CHAPTER 9

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 September 7, 2009, **Kraft Foods, Inc.**, announced that it had made an offer to the board of directors of **Cadbury PLC** to purchase their company for $16.7 billion in cash and stock. The CEO of Cadbury promptly rejected the offer, and a four month war of words began. Among other things, Cadbury's CEO described Kraft as an "unfocused conglomerate," with "unappealing categories," and having "a management that underperforms." He said that Kraft's offer greatly undervalued Cadbury. Meanwhile, the CEO of Kraft said its offer for Cadbury was "full and fair." Upon making its offer to Cadbury's board, Kraft also stipulated that if the board did not accept the offer by January 20, 2010, Kraft would make its offer to buy the company's stock directly to Cadbury's shareholders.

When a company makes a bid for one of its competitors, it often causes other companies to enter the bidding process. Analysts predicted that **Hershey** and **Nestle** would soon make their own offers for Cadbury. These offers did not materialize, although there were rumors that Hershey was preparing to make an offer of $18.8 billion.

On the morning of January 19, 2010, the last day before Kraft planned to take its offer directly to Cadbury's shareholders, the two companies announced they had reached an agreement. Kraft would buy Cadbury for $19.4 billion.

If after four months of waiting for Cadbury to accept its offer no other company was willing to make a competing bid for Cadbury, why whould Kraft agree to buy it at a price that was 16 percent higher than its original offer? (Answer on page 323.)

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 vary, 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 9.1 and 9.2 present comparative financial statements for Milavec Company. We refer to these statements in the examples of analysis techniques.

EXHIBIT 9.1

MILAVEC COMPANY
Income Statements and Statements of Retained Earnings
For the Years Ending December 31

	2012	2011
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 9.2

MILAVEC COMPANY
Balance Sheets
As of December 31

	2012	2011
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 items	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 9.3

MILAVEC COMPANY
Comparative Income Statements
For the Years Ending December 31

	2012	2011	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) ÷ $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 9.3 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. 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 9.1

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 ÷ $325) of sales. Horn's gross margin represents 40 percent ($272 ÷ $680) of sales. Because 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 **Kraft** agreed to acquire **Cadbury** because it believed it could make a profit on the investment. Two major reasons were discussed as to why Kraft would want Cadbury. First, Cadbury was a bigger player than Kraft in important markets outside of the United States. Owning Cadbury would make it easier for Kraft to expand globally, especially in several rapidly developing markets, including Egypt, India, Mexico, and Thailand. Second, in 2008, **Mars, Inc.** had acquired the giant chewing gum company, **Wm. Wrigley Jr. Company**, making it a much larger confectionary company. By purchasing Cadbury, Kraft felt it could better compete with Mars.

Kraft's optimism about its purchase of Cadbury does not guarantee that the investment will be successful. In the late 1980s and early 1990s **Hershey's** purchased several Dutch, German, and Italian confectionary companies that, a few years later, it sold at losses. How do companies decide what another company is worth, and how can such successful companies as Hershey, **Nestlé**, Kraft, and Cadbury have such different opinions about the value of an investment? Valuing a potential investment is the result of extensive financial analysis, as discussed in this chapter, and capital budgeting techniques, discussed in Chapter 16. As these references indicate, such decision making is based on estimates about future events. Predicting the future is imperfect, no matter how well trained the forecaster might be.

Does this mean that financial analysis is useless? No. Consider someone planning to drive across the United States. Would they prefer to take the trip with a map or without? Obviously they would prefer to have a map or GPS, even though they know neither device is perfect. Similarly, just as five different financial analysts may reach five different amounts they think a company is worth; five individuals planning a trip from Key West, Florida, to Anchorage Alaska, could look at the same map and decide on five different ways to get there. Only after the trips have been completed can we say which person made the best decision.

Sources: "Cadbury Sour on Kraft Bid," *The Wall Street Journal,* September 8, 2009, pp. A–1 and A–17; "Nestlé's Undercooked Deal Making," *The Wall Street Journal,* January 9 & 10, 2010, pp. B–10; "Kraft Near Deal for Cadbury," *The Wall Street Journal,* January 19, 2010, pp. A–1 and A–6; "Kraft Wins a Reluctant Cadbury with Help of Clock, Hedge Funds," *The Wall Street Journal,* January 20, 2010, pp. B–1 and B–6; and "Hershey, On Its Own, Has Limited Options," *The Wall Street Journal,* January 20, 2010, p. B–6.

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 2009 and 2010 were $600,000 and $750,000, respectively.

