. The market price of a company's stock reflects judgments about both the company's current results and expectations about future results. Investors cannot make informed use of these ratios for investment decisions without examining the reasons behind the ratios. On July 25, 2007, the average P/E ratio for the companies in the Dow Jones Industrial Average was around 18.

Dividend Yield

There are two ways to profit from a stock investment. One, investors can sell the stock for more than they paid to purchase it (if the stock price rises). Two, the company that issued the stock can pay cash dividends to the shareholders. Most investors view rising stock prices as the primary reward for investing in stock. The importance of receiving dividends, however, should not be overlooked. Evaluating dividend payments is more complex than simply comparing the dividends per share paid by one company to the dividends per share paid by another company. Receiving a \$1 dividend on a share purchased for \$10 is a much better return than receiving a \$1.50 dividend on stock bought for \$100. Computing the **dividend yield** simplifies comparing dividend payments. Dividend yield measures dividends received as a percentage of a stock's market price.

$$\text{Dividend yield} = \frac{\text{Dividends per share}}{\text{Market price per share}}$$

To illustrate, consider Dragonfly, Inc., and Elk Company. The information for calculating dividend yield follows.

	Dragonfly	Elk
Dividends per share (a)	\$ 1.80	\$ 3.00
Market price per share (b)	40.00	75.00
Dividend yield (a ÷ b)	4.5%	4.0%

Even though the dividend per share paid by Elk Company is higher, the yield is lower (4.5 percent versus 4.0 percent) because Elk's stock price is so high. The dividend yields for the companies included in the Dow Jones Industrial Average were averaging around 2.3 percent in July of 2007.

Other Ratios

Investors can also use a wide array of other ratios to analyze profitability. Most *profitability ratios* use the same reasoning. For example, you can calculate the *yield* of a variety of financial investments. Yield represents the percentage the amount received is of the amount invested. The dividend yield explained above could be calculated for

either common or preferred stock. Investors could measure the earnings yield by calculating earnings per share as a percentage of market price. Yield on a bond can be calculated the same way: interest received divided by the price of the bond.

The specific ratios presented in this chapter are summarized in Exhibit 13.6.

EXHIBIT 13.6

Summary of Key Relationships

Liquidity Ratios	1. Working capital	Current assets – Current liabilities
	2. Current ratio	Current assets ÷ Current liabilities
	3. Quick (acid-test) ratio	(Current assets – Inventory – Prepaids) ÷ Current liabilities
	4. Accounts receivable turnover	Net credit sales ÷ Average receivables
	5. Average days to collect receivables	365 ÷ Accounts receivable turnover
	6. Inventory turnover	Cost of goods sold ÷ Average inventory
	7. Average days to sell inventory	365 ÷ Inventory turnover
Solvency Ratios	8. Debt to assets ratio	Total liabilities ÷ Total assets
	9. Debt to equity ratio	Total liabilities ÷ Total stockholders' equity
	10. Number of times interest is earned	Earnings before interest and taxes ÷ Interest expense
Profitability Ratios	11. Plant assets to long-term liabilities	Net plant assets ÷ Long-term liabilities
	12. Net margin	Net income ÷ Net sales
	13. Asset turnover	Net sales ÷ Average total assets
	14. Return on investment (also: return on assets)	Net income ÷ Average total assets
Stock Market Ratios	15. Return on equity	Net income ÷ Average total stockholders' equity
	16. Earnings per share	Net earnings available for common stock ÷ Average outstanding common shares
	17. Book value per share	(Stockholders' equity – Preferred rights) ÷ Outstanding common shares
	18. Price-earnings ratio	Market price per share ÷ Earnings per share
	19. Dividend yield	Dividends per share ÷ Market price per share

LIMITATIONS OF FINANCIAL STATEMENT ANALYSIS

LO 8

Explain the limitations of financial statement analysis.

Analyzing financial statements is analogous to choosing a new car. Each car is different, and prospective buyers must evaluate and weigh a myriad of features: gas mileage, engine size, manufacturer's reputation, color, accessories, and price, to name a few. Just as it is difficult to compare a **Toyota** minivan to a **Ferrari** sports car, so it is difficult to compare a small textile firm to a giant oil company. To make a meaningful assessment, the potential car buyer must focus on key data that can be comparably expressed for each car, such as gas mileage. The superior gas mileage of the minivan may pale in comparison to the thrill of driving the sports car, but the price of buying and operating the sports car may be the characteristic that determines the ultimate choice.

External users can rely on financial statement analysis only as a general guide to the potential of a business. They should resist placing too much weight on any particular figure or trend. Many factors must be considered simultaneously before making any judgments. Furthermore, the analysis techniques discussed in this chapter are all based on historical information. Future events and unanticipated changes in conditions will also influence a company's operating results.

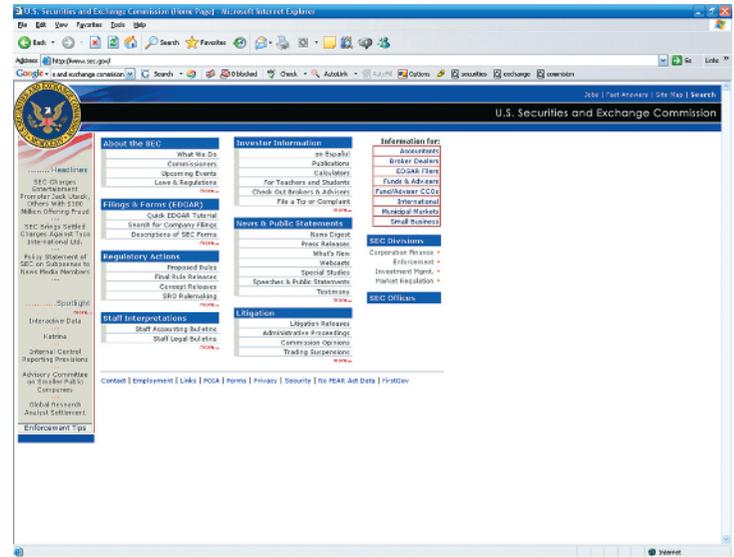
Different Industries

Different industries may be affected by unique social policies, special accounting procedures, or other individual industry attributes. Ratios of companies in different industries are not comparable without considering industry characteristics. A high debt

Reality BYTES

The single most important source of financial information is a company's annual report, but decision makers should also consider other sources. Interested persons can access quarterly and annual reports through the SEC's EDGAR database, and often from company websites. Many companies will provide printed versions of these reports upon request. Companies also post information on their websites that is not included in their annual reports. For example, some automobile companies provide very detailed production data through their corporate websites.

Users can frequently obtain information useful in analyzing a particular company from independent sources as well as from the company itself. For example, the websites of popular news services, such as CNN (www.money.cnn.com) and CNBC (www.moneycentral.msn.com) provide archived news stories and independent financial information about many companies. The websites of brokerage houses like www.schwab.com offer free financial information about companies. Finally, libraries often subscribe to independent services that evaluate companies as potential investments. One example worth reviewing is *Value Line Investment Survey*.



to assets ratio is more acceptable in some industries than others. Even within an industry, a particular business may require more or less working capital than the industry average. If so, the working capital and quick ratios would mean little compared to those of other firms, but may still be useful for trend analysis.

Because of industry-specific factors, most professional analysts specialize in one, or only a few, industries. Financial institutions such as brokerage houses, banks, and insurance companies typically employ financial analysts who specialize in areas such as mineral or oil extraction, chemicals, banking, retail, insurance, bond markets, or automobile manufacturing.

Changing Economic Environment

When comparing firms, analysts must be alert to changes in general economic trends from year to year. Significant changes in fuel costs and interest rates in recent years make old rule-of-thumb guidelines for evaluating these factors obsolete. In addition, the presence or absence of inflation affects business prospects.

Accounting Principles

Financial statement analysis is only as reliable as the data on which it is based. Although most firms follow generally accepted accounting principles, a wide variety of acceptable accounting methods is available from which to choose, including different inventory and depreciation methods, different schedules for recognizing revenue, and different ways to account for oil and gas exploration costs. Analyzing statements of companies that seem identical may produce noncomparable ratios if the companies used different accounting methods. Analysts may seek to improve comparability by trying to recast different companies' financial statements as if the same accounting methods had been applied.

Accrual accounting requires the use of many estimates; bad debt expense, warranty expense, asset lives, and salvage value are just a few. The reliability of the resulting financial reports depends on the expertise and integrity of the persons who make the estimates.

The quality and usefulness of accounting information are influenced by underlying accounting concepts. Two particular concepts, *conservatism* and *historical cost*, have a tremendous impact on financial reporting. Conservatism dictates recognizing estimated losses as soon as they occur, but gain recognition is almost always deferred until the gains are actually realized. Conservatism produces a negative bias in financial statements. There are persuasive arguments for the conservatism principle, but users should be alert to distortions it may cause in accounting information.

