

# Evaluating a Firm's Financial Performance

## Learning Objectives

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|--------------------------------------------------------------------------------|------------------------------------------|
| <b>b<sup>1</sup></b> Explain the purpose and importance of financial analysis. | <b>The Purpose of Financial Analysis</b> |
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- |                                                                                                                 |                                              |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>b<sup>2</sup></b> Calculate and use a comprehensive set of measurements to evaluate a company's performance. | <b>Measuring Key Financial Relationships</b> |
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- |                                                                            |                                                    |
|----------------------------------------------------------------------------|----------------------------------------------------|
| <b>b<sup>3</sup></b> Describe the limitations of financial ratio analysis. | <b>The Limitations of Financial Ratio Analysis</b> |
|----------------------------------------------------------------------------|----------------------------------------------------|
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As introduced in Chapter 3, you are giving serious consideration to joining the Home Depot, Inc. after graduation. You have been offered a position in marketing that you believe fits both your educational background and interests. Your Uncle Harry suggested that you learn more about the company's financial position by studying the firm's 10-K filed with the Securities and Exchange Commission, which you have done. You have studied the three financial statements provided by Home Depot but now want to dig deeper to interpret the information in the statements. You wonder how else you can use Home Depot's financial statements to evaluate the firm's financial strengths and weaknesses. Also, you wonder how you might compare Home Depot's financial performance with that of Lowe's, Inc., a major competitor.

As it turns out, this chapter is a natural extension of Chapter 3. It will help you evaluate a firm's financial performance in the same way as is done by any group having a financial interest in a business, including managers, employees, lenders, and shareholders. Specifically, we will look at key financial relationships, in the form of ratios, as a way to gain a better understanding of a company's financial performance—what we might call *financial analysis*. Before presenting the specific methods, let's start by first understanding the basic purpose and intent of conducting financial analysis.

**b<sup>1</sup>** Explain the purpose and importance of financial analysis.

## The Purpose of Financial Analysis

As explained in Chapter 1, the fundamental objective of financial management is not to focus on accounting numbers like earnings, but to create shareholder value. In a perfect world, we would rely totally on market values of a firm's assets to guide decision-making, rather than on its accounting data. However, since we rarely have market values for all of a firm's assets, accounting information can be a very useful substitute.

To begin, realize that financial analysis is about more than reviewing financial statements; it can be used both to evaluate historical performance and to serve as the basis for making projections about and improving future financial performance. The analysis helps us see critical relationships that might not otherwise be readily identifiable. Ratios are used to standardize financial information so that we can make comparisons. Otherwise, it is really difficult to compare the financial statements of two firms of different sizes or even of the same firm at different times.

**Financial ratios** give us two ways of making meaningful comparisons of a firm's financial data: (1) We can examine the ratios across time (say, for the past 5 years) to compare a firm's current and past performance; and (2) we can compare the firm's ratios with those of other firms. In comparing a firm with other companies, we could select a peer group of companies or we could use industry norms published by firms such as Dun & Bradstreet, Risk Management Association (RMA), Standard & Poor's, Value Line, and Prentice Hall. Dun & Bradstreet, for instance, annually publishes a set of 14 key ratios for each of 125 lines of business. The Risk Management Association (the association of bank loan and credit officers) publishes a set of 16 key ratios for more than 350 lines of business. The firms are grouped according to the North American Industrial Classification System (NAICS) codes. They are also segmented by firm size to provide the basis for more meaningful comparisons.

Figure 4-1 (on page 104) shows the financial statement information as reported by Risk Management Association for Software Publishers. The report shows the information by two asset-size and sales-size categories. The complete report (not provided here) presents other size categories. The balance sheet data in the report are provided as a percentage of total assets, or as what we called in Chapter 3 a *common-sized balance sheet*. Likewise, the income statement data are reported as a percentage of sales as a *common-sized income statement*.<sup>1</sup> In presenting the financial ratios in the bottom portion of the report, RMA gives three results for each ratio, representing the firms at the 75th, 50th, and 25th percentiles, respectively.

Financial analysis is not a tool just for financial managers; it can also be used effectively by investors, lenders, suppliers, employees, and customers. Within the firm, managers use financial ratios to:

- ◆ Identify deficiencies in the firm's performance and take corrective action.
- ◆ Evaluate employee performance and determine incentive compensation.



**financial ratios** accounting data restated in relative terms in order to help people identify some of the financial strengths and weaknesses of a company.

## REMEMBER YOUR PRINCIPLES

**Principle** As in Chapter 3 when we talked about financial statements, a primary rationale for evaluating a company's financial performance relates to **Principle 5: Conflicts of Interest Cause Agency Problems**. Thus, the firm's common stockholders need information that can be used to monitor managers' actions. Interpreting the firm's financial statements through the use of financial ratios is a key monitoring tool. Of course, the firm's managers also need metrics to monitor the company's performance so that corrective actions can be taken when necessary.

**Principle 4: Market Prices Are Generally Right** is also relevant when it comes to evaluating a firm's financial performance. Only if there are exceptionally profitable markets, where investments earn rates of return that exceed the opportunity cost of the money invested, can managers create shareholder value. Furthermore, financial ratios can help us have a sense of whether managers have indeed made exceptionally good investments or bad ones.

Finally, **Principle 3: Risk Requires a Reward** is also at work in this chapter. As we will see, how managers choose to finance the business affects the company's risk and, as a result, the rate of return stockholders receive on their investments.

<sup>1</sup>In Chapter 3, we presented a common-sized income statement and common-sized balance sheet for Home Depot. (See pages 54 and 61.)

**FIGURE 4-1 Financial Statement Data by Industry: Norms for Software Publishers**

| INFORMATION—SOFTWARE PUBLISHERS NAICS 511210 |       |                                 |                              |       |               |                               |          |           |                                    |                                                |               |
|----------------------------------------------|-------|---------------------------------|------------------------------|-------|---------------|-------------------------------|----------|-----------|------------------------------------|------------------------------------------------|---------------|
| CURRENT DATA SORTED BY ASSETS                |       |                                 | CURRENT DATA SORTED BY SALES |       |               | CURRENT DATA SORTED BY ASSETS |          |           | CURRENT DATA SORTED BY SALES       |                                                |               |
| 50-100MM                                     |       | 100-250MM                       | 10-25MM                      |       | 25MM and OVER | 50-100MM                      |          | 100-250MM | 10-25MM                            |                                                | 25MM and OVER |
| %                                            | %     | ASSETS                          | %                            | %     |               | %                             | %        | RATIOS    | %                                  | %                                              |               |
| 23.3                                         | 14.6  | Cash and Equivalents            | 24.6                         | 23.0  |               | 45                            | 8.1      | 47        | 7.7                                |                                                |               |
| 17.3                                         | 13.8  | Trade Receivables (net)         | 32.3                         | 20.0  |               | 61                            | 6.0      | 62        | 5.9                                | Sales/Receivables                              | 61            |
| 2.7                                          | 0.6   | Inventory                       | 1.3                          | 1.9   |               | 97                            | 3.8      | 82        | 4.5                                |                                                | 83            |
| 8.1                                          | 5.4   | All Other Current               | 7.0                          | 6.9   |               |                               | 3.0      | 6.7       |                                    |                                                | 4.4           |
| 51.3                                         | 34.4  | Total Current                   | 65.3                         | 51.8  |               |                               | 13.2     | 30.2      | Sales/Working Capital              |                                                | 27.2          |
| 7.6                                          | 5.0   | Fixed Assets (net)              | 9.1                          | 7.2   |               |                               | −15.6    | −8.2      |                                    |                                                | −18.2         |
| 34.9                                         | 51.8  | Intangibles (net)               | 16.1                         | 34.1  |               |                               | 7.0      | 2.7       |                                    |                                                | 14.0          |
| 6.2                                          | 8.8   | All Other Non-current           | 9.6                          | 6.9   |               | (31)                          | 4.0      | (49)      | 10.9                               | EBIT/Interest                                  | (31)          |
| 100.0                                        | 100.0 | Total                           | 100.0                        | 100.0 |               |                               | −0.9     | −1.8      |                                    |                                                | −4.6          |
| LIABILITIES                                  |       |                                 |                              |       |               |                               |          |           |                                    |                                                |               |
| 0.2                                          | 0.5   | Notes Payable Short Term        | 3.9                          | 1.9   |               |                               | 2.8      |           |                                    | Net Profit+Depr., Dep., Amort./Cur. Mat. L/T/D |               |
| 4.4                                          | 2.0   | Cur. Mat.-L/T/D                 | 11.9                         | 2.9   |               | (14)                          | 1.3      |           |                                    | (10)                                           | 2.3           |
| 5.1                                          | 5.4   | Trade Payables                  | 11.9                         | 7.8   |               |                               | 0.2      |           |                                    |                                                | (34)          |
| 0.4                                          | 0.5   | Income Taxes Payable            | 0.9                          | 1.0   |               |                               | −0.4     | 0.3       |                                    |                                                | 0.3           |
| 29.9                                         | 23.5  | All Other Current               | 34.6                         | 30.3  |               |                               | −0.4     | −0.1      | Fixed Assets/Net Worth             |                                                | 1.0           |
| 40.0                                         | 31.9  | Total Current                   | 63.3                         | 46.9  |               |                               | −0.1     | 0.0       |                                    |                                                | −0.1          |
| 20.7                                         | 24.6  | Long Term Debt                  | 8.3                          | 21.7  |               |                               | 2.6      | 4.0       |                                    |                                                | 1.4           |
| 1.1                                          | 3.4   | Deferred Taxes                  | 0.4                          | 2.0   |               |                               | −7.4     | −2.0      | Debt/Net Worth                     |                                                | 7.8           |
| 14.1                                         | 15.1  | All Other Non-current           | 12.3                         | 12.5  |               |                               | −1.8     | −1.4      |                                    |                                                | −3.3          |
| 24.1                                         | 25.0  | Net Worth                       | 15.8                         | 19.9  |               |                               | 111.4    | 33.1      | % Profit Before Taxes/Tangible     |                                                | 133.4         |
|                                              |       | Total Liabilities and Net Worth | 100.0                        | 100.0 |               | (17)                          | 23.2     | (25)      | 22.2                               |                                                | 21.9          |
| 100.0                                        | 100.0 |                                 |                              |       |               |                               | 0.7      | −8.5      | Net Worth                          |                                                | 4.4           |
|                                              |       | INCOME DATA                     |                              |       |               |                               | 12.4     | 5.5       |                                    |                                                | 14.8          |
| 100.0                                        | 100.0 | Net Sales                       | 100.0                        | 100.0 |               |                               | 4.9      | −0.3      | % Profit Before Taxes/Total Assets |                                                | 7.1           |
| 89.3                                         | 93.1  | Operating Expenses              | 95.9                         | 92.1  |               |                               | −4.1     | −7.5      |                                    |                                                | −7.2          |
| 10.7                                         | 6.9   | Operating Profit                | 4.1                          | 7.9   |               |                               | 34.5     | 37.2      |                                    |                                                | 53.7          |
|                                              |       | All Other                       |                              |       |               |                               | 16.4     | 22.7      | Sales/Net Fixed Assets             |                                                | 30.4          |
| 6.4                                          | 6.5   | Expenses (net)                  | 2.3                          | 5.0   |               |                               | 9.3      | 12.5      |                                    |                                                | 16.7          |
| 4.4                                          | 0.4   | Profit Before Taxes             | 1.7                          | 2.9   |               |                               | 1.1      | 1.0       |                                    |                                                | 2.5           |
| RATIOS                                       |       |                                 |                              |       |               |                               | 0.8      | 0.6       | Sales/Total Assets                 |                                                | 1.4           |
| 1.8                                          | 1.5   |                                 | 2.1                          | 1.8   |               |                               | 0.6      | 0.4       |                                    |                                                | 1.1           |
| 1.2                                          | 1.1   | Current                         | 1.1                          | 1.2   |               |                               | 1.9      | 2.7       |                                    |                                                | 1.0           |
| 0.9                                          | 0.8   |                                 | 0.8                          | 0.8   |               | (23)                          | 4.3      | (13)      | 3.6                                | % Depr., Dep., Amort./Sales                    | (31)          |
| 1.5                                          | 1.2   |                                 | 1.9                          | 1.4   |               |                               | 7.2      | 4.2       |                                    |                                                | 4.2           |
| 1.0                                          | 0.9   | Quick                           | (768)                        | 0.9   | (1302)        |                               | 2548082M | 6738043M  | Net Sales (\$)                     |                                                | 728430M       |
| 0.6                                          | 0.6   |                                 | 0.6                          | 0.6   |               |                               | 2604550M | 9439953M  | Total Assets (\$)                  |                                                | 551806M       |
| M = \$ thousand                              |       | MM = \$ million                 |                              |       |               |                               |          |           |                                    |                                                |               |