	2012	2011	2010	2009
Sales	$900,000	$800,000	$750,000	$600,000
Increase over 2009 sales	50.0%	33.3%	25.0%	–
Increase over preceding year	12.5%	6.7%	25.0%	–

Analysis discloses that Milavec's 2012 sales represented a 50 percent increase over 2009 sales, and a large increase (25 percent) occurred in 2010. From 2010 to 2011, 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 9.4 presents Milavec's income statements, along with vertical percentages, for 2012 and 2011. 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 9.4

MILAVEC COMPANY
Vertical Analysis of Comparative Income Statements

	2012		2011	
	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 9.5 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 2011 and 13.8% in 2012. While this appears to be a small increase, it actually represents a 62.8% increase in the inventory account balance ([$70,000 − $43,000] ÷ $43,000) from 2011 to 2012. Careful analysis requires considering changes in both percentages *and* absolute amounts.

Ratio Analysis

LO 3

Explain 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.

EXHIBIT 9.5

MILAVEC COMPANY
Vertical Analysis of Comparative Balance Sheets

	2012	Percentage* of Total	2011	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 items	4,000	0.8	4,000	0.9
Total current assets	168,000	33.1	145,000	31.9
Property, plant, and equipment	340,000	66.9	310,000	68.1
Total assets	$508,000	100.0%	$455,000	100.0%
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	46,000	9.1	43,000	9.5
Bonds payable, 8%	100,000	19.7	100,000	22.0
Total liabilities	146,000	28.7	143,000	31.4
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	162,000	31.9	137,000	30.1
Total stockholders' equity	362,000	71.3	312,000	68.6
Total liabilities and stockholders' equity	$508,000	100.0%	$455,000	100.0%

*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 pay 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 or consumed 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 2012 and 2011 for Milavec Company was as follows.

	2012	2011
Current assets	$168,000	$145,000
− Current liabilities	46,000	43,000
Working capital	$122,000	$102,000

Milavec's working capital increased from 2011 to 2012, 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)	46,000	378,000
Working capital	$122,000	$122,000
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 .05:1 to 3.0:1. 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 items, are omitted. Inventories may take several months to sell; prepaid items 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 2012 and 2011 follow.

	2012	2011
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 2011 to 2012 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 2012 than it was in 2011.

Accounts Receivable Ratios

Offering customers credit plays an enormous role in generating revenue, but it also increases expenses and delays cash receipts. To minimize uncollectible accounts 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 number of 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, allowances, 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). Because 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.

	2012	2011
Net sales (assume all on account) (a)	$900,000	$800,000
Beginning receivables (b)	$ 56,000	$ 55,000*
Ending receivables (c)	50,000	56,000
Average receivables (d) = (b + c) ÷ 2	$ 53,000	$ 55,500
Accounts receivable turnover (a ÷ d)	16.98	14.41

*The beginning receivables balance was drawn from the 2010 financial statements, which are not included in the illustration.

The 2012 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 number of days to collect receivables is calculated as follows.

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

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 2012, the average collection period was 21 days, 365 ÷ 16.98 (the number of days in the year divided by accounts receivable turnover). For 2011, it took an average of 25 days (365 ÷ 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.

	2012	2011
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 2010 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 number of days to sell inventory is determined by dividing the number of days in the year by the inventory turnover as follows.

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

The result approximates the number of days the firm could sell inventory without purchasing more. For Milavec, this figure was 34 days in 2012 (365 ÷ 10.80) and 32 days in 2011 (365 ÷ 11.57). In recent years it took around 72 days, on average, for the companies in the Dow Jones Industrial Average 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

LO 5

Calculate ratios for assessing a company's solvency.

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 their investment is in debt or stockholders' equity.

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.

	2012	2011
Total liabilities (a)	$146,000	$143,000
Total stockholders' equity (b)	362,000	312,000
Total assets (liabilities + stockholders' equity) (c)	$508,000	$455,000
Debt to assets (a ÷ c)	29%	31%
Debt to equity ratio (a ÷ 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

The **times interest earned** 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.

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

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.

	2012	2011
Income before taxes	$42,000	$40,000
Interest expense (b)	8,000	8,000*
Earnings before interest and taxes (a)	$50,000	$48,000
Times interest earned (a ÷ b)	6.25 times	6 times

*Interest on bonds: $100,000 × .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 9.2

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)	$950	$850
Interest expense (d)	$ 65	$ 45
Income before taxes (e)	140	130
Earnings before interest and taxes (f)	$205	$175

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:

Total assets = Liabilities + 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

Because 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.

	2012	2011
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 desire information about 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

LO 6

Calculate ratios for assessing company management's 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 2012 and 2011 were as follows.