The pervasive use of the historical cost concept is probably the greatest single cause of distorted financial statement analysis results. The historical cost of an asset does not represent its current value. The asset purchased in 2001 for \$10,000 is not comparable in value to the asset purchased in 2010 for \$10,000 because of changes in the value of the dollar. Using historical cost produces financial statements that report dollars with differing purchasing power in the same statement. Combining these differing dollar values is akin to adding miles to kilometers. To get the most from analyzing financial statements, users should be cognizant of these limitations.

CHECK *Yourself* 13.3

The return on equity for Gup Company is 23.4 percent and for Hunn Company is 17 percent. Does this mean Gup Company is better managed than Hunn Company?

Answer No single ratio can adequately measure management performance. Even analyzing a wide range of ratios provides only limited insight. Any useful interpretation requires the analyst to recognize the limitations of ratio analysis. For example, ratio norms typically differ between industries and may be affected by temporary economic factors. In addition, companies' use of different accounting practices and procedures produces different ratio results even when underlying circumstances are comparable.



A Look Back

Financial statement analysis involves many factors, among them user characteristics, information needs for particular types of decisions, and how financial information is analyzed. Analytical techniques include *horizontal*, *vertical*, and *ratio analysis*. Users commonly calculate ratios to measure a company's liquidity, solvency, and profitability. The specific ratios presented in this chapter are summarized in Exhibit 13.6. Although ratios are easy to calculate and provide useful insights into business operations, when interpreting analytical results, users should consider limitations resulting from differing industry characteristics, differing economic conditions, and the fundamental accounting principles used to produce reported financial information.



A Look Forward

We sincerely hope that this text has provided you a meaningful learning experience that will serve you well as you progress through your academic training and ultimately, your career. Good luck and best wishes!



SELF-STUDY REVIEW PROBLEM

A step-by-step audio-narrated series of slides is provided on the text website at www.mhhe.com/edmonds7e.

Financial statements for Stallings Company follow.



Income Statements for the Years Ended December 31		
	2009	2008
Revenues		
Net sales	\$ 315,000	\$ 259,000
Expenses		
Cost of goods sold	(189,000)	(154,000)
General, selling, and administrative expenses	(54,000)	(46,000)
Interest expense	(4,000)	(4,500)
Income before taxes	68,000	54,500
Income tax expense (40%)	(27,200)	(21,800)
Net income	<u>\$ 40,800</u>	<u>\$ 32,700</u>

Balance Sheets As of December 31		
	2009	2008
Assets		
Current assets		
Cash	\$ 6,500	\$ 11,500
Accounts receivable	51,000	49,000
Inventories	<u>155,000</u>	<u>147,500</u>
Total current assets	212,500	208,000
Plant and equipment (net)	<u>187,500</u>	<u>177,000</u>
Total assets	<u>\$400,000</u>	<u>\$385,000</u>
Liabilities and Stockholders' Equity		
Liabilities		
Current liabilities		
Accounts payable	\$ 60,000	\$ 81,500
Other	25,000	22,500
Total current liabilities	<u>85,000</u>	<u>104,000</u>
Bonds payable	<u>100,000</u>	<u>100,000</u>
Total liabilities	<u>185,000</u>	<u>204,000</u>
Stockholders' equity		
Common stock (50,000 shares, \$3 par)	150,000	150,000
Paid-in capital in excess of par	20,000	20,000
Retained earnings	45,000	11,000
Total stockholders' equity	<u>215,000</u>	<u>181,000</u>
Total liabilities and stockholders' equity	<u>\$400,000</u>	<u>\$385,000</u>

Required

- Use horizontal analysis to determine which expense item increased by the highest percentage from 2008 to 2009.
- Use vertical analysis to determine whether the inventory balance is a higher percentage of total assets in 2008 or 2009.
- Calculate the following ratios for 2008 and 2009. When data limitations prohibit computing averages, use year-end balances in your calculations.

- (1) Net margin
- (2) Return on investment
- (3) Return on equity
- (4) Earnings per share
- (5) Price-earnings ratio (market price per share at the end of 2009 and 2008 was \$12.04 and \$8.86, respectively)
- (6) Book value per share of common stock
- (7) Times interest earned
- (8) Working capital
- (9) Current ratio
- (10) Acid-test ratio
- (11) Accounts receivable turnover
- (12) Inventory turnover
- (13) Debt to equity

Solution to Requirement a

Income tax expense increased by the greatest percentage. Computations follow.

$$\text{Cost of goods sold } (\$189,000 - \$154,000) \div \$154,000 = 22.73\%$$

$$\text{General, selling, and administrative } (\$54,000 - \$46,000) \div \$46,000 = 17.39\%$$

Interest expense decreased.

$$\text{Income tax expense } (\$27,200 - \$21,800) \div \$21,800 = 24.77\%$$

Solution to Requirement b

$$2008: \$147,500 \div \$385,000 = 38.31\%$$

$$2009: \$155,000 \div \$400,000 = 38.75\%$$

Inventory is slightly larger relative to total assets in 2009.

Solution to Requirement c

	2009	2008
1. $\frac{\text{Net income}}{\text{Net sales}}$	$\frac{\$40,800}{\$315,000} = 12.95\%$	$\frac{\$32,700}{\$259,000} = 12.63\%$
2. $\frac{\text{Net income}}{\text{Average total assets}}$	$\frac{\$40,800}{\$392,500} = 10.39\%$	$\frac{\$32,700}{\$385,000} = 8.49\%$
3. $\frac{\text{Net income}}{\text{Average total stockholders' equity}}$	$\frac{\$40,800}{\$198,000} = 20.61\%$	$\frac{\$32,700}{\$181,000} = 18.07\%$
4. $\frac{\text{Net income}}{\text{Average common shares outstanding}}$	$\frac{\$40,800}{50,000 \text{ shares}} = \0.816	$\frac{\$32,700}{50,000 \text{ shares}} = \0.654
5. $\frac{\text{Market price per share}}{\text{Earnings per share}}$	$\frac{\$12.04}{\$0.816} = 14.75 \text{ times}$	$\frac{\$8.86}{\$0.654} = 13.55 \text{ times}$
6. $\frac{\text{Stockholders' equity} - \text{Preferred rights}}{\text{Outstanding common shares}}$	$\frac{\$215,000}{50,000 \text{ shares}} = \4.30	$\frac{\$181,000}{50,000 \text{ shares}} = \3.62
7. $\frac{\text{Net income} + \text{Taxes} + \text{Interest expense}}{\text{Interest expense}}$	$\frac{\$40,800 + \$27,200 + \$4,000}{\$4,000} = 18 \text{ times}$	$\frac{\$32,700 + \$21,800 + \$4,500}{\$4,500} = 13.1 \text{ times}$
8. $\text{Current assets} - \text{Current liabilities}$	$\$212,500 - \$85,000 = \$127,500$	$\$208,000 - \$104,000 = \$104,000$
9. $\frac{\text{Current assets}}{\text{Current liabilities}}$	$\frac{\$212,500}{\$85,000} = 2.5:1$	$\frac{\$208,000}{\$104,000} = 2:1$
10. $\frac{\text{Quick assets}}{\text{Current liabilities}}$	$\frac{\$57,500}{\$85,000} = 0.68:1$	$\frac{\$60,500}{\$104,000} = 0.58:1$
11. $\frac{\text{Net credit sales}}{\text{Average accounts receivable}}$	$\frac{\$315,000}{\$50,000} = 6.3 \text{ times}$	$\frac{\$259,000}{\$49,000} = 5.29 \text{ times}$
12. $\frac{\text{Cost of goods sold}}{\text{Average inventory}}$	$\frac{\$189,000}{\$151,250} = 1.25 \text{ times}$	$\frac{\$154,000}{\$147,500} = 1.04 \text{ times}$
13. $\frac{\text{Total liabilities}}{\text{Total stockholders' equity}}$	$\frac{\$185,000}{\$215,000} = 86.05\%$	$\frac{\$204,000}{\$181,000} = 112.71\%$

KEY TERMS

absolute amounts •••
accounts receivable
turnover •••
acid-test ratio •••
asset turnover ratio •••
average days to collect
receivables •••
average days to sell
inventory •••

book value per share •••
current ratio •••
debt to assets ratio •••
debt to equity ratio •••
dividend yield •••
earnings per share •••
horizontal analysis •••
information overload •••
inventory turnover •••

liquidity ratios •••
materiality •••
net margin •••
percentage analysis •••
price-earnings ratio •••
profitability ratios •••
quick ratio •••
ratio analysis •••
return on assets •••

return on equity •••
return on investment •••
solvency ratios •••
trend analysis •••
vertical analysis •••
working capital •••
working capital ratio •••

QUESTIONS

- Why are ratios and trends used in financial analysis?
- What do the terms *liquidity* and *solvency* mean?
- What is apparent from a horizontal presentation of financial statement information? A vertical presentation?
- What is the significance of inventory turnover, and how is it calculated?
- What is the difference between the current ratio and the quick ratio? What does each measure?
- Why are absolute amounts of limited use when comparing companies?
- What is the difference between return on investment and return on equity?
- Which ratios are used to measure long-term debt-paying ability? How is each calculated?
- What are some limitations of the earnings per share figure?
- What is the formula for calculating return on investment (ROI)?
- What is information overload?
- What is the price-earnings ratio? Explain the difference between it and the dividend yield.
- What environmental factors must be considered in analyzing companies?
- How do accounting principles affect financial statement analysis?