M = \$ thousand MM = \$ million

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- ◆ Compare the financial performance of the firm's different divisions.
- ◆ Prepare, at both the firm and division levels, financial projections, such as those associated with the launch of a new product.
- ◆ Understand the financial performance of the firm's competitors.
- ◆ Evaluate the financial condition of a major supplier.

Outside the company, financial ratios can be used by:

- ◆ Lenders to decide whether or not to make a loan to the company.
- ◆ Credit-rating agencies to determine the firm's creditworthiness.

- ◆ Investors to decide whether or not to invest in a company.
- ◆ Major suppliers to decide whether or not to grant credit terms to a company.

The conclusion: Financial analysis tools can help a wide group of individuals in a variety of purposes. However, in this chapter we will focus on how the firm itself uses financial ratios to evaluate its performance. But remember that personnel in marketing, human

## FINANCE AT WORK

### HOME DEPOT AND LOWE'S: THE HISTORIES

We are spending a lot of time with Home Depot and to a lesser extent Lowe's as we draw on them to understand financial statements. We thought you might enjoy knowing a little about their histories.

#### The Home Depot's History<sup>2</sup>

The Home Depot was founded in 1978 by Bernie Marcus, Arthur Blank, Ron Brill, and Pat Farrah. The Home Depot's proposition was to build home-improvement warehouses that were larger than any of their competitors' facilities. The first two stores were opened on June 22, 1979 in Atlanta, Georgia, creating a new concept of do-it-yourself retail. With 60,000 square feet of product and floor space each, these two stores were the first mega-stores in the home-improvement industry.

The founders wanted to provide customers the knowledge they needed to undertake do-it-yourself projects. Employees were trained to advise customers on buying tools, selecting materials, and completing projects on their own.

In 1981, only 3 years after the first stores opened, the company went public on the NASDAQ, and in 1984, moved to the New York Stock Exchange. In 1989, 10 years after the founding of the company, Home Depot celebrated the opening of the 100th store.

In 2000, after the retirement of the company's founders, Robert Nardelli became the CEO and chairman of the board of directors. Nardelli was credited with improving gross revenue and lowering costs, almost doubling the company's net income over the course of his tenure. But according to some, his bottom-line management style negatively affected employee morale, which in turn hurt customer service. In 2007, Nardelli resigned amid complaints regarding his relatively high compensation and the company's stagnant stock price. Frank Blake followed Nardelli as Home Depot's CEO.

By 2012, Home Depot had over 2,200 stores, with almost 300 stores outside the United States. For the fiscal year ending on January 9, 2012, Home Depot had \$70.4 billion in sales and \$3.9 billion in profits—up 18 percent from the prior year.

#### Lowe's History<sup>3</sup>

In 1921, Lucius S. Lowe opened Lowe's North Wilkesboro Hardware in North Wilkesboro, North Carolina. When Lucius died in 1940, his daughter, Ruth, inherited the business. She later sold the company to her brother, Jim, who then added Carl Buchan as a partner.

Under Buchan's management, the store focused on hardware and building materials. In 1946, at the start of the post-World War II housing boom, the company began carrying more wholesale products to cater to professional contractors. The housing boom brought such a demand for supplies that sales were often made out of the freight cars that ran by the store.

In 1952, Carl Buchan and Jim Lowe separated over differences in their views of the future of the business, with Buchan taking control of the hardware and building supply business. In 1960, Buchan died of a heart attack at the age of 44; his management team, which included Robert Strickland and Leonard Herring, assumed the leadership of the company. In 1961, the firm went public on the New York Stock Exchange, and in the next year was operating 21 stores with reported annual revenues of \$32 million.

In the late 1970s, Lowe's experienced a slowdown as a result of a decline in housing construction. In response, the company began reaching out to retail consumers as well as to contractors. With fewer people building new homes, consumers were refurbishing their current homes, doing more of the work themselves. By 1983, Lowe's was making more money selling to consumers than it was selling to contractors.

At about the same time, Home Depot entered the market, setting a new trend of big warehouse-style stores that dwarfed the average Lowe's store. Nevertheless, Lowe's maintained its existing business model, thinking that smaller towns where it operated could not support the mega-stores. With time, however, Lowe's realized its mistake and began building its own mega-stores, creating the Lowe's we know today. While not as large as Home Depot, Lowe's is certainly a major competitor of Home Depot's, having 1,712 stores in the U.S. and 33 stores in Canada and Mexico, for a total of 1,745 stores. For the fiscal year ending February 2012, Lowe's had \$50.2 billion in sales, with \$1.9 billion in net income.

<sup>2</sup> *Our History* (n.d.), retrieved May 26, 2012 from: <https://corporate.homedepot.com/OurCompany/History/Pages/default.aspx>, retrieved June 1, 2012; The Home Depot (n.d.), retrieved May 15, 2012 from: <http://www.thehistoryofcorporate.com/companies-by-industry/traderetail/the-home-depot>, retrieved May 17, 2012; and Form 10-K, The Home Depot, Inc. for the year ended January 29, 2012, retrieved April 26, 2012.

<sup>3</sup> *Our Heritage* (n.d.), retrieved May 27, 2012 from: [http://media.lowes.com/history/Lowe's Companies, Inc. History](http://media.lowes.com/history/Lowe's%20Companies,%20Inc.%20History) (n.d.), retrieved May 27, 2012 from: <http://www.fundinguniverse.com/company-histories/lowe-s-companies-inc-history>, retrieved May 27, 2012; and Form 10-K, Lowe's Companies, Inc. for the year ended February 3, 2012, retrieved May 25, 2012.

resources, information systems, and other groups within a firm can use financial ratios for a variety of other reasons.

## Concept Check

1. What is the basic purpose of *financial analysis*?
2. How does a firm use financial ratios? Who else might use financial ratios and why?
3. Where can we find financial ratios for different companies or for peer groups?

**b<sup>2</sup>** Calculate and use a comprehensive set of measurements to evaluate a company's performance.

## Measuring Key Financial Relationships

Instructors usually take one of two approaches to teaching students about financial ratios. The first approach reviews the different types or categories of ratios, whereas the second approach uses ratios to answer important questions about a firm's operations. We prefer the latter approach and have chosen the following five questions to help you map out the process of using financial ratios:

1. How liquid is the firm?
2. Are the firm's managers generating adequate operating profits from the company's assets?
3. How is the firm financing its assets?
4. Are the firm's managers providing a good return on the capital provided by the shareholders?
5. Are the firm's managers creating shareholder value?

Let's look at each of these five questions in turn. In doing so, we will use Home Depot to illustrate the use of financial ratios. The company's financial statements for fiscal year ended January 30, 2011, which were originally presented in Chapter 3, are shown again in Table 4-1 and Table 4-2. As we remember from Chapter 3, the numbers in Home Depot's financial statements are expressed in millions, so that any number exceeding \$1,000 million is actually over a billion dollars. We have color coded the numbers in the ratio computations so that you can readily determine whether a particular number is coming from the income statement (red numbers) or the balance sheet (blue numbers).

In addition to calculating Home Depot's financial ratios, we will provide the same ratios for Lowe's Companies, Inc., a home improvement stores company we learned about on the previous page in the Finance at Work box. By comparing Home Depot's results with Lowe's, we gain additional perspective about its performance relative to a major competitor.

**TABLE 4-1 The Home Depot, Inc. Income Statement for Year Ending January 30, 2011 (\$ millions)**

|                                                            |             |
|------------------------------------------------------------|-------------|
| Sales                                                      | \$ 67,997   |
| Cost of goods sold                                         | (44,693)    |
| Gross profits                                              | \$ 23,304   |
| Operating expenses:                                        |             |
| Marketing expenses and general and administrative expenses | (\$ 15,885) |
| Depreciation expenses                                      | (1,616)     |
| Total operating expenses                                   | (\$ 17,501) |
| Operating income                                           | \$ 5,803    |
| Interest expense                                           | (530)       |
| Earnings before taxes                                      | \$ 5,273    |
| Income taxes                                               | (1,935)     |
| Net income (earnings available to common stockholders)     | \$ 3,338    |
| Additional information:                                    |             |
| Numbers of common shares outstanding (millions)            | 1,623       |
| Earnings per share (net income ÷ number of shares)         | \$ 2.06     |
| Dividends paid to stockholders                             | \$ 1,569    |
| Dividends per share (total dividends ÷ number of shares)   | \$ 0.97     |

**TABLE 4-2 The Home Depot, Inc. Balance Sheets (\$ millions) January 30, 2011**

|                               |          |
|-------------------------------|----------|
| <b>Assets</b>                 |          |
| Cash                          | \$ 545   |
| Account receivables           | 1,085    |
| Inventories                   | 10,625   |
| Other current assets          | 1,224    |
| Total current assets          | \$13,479 |
| Gross fixed assets            | \$38,471 |
| Accumulated depreciation      | (13,411) |
| Net fixed assets              | \$25,060 |
| Other assets                  | 1,586    |
| Total assets                  | \$40,125 |
| <b>Liabilities and Equity</b> |          |
| Accounts payable              | \$ 9,080 |
| Short-term notes payable      | 1,042    |
| Total current liabilities     | \$10,122 |
| Long-term debt                | \$11,114 |
| Total liabilities             | \$21,236 |
| Common equity:                |          |
| Common stock:                 |          |
| Par value                     | \$ 86    |
| Paid-in capital               | 7,001    |
| Total common stock sold       | \$ 7,087 |
| Treasury stock                | (3,193)  |
| Total common stock            | \$ 3,894 |
| Retained earnings             | 14,995   |
| Total common equity           | \$18,889 |
| Total liabilities and equity  | \$40,125 |

We will begin our analysis by addressing the first question shown above, “How liquid is the firm?” and then proceed through the remaining questions in the order listed.

### Question 1: How Liquid Is the Firm—Can It Pay Its Bills?

A liquid asset is one that can be converted quickly and routinely into cash at the current market price. So the **liquidity** of a business is a function of its ability to have cash available when needed to meet its financial obligations. Very simply, can we expect a company to be able to pay creditors on a timely basis?