	2012	2011
Net income (a)	$ 25,000	$ 22,000
Net sales (b)	900,000	800,000
Net margin (a ÷ b)	2.78%	2.75%

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. Because 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.

	2012	2011
Net sales (a)	$900,000	$800,000
Beginning assets (b)	$455,000	$420,000*
Ending assets (c)	508,000	455,000
Average assets (d) = (b + c) ÷ 2	$481,500	$437,500
Asset turnover (a ÷ d)	1.87	1.83

*The beginning asset balance was drawn from the 2010 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]

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

[1]Detailed coverage of the return on investment ratio is provided in Chapter 15. 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.

2012

$25,000 ÷ $481,500* = 5.19%

2011

$22,000 ÷ $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 averaged around 9 percent. 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.

	2012	2011
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)	$362,000	$312,000
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

LO 7

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

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.

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 9.1 shows that Milavec did not pay the preferred dividends in 2012. Because 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 2012 and $\$125{,}000 \div \$10 = 12{,}500$ for 2011). Using these data, Milavec's 2012 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 uncollectible accounts 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 2012 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. Recently 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 (4.0 percent versus 4.5 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.

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 9.6.

EXHIBIT 9.6

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 − Prepaid Items) ÷ Current liabilities
	4. Accounts receivable turnover	Net credit sales ÷ Average receivables
	5. Average number of days to collect receivables	365 ÷ Accounts receivable turnover
	6. Inventory turnover	Cost of goods sold ÷ Average inventory
	7. Average number of 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. Times interest earned	Earnings before interest expense and taxes ÷ Interest expense
	11. Plant assets to long-term liabilities	Net plant assets ÷ Long-term liabilities
Profitability Ratios	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
	15. Return on equity	Net income ÷ Average total stockholders' equity
Stock Market Ratios	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

PRESENTATION OF ANALYTICAL RELATIONSHIPS

To communicate with users, companies present analytical information in endless different ways in annual reports. Although providing diagrams and illustrations in annual reports is not usually required, companies often include various forms of graphs and charts along with the underlying numbers to help users interpret financial statement data more easily. Common types presented include bar charts, pie charts, and line graphs. Exhibits 9.7, 9.8, and 9.9 show examples of these forms.

EXHIBIT 9.7

Earnings and Dividends on Common Stock

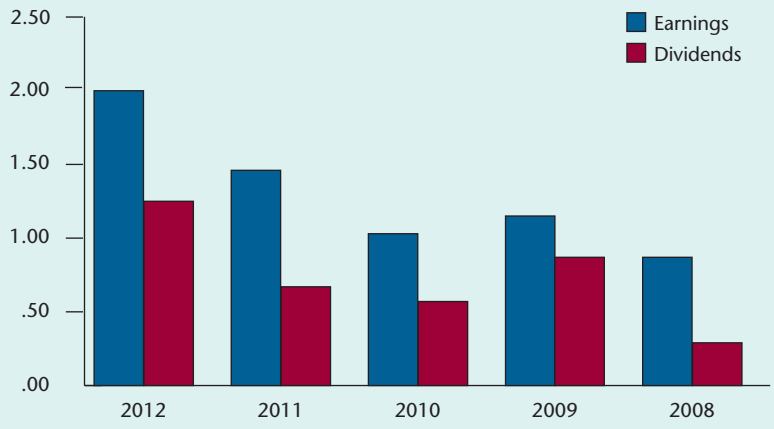


EXHIBIT 9.8

Percentage of Sales Dollar

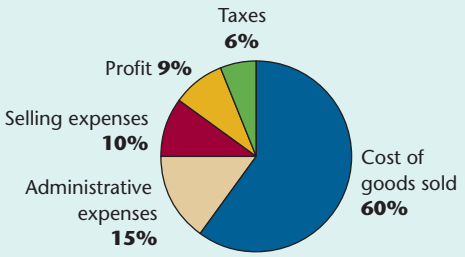
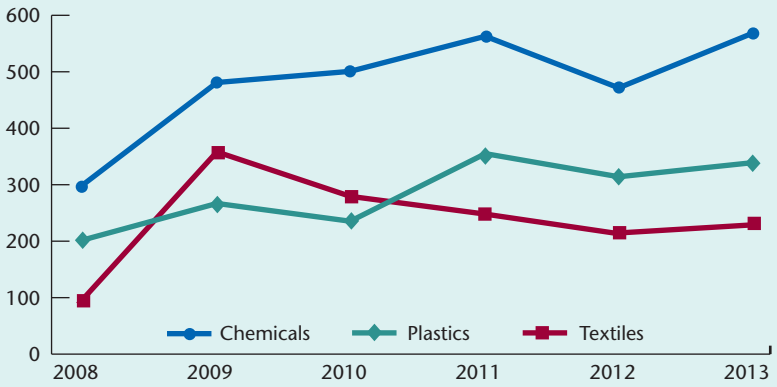