MULTIPLE-CHOICE QUESTIONS

Multiple-choice questions are provided on the text website at www.mhhe.com/edmonds7e.



Quiz 13



EXERCISES—SERIES A

All applicable Exercises in Series A are available with McGraw-Hill's *Connect Accounting*.

connect
ACCOUNTING

Exercise 13-1A Inventory turnover

LO 4

Selected financial information for Atwell Company for 2009 follows.

Sales	\$1,500,000
Cost of goods sold	1,200,000
Merchandise inventory	
Beginning of year	180,000
End of year	220,000

Required

Assuming that the merchandise inventory buildup was relatively constant, how many times did the merchandise inventory turn over during 2009?

LO 5

Exercise 13-2A *Number of times interest earned*

The following data come from the financial records of Linton Corporation for 2008.

Sales	\$135,000
Interest expense	3,800
Income tax expense	22,500
Net income	30,700

Required

How many times was interest earned in 2008?

LO 4

**Exercise 13-3A** *Current ratio*

Piper Corporation wrote off a \$900 uncollectible account receivable against the \$9,600 balance in its allowance account.

Required

Explain the effect of the write-off on Piper's current ratio.

LO 4

Exercise 13-4A *Working capital and current ratio*

On June 30, 2008, Thorpe Company's total current assets were \$250,000 and its total current liabilities were \$125,000. On July 1, 2008, Thorpe issued a short-term note to a bank for \$25,000 cash.

Required

- Compute Thorpe's working capital before and after issuing the note.
- Compute Thorpe's current ratio before and after issuing the note.

LO 4

Exercise 13-5A *Working capital and current ratio*

On June 30, 2008, Thorpe Company's total current assets were \$250,000 and its total current liabilities were \$125,000. On July 1, 2008, Thorpe issued a long-term note to a bank for \$25,000 cash.

Required

- Compute Thorpe's working capital before and after issuing the note.
- Compute Thorpe's current ratio before and after issuing the note.

LO 2

**Exercise 13-6A** *Horizontal analysis*

Hammond Corporation reported the following operating results for two consecutive years.

	2008	2007	Percentage Change
Sales	\$1,250,000	\$1,000,000	
Cost of goods sold	<u>750,000</u>	<u>600,000</u>	
Gross margin	500,000	\$ 400,000	
Operating expenses	<u>300,000</u>	<u>200,000</u>	
Income before taxes	200,000	\$ 200,000	
Income taxes	<u>61,000</u>	<u>53,000</u>	
Net income	<u>\$ 139,000</u>	<u>\$ 147,000</u>	

Required

- Compute the percentage changes in Hammond Corporation's income statement components between the two years.
- Comment on apparent trends revealed by the percentage changes computed in Requirement *a*.

Exercise 13-7A *Vertical analysis***LO 4, 5**

Garcia Company reported the following operating results for two consecutive years.

2008	Amount	Percent of Sales
Sales	\$600,000	
Cost of goods sold	<u>400,000</u>	
Gross margin on sales	200,000	
Operating expenses	<u>130,000</u>	
Income before taxes	70,000	
Income taxes	<u>30,000</u>	
Net income	<u>\$ 40,000</u>	
2009	Amount	Percent of Sales
Sales	\$580,000	
Cost of goods sold	<u>377,000</u>	
Gross margin on sales	203,000	
Operating expenses	<u>150,000</u>	
Income before taxes	53,000	
Income taxes	<u>23,000</u>	
Net income	<u>\$ 30,000</u>	

Required

Express each income statement component for each of the two years as a percent of sales.

Exercise 13-8A *Ratio analysis***LO 2**

The balance sheet for Ramsey Corporation follows.

Current assets	\$ 150,000
Long-term assets (net)	<u>850,000</u>
Total assets	<u>\$1,000,000</u>
Current liabilities	\$ 84,000
Long-term liabilities	<u>492,000</u>
Total liabilities	576,000
Common stock and retained earnings	<u>424,000</u>
Total liabilities and stockholders' equity	<u>\$1,000,000</u>

Required

Compute the following.

Working capital	_____
Current ratio	_____
Debt to assets ratio	_____
Debt to equity ratio	_____

Exercise 13-9A *Ratio analysis***LO 7**

During 2008, Orchard Corporation reported after-tax net income of \$5,800,000. During the year, the number of shares of stock outstanding remained constant at 10,000 of \$100 par, 9 percent preferred stock and 400,000 shares of common stock. The company's total stockholders'

equity is \$23,000,000 at December 31, 2008. Orchard Corporation's common stock was selling at \$52 per share at the end of its fiscal year. All dividends for the year have been paid, including \$4.80 per share to common stockholders.

Required

Compute the following:

- Earnings per share
- Book value per share of common stock
- Price-earnings ratio
- Dividend yield

LO 4, 5, 6, 7

Exercise 13-10A *Ratio analysis*

Required

Match each of the following ratios with the formula used to compute it.

_____ 1. Working capital	a. $\text{Net income} \div \text{Average total stockholders' equity}$
_____ 2. Current ratio	b. $\text{Cost of goods sold} \div \text{Average inventory}$
_____ 3. Quick ratio	c. $\text{Current assets} - \text{Current liabilities}$
_____ 4. Accounts receivable turnover	d. $365 \div \text{Inventory turnover}$
_____ 5. Average days to collect	e. $\text{Net income} \div \text{Average total assets}$
_____ 6. Inventory turnover	f. $(\text{Net income} - \text{Preferred dividends}) \div \text{Average outstanding common shares}$
_____ 7. Average days to sell inventory	g. $(\text{Current assets} - \text{Inventory} - \text{Prepaid expenses}) \div \text{Current liabilities}$
_____ 8. Debt to assets ratio	h. $\text{Total liabilities} \div \text{Total assets}$
_____ 9. Debt to equity ratio	i. $365 \div \text{Accounts receivable turnover}$
_____ 10. Return on investment	j. $\text{Total liabilities} \div \text{Total stockholders' equity}$
_____ 11. Return on equity	k. $\text{Net credit sales} \div \text{Average accounts receivables}$
_____ 12. Earnings per share	l. $\text{Current assets} \div \text{Current liabilities}$

LO 2

Exercise 13-11A *Horizontal and vertical analysis*

Income statements for Sennett Company for 2008 and 2009 follow.

	2009	2008
Sales	\$121,000	\$92,000
Cost of goods sold	75,000	51,000
Selling expenses	20,000	11,000
Administrative expenses	12,000	14,000
Interest expense	3,000	5,000
Total expenses	<u>\$110,000</u>	<u>81,000</u>
Income before taxes	11,000	11,000
Income taxes expense	<u>3,000</u>	<u>2,000</u>
Net income	<u>\$ 8,000</u>	<u>\$ 9,000</u>

Required

- Perform a horizontal analysis, showing the percentage change in each income statement component between 2008 and 2009.
- Perform a vertical analysis, showing each income statement component as a percent of sales for each year.

Exercise 13-12A *Ratio analysis*

LO 4, 5, 6, 7

Compute the specified ratios using Bryce Company's balance sheet for 2008.

Assets	
Cash	\$ 18,000
Marketable securities	8,000
Accounts receivable	13,000
Inventory	11,000
Property and equipment	170,000
Accumulated depreciation	<u>(12,500)</u>
Total assets	<u>\$207,500</u>
Liabilities and Stockholders' Equity	
Accounts payable	\$ 8,500
Current notes payable	3,500
Mortgage payable	7,500
Bonds payable	21,500
Common stock, \$50 par	110,000
Paid-in capital in excess of par	4,000
Retained earnings	<u>52,500</u>
Total liabilities and stockholders' equity	<u>\$207,500</u>

The average number of common stock shares outstanding during 2008 was 880 shares. Net income for the year was \$15,000.

Required

Compute each of the following:

- Current ratio.
- Earnings per share.
- Quick (acid-test) ratio.
- Return on investment.
- Return on equity.
- Debt to equity ratio.

Exercise 13-13A *Comprehensive analysis*

LO 4, 5, 6, 7

Required

Indicate the effect of each of the following transactions on (1) the current ratio, (2) working capital, (3) stockholders' equity, (4) book value per share of common stock, (5) retained earnings. Assume that the current ratio is greater than 1:1.

- Collected account receivable.
- Wrote off account receivable.
- Purchased treasury stock.
- Purchased inventory on account.
- Declared cash dividend.
- Sold merchandise on account at a profit.
- Issued stock dividend.
- Paid account payable.
- Sold building at a loss.