We answer this question by comparing a firm's assets that can be converted quickly and easily into cash—namely its current assets—with the firm's current liabilities. In our analysis we are interested in both (1) the amount of current assets relative to current liabilities and (2) the *quality* of the individual current assets that will be used in meeting current debt payments.

When it comes to examining the relative size of current assets to current liabilities, the most commonly used measure of a firm's short-term solvency is the **current ratio**:

$$\text{Current ratio} = \frac{\text{current assets}}{\text{current liabilities}} \quad (4-1)$$

For Home Depot:

$$\text{Current ratio} = \frac{\text{current assets}}{\text{current liabilities}} = \frac{\$13,479\text{M}}{\$10,122\text{M}} = 1.33$$

where M represents millions.

|                      |      |
|----------------------|------|
| Lowe's current ratio | 1.40 |
|----------------------|------|

**liquidity** a firm's ability to pay its bills on time. Liquidity is related to the ease and speed with which a firm can convert its noncash assets into cash.

**current ratio** the firm's current assets divided by its current liabilities. This ratio indicates a company's degree of liquidity by comparing its current assets to its current liabilities.

**acid-test (quick) ratio** the sum of a firm's cash and accounts receivable divided by its current liabilities. This ratio is a more stringent measure of liquidity than the current ratio because it excludes inventories and other current assets (those that are least liquid) from the numerator.

Based on the current ratio, Home Depot is less liquid than Lowe's. The company has \$1.33 in current assets for every \$1 in current liabilities, while Lowe's has \$1.40.

When we use the current ratio, we assume that the firm's accounts receivable will be collected and turned into cash on a timely basis and that its inventories can be sold without any extended delay. Given that a company's inventory by its very nature is less liquid than its accounts receivable—it must first be sold before any cash can be collected—a more stringent measure of liquidity would exclude the inventories and include only the firm's cash and accounts receivable in the numerator. This revised ratio is called the **acid-test** (or **quick**) **ratio**. It is calculated as follows:

$$\text{Acid-test ratio} = \frac{\text{cash} + \text{accounts receivable}}{\text{current liabilities}} \quad (4-2)$$

For Home Depot:

$$\text{Acid-test ratio} = \frac{\text{cash} + \text{accounts receivable}}{\text{current liabilities}} = \frac{\$545\text{M} + \$1,085\text{M}}{\$10,122\text{M}} = 0.16$$

|                        |      |
|------------------------|------|
| Lowe's acid-test ratio | 0.12 |
|------------------------|------|

Based on the acid-test ratio, Home Depot appears to be *more* liquid than Lowe's. It has \$0.16 in cash and accounts receivable per \$1 in current debt, compared to \$0.12 for Lowe's.

So what should we conclude? The current ratio suggests that Lowe's is more liquid, while the acid-test ratio tells us that Home Depot is. The difference must come from the amount of inventories each firm has relative to their current liabilities; that is, the higher current ratio for Lowe's indicates that it has relatively more inventory than Home Depot. Thus, we will want to know more about the quality of Lowe's inventories compared to Home Depot's. That answer will come shortly.<sup>4</sup>

We now want to evaluate the quality of a firm's accounts receivable and inventories in terms of the firm's ability to convert these assets into cash on a timely basis. A firm might have a higher current ratio, as Lowe's does relative to Home Depot, but have more uncollectible receivables and/or be carrying a lot of obsolete inventory. So knowing the quality of these assets is necessary if we are to have a complete understanding of a firm's liquidity.

**Converting Accounts Receivable to Cash** The conversion of accounts receivable into cash can be measured by computing how long it takes to collect the firm's receivables on average. We can answer this question by computing a firm's **days in receivables** (or **average collection period**) as follows:<sup>5</sup>

$$\text{Days in receivables} = \frac{\text{accounts receivable}}{\text{daily credit sales}} = \frac{\text{accounts receivable}}{\text{annual credit sales} \div 365} \quad (4-3)$$

Note that in this equation, we are including only sales where the customer purchases on credit, omitting cash sales. As you would expect, businesses like Home Depot have mostly cash sales. Specifically, we estimate that only 30 percent of their sales are on credit, so credit sales

**days in receivables (average collection period)** a firm's accounts receivable divided by the company's average daily *credit* sales (annual credit sales  $\div$  365). This ratio expresses how many days on average it takes to collect receivables.

<sup>4</sup>Is it possible that a firm's current ratio or acid-test ratio could be too high? Absolutely. Liquid assets generally provide little in the way of profitability. For example, tying too much money up in inventories may prevent a company from investing in assets that will generate more profits. In other words, there is usually a tradeoff between having more liquidity and generating profits.

<sup>5</sup>When computing a given ratio that uses information from both the income statement and the balance sheet, we should remember that the income statement is for a given time period (for example, 2010), whereas balance sheet data are at a point in time (for example, January 30, 2011). If there has been a significant change in an asset balance from the beginning of the period to the end, it would be better to use the average balance for the year. For example, if the accounts receivable for a company have increased from \$1,000 at the beginning of the year to \$2,000 at the end of the year, it would be more appropriate to use the average accounts receivable of \$1,500 in our computations. Nevertheless, in an effort to simplify, we will use year-end amounts from the balance sheet in our computations.

amounted to about \$20.399 billion (\$20.399 billion = \$67.997 billion total sales  $\times$  30% credit sales). Thus, Home Depot's days in receivables is 19.41 days, computed as follows:

$$\begin{aligned}\text{Days in receivables} &= \frac{\text{accounts receivable}}{\text{annual credit sales} \div 365} \\ &= \frac{\$1,085\text{M}}{\$20,399\text{M} \div 365} = \frac{\$1,085\text{M}}{\$55.89\text{M}} = 19.41 \text{ days}\end{aligned}$$

|                            |         |
|----------------------------|---------|
| Lowe's days in receivables | 16 days |
|----------------------------|---------|

So on average Home Depot collected its accounts receivable in about 19.4 days compared to 16 days for Lowe's. Thus, Home Depot is slower at collecting its receivables than Lowe's, suggesting that its receivables are less liquid than Lowe's.

We could have reached the same conclusion by measuring how many times accounts receivable are "rolled over" during a year, using the **accounts receivable turnover ratio**. If Home Depot collects its accounts receivable every 19.41 days, then it is collecting 18.8 times per year (18.8 times = 365 days  $\div$  19.41 days). The accounts receivable turnover can also be calculated as follows:

$$\text{Accounts receivable turnover} = \frac{\text{annual credit sales}}{\text{accounts receivable}} \quad (4-4)$$

For Home Depot:

$$\text{Accounts receivable turnover} = \frac{\text{annual credit sales}}{\text{accounts receivable}} = \frac{\$20,399\text{M}}{\$1,085\text{M}} = 18.80\text{X}$$

|                                     |        |
|-------------------------------------|--------|
| Lowe's accounts receivable turnover | 22.81X |
|-------------------------------------|--------|

Whether we use the days in receivables or the accounts receivable turnover ratio, the conclusion is the same. Home Depot collects its accounts receivable more slowly than Lowe's. In other words, Home Depot's accounts receivable are of lesser quality. (Think about this: If Home Depot's days in receivables were as low as Lowe's, it would have less accounts receivable and its current ratio would be lower.)

**Converting Inventories to Cash** We now want to know the quality of Home Depot's inventory, as indicated by how long the inventory is held before being sold. This is called **days in inventory**, which is computed as follows:

$$\text{Days in inventory} = \frac{\text{inventory}}{\text{daily cost of goods sold}} = \frac{\text{inventory}}{\text{annual cost of goods sold} \div 365} \quad (4-5)$$

For Home Depot:

$$\begin{aligned}\text{Days in inventory} &= \frac{\text{inventory}}{\text{annual cost of goods sold} \div 365} \\ &= \frac{\$10,625\text{M}}{\$44,693\text{M} \div 365} = \frac{\$10,625\text{M}}{\$122.45\text{M}} = 86.77 \text{ days}\end{aligned}$$

|                          |            |
|--------------------------|------------|
| Lowe's days in inventory | 95.80 days |
|--------------------------|------------|

Note that when we calculated accounts receivable turnover or days in receivables, we use *sales* in our computation. But when calculating days in inventory or inventory turnover, we use cost of goods sold. We do this because inventory is measured at cost.

**accounts receivable turnover ratio** a firm's credit sales divided by its accounts receivable. This ratio expresses how often accounts receivable are "rolled over" during a year.

**days in inventory** inventory divided by daily cost of goods sold. This ratio measures the number of days a firm's inventories are held on average before being sold; it also indicates the quality of the inventory.

**inventory turnover** a firm's cost of goods sold divided by its inventory. This ratio measures the number of times a firm's inventories are sold and replaced during the year, that is, the relative liquidity of the inventories.

As we did with days in receivables and accounts receivable turnover, we can restate days in inventory as **inventory turnover**, which is calculated as follows:<sup>6</sup>

$$\text{Inventory turnover} = \frac{\text{cost of goods sold}}{\text{inventory}} \quad (4-6)$$

For Home Depot:

$$\text{Inventory turnover} = \frac{\$44,693\text{M}}{\$10,625\text{M}} = 4.21\text{X}$$

|                           |       |
|---------------------------|-------|
| Lowe's inventory turnover | 3.81X |
|---------------------------|-------|

Hence, we see that Home Depot is moving (turning over) its inventory more quickly than Lowe's—4.21 times per year, compared with 3.81 times for Lowe's. This suggests that Home Depot's inventory is more liquid than Lowe's.

To conclude, the current ratio indicates that Home Depot is less liquid than Lowe's, but this result assumes that Home Depot's accounts receivable and inventory are of similar quality to Lowe's. However, this is not the case given Home Depot's lower accounts receivable turnover (more days in receivables) and higher inventory turnover (fewer days in inventory). The acid-test ratio, on the other hand, suggests that Home Depot is more liquid than Lowe's, but we know that Home Depot's accounts receivable are a bit less liquid than Lowe's. We therefore have a mixed outcome, and cannot say definitively whether Home Depot is more or less liquid. Thus, we have to conclude that Home Depot's liquidity and Lowe's liquidity are probably very similar.

We have completed our presentation of liquidity decision tools, which can be summarized as follows:

| FINANCIAL DECISION TOOLS     |                                                                               |                                                                                                                                                                                                                                                                    |
|------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Tool                 | Formula                                                                       | What It Tells You                                                                                                                                                                                                                                                  |
| Current ratio                | $\frac{\text{current assets}}{\text{current liabilities}}$                    | Measures a firm's liquidity. A higher ratio means greater liquidity.                                                                                                                                                                                               |
| Acid-test ratio              | $\frac{\text{cash} + \text{accounts receivable}}{\text{current liabilities}}$ | Gives a more stringent measure of liquidity than the current ratio in that it excludes inventories and other current assets from the numerator. A higher ratio means greater liquidity.                                                                            |
| Days in receivables          | $\frac{\text{accounts receivable}}{\text{annual credit sales} \div 365}$      | Indicates how rapidly a firm is collecting its receivables. A longer (shorter) period means a slower (faster) collection of receivables and that the receivables are of lesser (greater) quality.                                                                  |
| OR                           |                                                                               |                                                                                                                                                                                                                                                                    |
| Accounts receivable turnover | $\frac{\text{annual credit sales}}{\text{accounts receivable}}$               | Tells how many times a firm's accounts receivable are collected, or <i>turned over</i> , during a year. Provides the same information as the <i>days in receivables</i> , just expressed differently, where a high (low) number indicates fast (slow) collections. |
| Days in inventory            | $\frac{\text{inventory}}{\text{annual cost of goods sold} \div 365}$          | Measures how many days a firm's inventories are held on average before being sold; the more (less) days required, the lower (higher) the quality of the inventory.                                                                                                 |
| OR                           |                                                                               |                                                                                                                                                                                                                                                                    |
| Inventory turnover           | $\frac{\text{cost of goods sold}}{\text{inventory}}$                          | Gives the number of times a firm's inventory is sold and replaced during the year; as with days in inventory, serves as an indicator of the quality of the inventories; the higher the number, the better the inventory quality.                                   |

<sup>6</sup>However, some of the industry norms provided by financial services are computed using sales in the numerator of inventory turnover. To make comparisons with ratios from these services, we will want to use sales in our computation of inventory turnover.