EXHIBIT 9.9

Profits by Major Industry Segment



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

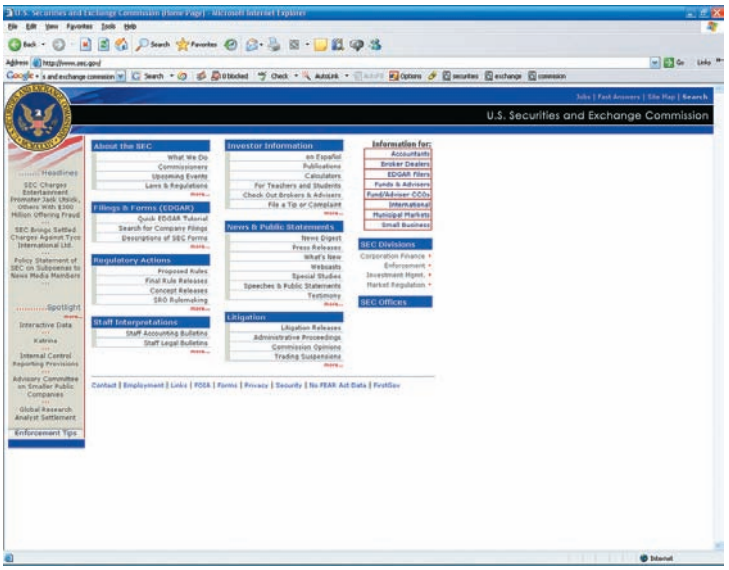
LO 8

Explain the limitations of financial statement analysis.

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.*



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 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 companies 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; uncollectible accounts 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 1982 for $10,000 is not comparable in value to the asset purchased in 2012 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 9.3

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 changing 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 9.6. 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 >>

This chapter concludes the *financial* accounting portion of the text. Beginning with Chapter 10, we introduce various tools from a branch of the field called *managerial* accounting. Managerial accounting focuses on meeting the accounting information needs of decision makers inside, rather than outside, a company. In addition to financial statement data, inside users require detailed, forward looking information that includes nonfinancial as well as financial components. We begin with a chapter that discusses the value management accounting adds to the decision making process.

A step-by-step audio-narrated series of slides is provided on the text website at www.mhhe.com/edmondssurvey3e

SELF-STUDY REVIEW PROBLEM

Financial statements for Stallings Company follow.

INCOME STATEMENTS
For the Years Ended December 31

	2013	2012
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	$ 40,800	$ 32,700

Balance Sheets as of December 31

	2013	2012
Assets		
Current assets		
Cash	$ 6,500	$ 11,500
Accounts receivable	51,000	49,000
Inventories	155,000	147,500
Total current assets	212,500	208,000
Plant and equipment (net)	187,500	177,000
Total assets	$400,000	$385,000
Liabilities and Stockholders' Equity		
Liabilities		
Current liabilities		
Accounts payable	$ 60,000	$ 81,500
Other	25,000	22,500
Total current liabilities	85,000	104,000
Bonds payable	100,000	100,000
Total liabilities	185,000	204,000
Stockholders' equity		
Common stock (50,000 shares, $3 par)	150,000	150,000
Paid-in capital in excess of par value	20,000	20,000
Retained earnings	45,000	11,000
Total stockholders' equity	215,000	181,000
Total liabilities and stockholders' equity	$400,000	$385,000

Required

a. Use horizontal analysis to determine which expense item increased by the highest percentage from 2012 to 2013.

b. Use vertical analysis to determine whether the inventory balance is a higher percentage of total assets at the end of 2012 or 2013.

c. Calculate the following ratios for 2012 and 2013. 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 2013 and 2012 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.

Cost of goods sold ($189,000 − $154,000) ÷ $154,000 = 22.73%

General, selling, and administrative ($54,000 − $46,000) ÷ $46,000 = 17.39%

Interest expense decreased.

Income tax expense ($27,200 − $21,800) ÷ $21,800 = 24.77%

Solution to Requirement *b*

2012: $147,500 ÷ $385,000 = 38.31%

2013: $155,000 ÷ $400,000 = 38.75%

Inventory is slightly larger relative to total assets at the end of 2013.