LO 4, 6

Exercise 13-14A *Accounts receivable turnover, inventory turnover, and net margin*

Selected data from Anthony Company follow.

Balance Sheet As of December 31		
	2008	2007
Accounts receivable	\$490,000	\$380,000
Allowance for doubtful accounts	(40,000)	(30,000)
Net accounts receivable	<u>\$450,000</u>	<u>\$350,000</u>
Inventories, lower of cost or market	<u>\$600,000</u>	<u>\$480,000</u>

Income Statement for the Years Ended December 31		
	2008	2007
Net credit sales	\$2,000,000	\$1,760,000
Net cash sales	400,000	320,000
Net sales	<u>2,400,000</u>	<u>2,080,000</u>
Cost of goods sold	1,600,000	1,440,000
Selling, general, & administrative expenses	240,000	216,000
Other expenses	40,000	24,000
Total operating expenses	<u>\$1,880,000</u>	<u>\$1,680,000</u>

Required

Compute the following:

- The accounts receivable turnover for 2008.
- The inventory turnover for 2008.
- The net margin for 2008.

LO 4, 5

Exercise 13-15A *Comprehensive analysis*

The December 31, 2010, balance sheet for Grogan Corporation is presented here. These are the only accounts on Grogan's balance sheet. Amounts indicated by question marks (?) can be calculated using the following additional information.

Assets	
Cash	\$ 25,000
Accounts receivable (net)	?
Inventory	?
Property, plant, and equipment (net)	<u>294,000</u>
	<u>\$432,000</u>
Liabilities and Stockholders' Equity	
Accounts payable (trade)	\$?
Income taxes payable (current)	25,000
Long-term debt	?
Common stock	300,000
Retained earnings	<u>?</u>
	<u>\$?</u>

continued

Additional Information

Current ratio (at year end)	1.5 to 1.0
Total liabilities ÷ Total stockholders' equity	80%
Gross margin percent	30%
Inventory turnover (Cost of goods sold ÷ Ending inventory)	10.5 times
Gross margin for 2010	\$ 315,000

Required

Determine the following.

- The balance in trade accounts payable as of December 31, 2010.
- The balance in retained earnings as of December 31, 2010.
- The balance in the inventory account as of December 31, 2010. (Assume that the level of inventory did not change from last year.)

PROBLEMS—SERIES A

All applicable Problems in Series A are available with McGraw-Hill's *Connect Accounting*.

connect
ACCOUNTING

Problem 13-16A Vertical analysis

LO 2

The following percentages apply to Walton Company for 2007 and 2008.

	2008	2007
Sales	100.0%	100.0%
Cost of goods sold	61.0	64.0
Gross margin	39.0	36.0
Selling and administrative expense	26.5	20.5
Interest expense	2.5	2.0
Total expenses	29.0	22.5
Income before taxes	10.0	13.5
Income tax expense	5.5	7.0
Net income	4.5%	6.5%

CHECK FIGURES

NI of 2008: \$28,800

Total Expenses of 2007: \$108,000

Required

Assuming that sales were \$480,000 in 2007 and \$640,000 in 2008, prepare income statements for the two years.

Problem 13-17A Ratio analysis

LO 5, 6, 7

Hood Company's income statement information follows.

Excel

	2009	2008
Net sales	\$210,000	\$130,000
Income before interest and taxes	55,000	42,500
Net income after taxes	27,750	31,500
Interest expense	4,500	4,000
Stockholders' equity, December 31 (2007: \$100,000)	158,500	117,500
Common stock, par \$50, December 31	130,000	115,000

CHECK FIGURES

a. 2009: 12.22 times

c. 2008: 8.5 times

The average number of shares outstanding was 2,600 for 2009 and 2,300 for 2008.

Required

Compute the following ratios for Hood for 2009 and 2008.

- a. Number of times interest was earned.
- b. Earnings per share based on the average number of shares outstanding.
- c. Price-earnings ratio (market prices: 2009, \$116 per share (unchanged); 2008, \$96 per share (unchanged)).
- d. Return on average equity.
- e. Net margin.

LO 4

Problem 13-18A *Effect of transactions on current ratio and working capital*

Gilchrist Manufacturing has a current ratio of 3:1 on December 31, 2008. Indicate whether each of the following transactions would increase (+), decrease (−), or have no effect (NA) on Gilchrist’s current ratio and its working capital.

Required

- a. Paid cash for a trademark.
- b. Wrote off an uncollectible account receivable.
- c. Sold equipment for cash.
- d. Sold merchandise at a profit (cash).
- e. Declared a cash dividend.
- f. Purchased inventory on account.
- g. Scrapped a fully depreciated machine (no gain or loss).
- h. Issued a stock dividend.
- i. Purchased a machine with a long-term note.
- j. Paid a previously declared cash dividend.
- k. Collected accounts receivable.
- l. Invested in current marketable securities.

LO 7



Problem 13-19A *Ratio analysis*

Selected data for Koch Company for 2007 and additional information on industry averages follow.

CHECK FIGURE

a. Earnings per share: \$5.02

Earnings (net income)		<u>\$ 289,000</u>
Preferred stock (19,800 shares at \$50 par, 4%)		\$ 990,000
Common stock (45,000 shares at \$1 par, market value \$56)		45,000
Paid-in capital in excess of par—Common		720,000
Retained earnings		<u>843,750</u>
		<u>\$2,598,750</u>
Less: Treasury stock		
Preferred (1,800 shares)	\$81,000	
Common (1,800 shares)	<u>36,000</u>	<u>117,000</u>
Total stockholders’ equity		<u>\$2,481,750</u>

Note: Dividends in arrears on preferred stock: \$36,000. The preferred stock can be called for \$51 per share.

Industry averages	
Earnings per share	\$ 5.20
Price-earnings ratio	9.50
Return on equity	11.20%

Required

- a. Calculate and compare Koch Company’s ratios with the industry averages.
- b. Discuss factors you would consider in deciding whether to invest in the company.

Problem 13-20A *Supply missing balance sheet numbers***LO 4, 5**

The bookkeeper for Andy's Country Music Bar left this incomplete balance sheet. Andy's working capital is \$95,000 and its debt to assets ratio is 40 percent.

CHECK FIGURES

d. \$342,500

f. \$99,500

Assets	
Current assets	
Cash	\$ 21,000
Accounts receivable	42,000
Inventory	(A)
Prepaid expenses	9,000
Total current assets	(B)
Long-term assets	
Building	(C)
Less: Accumulated depreciation	(39,000)
Total long-term assets	210,000
Total assets	\$ (D)
Liabilities and Stockholders' Equity	
Liabilities	
Current liabilities	
Accounts payable	\$ (E)
Notes payable	12,000
Income tax payable	10,500
Total current liabilities	37,500
Long-term liabilities	
Mortgage payable	(F)
Total liabilities	(G)
Stockholders' equity	
Common stock	105,000
Retained earnings	(H)
Total stockholders' equity	(I)
Total liabilities and stockholders' equity	\$ (J)

Required

Complete the balance sheet by supplying the missing amounts.

Problem 13-21A *Ratio analysis***LO 4, 5, 6, 7**

The following financial statements apply to Keating Company.

eXcel

	2009	2008
Revenues		
Net sales	\$210,000	\$175,000
Other revenues	4,000	5,000
Total revenues	214,000	180,000
Expenses		
Cost of goods sold	126,000	103,000
Selling expenses	21,000	19,000
General and administrative expenses	11,000	10,000
Interest expense	3,000	3,000
Income tax expense	21,000	18,000
Total expenses	182,000	153,000

continued

CHECK FIGURES

d. 2009: \$0.72

k. 2008: 5.47 times

	2009	2008
Earnings from continuing operations before extraordinary items	32,000	27,000
Extraordinary gain (net of \$3,000 tax)	<u>4,000</u>	<u>0</u>
Net income	<u>\$ 36,000</u>	<u>\$ 27,000</u>
Assets		
Current assets		
Cash	\$ 4,000	\$ 8,000
Marketable securities	1,000	1,000
Accounts receivable	35,000	32,000
Inventories	100,000	96,000
Prepaid expenses	<u>3,000</u>	<u>2,000</u>
Total current assets	143,000	139,000
Plant and equipment (net)	105,000	105,000
Intangibles	<u>20,000</u>	<u>0</u>
Total assets	<u>\$268,000</u>	<u>\$244,000</u>
Liabilities and Stockholders' Equity		
Liabilities		
Current liabilities		
Accounts payable	\$ 40,000	\$ 54,000
Other	<u>17,000</u>	<u>15,000</u>
Total current liabilities	57,000	69,000
Bonds payable	<u>66,000</u>	<u>67,000</u>
Total liabilities	<u>123,000</u>	<u>136,000</u>
Stockholders' equity		
Common stock (\$2 par)	100,000	100,000
Paid-in capital in excess of par	15,000	15,000
Retained earnings	<u>30,000</u>	<u>(7,000)</u>
Total stockholders' equity	<u>145,000</u>	<u>108,000</u>
Total liabilities and stockholders' equity	<u>\$268,000</u>	<u>\$244,000</u>

Required

Calculate the following ratios for 2008 and 2009. When data limitations prohibit computing averages, use year-end balances in your calculations.