**EXAMPLE 4.1****Evaluating Disney's liquidity**

The following information (expressed in \$ millions) is taken from the Walt Disney Company's 2011 financial statements:

|                           |           |
|---------------------------|-----------|
| Current assets            | \$ 13,757 |
| Cash                      | 2,722     |
| Accounts receivable       | 6,182     |
| Inventories               | 2,269     |
| Credit sales              | 27,262    |
| Cash sales                | 13,631    |
| Total sales               | 40,893    |
| Cost of goods sold        | 31,221    |
| Total current liabilities | 12,088    |

Source: Data from The Walt Disney Company's Fiscal Year 2011 Annual Financial Report.

Evaluate Disney's liquidity based on the following norms in the broadcasting and entertainment industry:

|                              |        |
|------------------------------|--------|
| Current ratio                | 1.17   |
| Acid-test ratio              | 0.92   |
| Accounts receivable turnover | 5.80X  |
| Inventory turnover           | 18.30X |

**STEP 1: FORMULATE A DECISION STRATEGY**

We analyze a company's liquidity by looking at selected ratios. These include the current ratio, acid-test ratio, accounts receivable turnover (or days in receivables), and inventory turnover (or days in inventory). The formulas are:

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

$$\text{Acid-test ratio} = \frac{\text{cash} + \text{accounts receivable}}{\text{current liabilities}}$$

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

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

**STEP 2: CRUNCH THE NUMBERS**

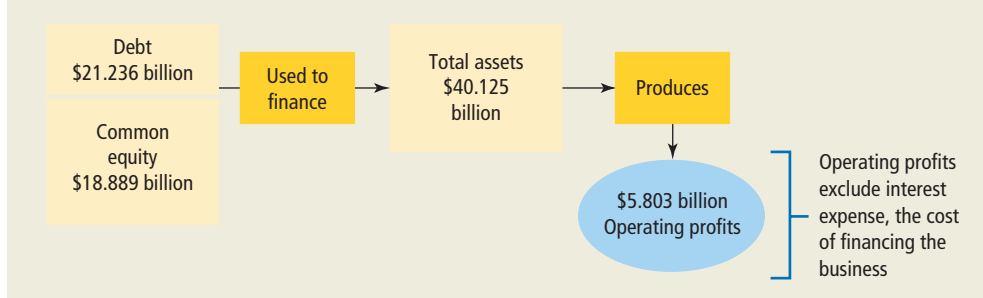
|                              | <b>DISNEY</b> | <b>INDUSTRY</b> |
|------------------------------|---------------|-----------------|
| Current ratio                | 1.14          | 1.17            |
| Acid-test ratio              | 0.74          | 0.92            |
| Accounts receivable turnover | 4.41X         | 5.8X            |
| Inventory turnover           | 13.78X        | 18.3X           |

**STEP 3: ANALYZE YOUR RESULTS**

Based on these results, Disney is not as liquid as the average firm in the industry! The company has smaller amounts of liquid assets relative to its current liabilities than does its average competitor. The firm does not convert its receivables to cash as quickly as do its competitors, and is slower at turning inventory.

**Concept Check**

1. What information about the firm is provided by liquidity measures?
2. Describe the two perspectives available for measuring liquidity.
3. Why might a very high current ratio actually indicate there's a problem with a firm's inventory or accounts receivable management? What might be another reason for a high current ratio?
4. Why might a successful (liquid) firm have an acid-test ratio that is less than 1?

**FIGURE 4-2 Home Depot Operating Profits Resulting from Asset Investments**

## Question 2: Are the Firm's Managers Generating Adequate Operating Profits from the Company's Assets?<sup>7</sup>

We now switch to a different dimension of performance—the firm's profitability. The question here is, "Do the firm's managers produce adequate profits from the company's assets?" From the perspective of the firm's shareholders, there is no more important question to be asked. One of the most important ways managers create shareholder value is to earn strong profits on the assets in which they have invested.

To answer this all-important question, think about the process of financing a company. In its simplest form, a firm's shareholders invest in a business. The company may also borrow additional money from other sources (banks and so forth). The purpose of making these investments is to create profits. Figure 4-2 graphically illustrates this process for Home Depot, where we see that the shareholders invested \$18.889 billion in the company, and that the company borrowed another \$21.236 billion, which together allowed the company to finance \$40.125 billion of assets. These assets were then used to produce \$5.803 billion in operating profits.

Notice that we are using *operating profits* rather than *net income*. Operating profits are the income generated from the firm's assets independent of how the firm is financed. The effect of financing will be explicitly considered in the two questions that follow, but for now we want to isolate only the operating aspects of the company's profits.

While knowing the dollar amount of a firm's operating profits is important, we also want to know the amount of operating profits relative to the total assets employed. In other words, we want to know how much operating profit is generated per dollar of assets used; that is, we are interested in a firm's return on its asset investment. We find this return by calculating the **operating return on assets (OROA)** as follows:

$$\text{Operating return on assets} = \frac{\text{operating profits}}{\text{total assets}} \quad (4-7)$$

For Home Depot:

$$\text{Operating return on assets} = \frac{\text{operating profits}}{\text{total assets}} = \frac{\$5,803\text{M}}{\$40,125\text{M}} = 0.145 = 14.5\%$$

|                                   |       |
|-----------------------------------|-------|
| Lowe's operating return on assets | 10.6% |
|-----------------------------------|-------|

Thus, Home Depot earned a higher return on its assets relative to Lowe's—14.5 cents of operating profits for every \$1 of assets for Home Depot, compared to 10.6 cents for Lowe's.

Clearly, Home Depot was doing something better than Lowe's when it came to earning a higher return on its assets. But what? The answer lies in two areas: (1) how effectively the company's income statement was being managed or what we will call **operations management**, which involves the day-to-day buying and selling of a firm's goods or services as reflected in the income statement; and (2) how efficiently assets are being

**operating return on assets (OROA)** the ratio of a firm's operating profits divided by its total assets. This ratio indicates the rate of return being earned on the firm's assets.

**operations management** how effectively management is performing in the day-to-day operations in terms of how well management is generating revenues and controlling costs and expenses; in other words, how well is the firm managing the activities that directly affect the income statement?

<sup>7</sup>We will use the term *operating profits* throughout this chapter. We could just as correctly use the term *operating income*. We also could use the term *earnings before interest and taxes*—frequently abbreviated as *EBIT*. After all, operating profits are usually the firm's earnings before subtracting interest and taxes. So you may see these terms used interchangeably in practice. Just understand that they are for the most part the same.

managed to generate sales, or, **asset management**. That these two issues relate to the operating return on assets can be seen by using two other ratios—operating profit margin and total asset turnover. We can compute operating return on assets using the following revised equation and get the same answer as we did with equation (4-7):

$$\text{Operating return on assets} = \text{operating profit margin} \times \text{total asset turnover} \quad (4-8a)$$

calculated as follows:

$$\text{Operating return on assets} = \frac{\text{operating profit}}{\text{sales}} \times \frac{\text{sales}}{\text{total assets}} \quad (4-8b)$$

The operating profit margin is the result of how a company manages its day-to-day operations (*operations management*), and the total asset turnover is the result of how efficiently the company's assets are being managed (*asset management*). Let's consider managing operations and asset management in turn.

**Managing Operations** The first component of the operating return on assets (OROA), the operating profit margin, is an indicator of how well the company manages its operations—that is, how well revenues are being generated and costs and expenses controlled. The **operating profit margin** measures how well a firm is managing its cost of operations, in terms of both the cost of goods sold and operating expenses (marketing expenses, general and administrative expenses, and depreciation expenses) relative to the firm's revenues. All else being equal, the objective for managing operations is to keep costs and expenses low relative to sales. Thus, we use the operating profit margin to measure *how well the firm is managing its income statement*, where:

$$\text{Operating profit margin} = \frac{\text{operating profits}}{\text{sales}} \quad (4-9)$$

For Home Depot:

$$\text{Operating profit margin} = \frac{\text{operating profits}}{\text{sales}} = \frac{\$5,803\text{M}}{\$67,997\text{M}} = 0.085 = 8.5\%$$

|                                |      |
|--------------------------------|------|
| Lowe's operating profit margin | 7.3% |
|--------------------------------|------|

The foregoing result clearly indicates that Home Depot's managers were better at managing its cost of goods sold and operating expenses than Lowe's. Home Depot had lower costs per sales dollar, which resulted in a higher operating profit margin. Put another way, Home Depot was better than Lowe's at managing its income statement. Thus, one reason for Home Depot's higher operating return on assets was its higher operating profit margin.

Now let's look at the second driver of a company's operating return on assets—how efficiently assets are being managed.

**Managing Assets** The second component in equation (4-8) is the **total asset turnover**. This ratio tells us how efficiently a firm is using its assets to generate sales. To clarify, assume that Company A generates \$3 in sales for every \$1 invested in assets, whereas Company B generates the same \$3 in sales but has invested \$2 in assets. In other words, Company A is using its assets more efficiently to generate sales, which leads to a higher return on the firm's investment in assets. This efficiency is captured by the total asset turnover ratio, shown again as follows:

$$\text{Total asset turnover} = \frac{\text{sales}}{\text{total assets}} \quad (4-10)$$

For Home Depot:

$$\text{Total asset turnover} = \frac{\text{sales}}{\text{total assets}} = \frac{\$67,997\text{M}}{\$40,125\text{M}} = 1.69\text{X}$$

|                             |       |
|-----------------------------|-------|
| Lowe's total asset turnover | 1.45X |
|-----------------------------|-------|

**asset management** how efficiently management is using the firm's assets to generate sales.

**operating profit margin** a firm's operating profits divided by sales. This ratio serves as an overall measure of operating effectiveness.

**total asset turnover** a firm's sales divided by its total assets. This ratio is an overall measure of asset efficiency based on the relation between a firm's sales and the total assets.

We now know that Home Depot is using its assets more efficiently than Lowe's, generating \$1.69 in sales per dollar of assets, whereas Lowe's produces only \$1.45. This is the second reason for Home Depot's higher operating return on assets—the first being the higher operating profit margin.

However, we should not stop here with our analysis of Home Depot's asset management. We have learned that, in general, Home Depot's managers are making efficient use of the firm's assets, but this may not be the case for each type of asset. We also want to know how well the firm is managing its main operating assets, accounts receivable, inventories, and fixed assets, respectively.