Solution to Requirement *c*

		2013	2012
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.	Current assets − 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

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Average number of days to collect receivables 328
Average number of days to sell inventory 328
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Working capital ratio 326

QUESTIONS

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

MULTIPLE-CHOICE QUESTIONS

Multiple-choice questions are provided on the text website at www.mhhe.com/edmondssurvey3e.

EXERCISES

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

LO 4

Exercise 9-1 *Inventory turnover*

Selected financial information for Feemster Company for 2012 follows.

Sales	$2,000,000
Cost of goods sold	1,400,000
Merchandise inventory	
Beginning of year	155,000
End of year	195,000

Required

Assuming that the merchandise inventory buildup was relatively constant, how many times did the merchandise inventory turn over during 2012?

Exercise 9-2 *Times interest earned* LO 5

The following data come from the financial records of Bynum Corporation for 2011.

Sales	$840,000
Interest expense	5,000
Income tax expense	27,000
Net income	28,000

Required

How many times was interest earned in 2011?

Exercise 9-3 *Current ratio* LO 4

Meador Corporation wrote off a $1,000 uncollectible account receivable against the $12,000 balance in its allowance account.

Required

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

Exercise 9-4 *Working capital and current ratio* LO 4

On June 30, 2011, Weslaco Company's total current assets were $500,000 and its total current liabilities were $275,000. On July 1, 2011, Weslaco issued a short-term note to a bank for $40,000 cash.

Required

a. Compute Weslaco's working capital before and after issuing the note.
b. Compute Weslaco's current ratio before and after issuing the note.

Exercise 9-5 *Working capital and current ratio* LO 4

On June 30, 2011, Weslaco Company's total current assets were $500,000 and its total current liabilities were $275,000. On July 1, 2011, Weslaco issued a long-term note to a bank for $40,000 cash.

Required

a. Compute Weslaco's working capital before and after issuing the note.
b. Compute Weslaco's current ratio before and after issuing the note.

Exercise 9-6 *Horizontal analysis* LO 2, 3

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

	2011	2010	Percentage Change
Sales	$1,300,000	$1,000,000	
Cost of goods sold	800,000	600,000	
Gross margin	500,000	400,000	
Operating expenses	300,000	200,000	
Income before taxes	200,000	200,000	
Income taxes	61,000	53,000	
Net income	$ 139,000	$ 147,000	

Required

a. Compute the percentage changes in Pettit Corporation's income statement components between the two years.

b. Comment on apparent trends disclosed by the percentage changes computed in Requirement *a*.

LO 2

Exercise 9-7 *Vertical analysis*

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

2011	Amount	Percent of Sales
Sales	$1,000,000	
Cost of goods sold	550,000	
Gross margin	450,000	
Operating expenses	130,000	
Income before taxes	320,000	
Income taxes	80,000	
Net income	$240,000	

2012	Amount	Percent of Sales
Sales	$1,080,000	
Cost of goods sold	600,000	
Gross margin	480,000	
Operating expenses	150,000	
Income before taxes	330,000	
Income taxes	82,000	
Net income	$248,000	

Required

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

LO 4, 5

Exercise 9-8 *Ratio analysis*

Balance sheet data for Kamel Corporation follow.

Current assets	$ 240,000
Long-term assets (net)	760,000
Total assets	$1,000,000
Current liabilities	$ 150,000
Long-term liabilities	450,000
Total liabilities	600,000
Total stockholders' equity	400,000
Total liabilities and stockholders' equity	$1,000,000

Required

Compute the following:

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

Exercise 9-9 *Ratio analysis* LO 7

For 2011, Stanton Corporation reported after-tax net income of $3,600,000. 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 was $20,000,000 at December 31, 2011. Stanton Corporation's common stock was selling at $52 per share at the end of its fiscal year. All dividends for the year had been paid, including $4.80 per share to common stockholders.

Required

Compute the following:

a. Earnings per share
b. Book value per share of common stock
c. Price-earnings ratio
d. Dividend yield

Exercise 9-10 *Ratio analysis* LO 4, 5, 6, 7

Required

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

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

Exercise 9-11 *Horizontal and vertical analysis* LO 2

Income statements for Thompson Company for 2011 and 2012 follow.

	2012	2011
Sales	$200,000	$180,000
Cost of goods sold	142,000	120,000
Selling expenses	20,000	18,000
Administrative expenses	12,000	14,000
Interest expense	3,000	5,000
Total expenses	177,000	157,000
Income before taxes	23,000	23,000
Income taxes expense	5,000	3,000
Net income	$ 18,000	$ 20,000

Required

a. Perform a horizontal analysis, showing the percentage change in each income statement component between 2011 and 2012.

b. Perform a vertical analysis, showing each income statement component as a percent of sales for each year.