- a. Net margin
- b. Return on investment
- c. Return on equity
- d. Earnings per share
- e. Price-earnings ratio (market prices at the end of 2008 and 2009 were \$5.94 and \$4.77, respectively)
- f. Book value per share of common stock
- g. Times interest earned
- h. Working capital
- i. Current ratio
- j. Quick (acid-test) ratio
- k. Accounts receivable turnover
- l. Inventory turnover
- m. Debt to equity ratio
- n. Debt to assets ratio

Problem 13-22A *Horizontal analysis*

Financial statements for Thorn Company follow.

LO 2**CHECK FIGURES**

Total Assets: +11.6%

Total Liabilities: +14.4%

THORN COMPANY		
Balance Sheets		
As of December 31		
	2008	2007
Assets		
Current assets		
Cash	\$ 16,000	\$ 12,000
Marketable securities	20,000	6,000
Accounts receivable (net)	54,000	46,000
Inventories	135,000	143,000
Prepaid items	<u>25,000</u>	<u>10,000</u>
Total current assets	250,000	217,000
Investments	27,000	20,000
Plant (net)	270,000	255,000
Land	<u>29,000</u>	<u>24,000</u>
Total assets	<u>\$576,000</u>	<u>\$516,000</u>
Liabilities and Stockholders' Equity		
Liabilities		
Current liabilities		
Notes payable	\$ 17,000	\$ 6,000
Accounts payable	113,800	100,000
Salaries payable	<u>21,000</u>	<u>15,000</u>
Total current liabilities	<u>151,800</u>	<u>121,000</u>
Noncurrent liabilities		
Bonds payable	100,000	100,000
Other	<u>32,000</u>	<u>27,000</u>
Total noncurrent liabilities	<u>132,000</u>	<u>127,000</u>
Total liabilities	<u>283,800</u>	<u>248,000</u>
Stockholders' equity		
Preferred stock, (par value \$10, 4% cumulative, non-participating; 7,000 shares authorized and issued; no dividends in arrears)	70,000	70,000
Common stock (\$5 par; 50,000 shares authorized; 10,000 shares issued)	50,000	50,000
Paid-in capital in excess of par—Preferred	10,000	10,000
Paid-in capital in excess of par—Common	30,000	30,000
Retained earnings	<u>132,200</u>	<u>108,000</u>
Total stockholders' equity	<u>292,200</u>	<u>268,000</u>
Total liabilities and stockholders' equity	<u>\$576,000</u>	<u>\$516,000</u>

THORN COMPANY		
Statements of Income and Retained Earnings		
For the Years Ended December 31		
	2008	2007
Revenues		
Sales (net)	\$230,000	\$210,000
Other revenues	<u>8,000</u>	<u>5,000</u>
Total revenues	<u>238,000</u>	<u>215,000</u>

continued

	2008	2007
Expenses		
Cost of goods sold	120,000	103,000
Selling, general, and administrative	55,000	50,000
Interest expense	8,000	7,200
Income tax expense	23,000	22,000
Total expenses	<u>206,000</u>	<u>182,200</u>
Net earnings (net income)	32,000	32,800
Retained earnings, January 1	108,000	83,000
Less: Preferred stock dividends	2,800	2,800
Common stock dividends	5,000	5,000
Retained earnings, December 31	<u>\$132,200</u>	<u>\$108,000</u>

Required

Prepare a horizontal analysis of both the balance sheet and income statement.

LO 4, 5, 6, 7

**CHECK FIGURES**

- k. 2008: 2.0:1
p. 2007: \$3.00

Problem 13-23A Ratio analysis**Required**

Use the financial statements for Thorn Company from Problem 13-22A to calculate the following ratios for 2008 and 2007:

- a. Working capital
- b. Current ratio
- c. Quick ratio
- d. Receivables turnover (beginning receivables at January 1, 2007, were \$47,000.)
- e. Average days to collect accounts receivable
- f. Inventory turnover (beginning inventory at January 1, 2007, was \$140,000.)
- g. Number of days to sell inventory
- h. Debt to assets ratio
- i. Debt to equity ratio
- j. Number of times interest was earned
- k. Plant assets to long-term debt
- l. Net margin
- m. Turnover of assets
- n. Return on investment
- o. Return on equity
- p. Earnings per share
- q. Book value per share of common stock
- r. Price-earnings ratio (market price per share: 2007, \$11.75; 2008, \$12.50)
- s. Dividend yield on common stock

LO 2

**CHECK FIGURE**

2008 Retained Earnings: 23%

Problem 13-24A Vertical analysis**Required**

Use the financial statements for Thorn Company from Problem 13-22A to perform a vertical analysis of both the balance sheets and income statements for 2008 and 2007.

EXERCISES—SERIES B

LO 4

Exercise 13-1B Inventory turnover

Selected financial information for Wellow Company for 2008 follows.

Sales	\$3,000,000
Cost of goods sold	2,650,000
Merchandise inventory	
Beginning of year	380,000
End of year	620,000

Required

Assuming that the merchandise inventory buildup was relatively constant, how many times did the merchandise inventory turn over during 2008?

Exercise 13-2B *Number of times interest earned*

LO 5

The following data come from the financial records of the Jensen Corporation for 2007.

Sales	\$1,600,000
Interest expense	100,000
Income tax	280,000
Net income	520,000

Required

How many times was interest earned in 2007?

Exercise 13-3B *Current ratio*

LO 4

Mayer Corporation purchased \$350 of merchandise on account.

Required

Explain the effect of the purchase on Mayer's current ratio.

Exercise 13-4B *Working capital and current ratio*

LO 4

On October 31, 2008, Oram Company's total current assets were \$45,000 and its total current liabilities were \$20,000. On November 1, 2008, Oram purchased marketable securities for \$10,000 cash.

Required

- Compute Oram's working capital before and after the securities purchase.
- Compute Oram's current ratio before and after the securities purchase.

Exercise 13-5B *Working capital and current ratio*

LO 4

On October 31, 2008, Oram Company's total current assets were \$45,000 and its total current liabilities were \$20,000. On November 1, 2008, Oram bought manufacturing equipment for \$10,000 cash.

Required

- Compute Oram's working capital before and after the equipment purchase.
- Compute Oram's current ratio before and after the equipment purchase.

Exercise 13-6B *Horizontal analysis*

LO 2

Toby Corporation reported the following operating results for two consecutive years.

	2008	2007	Percentage Change
Sales	\$460,000	\$400,000	
Cost of goods sold	264,000	254,000	
Gross margin	196,000	146,000	
Operating expenses	75,000	65,000	
Income before taxes	121,000	81,000	
Income taxes	55,000	31,600	
Net income	\$ 66,000	\$ 49,400	

Required

- Compute the percentage changes in Toby Corporation's income statement components for the two years.
- Comment on apparent trends revealed by the percentage changes computed in Requirement *a*.

LO 2**Exercise 13-7B** *Vertical analysis*

Andersen Company reported the following operating results for two consecutive years.

2008	Amount	Percentage of Sales
Sales	\$400,000	
Cost of goods sold	<u>260,000</u>	
Gross margin	140,000	
Operating expenses	<u>65,000</u>	
Income before taxes	75,000	
Income taxes	<u>20,000</u>	
Net income	<u>\$ 55,000</u>	

2009	Amount	Percentage of Sales
Sales	\$560,000	
Cost of goods sold	<u>350,000</u>	
Gross margin	210,000	
Operating expenses	<u>100,000</u>	
Income before taxes	110,000	
Income taxes	<u>28,000</u>	
Net income	<u>\$ 82,000</u>	

Required

Express each income statement component for each of the two years as a percentage of sales.

LO 4, 5**Exercise 13-8B** *Ratio analysis*

Balance sheet data for the Gentry Corporation follows.

Current assets	\$ 45,000
Long-term assets (net)	<u>140,000</u>
Total assets	<u>\$185,000</u>
Current liabilities	\$ 20,000
Long-term liabilities	<u>65,000</u>
Total liabilities	85,000
Common stock and retained earnings	<u>100,000</u>
Total liabilities and stockholders' equity	<u>\$185,000</u>

Required

Compute the following:

- Working capital
- Current ratio
- Debt to assets ratio
- Debt to equity ratio

Exercise 13-9B *Ratio analysis*

LO 7

During 2008, Grosvenor Corporation reported net income after taxes of \$1,080,000. During the year, the number of shares of stock outstanding remained constant at 20,000 shares of \$100 par 8 percent preferred stock and 200,000 shares of common stock. The company's total equities at December 31, 2008, were \$3,500,000, which included \$640,000 of liabilities. The common stock was selling for \$40 per share at the end of the year. All dividends for the year were declared and paid, including \$3.60 per share to common stockholders.