To answer this question, we can compute the turnover ratios for each of these asset categories. Of course, we have already calculated the turnover ratios for the company's accounts receivable and inventories and concluded that Home Depot's managers were not managing accounts receivable as efficiently as Lowe's, but were turning over inventories more quickly. We still need to compute the **fixed asset turnover**, which we do as follows:

$$\text{Fixed asset turnover} = \frac{\text{sales}}{\text{net fixed assets}} \quad (4-11)$$

For Home Depot:

$$\text{Fixed asset turnover} = \frac{\text{sales}}{\text{net fixed assets}} = \frac{\$67,997\text{M}}{\$25,060\text{M}} = 2.71\text{X}$$

Lowe's fixed asset turnover 2.21X

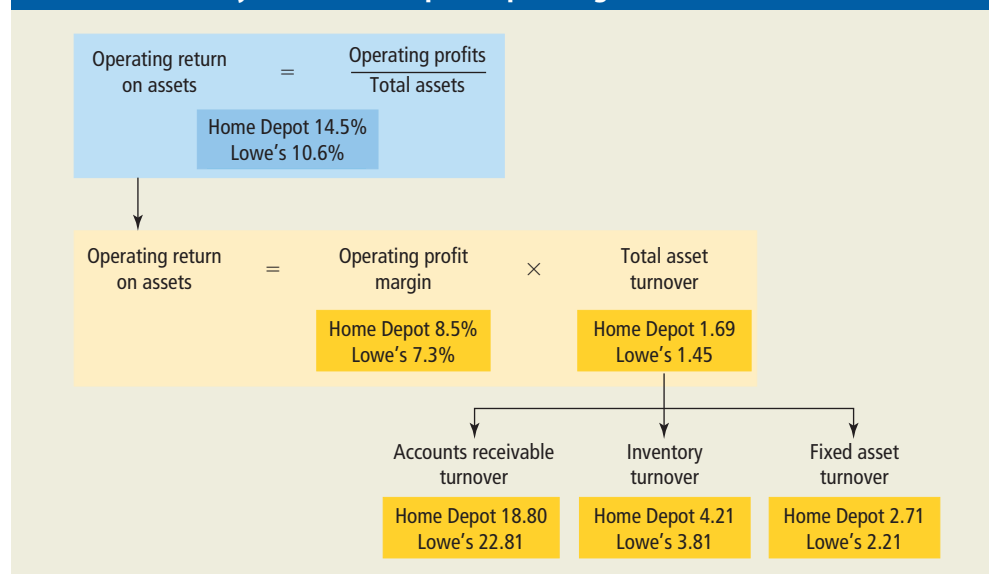
Thus, Home Depot has a smaller investment in fixed assets relative to the firm's sales than does Lowe's.

We can now look at all the asset efficiency ratios together to summarize Home Depot's asset management:

|                              | HOME DEPOT | LOWE'S |
|------------------------------|------------|--------|
| Total asset turnover         | 1.69X      | 1.45X  |
| Accounts receivable turnover | 18.80X     | 22.81X |
| Inventory turnover           | 4.21X      | 3.81X  |
| Fixed assets turnover        | 2.71X      | 2.21X  |

Home Depot's situation with respect to asset management is now clear. Overall, Home Depot's managers are utilizing their firm's assets efficiently, based on the firm's total asset turnover. This overall asset efficiency results from better management of the firm's inventories and fixed assets (which have higher turnovers than Lowe's). However, the firm is not managing its accounts receivable as well: Home Depot's accounts receivable turnover is lower than Lowe's.

**FIGURE 4-3 Analysis of Home Depot's Operating Return on Assets**



**fixed asset turnover** a firm's sales divided by its net fixed assets. This ratio indicates how efficiently the firm is using its fixed assets.

Figure 4-3 (on page 114) provides a summary of our evaluation of Home Depot's operating and asset management performance. We began by computing the operating return on assets to determine if managers were producing good returns on the assets. We then broke the operating return on assets into its two pieces, operations management (operating profit margin) and asset management (asset turnover ratios), to explain why Home Depot's operating return on assets was higher than Lowe's. We can also provide a summary of the financial ratios being used as tools to evaluate a firm's profitability as follows:

| FINANCIAL DECISION TOOLS          |                                                                                                                                   |                                                                                                                                                                                                                              |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Tool                      | Formula                                                                                                                           | What It Tells You                                                                                                                                                                                                            |
| Operating return on assets (OROA) | $\frac{\text{operating profits}}{\text{total assets}}$ or<br>$\text{operating profit margin} \times \text{total assets turnover}$ | The rate of return being earned on a firm's assets. A higher (lower) return indicates more (less) operating profits per dollar of assets invested.                                                                           |
| Operating profit margin           | $\frac{\text{operating profits}}{\text{sales}}$                                                                                   | Overall measure of day-to-day operating effectiveness—how well revenues are being generated and costs and expenses controlled. A higher (lower) margin means a firm is better (worse) at managing its day-to-day operations. |
| Total asset turnover              | $\frac{\text{sales}}{\text{total assets}}$                                                                                        | Measures how efficiently a firm is using its total assets. A higher turnover means the firm is using its assets more efficiently.                                                                                            |
| Days in receivables               | $\frac{\text{accounts receivable}}{\text{annual credit sales} \div 365}$                                                          | Measures how rapidly a firm is collecting its receivables. A longer (shorter) period means slower (faster) collections and a larger (smaller) investment in receivables.                                                     |
| Accounts receivable turnover      |                                                                                                                                   |                                                                                                                                                                                                                              |
| Days in inventory                 | $\frac{\text{inventory}}{\text{annual cost of goods sold} \div 365}$                                                              | Measures how many days a firm's inventories are held on average before being sold; the more (less) days required, the larger (smaller) will be the investment in inventories.                                                |
| Inventory turnover                |                                                                                                                                   |                                                                                                                                                                                                                              |
| Fixed asset turnover              | $\frac{\text{sales}}{\text{net fixed assets}}$                                                                                    | Measures how efficiently the firm is using its fixed assets. A higher (lower) turnover means the firm is using its fixed assets more (less) efficiently.                                                                     |

## Concept Check

1. Which number in a company's income statement should be used to measure its profitability relative to its total assets? Why?
2. What two broad areas of the firm's management does the operating return on assets assess?
3. What factors influence the operating profit margin?
4. A low total asset turnover indicates that a firm's total assets are not being managed efficiently. What additional information would you want to know when this is the case?

**EXAMPLE 4.2****Evaluating Disney's operating return on assets**

Given the following financial information for the Walt Disney Company (expressed in \$ millions), evaluate the firm's operating return on its assets (OROA).

|                     |          |
|---------------------|----------|
| Accounts receivable | \$ 6,182 |
| Inventories         | 2,269    |
| Sales               | 40,893   |
| Credit sales        | 27,262   |
| Cost of goods sold  | 31,221   |
| Operating profits   | 7,781    |
| Net fixed assets    | 19,695   |
| Total assets        | 72,124   |

Source: Data from The Walt Disney Company's Fiscal Year 2011 Annual Financial Report.

The industry norms are as follows:

|                              |        |
|------------------------------|--------|
| Operating return on assets   | 7.25%  |
| Operating profit margin      | 16.10% |
| Total asset turnover         | 0.45X  |
| Accounts receivable turnover | 7.10X  |
| Inventory turnover           | 18.30X |
| Fixed assets turnover        | 1.05X  |

**STEP 1: FORMULATE A DECISION STRATEGY**

The operating return on assets is determined by two factors: managing operations and managing assets. Recall equation (4-8a):

$$\text{Operating return on assets} = \frac{\text{operating profit}}{\text{margin}} \times \frac{\text{total asset}}{\text{turnover}}$$

Substituting for the operating profit margin and total asset turnover (equation 4-8b):

$$\text{Operating return on assets} = \frac{\text{operating profits}}{\text{sales}} \times \frac{\text{sales}}{\text{total assets}}$$

We can further analyze the total asset turnover ratio by looking at the efficiency of various components of total assets, including accounts receivable turnover, inventory turnover, and fixed assets turnover.

**STEP 2: CRUNCH THE NUMBERS**

|                                                         | DISNEY | INDUSTRY |
|---------------------------------------------------------|--------|----------|
| Operating return on assets $\frac{\$7,781}{\$72,124}$   | 10.79% | 7.25%    |
| Operating profit margin $\frac{\$7,781}{\$40,893}$      | 19.03% | 16.10%   |
| Total asset turnover $\frac{\$40,893}{\$72,124}$        | 0.57X  | 0.45X    |
| Accounts receivable turnover $\frac{\$27,262}{\$6,182}$ | 4.41X  | 7.10X    |
| Inventory turnover $\frac{\$31,221}{\$2,269}$           | 13.76X | 18.30X   |
| Fixed assets turnover $\frac{\$40,893}{\$19,695}$       | 2.08X  | 1.05X    |

**STEP 3: ANALYZE YOUR RESULTS**

Disney generated a higher return on its assets than the average firm in the industry, 10.79 percent compared to 7.25 percent for the industry. Disney provided a higher operating return on its assets by (1) managing its operations better, achieving a higher operating profit margin (19 percent compared to 16.10 percent), and (2) making better use of its assets, as indicated by a higher total asset turnover (0.57X versus 0.45X). However, the higher total asset turnover is caused entirely by a much higher fixed-asset turnover (2.08X compared to 1.05X), which more than offsets the lower accounts receivable turnover (4.41X as compared to 7.10X) and the less efficient management of inventories, as reflected by the lower inventory turnover (13.76X versus 18.30X).

**Question 3: How Is the Firm Financing Its Assets?**

We now turn to the matter of how a firm is financed. (We will return to the issue of profitability shortly.) The key issue is management's choice between financing with debt or with equity. To begin, we want to know what percentage of the firm's assets is financed by debt, including both short-term and long-term debt, realizing that the remaining percentage must be financed by equity. To answer this question, we compute the **debt ratio** as follows:<sup>8</sup>

$$\text{Debt ratio} = \frac{\text{total debt}}{\text{total assets}} \quad (4-12)$$

For Home Depot:

$$\text{Debt ratio} = \frac{\text{total debt}}{\text{total assets}} = \frac{\$21,236\text{M}}{\$40,125\text{M}} = 0.53 = 53\%$$

|                   |     |
|-------------------|-----|
| Lowe's debt ratio | 46% |
|-------------------|-----|

Home Depot finances 53 percent of its assets with debt (taken from Home Depot's balance sheet in Table 4-2), compared with Lowe's 46 percent. Stated differently, Home Depot finances with 47 percent equity, whereas Lowe's is 54 percent equity. Thus, Home Depot uses more debt than Lowe's. As we will see in later chapters, more debt financing results in more financial risk.

Our second perspective regarding the firm's financing decisions comes from looking at the income statement. When the firm borrows money, it must at least pay the interest on what it has borrowed. Thus, it is informative to compare (1) the amount of operating profits that are available to pay the interest with (2) the amount of interest that has to be paid. Stated as a ratio, we compute the number of times the firm is earning its interest. The **times interest earned** ratio is commonly used when examining a firm's debt position and is computed in the following manner:

$$\text{Times interest earned} = \frac{\text{operating profits}}{\text{interest expense}} \quad (4-13)$$

For Home Depot:

$$\text{Times interest earned} = \frac{\text{operating profits}}{\text{interest expense}} = \frac{\$5,803\text{M}}{\$530\text{M}} = 10.9\text{X}$$

|                              |      |
|------------------------------|------|
| Lowe's times interest earned | 9.0X |
|------------------------------|------|

Home Depot's interest expense is \$530 million, which when compared to its operating profits of \$5.803 billion (\$5,803 million) indicates that its interest expense is consuming less of the operating profits than is the case for Lowe's. Home Depot's higher *times interest earned* can be attributed to the firm's relatively higher operating profits, as reflected in a

**debt ratio** a firm's total liabilities divided by its total assets. This ratio measures the extent to which a firm has been financed with debt.