LO 4, 5, 6, 7

Exercise 9-12 *Ratio analysis*

Compute the specified ratios using Hilda Company's balance sheet at December 31, 2011.

Assets	
Cash	$ 15,000
Marketable securities	8,000
Accounts receivable	13,000
Inventory	11,000
Property and equipment	170,000
Accumulated depreciation	(12,500)
Total assets	$204,500
Equities	
Accounts payable	$ 8,500
Current notes payable	3,500
Mortgage payable	4,500
Bonds payable	21,500
Common stock	114,000
Retained earnings	52,500
Total liabilities and stockholders' equity	$204,500

The average number of common stock shares outstanding during 2011 was 880 shares. Net income for the year was $15,000.

Required

Compute each of the following:

a. Current ratio

b. Earnings per share

c. Quick (acid-test) ratio

d. Return on investment

e. Return on equity

f. Debt to equity ratio

LO 4, 5, 6, 7

Exercise 9-13 *Comprehensive analysis*

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 1.0.

a. Collected account receivable.

b. Wrote off account receivable.

c. Converted a short-term note payable to a long-term note payable.

d. Purchased inventory on account.

e. Declared cash dividend.

f. Sold merchandise on account at a profit.

g. Issued stock dividend.

h. Paid account payable.

i. Sold building at a loss.

Exercise 9-14 *Accounts receivable turnover, inventory turnover, and net margin* LO 4, 6

Selected data from Warren Company follow.

Balance Sheet Data
As of December 31

	2011	2010
Accounts receivable	$400,000	$376,000
Allowance for doubtful accounts	(20,000)	(16,000)
Net accounts receivable	$380,000	$360,000
Inventories, lower of cost or market	$480,000	$440,000

Income Statement Data
For the Year Ended December 31

	2011	2010
Net credit sales	$2,000,000	$1,760,000
Net cash sales	400,000	320,000
Net sales	2,400,000	2,080,000
Cost of goods sold	1,600,000	1,440,000
Selling, general, and administrative expenses	240,000	216,000
Other expenses	40,000	24,000
Total operating expenses	$1,880,000	$1,680,000

Required

Compute the following:

a. The accounts receivable turnover for 2011.
b. The inventory turnover for 2011.
c. The net margin for 2010.

Exercise 9-15 *Comprehensive analysis* LO 4, 5

The December 31, 2012, balance sheet for Kessler Inc. is presented here. These are the only accounts on Kessler's balance sheet. Amounts indicated by question marks (?) can be calculated using the additional information following the balance sheet.

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

continued

Additional Information	
Current ratio (at year end)	1.5 to 1.0
Total liabilities ÷ Total stockholders' equity	0.8
Gross margin percent	30%
Inventory turnover (Cost of goods sold ÷ Ending inventory)	10.5 times
Gross margin for 2012	$315,000

Required

Determine the following.

a. The balance in trade accounts payable as of December 31, 2012.
b. The balance in retained earnings as of December 31, 2012.
c. The balance in the inventory account as of December 31, 2012.

PROBLEMS

connect ACCOUNTING

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

LO 2

Problem 9-16 *Vertical analysis*

CHECK FIGURES
NI of 2012: $27,000
Total expenses of 2011: $112,500

The following percentages apply to Lowther Company for 2011 and 2012.

	2012	2011
Sales	100.0%	100.0%
Cost of goods sold	61.0	64.0
Gross margin	39.0	36.0
Selling and administrative expenses	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%

Required

Assuming that sales were $500,000 in 2011 and $600,000 in 2012, prepare income statements for the two years.

LO 5, 6, 7

eXcel

Problem 9-17 *Ratio analysis*

CHECK FIGURES
a. 2011: 12.22 times
c. 2010: 8.5 times

Weimar Company's income statement information follows.

	2011	2010
Net sales	$420,000	$260,000
Income before interest and taxes	110,000	85,500
Net income after taxes	55,500	63,000
Interest expense	9,000	8,000
Stockholders' equity, December 31 (2009: $200,000)	305,000	235,000
Common stock, December 31	260,000	230,000

The average number of shares outstanding was 7,800 for 2011 and 6,900 for 2010.

Required

Compute the following ratios for Weimar for 2011 and 2010.

a. Times interest earned.
b. Earnings per share based on the average number of shares outstanding.
c. Price-earnings ratio (market prices: 2011, $64 per share; 2010, $78 per share).
d. Return on average equity.
e. Net margin.

Problem 9-18 *Effect of transactions on current ratio and working capital*

LO 4

Sherman Manufacturing has a current ratio of 3:1 on December 31, 2011. Indicate whether each of the following transactions would increase (+), decrease (−), or have no affect (NA) Sherman'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.