Required

Compute the following.

- Earnings per share
- Book value per share
- Price-earnings ratio
- Dividend yield

Exercise 13-10B *Ratio analysis*

LO 2, 3, 4, 5, 6, 7

Match each of the following ratios with its formula.

_____ 1. Price-earnings ratio	a. Total liabilities ÷ Total stockholders' equity
_____ 2. Dividend yield	b. Current assets ÷ Current liabilities
_____ 3. Book value per share	c. 365 ÷ Accounts receivable turnover
_____ 4. Plant assets to long-term liabilities	d. (Net income – Preferred dividends) ÷ Average outstanding common shares
_____ 5. Times interest is earned	e. (Stockholders' equity – Preferred rights) ÷ Outstanding common shares
_____ 6. Earnings per share	f. 365 ÷ Inventory turnover
_____ 7. Net margin	g. Dividends per share ÷ Market price per share
_____ 8. Debt to equity ratio	h. Net plant assets ÷ Long-term liabilities
_____ 9. Current ratio	i. Market price per share ÷ Earnings per share
_____ 10. Turnover of assets	j. Net income ÷ Net sales
_____ 11. Days to collect A/R	k. Net sales ÷ Average total assets
_____ 12. Number of days to sell inventory	l. Income before taxes and interest expense ÷ Interest expense

Exercise 13-11B *Horizontal and vertical analysis*

LO 2

Lark Company reported the following operating results for 2008 and 2007.

	2008	2007
Sales	\$250,000	\$225,000
Cost of goods sold	126,000	114,000
Selling expenses	15,000	12,000
Administrative expenses	27,000	25,000
Interest expense	4,000	5,000
Total expenses	<u>172,000</u>	<u>156,000</u>
Income before taxes	78,000	69,000
Income taxes expense	<u>14,000</u>	<u>12,000</u>
Net income	<u>\$ 64,000</u>	<u>\$ 57,000</u>

Required

- Perform a horizontal analysis, showing the percentage change in each income statement component between 2008 and 2007.
- Perform a vertical analysis, showing each income statement component as a percent of sales for each year.

LO 4, 5, 6, 7**Exercise 13-12B** *Ratio analysis*

Compute the specified ratios using the following December 31, 2008, statement of financial position for Merton Company.

Assets	
Cash	\$ 32,000
Marketable securities	9,000
Accounts receivable	72,800
Inventory	112,200
Property and equipment	150,000
Accumulated depreciation	<u>(24,000)</u>
Total assets	<u>\$352,000</u>
Liabilities and Stockholders' Equity	
Accounts payable	\$ 39,200
Current notes payable	6,800
Mortgage payable	62,000
Bonds payable	42,000
Common stock	128,000
Retained earnings	<u>74,000</u>
Total liabilities and stockholders' equity	<u>\$352,000</u>

The average number of common shares outstanding during 2008 was 1,500. Net income for the year was \$60,000.

Required

Compute each of the following:

- Current ratio
- Earnings per share
- Acid-test ratio
- Return on investment
- Return on equity
- Debt to equity ratio

LO 4, 5, 6, 7**Exercise 13-13B** *Comprehensive analysis*

The following is a list of transactions.

- Paid cash for short-term marketable securities.
- Purchased a computer, issuing a short-term note for the purchase price.
- Purchased factory equipment, issuing a long-term note for the purchase price.
- Sold merchandise on account at a profit.
- Paid cash on accounts payable.
- Received cash from issuing common stock.
- Sold a factory for cash at a profit.
- Purchased raw materials on account.
- Paid cash for property taxes on administrative buildings.

Required

Indicate the effect of each of the preceding transactions on (a) the quick ratio, (b) working capital, (c) stockholders' equity, (d) the debt/equity ratio, (e) retained earnings.

Exercise 13-14B *Accounts receivable turnover, inventory turnover, and net margin***LO 4, 6**

Selected data from Newman Company follow.

Balance Sheet Data As of December 31		
	2009	2008
Accounts receivable	\$640,000	\$600,000
Allowance for doubtful accounts	(32,000)	(28,000)
Net accounts receivable	<u>\$608,000</u>	<u>\$572,000</u>
Inventories, lower of cost or market	<u>\$400,000</u>	<u>\$420,000</u>

Income Statement Data Year Ended December 31		
	2009	2008
Net credit sales	\$5,000,000	\$3,600,000
Net cash sales	<u>1,000,000</u>	<u>800,000</u>
Net sales	<u>\$6,000,000</u>	<u>\$4,400,000</u>
Cost of goods sold	\$3,500,000	\$2,600,000
Selling, general, and administrative expenses	600,000	320,000
Other expenses	<u>300,000</u>	<u>240,000</u>
Total operating expenses	<u>\$4,400,000</u>	<u>\$3,160,000</u>

Required

Compute the following.

- The accounts receivable turnover for 2009.
- The inventory turnover for 2009.
- The net margin for 2008.

Exercise 13-15B *Comprehensive analysis***LO 4, 5**

December 31, 2009, balance sheet data for Remington Company follow. All accounts are represented. Amounts indicated by question marks (?) can be calculated using the following additional information.

Assets	
Cash	\$ 15,000
Accounts receivable (net)	?
Inventory	?
Property, plant, and equipment (net)	<u>278,000</u>
	<u>\$?</u>
Liabilities and Stockholders' Equity	
Accounts payable (trade)	\$ 26,000
Income taxes payable (current)	14,000
Long-term debt	?
Common stock	160,000
Retained earnings	<u>?</u>
	<u>\$?</u>

continued

Additional Information

Quick ratio (at year end)	1.3 to 1
Working capital	\$42,000
Inventory turnover (cost of goods sold ÷ ending inventory)	12 times
Debt/Equity ratio	80%
Gross margin for 2009	\$126,000

Required

Determine the following.

- The balance in accounts receivable as of December 31, 2009.
- The turnover of assets for 2009.
- The balance of long-term debt as of December 31, 2009.
- The balance in retained earnings as of December 2009.

PROBLEMS—SERIES B**LO 2****Problem 13-16B** *Vertical analysis*

Stobart Corporation's controller has prepared the following vertical analysis for the president.

	2008	2007
Sales	100.0%	100.0%
Cost of goods sold	57.0	54.0
Gross margin	43.0	46.0
Selling and administrative expense	18.0	20.0
Interest expense	2.8	4.0
Total expenses	20.8	24.0
Income before taxes	22.2	22.0
Income tax expense	10.0	8.0
Net income	12.2%	14.0%

Required

Sales were \$500,000 in 2007 and \$750,000 in 2008. Convert the analysis to income statements for the two years.

LO 5, 6, 7**Problem 13-17B** *Ratio analysis*

Information from Tracey Company's financial statements follows.

	2008	2007
Net sales	\$1,800,000	\$1,250,000
Income before interest and taxes	480,000	360,000
Net income after taxes	235,000	148,000
Bond interest expense	45,000	30,000
Stockholders' equity, December 31 (2006: \$600,000)	900,000	750,000
Common stock, par \$24, December 31	525,000	450,000

Average number of shares outstanding was 16,000 for 2008 and 15,000 for 2007.

Required

Compute the following ratios for Tracey Company for 2008 and 2007.

- Number of times interest was earned.
- Earnings per share based on the average number of shares outstanding.
- Price-earnings ratio (market prices: 2008, \$75 per share; 2007, \$60 per share).
- Return on equity.
- Net margin.

Problem 13-18B *Effect of transactions on current ratio and working capital***LO 4**

Bend Company has a current ratio of 2:1 on June 30, 2008. Indicate whether each of the following transactions would increase (+), decrease (−), or not affect (NA) Bend's current ratio and its working capital.

Required

- Issued 10-year bonds for \$100,000 cash.
- Paid cash to settle an account payable.
- Sold merchandise for more than cost.
- Recognized depreciation on plant equipment.
- Purchased a machine by issuing a long-term note payable.
- Purchased merchandise inventory on account.
- Received customer payment on account receivable.
- Paid cash for federal income tax expense (assume that the expense has not been previously accrued).
- Declared cash dividend payable in one month.
- Received cash for interest on a long-term note receivable (assume that interest has not been previously accrued).
- Received cash from issuing a short-term note payable.
- Traded a truck for a sedan.

Problem 13-19B *Ratio analysis***LO 7**

Selected data for Cranston Company for 2008 and additional information on industry averages follow.

Earnings (net income)		\$ 240,000
Preferred stock (20,000 shares at \$35 par, 6%)		\$ 700,000
Common stock (40,500 shares at \$10 par, market value \$52)		405,000
Paid-in capital in excess of par—Common		450,000
Retained earnings		600,000
		<u>2,155,000</u>
Less: Treasury stock		
Preferred (1,000 shares)	\$36,000	
Common (500 shares)	<u>16,000</u>	52,000
Total stockholders' equity		<u>\$2,103,000</u>

Note: Dividends in arrears on preferred stock: \$39,900. The preferred stock can be called for \$46 per share.