**times interest earned** a firm's operating profits divided by interest expense. This ratio measures a firm's ability to meet its interest payments from its annual operating earnings.

<sup>8</sup>Instead of using the debt ratio, we could use the debt-equity ratio. The debt-equity ratio is simply a transformation of the debt ratio:

$$\text{Debt-equity ratio} = \frac{\text{total debt}}{\text{total equity}} = \frac{\text{debt ratio}}{1 - \text{debt ratio}}; \text{Debt ratio} = \frac{\text{debt/equity}}{1 + \text{debt/equity}}$$

higher operating return on assets. The higher the profits, the higher will be the times interest earned. Home Depot's higher debt ratio would most likely lower the times interest earned, relative to Lowe's, since the more debt you have, the more interest you will pay. However, Home Depot's higher income apparently more than covers any additional interest expense on its greater amount of debt.

Before concluding our discussion regarding times interest earned, we should understand that interest is not paid with income but with cash. Moreover, in addition to the interest that must be paid, the firm will also be required to repay the debt principal. Thus, the times interest earned ratio is only a crude measure of the firm's capacity to service its debt. Nevertheless, it does give us a general indication of a company's financial risk and its capacity to borrow.

So the two ratios that can be used as financial decision tools are as follows:

| FINANCIAL DECISION TOOLS |                                                            |                                                                                                                                                                                                                  |
|--------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Tool             | Formula                                                    | What It Tells You                                                                                                                                                                                                |
| Debt Ratio               | $\frac{\text{total debt}}{\text{total assets}}$            | The percentage of assets that is financed with debt. The higher (lower) the debt ratio, the more (less) financial risk the firm is assuming.                                                                     |
| Times interest earned    | $\frac{\text{operating profits}}{\text{interest expense}}$ | The number of times a firm is earning its interest expense. Indicates a company's ability to service its fixed interest payments. A higher (lower) value means the firm is more (less) able to service its debt. |

#### EXAMPLE 4.3

#### Evaluate Disney's financing decisions

Given the information below (expressed in \$ millions) for the Disney Corporation, calculate the firm's debt ratio and its times interest earned. How do Disney's ratios compare to those of the industry in which it operates? What are the implications of your findings?

|                       |          |
|-----------------------|----------|
| Total debt            | \$32,671 |
| Total assets          | 72,124   |
| Operating profits     | 7,781    |
| Interest expense      | 526      |
| Industry norms:       |          |
| Debt ratio            | 34.21%   |
| Times interest earned | 8.5X     |

#### STEP 1: FORMULATE A DECISION STRATEGY

A company's financing decisions can be evaluated by considering two questions: (1) How much debt is used to finance the firm's assets, and (2) Does the company have the ability to service its interest payments? These two issues can be assessed by using the debt ratio and the times interest earned ratio, respectively, calculated as follows:

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

$$\text{Times interest earned} = \frac{\text{operating profits}}{\text{interest expense}}$$

#### STEP 2: CRUNCH THE NUMBERS

A comparison of Disney's debt ratio and times interest earned with the industry is as follows:

|                       | DISNEY | INDUSTRY |
|-----------------------|--------|----------|
| Debt ratio            | 45.30% | 34.21%   |
| Times interest earned | 14.79X | 8.50X    |

**STEP 3: ANALYZE YOUR RESULTS**

Disney uses significantly more debt financing than the average firm in the industry. The higher debt ratio implies that the firm has greater financial risk. Even so, Disney appears to have no difficulty servicing its debt, covering its interest almost 15 times compared to only 8.5 times for the average firm in the industry. Disney's higher times interest earned is attributable to significantly higher operating profits on its assets, which more than offsets the firm's use of more debt.

**Concept Check**

1. What information is provided by the debt ratio?
2. Why is it important to calculate the times interest earned ratio, even for firms that have low debt ratios?
3. Why do operating profits not give a complete picture of a firm's ability to service its debt?

**Question 4: Are the Firm's Managers Providing a Good Return on the Capital Provided by the Shareholders?**

We now want to determine if the firm's owners (shareholders) are receiving an attractive return on their equity investment when compared to the return on equity at competing firms. For this, we use the **return on equity** (frequently shortened to ROE), which is computed as follows:

$$\text{Return on equity} = \frac{\text{net income}}{\text{total common equity}} \quad (4-14)$$

**return on equity** a firm's net income divided by its common book equity. This ratio is the accounting rate of return earned on the common stockholders' investment.

For Home Depot:

$$\text{Return on equity} = \frac{\text{net income}}{\text{total common equity}} = \frac{\$3,338\text{M}}{\$18,889\text{M}} = 0.177 = 17.7\%$$

|                         |       |
|-------------------------|-------|
| Lowe's return on equity | 11.1% |
|-------------------------|-------|

In the computation above, remember that the *total* common equity includes all common equity in the balance sheet, including par value, paid-in capital, and retained earnings, less any treasury stock. (After all, profits retained within the business are as much of an investment for the common stockholders as are their purchases of a company's stock.)

The returns on equity for Home Depot and Lowe's are 17.7 percent and 11.1 percent, respectively. Hence, the owners of Home Depot are receiving a higher return on their equity investment than are the shareholders of Lowe's. How are they doing it? To answer, we need to draw on what we have already learned, namely, that:

1. We know from our analysis of Question 2 that Home Depot is receiving a higher operating return on its assets—14.5 percent for Home Depot, compared to 10.6 percent for Lowe's. A higher (lower) return on the firm's assets will always result in a higher (lower) return on equity.
2. Home Depot uses more debt (less equity) financing than Lowe's—53 percent debt for Home Depot and 46 percent debt for Lowe's. As we will see shortly, the more debt a firm uses, the higher its return on equity will be, provided that the firm is earning a return on assets greater than the interest rate on its debt. Conversely, the less debt a firm uses, the lower its return on equity will be (again, provided that the firm is earning a return on assets greater than the interest rate on its debt). Thus, Home Depot has increased its return for the shareholders by using more debt. That's the good news. The bad news for Home Depot's shareholders is that the more debt a firm uses, the greater is the company's financial risk, which translates into more risk for the shareholders.

To help us understand the foregoing explanation for Home Depot's higher return on equity and its implications, consider the following hypothetical example.

Assume that two companies, Firms A and B, are identical in size. Both have \$1,000 in total assets and an operating return on assets of 14 percent. However, they are different in one respect: Firm A uses all equity and no debt financing; Firm B finances 60 percent of its investments with debt and 40 percent with equity. We will also assume the interest rate on any debt is 6 percent, and for simplicity we will assume that there are no income taxes. The financial statements for the two companies would be as follows:

|                                | FIRM A  | FIRM B  |
|--------------------------------|---------|---------|
| <b>BALANCE SHEET</b>           |         |         |
| Total assets                   | \$1,000 | \$1,000 |
| Debt (6% interest rate)        | \$0     | \$ 600  |
| Equity                         | 1,000   | 400     |
| Total debt and equity          | \$1,000 | \$1,000 |
| <b>INCOME STATEMENT</b>        |         |         |
| Operating profits (OROA = 14%) | \$ 140  | \$ 140  |
| Interest expense (6%)          | (0)     | (36)    |
| Net income                     | \$ 140  | \$ 104  |

$\$140 = 0.14 \text{ OROA} \times \$1,000 \text{ total assets}$

$\$36 = 0.06 \text{ interest rate} \times \$600 \text{ debt principal}$

Computing the return on equity for both companies, we see that Firm B has a more attractive return of 26 percent compared with Firm A's 14 percent. The calculations are as follows:

|                                                                            | FIRM A                         | FIRM B                       |
|----------------------------------------------------------------------------|--------------------------------|------------------------------|
| Return on common equity = $\frac{\text{net income}}{\text{common equity}}$ | $\frac{\$140}{\$1,000} = 14\%$ | $\frac{\$104}{\$400} = 26\%$ |

Why the difference? The answer is straightforward. Firm B is earning 14 percent on all of its \$1,000 in assets but only having to pay 6 percent to the lenders on the \$600 debt principal. The difference between the 14 percent return on the firm's assets (operating return on assets) and the 6 percent interest rate goes to the owners, thus boosting Firm B's return on equity above that of Firm A.

This is an illustration of favorable financial leverage. What's favorable, you might ask. Well, the company is earning 14 percent on its assets while only paying 6 percent to the bankers, thus allowing the shareholders to receive the 8 percent spread (14 percent return on assets – 6 percent interest paid to the bankers) on each dollar of debt financing. The result is an increase in the return on equity for Firm B's owners when compared to Firm A's. What a great deal for Firm B's shareholders! So if debt enhances owners' returns, why doesn't Firm A borrow money or Firm B borrow even more money?

The good outcome for Firm B shareholders is based on the assumption that the firm does in fact earn a 14 percent operating return on its assets. But what if the economy falls into a deep recession, business declines sharply, and Firms A and B only earn a 2 percent operating return on their assets? Let's recompute the return on equity given the new conditions:

|                                                  | FIRM A                        | FIRM B                          |
|--------------------------------------------------|-------------------------------|---------------------------------|
| Operating profits (OROA = 2%)                    | \$ 20                         | \$ 20                           |
| Less interest expense                            | 0                             | (36)                            |
| Net income                                       | \$ 20                         | (\$ 16)                         |
| Return on equity:                                |                               |                                 |
| $\frac{\text{net income}}{\text{common equity}}$ | $\frac{\$ 20}{\$1,000} = 2\%$ | $\frac{(\$ 16)}{\$400} = (4\%)$ |

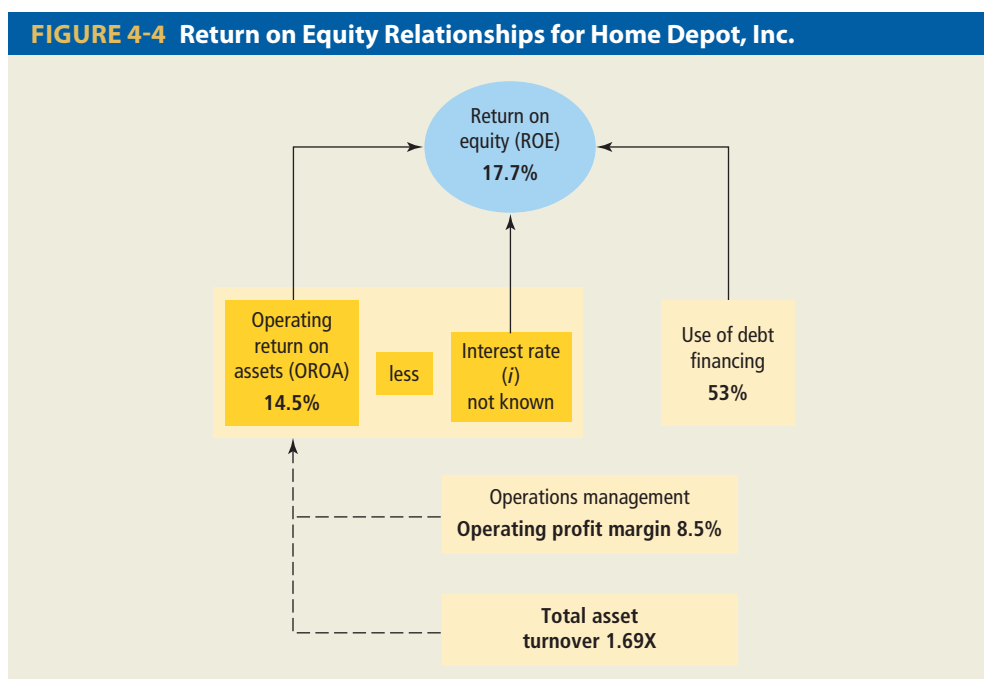
Now the use of financial leverage has a negative influence on the return on equity, with Firm B earning less than Firm A for its owners. This results from Firm B's earning less than the interest rate of 6 percent; consequently, the shareholders have to make up the difference. Thus, financial leverage is a two-edged sword: When times are good, financial leverage can make them very, very good, but when times are bad, financial leverage makes them very, very bad. Financial leverage can enhance the returns of the shareholders, but it also increases the possibility of losses, thereby increasing the uncertainty, or risk, for the owners. Chapter 12 will address financial leverage in greater detail.