Problem 9-19 *Ratio analysis*

LO 7

CHECK FIGURE
a. Earnings per share: $3.50

Selected data for Richmond Company for 2011 and additional information on industry averages follow.

Earnings (net income)		$ 174,000
Preferred stock (13,200 shares at $50 par, 4%)		$ 660,000
Common stock (45,000 shares, market value $56)		510,000
Retained earnings		562,500
		$1,732,500
Less: Treasury stock		
Preferred (1,800 shares)	$54,000	
Common (1,800 shares)	24,000	78,000
Total stockholders' equity		$1,654,500

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

Required

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

LO 2

CHECK FIGURES
D. $337,500
F. $97,500

Problem 9-20 *Supply missing balance sheet numbers*

The bookkeeper for Lowell's Country Music Bar went insane and left this incomplete balance sheet. Lowell's working capital is $90,000 and its debt to assets ratio is 40 percent.

Assets	
Current assets	
Cash	$ 21,000
Accounts receivable	42,000
Inventory	(A)
Prepaid items	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.

LO 4, 5, 6, 7

eXcel

CHECK FIGURES
d. 2012: $0.72
k. 2011: 5.47 times

Problem 9-21 *Ratio analysis*

The following financial statements apply to Bassie Company.

	2012	2011
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

	2012	2011
Earnings from continuing operations before extraordinary items	32,000	27,000
Extraordinary gain (net of $3,000 tax)	4,000	0
Net earnings	$ 36,000	$ 27,000
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 items	3,000	2,000
Total current assets	143,000	139,000
Plant and equipment (net)	105,000	105,000
Intangibles	20,000	0
Total assets	$268,000	$244,000
Liabilities and Stockholders' Equity		
Liabilities		
Current liabilities		
Accounts payable	$ 40,000	$ 54,000
Other	17,000	15,000
Total current liabilities	57,000	69,000
Bonds payable	66,000	67,000
Total liabilities	123,000	136,000
Stockholders' equity		
Common stock (50,000 shares)	115,000	115,000
Retained earnings	30,000	(7,000)
Total stockholders' equity	145,000	108,000
Total liabilities and stockholders' equity	$268,000	$244,000

Required

Calculate the following ratios for 2011 and 2012. 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 2011 and 2012 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

LO 2

Problem 9-22 *Horizontal analysis*

Financial statements for Bernard Company follow.

CHECK FIGURES
Total Assets: +11.6%
Total Liabilities: +14.4%

BERNARD COMPANY
Balance Sheets
As of December 31

	2012	2011
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	25,000	10,000
Total current assets	250,000	217,000
Investments	27,000	20,000
Plant (net)	270,000	255,000
Land	29,000	24,000
Total assets	$576,000	$516,000
Liabilities and Stockholders' Equity		
Liabilities		
Current liabilities		
Notes payable	$ 17,000	$ 6,000
Accounts payable	113,800	100,000
Salaries payable	21,000	15,000
Total current liabilities	151,800	121,000
Noncurrent liabilities		
Bonds payable	100,000	100,000
Other	32,000	27,000
Total noncurrent liabilities	132,000	127,000
Total liabilities	283,800	248,000
Stockholders' equity		
Preferred stock, par value $10, 4% cumulative, non-participating; 8,000 shares authorized and issued	80,000	80,000
Common stock, no par; 50,000 shares authorized; 10,000 shares issued	80,000	80,000
Retained earnings	132,200	108,000
Total stockholders' equity	292,200	268,000
Total liabilities and stockholders' equity	$576,000	$516,000

BERNARD COMPANY
Statements of Income and Retained Earnings
For the Years Ended December 31

	2012	2011
Revenues		
Sales (net)	$230,000	$210,000
Other revenues	8,000	5,000
Total revenues	238,000	215,000

continued

	2012	2011
Expenses		
Cost of goods sold	120,000	103,000
Selling, general, and administrative expenses	55,000	50,000
Interest expense	8,000	7,200
Income tax expense	23,000	22,000
Total expenses	206,000	182,200
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	$132,200	$108,000

Required

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

Problem 9-23 *Ratio analysis*

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

eXcel

Required

Use the financial statements for Bernard Company from Problem 9-22 to calculate the following for 2012 and 2011.