Industry averages	
Earnings per share	\$2.50
Price-earnings ratio	8.00
Return on equity	7.30%

Required

- Calculate and compare Cranston Company's ratios with the industry averages.
- Discuss factors you would consider in deciding whether to invest in the company.

LO 4, 5

Problem 13-20B *Supply missing balance sheet numbers*

Beth Nail discovered a piece of wet and partially burned balance sheet after her office was destroyed by fire. She could recall a current ratio of 1.75 and a debt to assets ratio of 45 percent.

Assets	
Current assets	
Cash	\$ 36,000
Accounts receivable	(A)
Inventory	63,000
Prepaid expenses	13,500
Total current assets	(B)
Long-term assets	
Building	(C)
Less: Accumulated depreciation	(45,000)
Total long-term assets	270,000
Total assets	\$ (D)
Liabilities and Stockholders' Equity	
Liabilities	
Current liabilities	
Accounts payable	\$ 63,000
Notes payable	(E)
Income tax payable	27,000
Total current liabilities	120,000
Long-term liabilities	
Bonds payable	67,500
Mortgage payable	(F)
Total liabilities	(G)
Stockholders' equity	
Common stock	135,000
Retained earnings	(H)
Total stockholders' equity	(I)
Total liabilities and stockholders' equity	\$ (J)

Required

Complete the balance sheet by supplying the missing amounts.

LO 4, 5, 6, 7

Problem 13-21B *Ratio analysis*

The following financial statements apply to Quincy Appliances, Inc.

QUINCY APPLIANCES, INC.		
Balance Sheets		
As of December 31		
	2008	2007
Assets		
Current assets		
Cash	\$118,000	\$ 91,000
Marketable securities	24,000	18,000
Accounts receivable (net)	112,000	108,000
Inventories	180,000	192,000
Prepaid expenses	27,000	14,000
Total current assets	461,000	423,000
Investments	120,000	120,000
Plant (net)	260,000	254,000
Other	81,000	74,000
Total assets	\$922,000	\$871,000

continued

	2008	2007
Liabilities and Stockholders' Equity		
Liabilities		
Current liabilities		
Notes payable	\$ 20,000	\$ 15,000
Accounts payable	80,000	38,000
Other	66,000	9,000
Total current liabilities	<u>166,000</u>	<u>62,000</u>
Noncurrent liabilities		
Bonds payable	110,000	210,000
Other	26,000	12,000
Total noncurrent liabilities	<u>136,000</u>	<u>222,000</u>
Total liabilities	<u>302,000</u>	<u>284,000</u>
Stockholders' equity		
Preferred stock (\$100 par, 4% cumulative, non-participating; \$100 liquidating value; 1,000 shares authorized and issued; no dividends in arrears)	100,000	100,000
Common stock (\$10 par; 50,000 shares authorized; 12,000 shares issued)	120,000	120,000
Paid-in capital in excess of par—Preferred	36,000	36,000
Paid-in capital in excess of par—Common	120,000	120,000
Retained earnings	244,000	211,000
Total stockholders' equity	<u>620,000</u>	<u>587,000</u>
Total liabilities and stockholders' equity	<u>\$922,000</u>	<u>\$871,000</u>

QUINCY APPLIANCES, INC.		
Statements of Income and Retained Earnings		
For the Years Ended December 31		
	2008	2007
Revenues		
Sales (net)	\$240,000	\$230,000
Other revenues	7,000	4,000
Total revenues	<u>247,000</u>	<u>234,000</u>
Expenses		
Cost of goods sold	143,000	130,000
Selling, general, and administrative	46,000	57,000
Bond interest expense	7,000	10,000
Income tax expense	8,000	14,000
Total expenses	<u>204,000</u>	<u>211,000</u>
Net income	43,000	23,000
Retained earnings, January 1	211,000	198,000
Less: Preferred stock dividends	4,000	4,000
Common stock dividends	6,000	6,000
Retained earnings, December 31	<u>\$244,000</u>	<u>\$211,000</u>

Required

Calculate the following ratios for 2008.

- Working capital
- Current ratio
- Quick ratio
- Accounts receivable turnover
- Average days to collect accounts receivable

- f. Inventory turnover
- g. Avg. days to sell inventory
- h. Debt to assets ratio
- i. Debt to equity ratio
- j. Times interest was earned
- k. Plant assets to long-term debt
- l. Net margin
- m. Turnover of assets
- n. Return on investment
- o. Return on equity
- p. Earnings per share
- q. Book value per share
- r. Price-earnings ratio (market price: \$13.26)
- s. Dividend yield on common stock

LO 4, 5, 6, 7

**Problem 13-22B** *Ratio analysis*

Jefferson Company's stock is quoted at \$16 per share at December 31, 2008 and 2007. Jefferson's financial statements follow.

JEFFERSON COMPANY		
Balance Sheets		
As of December 31		
(In thousands)		
	2008	2007
Assets		
Current assets		
Cash	\$ 3,000	\$ 2,000
Marketable securities at cost which approximates market	5,000	4,000
Accounts receivable, net of allowance for doubtful accounts	47,000	44,000
Inventories, lower of cost or market	50,000	60,000
Prepaid expenses	2,000	1,000
Total current assets	107,000	111,000
Property, plant, and equipment, net of accumulated depreciation	100,000	105,000
Investments	1,000	1,000
Long-term receivables	3,000	2,000
Goodwill and patents, net of accumulated amortization	2,000	4,000
Other assets	2,000	3,000
Total assets	<u>\$215,000</u>	<u>\$226,000</u>
Liabilities and Stockholders' Equity		
Current liabilities		
Notes payable	\$ 3,000	\$ 5,000
Accounts payable	12,000	16,000
Accrued expenses	9,000	11,000
Income taxes payable	1,000	1,000
Payments due within one year	3,000	2,000
Total current liabilities	28,000	35,000
Long-term debt	50,000	60,000
Deferred income taxes	30,000	27,000
Other liabilities	5,000	4,000
Total liabilities	<u>113,000</u>	<u>126,000</u>

continued

	2008	2007
Stockholders' equity		
5% cumulative preferred stock, par value \$100 per share; \$100 liquidating value; authorized 25,000 shares; issued and outstanding 20,000 shares	20,000	20,000
Common stock, \$1 par value; 10,000,000 shares authorized and 5,000,000 shares issued and outstanding	5,000	5,000
Additional paid-in capital, common	35,000	35,000
Retained earnings	42,000	40,000
Total stockholders' equity	<u>102,000</u>	<u>100,000</u>
Total liabilities and stockholders' equity	<u>\$215,000</u>	<u>\$226,000</u>

JEFFERSON COMPANY		
Statements of Income and Retained Earnings		
For the Years Ended December 31		
(In thousands)		
	2008	2007
Net sales	<u>\$180,000</u>	<u>\$150,000</u>
Expenses		
Cost of goods sold	147,000	120,000
Selling, general, and administrative expenses	20,000	18,000
Other	2,000	2,000
Total expenses	<u>169,000</u>	<u>140,000</u>
Income before income taxes	11,000	10,000
Income taxes	5,000	4,000
Net income	6,000	6,000
Retained earnings at beginning of period	40,000	38,000
Less: Dividends on common stock	3,000	3,000
Dividends on preferred stock	1,000	1,000
Retained earnings at end of period	<u>\$ 42,000</u>	<u>\$ 40,000</u>

Required

Based on the preceding information, compute the following for 2008 only.

- a. Current ratio
- b. Quick (acid-test) ratio
- c. Average days to collect accounts receivable, assuming all sales on account
- d. Inventory turnover
- e. Book value per share of common stock
- f. Earnings per share on common stock
- g. Price-earnings ratio on common stock
- h. Debt to assets ratio
- i. Return on investment
- j. Return on equity

Problem 13-23B *Horizontal analysis***LO 2****Required**

Use the financial statements for Jefferson Company from Problem 13-22B to perform a horizontal analysis of both the balance sheet and income statement for 2008 and 2007.

LO 2

Problem 13-24B *Vertical analysis***Required**

Use the financial statements for Jefferson Company from Problem 13-22B to perform a vertical analysis (based on total assets, total equities, and sales) of both the balance sheets and income statements for 2008 and 2007.

ANALYZE, THINK, COMMUNICATE**ATC 13-1 Business Applications Case** *Analyzing Best Buy Company and Circuit City Stores*

The following information relates to **Best Buy** and **Circuit City Stores, Inc.**, for their 2007 and 2006 fiscal years.