Returning to Home Depot, Figure 4-4 provides a summary of our discussion of the return on equity and helps us visualize the two fundamental factors affecting a firm's return on equity:

1. There is a direct relationship between a firm's operating return on assets (OROA) and the resulting return on equity (ROE). As we have explained, the higher the operating return on assets (OROA), the higher will be the return on equity (ROE). Even more precisely, the greater the difference between the firm's operating return on assets (OROA) and the interest rate ( $i$ ) being paid on the firm's debt, the higher the return on equity will be. So increasing the operating return on assets relative to the interest rate ( $\text{OROA} - i$ ) increases the return on equity (ROE). But if  $\text{OROA} - i$  decreases, then ROE will decrease as well.
2. Increasing the amount of debt financing relative to the amount of equity (increasing the debt ratio) increases the return on equity if the operating return on assets is higher than the interest rate being paid. If the operating return on assets falls below the interest rate, more debt financing will decrease the return on equity.

In short, the return on equity is driven by (1) the difference between the operating return on assets and the interest rate ( $\text{OROA} - i$ ) and (2) how much debt is used, as measured by the debt ratio.

To recap, remember that the return on equity is the financial analysis tool that we use to measure the return on the owners' equity, which is shown as follows:



## FINANCIAL DECISION TOOLS

| Name of Tool     | Formula                                                | What It Tells You                                                                                                                                                                      |
|------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Return on equity | $\frac{\text{net income}}{\text{total common equity}}$ | The shareholders' accounting return on their investment, which is the result of how well management does at generating a good operating return on assets and how the firm is financed. |

**EXAMPLE 4.4****Evaluating Disney's Return on equity**

The net income and also the common equity invested by Disney's shareholders (expressed in \$ millions) are provided here, along with the average return on equity for the industry. Evaluate the rate of return being earned on the common stockholders' equity investment. In addition to comparing the Disney Corporation's return on equity to the industry, consider the implications Disney's operating return on assets and its debt financing practices have on the firm's return on equity.

|                                   |          |
|-----------------------------------|----------|
| Net income                        | \$4,807  |
| Total common equity               |          |
| Common stock (par value)          | 27       |
| Paid-in capital                   | 30,269   |
| Retained earnings                 | 35,745   |
| Treasury stock                    | (26,588) |
| Industry average return on equity | 8.31%    |

**STEP 1: FORMULATE A DECISION STRATEGY**

To evaluate return on equity, recall equation 4-14:

$$\text{Return on equity} = \frac{\text{net income}}{\text{total common equity}}$$

**STEP 2: CRUNCH THE NUMBERS**

First, we determine Disney's total common equity to be \$39.453 billion by adding all the individual equity items shown above. Then, dividing net income of \$4.807 billion by the total common equity, we find Disney's return on equity to be 12.2 percent ( $12.2\% = \$4.807 \text{ billion net income} \div \$39.453 \text{ billion total common equity}$ ), compared to 8.31 percent for the industry average.

**STEP 3: ANALYZE YOUR RESULTS**

Disney's higher return on equity is a result of the firm's having a higher operating return on assets and using more debt financing than the average firm in the industry.

**Concept Check**

1. How is a company's return on equity related to the firm's operating return on assets?
2. How is a company's return on equity related to the firm's debt ratio?
3. What is the upside of debt financing? What is the downside?

**Question 5: Are the Firm's Managers Creating Shareholder Value?**

To this point, we have relied exclusively on accounting data to assess the performance of a firm's managers. We now want to look at management's performance in terms of creating or destroying shareholder value. To answer this question, we use two approaches: (1) we examine market-value ratios and (2) we estimate the value being created for shareholders, as measured by a popular technique called Economic Value Added (EVA<sup>TM</sup>).

**Market-Value Ratios** There are two ratios commonly used to compare a firm's stock price to its earnings and to accounting book value of its equity. These two ratios indicate what investors think of management's past performance and future prospects.

**Price/Earnings Ratio** The **price/earnings (P/E) ratio** indicates how much investors are willing to pay for \$1 of reported earnings. Returning to Home Depot, the firm had net income in the fiscal year of 2010 of \$3.338 billion and 1.623 billion shares of common stock outstanding. (See Table 4-1.) Accordingly, its earnings per share were \$2.06 ( $\$2.06 = \$3,338 \text{ million net income} \div 1,623 \text{ million shares}$ ). At the time, the firm's stock was selling for \$36.77 per share. Thus, the price/earnings ratio was 17.85 times, calculated as follows:

$$\text{Price/earnings ratio} = \frac{\text{market price per share}}{\text{earnings per share}} \quad (4-15)$$

For Home Depot:

$$\text{Price/earnings ratio} = \frac{\text{market price per share}}{\text{earnings per share}} = \frac{\$36.77}{\$2.06} = 17.85X$$

|                             |        |
|-----------------------------|--------|
| Lowe's price/earnings ratio | 16.90X |
|-----------------------------|--------|

Home Depot's price/earnings ratio tells us that the investors were willing to pay \$17.85 for every dollar of earnings per share that Home Depot produced, compared to only \$16.90 for \$1 of earnings from Lowe's. Thus, investors were willing to pay somewhat more for Home Depot's earnings than they were for Lowe's. Why might that be? The price/earnings ratio will be higher for companies that investors think have strong earnings growth prospects and/or less risk. Thus, investors must perceive Home Depot to have more growth potential and/or smaller risk than Lowe's.

**Price/Book Ratio** A second frequently used indicator of investors' assessment of the firm is its **price/book ratio**. This ratio compares the market value of a share of stock to its book value per share. Book value per share comes from of the firm's total common equity in its balance sheet. We already know that the market price of Home Depot's common stock was \$36.77. To determine the equity book value per share, we divide the firm's equity book value (total common equity) by the number of shares of stock outstanding. From Home Depot's balance sheet (Table 4-2), we see that the equity book value was \$18.889 billion. Given that Home Depot had 1.623 billion shares outstanding, the equity book value per share is \$11.64 ( $\$11.64 = \$18.889 \text{ billion book equity value} \div 1.623 \text{ billion shares}$ ). With this information, we determine the price/book ratio to be:

$$\text{Price/book ratio} = \frac{\text{market price per share}}{\text{equity book value per share}} \quad (4-16)$$

For Home Depot:

$$\text{Price/book ratio} = \frac{\text{market price per share}}{\text{equity book value per share}} = \frac{\$36.77}{\$11.64} = 3.16X$$

|                         |       |
|-------------------------|-------|
| Lowe's price/book ratio | 1.95X |
|-------------------------|-------|

Given that the book value per share is an accounting number that reflects historical costs, we can think of it roughly as the amount shareholders have invested in the business over its lifetime. Thus, a ratio greater than 1 indicates that investors believe the firm is more valuable than the amount shareholders have invested in it. Conversely, a ratio less than 1 suggests that investors do not believe the stock is worth the amount shareholders have invested in it. Clearly, investors believed that Home Depot's stock was worth more than was originally invested in the company, since they were willing to pay \$3.16 per share for each dollar of equity book value (total common equity). In comparison, Lowe's stock was selling for only \$1.95 for every \$1 in book equity. Again, the investors were signaling that they believed that Home Depot had more growth prospects relative to its risk.

**price/earnings ratio** the price the market places on \$1 of a firm's earnings. For example, if a firm has an earnings per share of \$2, and a stock price of \$30 per share, its price/earnings ratio is 15. ( $\$30 \div \$2$ ).

**price/book ratio** the market value of a share of the firm's stock divided by the book value per share of the firm's reported equity in the balance sheet. Indicates the market price placed on \$1 of capital that was invested by shareholders.

**Economic Value Added (EVA™)** The price/book ratio, as just described, indicates whether the shareholders think the firm's equity is worth more or less than the amount of capital they originally invested. If the firm's market value is above the accounting book value (price/book > 1), then management has created value for shareholders, but if the firm's market value is below book value (price/book < 1), then management has destroyed shareholder value.

How is shareholder value created or destroyed? Quite simply, shareholder value is created when a firm earns a rate of return on the capital invested that is greater than the investors' required rate of return. If we invest in a firm and have a 12 percent required rate of return, and the firm earns 15 percent on our capital, then the firm's managers have created value for investors. If instead the firm earns only 10 percent, then value has been destroyed. This concept is regularly applied by firms when they decide whether or not to make large capital investments in plant and equipment; however, it has not been generally applied to the analysis of a firm's day-to-day operations. Instead, managers have traditionally focused on accounting results, such as earnings growth, profit margins, and the return on equity.

In recent years, however, investors have been demanding that managers show evidence that they are creating shareholder value. Although several techniques have been developed for making this assessment, the one that has received the most attention is Economic Value Added (EVA™).

#### EXAMPLE 4.5

#### Computing Disney's price/earnings ratio and price/book ratio

Consider the following about Disney:

1. At the time of our analysis, Disney's stock was selling for \$33.
2. The firm's net income was \$3.963 billion, and its total common equity in the balance sheet (book equity) was \$37.519 billion.
3. There were 1.915 billion shares outstanding.

Given the information above, calculate the firm's earnings per share and its book value per share. Calculate the price/earnings ratio and the price/book ratio. The average firm in the industry sold for 11 times earnings and 1.6 times book value. What do the shareholders think about Disney's performance and future growth prospects relative to its competitors?