CHECK FIGURES

k. 2012: 2.0:1

p. 2011: $2.96

a. Working capital
b. Current ratio
c. Quick ratio
d. Accounts receivable turnover (beginning receivables at January 1, 2011, were $47,000)
e. Average number of days to collect accounts receivable
f. Inventory turnover (beginning inventory at January 1, 2011, was $140,000)
g. Average number of days to sell inventory
h. Debt to assets ratio
i. Debt to equity ratio
j. Times interest earned
k. Plant assets to long-term debt
l. Net margin
m. Asset turnover
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: 2011, $11.75; 2012, $12.50)
s. Dividend yield on common stock

Problem 9-24 *Vertical analysis*

LO 2

eXcel

Required

Use the financial statements for Bernard Company from Problem 9-22 to perform a vertical analysis of both the balance sheets and income statements for 2012 and 2011.

CHECK FIGURE

2012 Retained Earnings: 23%

ANALYZE, THINK, COMMUNICATE

ATC 9-1 Business Applications Case *Analyzing the Kroger Company and Whole Foods Market*

The following information relates to **The Kroger Company** and **Whole Foods Market, Inc.** for their 2009 and 2008 fiscal years.

THE KROGER COMPANY
Selected Financial Information
(Amounts in millions, except per share amounts)

	January 31, 2009	February 2, 2008
Total current assets	$ 7,206	$ 7,114
Merchandise inventories	6,459	6,063
Property and equipment, net of depreciation	13,161	12,498
Total assets	23,211	22,299
Total current liabilities	7,629	8,689
Total long-term liabilities	10,311	8,696
Total liabilities	17,940	17,385
Total shareholders' equity	5,271	4,914
Revenue	76,000	70,235
Cost of goods sold	58,564	53,779
Gross profit	17,436	16,456
Operating income	2,451	2,301
Earnings from continuing operations before income tax expense	1,966	1,827
Income tax expense	717	646
Net earnings	1,249	1,181
Basic earnings per share	$ 1.92	$ 1.71

WHOLE FOODS MARKET, INC.
Selected Financial Information
(Amounts in millions except per share data)

	September 27, 2009	September 28, 2008
Total current assets	$1,055	$ 623
Merchandise inventory	311	327
Property and equipment, net of depreciation	1,898	1,900
Total assets	3,783	3,381
Total current liabilities	684	666
Total long-term liabilities	1,058	1,209
Total liabilities	1,742	1,875
Total stockholders' equity	2,041	1,506
Revenues	$8,032	$7,954
Cost of goods sold	5,277	5,247
Gross profit	2,754	2,707
Operating income	284	236
Earnings from continuing operations before income taxes	251	207
Income tax expense	104	92
Net earnings	147	115
Basic earnings per share	$ 0.85	$ 0.82

Required

a. Compute the following ratios for the companies' 2009 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 9-2 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 9-3 Research Assignment *Analyzing Whirlpool's Acquisition of Maytag*

To complete the requirements below you will need to obtain **Whirlpool**'s income statements for 2005, 2007, and 2008, and its balance sheets for 2004 through 2008. The easiest way to obtain these income statements is to retrieve the company's 2005 and 2008 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, www.whirlpoolcorp.com. On March 31, 2006, Whirlpool Corporation acquired Maytag, another manufacturer of home appliances. The company's 2006, 2007, and 2008 financial statements include the activities of Maytag; its 2005 and 2004 statements do not.

Required

a. Compute the following ratios for 2005, 2007, and 2008. 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 9-4 Writing Assignment *Identifying companies based on financial statement information*

The following ratios are for four companies in different industries. Some of these ratios have been discussed in the textbook, others have not, but their names explain how the ratio was computed. These data are for the companies' 2008 fiscal years. The four sets of ratios, presented randomly are:

	Company 1	Company 2	Company 3	Company 4
Current assets ÷ Total assets	47%	11%	15%	20%
Average days to sell inventory	33	138	7	9
Average days to collect receivables	25	83	3	21
Return on assets	5%	4%	4%	18%
Gross profit ÷ Sales	20%	40%	20%	54%
Asset turnover	0.46	0.71	2.19	1.39
Sales ÷ Number of full-time employees	$453,407	$341,958	$49,865	$29,057

The four companies to which these ratios relate, listed in alphabetical order, are:

Caterpillar, Inc., a company that manufactures heavy construction equipment.

Denny's Corporation, which operated over 1,541 restaurants as of December 31, 2008.

Molson Coors Brewing, Inc., a company that produces beer and related products.

Weight Watchers International, Inc., a company that provides weight-loss services and products.

Required

Determine which company should be matched with each set of ratios. Write a memorandum explaining the rationale for your decisions.

ATC 9-5 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

a. How will the write-off affect the following year's return on assets ratio?

b. How will the write-off affect the asset and income growth percentages?

c. Would writing off the garbage trucks for the reasons stated present any ethical concerns for Kolla? Explain.