BEST BUY COMPANY		
Selected Financial Information		
(Amounts in millions, except per share amounts)		
	March 3, 2007	February 25, 2006
Total current assets	\$ 9,081	\$ 7,985
Merchandise inventories	4,028	3,338
Property and equipment, net of depreciation	2,938	2,712
Total assets	13,570	11,864
Total current liabilities	6,301	6,056
Total long-term liabilities	590	178
Total liabilities	7,369	6,607
Total shareholders equity	6,201	5,257
Revenue	35,934	30,848
Cost of goods sold	27,165	23,122
Gross profit	8,769	7,726
Operating income	1,999	1,644
Earnings from continuing operations		
before income tax expense	2,130	1,721
Income tax expense	752	581
Net earnings	1,377	1,140
Basic earnings per share	\$ 2.86	\$ 2.33

CIRCUIT CITY STORES		
Selected Financial Information		
(Amounts in millions except per share data)		
	February 28, 2007	February 28, 2006
Total current assets	\$ 2,884	\$ 2,833
Merchandise inventory	1,637	1,698
Property and equipment, net of depreciation	921	839
Total assets	4,007	4,069
Total current liabilities	1,714	1,622
Total long-term liabilities	502	492
Total liabilities	2,216	2,114
Total stockholders' equity	1,791	1,955

continued

	February 28, 2007	February 28, 2006
Revenues	\$ 12,430	\$ 11,598
Cost of sales, buying, and warehousing	9,501	8,767
Gross profit	2,928	2,831
Earnings from continuing operations before income taxes	20	239
Provision for income taxes	31	88
Earnings from continuing operations	(10)	151
Net earnings	(8)	140
Basic earnings per share: Continuing operations:	(\$ 0.05)	\$ 0.79

Required

- a. Compute the following ratios for the companies' 2007 fiscal years:
 - (1) Current ratio.
 - (2) Average days to sell inventory. (Use average inventory.)
 - (3) Debt to assets ratio.
 - (4) Return on investment. (Use average assets and use "earnings from continuing operations" rather than "net earnings.")
 - (5) Gross margin percentage.
 - (6) Asset turnover. (Use average assets.)
 - (7) Return on sales. (Use "earnings from continuing operations" rather than "net earnings.")
 - (8) Plant assets to long-term debt ratio.
- b. Which company appears to be more profitable? Explain your answer and identify which of the ratio(s) from Requirement *a* you used to reach your conclusion.
- c. Which company appears to have the higher level of financial risk? Explain your answer and identify which of the ratio(s) from Requirement *a* you used to reach your conclusion.
- d. Which company appears to be charging higher prices for its goods? Explain your answer and identify which of the ratio(s) from Requirement *a* you used to reach your conclusion.
- e. Which company appears to be the more efficient at using its assets? Explain your answer and identify which of the ratio(s) from Requirement *a* you used to reach your conclusion.

ATC 13-2 Group Assignment *Ratio analysis and logic*

Presented here are selected data from the 10-K reports of four companies. The four companies, in alphabetical order, are

BellSouth Corporation, a telephone company that operates in the southeastern United States.

Caterpillar, Inc., a manufacturer of heavy machinery.

Dollar General Corporation, a company that owns Dollar General Stores discount stores.

Tiffany & Company, a company that operates high-end jewelry stores.

The data, presented in the order of the amount of sales, are as follows. Dollar amounts are in millions.

	A	B	C	D
Sales	\$20,561	\$18,110	\$2,627.3	\$1,017.6
Cost of goods sold	6,254	13,374	1,885.2	453.4
Net earnings	3,261	1,665	144.6	72.8
Inventory or NA	2,603	632.0	386.4	NA
Materials and supplies	398	NA	NA	NA
Accounts receivable	4,750	3,331	0	99.5
Total assets	36,301	20,756	914.8	827.1

Required

- a. Divide the class into groups of four or five students per group and then organize the groups into four sections. Assign Task 1 to the first section of groups, Task 2 to the second section, Task 3 to the third section, and Task 4 to the fourth section.



Group Tasks

- (1) Assume that you represent BellSouth Corporation. Identify the set of financial data (Column A, B, C, or D) that relates to your company.
- (2) Assume that you represent Caterpillar, Inc. Identify the set of financial data (Column A, B, C, or D) that relates to your company.
- (3) Assume that you represent Dollar General Corporation. Identify the set of financial data (Column A, B, C, or D) that relates to your company.
- (4) Assume that you represent Tiffany & Company. Identify the set of financial data (Column A, B, C, or D) that relates to your company.

Hint: Use a gross margin ratio (gross margin ÷ sales), a net margin ratio (net income ÷ sales), and return on assets (net income ÷ total assets) to facilitate identifying the financial data related to your particular company.

- b. Select a representative from each section. Have the representatives explain the rationale for the group’s selection. The explanation should include a set of ratios that support the group’s conclusion.

ATC 13-3 Research Assignment *Analyzing Whirlpool’s acquisition of Maytag*



To complete the requirements below you will need to obtain Whirlpool’s income statements for 2005 and 2006, and its balance sheets for 2004, 2005, and 2006. The easiest way to obtain these financial statements is to retrieve the company’s 2006 and 2005 Form 10-Ks. To obtain the Form 10-Ks you can use either the EDGAR system following the instructions in Appendix A, or they can be found under the “Investors” link on the company’s corporate website at www.whirlpoolcorp.com. On March 31, 2006, Whirlpool Corporation acquired Maytag, another manufacturer of home appliances. The company’s 2006 financial statements include the activities of Maytag; its 2005 and 2004 statements do not.

Required

- a. Compute the following ratios for 2006 and 2005. Show your calculations.

Gross margin percentage	Net margin
Return on investment	Return on equity
Current ratio	Debt to assets ratio

- b. Based on the ratios computed in Requirement a, comment on the apparent effects of Whirlpool’s acquisition of Maytag. Assume any significant change in these ratios was the result of the acquisition.
- c. Based on this limited analysis, does it appear that the short-term effects of the acquisition were good or bad for Whirlpool?

ATC 13-4 Writing Assignment *Interpreting ratios*



Following are the debt to assets, return on assets, and return on equity ratios for four companies from two different industries. The interest rate shown for each company is its approximate average interest rate on all debt. Each of these public companies is a leader in its particular industry. The data for **Wachovia** and **Toll Brothers** are for the fiscal years ending in 2005, and the data for **Wells Fargo** and **Pulte** are for the fiscal years ending in 2004. All numbers are percentages.

	Debt to Assets	Return on Assets	Return on Equity	Interest Rate
Banking Industry				
Wachovia Corporation	90.3	1.2	14.0	2.1
Wells Fargo & Co.	91.1	1.6	18.5	1.0
Home Construction Industry				
Pulte Corporation	56.5	9.5	21.8	3.6
Toll Brothers, Inc.	56.4	12.7	29.2	4.7

Required

- Based only on the debt to assets ratios, the banking companies appear to have the most financial risk. Generally, companies with more financial risk have higher interest rates. Write a brief explanation of why the banking companies can borrow money at lower interest rates than the construction companies.
- Explain why the return on equity ratio for Wachovia is more than 10 times greater than its return on assets ratio, while the return on equity ratio for Pulte is less than 3 times greater than its return on assets ratio.

ATC 13-5 Ethical Dilemma *Making the ratios look good*

J. Talbot is the accounting manager for Kolla Waste Disposal Corporation. Kolla is having its worst financial year since its inception. The company is expected to report a net loss. In the midst of such bad news, Ms. Talbot surprised the company president, Mr. Winston, by suggesting that the company write off approximately 25 percent of its garbage trucks. Mr. Winston responded by noting that the trucks could still be operated for another two or three years. Ms. Talbot replied, "We may use them for two or three more years, but you couldn't sell them on the street if you had to. Who wants to buy a bunch of old garbage trucks and besides, it will make next year's financials so sweet. No one will care about the additional write-off this year. We are already showing a loss. Who will care if we lose a little bit more?"

**Required**

- How will the write-off affect the following year's return on assets ratio?
- How will the write-off affect the asset and income growth percentages?
- Would writing off the garbage trucks violate any of the standards of ethical conduct shown in Exhibit 1.15 of Chapter 1?
- Explain how the components of the fraud triangle relate to this case.

ATC 13-6 Spreadsheet Assignment *Using Excel*

Tomkung Corporation's 2007 income statements are presented in the following spreadsheet.

Required

Construct a spreadsheet to conduct horizontal analysis of the income statements for 2010 and 2009.

	2010	2009	Percentage Change
Sales	\$1,025,000	\$987,000	3.9%
Cost of Goods Sold	795,000	732,000	8.6%
Gross Margin	230,000	255,000	-9.8%
Operating Expenses	200,000	205,000	-2.4%
Income before Taxes	30,000	50,000	-40.0%
Income Taxes	10,000	17,100	-41.5%
Net Income	\$20,000	\$32,900	-39.2%

ATC 13-7 Spreadsheet Assignment *Mastering Excel*

Refer to the data in ATC 13-6.

Required

Construct a spreadsheet to conduct vertical analysis for both years, 2010 and 2009.