#### STEP 1: FORMULATE A DECISION STRATEGY

Calculating the price/earnings ratio and the price-to-book ratio for Disney shows how much investors are willing to pay for 1 dollar of Disney's earnings and how much value has been created on a dollar of equity capital invested (book value of equity). The equations to be used are as follows:

$$\text{Price/earnings ratio} = \frac{\text{market price per share}}{\text{earnings per share}}$$

$$\text{Price/book ratio} = \frac{\text{market price per share}}{\text{equity book value per share}}$$

#### STEP 2: CRUNCH THE NUMBERS

We compute Disney's price/earnings ratio and price/book ratio as follows:

$$\begin{aligned} \text{Earnings per share} &= \frac{\text{net income}}{\text{number of shares}} \\ &= \frac{\$3,963\text{M}}{1,915\text{M shares}} = \$2.07 \end{aligned}$$

$$\begin{aligned} \text{Equity book value per share} &= \frac{\text{total common equity}}{\text{number of shares}} \\ &= \frac{\$37,519 \text{ million}}{1,915 \text{ million shares}} = \$19.59 \end{aligned}$$

$$\text{Price/earnings ratio} = \frac{\text{market price per share}}{\text{earning per share}} = \frac{\$33}{\$2.07} = 15.94\times$$

$$\begin{aligned}\text{Price/book ratio} &= \frac{\text{market price per share}}{\text{equity book value per share}} \\ &= \frac{\$33.00}{\$19.59} = 1.68\end{aligned}$$

### STEP 3: ANALYZE YOUR RESULTS

Disney's stock is selling for 15.94 times its earnings and 1.68 times its book value. At the same time, the average firm in the industry was selling for 11 times its earnings and 1.6 times its book value. Thus, investors see Disney as having greater growth prospects and/or less risk.

**Economic Value Added** is a financial performance measure developed by the investment consulting firm Stern Stewart & Co. EVA attempts to measure a firm's economic profit, rather than accounting profit, in a given year. Economic profits assign a cost to the equity capital (the opportunity cost of the funds provided by the shareholders) in addition to the interest cost on the firm's debt—even though accountants recognize only the interest expense as a financing cost when calculating a firm's net income.

For example, assume a firm has total assets of \$1,000; 40 percent (\$400) is financed with debt, and 60 percent (\$600) is financed with equity. If the interest rate on the debt is 5 percent, the firm's interest expense is \$20 (\$20 = \$400 × 0.05), which would be reported on the firm's income statement. However, there would be no cost shown on the income statement for the equity financing. To estimate economic profits, we include not only the \$20 in interest expense but also the opportunity cost of the \$600 equity capital invested in the firm. For example, if the shareholders could earn 15 percent on another investment of similar risk (their opportunity cost is 15 percent), then we should count that cost just as we do the interest expense. This would involve subtracting not only the \$20 in interest but also \$90 (\$90 = \$600 equity × 0.15) as the cost of equity. Thus, the firm has earned an economic profit only if its operating profit exceeds \$110 (\$20 interest cost + \$90 opportunity cost of equity). Stated as a percentage, the firm must earn at least an 11 percent operating return on its assets (11% = \$110 ÷ \$1,000) in order to meet the investors' required rate of return.

We can calculate Economic Value Added (EVA)—the value created for the shareholders for a given year—as follows:

$$\text{EVA} = \left( \begin{array}{c} \text{operating return} \\ \text{on assets} \end{array} - \begin{array}{c} \text{cost of} \\ \text{capital} \end{array} \right) \times \text{total assets} \quad (4-17)$$

where the cost of capital is the cost of the entire firm's capital, both debt and equity. That is, the value created by management is determined by (1) the amount a firm earns on its invested capital relative to the investors' required rate of return and (2) the total amount of capital invested in the firm (total assets).<sup>9</sup>

Continuing with our previous example, assume that our company is earning a 16 percent operating return on its assets (total invested capital). Then the firm's Economic Value Added is \$50, calculated as follows:

$$\begin{aligned}\text{EVA} &= \left( \begin{array}{c} \text{operating return} \\ \text{on assets} \end{array} - \begin{array}{c} \text{cost of} \\ \text{capital} \end{array} \right) \times \text{total assets} \\ &= (0.16 - 0.11) \times \$1000 = \$50\end{aligned}$$

Let's see what we find when we estimate Home Depot's Economic Value Added. We know from our previous calculations that in fiscal year ending January 30, 2011, Home Depot had an operating return on assets of 14.5 percent. In other words, the firm was earning operating profits of 14.5 percent on every dollar invested in assets, and it had invested a total of \$40.125 billion in assets. If we assume that the firm's cost of capital (the required

**economic value added** measures a company's economic profits, as compared to its accounting profits, by including not only interest expense as a cost but also the shareholders' required rate of return on their investment.

<sup>9</sup>In Chapter 9, we will explain how the firm's cost of capital is calculated.

rate of all the investors) was 10 percent, then we can calculate the Economic Value Added for Home Depot as follows:

$$\begin{aligned} \text{EVA} &= \left( \frac{\text{operating return}}{\text{on assets}} - \frac{\text{cost of}}{\text{capital}} \right) \times \text{total assets} \\ &= (0.145 - 0.10) \times \$40.125 \text{ billion} = \$1.806 \text{ billion} \end{aligned}$$

The foregoing explains the EVA concept in its simplest form. However, computing EVA requires converting a firm's financial statements from an accountant's perspective (GAAP) to an economic book value. This process is much more involved than we will go into here, but the basic premise involved in its computation is the same.

A summary of the ratios to be used to determine whether managers are creating shareholder value is as follows:

| FINANCIAL DECISION TOOLS |                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Tool             | Formula                                                                                                                              | What It Tells You                                                                                                                                                                                                                                                                                                                                |
| Price/earnings ratio     | $\frac{\text{market price per share}}{\text{earnings per share}}$                                                                    | The price that the market places on \$1 of a firm's earnings. The higher (lower) the ratio, the more (less) value investors assign to the firm's earnings.                                                                                                                                                                                       |
| Price/book ratio         | $\frac{\text{market price per share}}{\text{equity book value per share}}$                                                           | The price that the market places on \$1 of the shareholders' investment in the business, measured by the equity book value per share. The higher (lower) the number, the greater (lesser) the market value investors assign to each dollar invested in the company.                                                                              |
| Economic value added     | $\left( \frac{\text{operating return}}{\text{on assets}} - \frac{\text{cost of}}{\text{capital}} \right) \times \text{total assets}$ | A measure of a company's economic profits (as compared to its accounting profits), which includes not only interest expense as a cost but also the shareholders' required rate of return on their investment. A positive number says managers created shareholder value, while a negative number indicates that shareholder value was destroyed. |

To conclude, a summary of all the ratios we used to analyze the financial performance of Home Depot is provided in Table 4-3.

#### EXAMPLE 4.6

#### Calculating Disney's Economic Value Added

Earlier in the chapter, we determined that Disney's operating return on assets (OROA) was 10.79 percent. If Disney's cost of capital (the cost of both its debt and equity capital) was 9 percent at that time, what was the Economic Value Added (EVA) for the firm when its total assets were approximately \$72.124 billion?

##### STEP 1: FORMULATE A DECISION STRATEGY

Economic Value Added includes the opportunity cost of the equity in the total cost of capital, to measure a firm's economic profit.

##### STEP 2: CRUNCH THE NUMBERS

Disney's Economic Value Added is calculated as follows:

$$\begin{aligned} \text{EVA} &= \left( \frac{\text{operating return}}{\text{on assets}} - \frac{\text{cost of}}{\text{capital}} \right) \times \text{total assets} \\ &= (0.1079 - 0.09) \times \$72.124 \text{ billion} = \$1.29 \text{ billion} \end{aligned}$$

**STEP 3: ANALYZE YOUR RESULTS**

Disney created approximately \$1.29 billion in shareholder value by earning a rate of return on the firm's assets, 10.79 percent, that was higher than the investors' required rate of return of 9 percent.

**TABLE 4.3 Home Depot, Inc. Financial Ratio Analysis**

| FINANCIAL RATIOS                                                                                | HOME DEPOT                                                                | LOWE'S    |
|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------|
| <b>1. FIRM LIQUIDITY</b>                                                                        |                                                                           |           |
| Current ratio = $\frac{\text{current assets}}{\text{current liabilities}}$                      | $\frac{\$13,479\text{M}}{\$10,122\text{M}} = 1.33$                        | 1.40      |
| Acid-test ratio = $\frac{\text{cash} + \text{accounts receivable}}{\text{current liabilities}}$ | $\frac{\$545\text{M} + \$1,085\text{M}}{\$10,122\text{M}} = 0.16$         | 0.12      |
| Days in receivables = $\frac{\text{accounts receivable}}{\text{daily credit sales}}$            | $\frac{\$1,085\text{M}}{\$20,399\text{M} \div 365} = 19.41 \text{ days}$  | 16 days   |
| Accounts receivable turnover = $\frac{\text{annual credit sales}}{\text{accounts receivable}}$  | $\frac{\$20,399\text{M}}{\$1,085\text{M}} = 18.80\text{X}$                | 22.81X    |
| Days in inventory = $\frac{\text{inventory}}{\text{daily cost of goods sold}}$                  | $\frac{\$10,625\text{M}}{\$44,693\text{M} \div 365} = 86.77 \text{ days}$ | 95.8 days |
| Inventory turnover = $\frac{\text{cost of goods sold}}{\text{inventory}}$                       | $\frac{\$44,693\text{M}}{\$10,625\text{M}} = 4.21\text{X}$                | 3.81X     |
| <b>2. OPERATING PROFITABILITY</b>                                                               |                                                                           |           |
| Operating return on assets = $\frac{\text{operating profits}}{\text{total assets}}$             | $\frac{\$5,803\text{M}}{\$40,125\text{M}} = 14.5\%$                       | 10.6%     |
| Operating profit margin = $\frac{\text{operating profits}}{\text{sales}}$                       | $\frac{\$5,803\text{M}}{\$67,997\text{M}} = 8.50\%$                       | 7.3%      |
| Total asset turnover = $\frac{\text{sales}}{\text{total assets}}$                               | $\frac{\$67,997\text{M}}{\$40,125\text{M}} = 1.69\text{X}$                | 1.45X     |
| Accounts receivable turnover = $\frac{\text{annual credit sales}}{\text{accounts receivable}}$  | $\frac{\$20,399\text{M}}{\$1,085\text{M}} = 18.80\text{X}$                | 22.81X    |
| Inventory turnover = $\frac{\text{cost of goods sold}}{\text{inventory}}$                       | $\frac{\$44,693\text{M}}{\$10,625\text{M}} = 4.21\text{X}$                | 3.81X     |
| Fixed asset turnover = $\frac{\text{sales}}{\text{net fixed assets}}$                           | $\frac{\$67,997\text{M}}{\$25,060\text{M}} = 2.71\text{X}$                | 2.21X     |
| <b>3. FINANCING DECISIONS</b>                                                                   |                                                                           |           |
| Debt ratio = $\frac{\text{total debt}}{\text{total assets}}$                                    | $\frac{\$21,236\text{M}}{\$40,125\text{M}} = 53\%$                        | 46%       |
| Times interest earned = $\frac{\text{operating profits}}{\text{interest}}$                      | $\frac{\$5,803\text{M}}{\$530\text{M}} = 10.9\text{X}$                    | 9.0X      |
| <b>4. RETURN ON EQUITY</b>                                                                      |                                                                           |           |
| Return on equity = $\frac{\text{net income}}{\text{total common equity}}$                       | $\frac{\$3,338\text{M}}{\$18,889\text{M}} = 17.7\%$                       | 11.10%    |

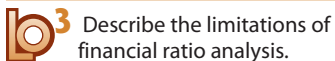
(Continued)

**TABLE 4.3** Home Depot, Inc. Financial Ratio Analysis (*Continued*)

| FINANCIAL RATIOS                                                                                             | HOME DEPOT                                                                 | LOWE'S       |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| <b>5. CREATING SHAREHOLDER VALUE</b>                                                                         |                                                                            |              |
| Price earnings ratio = $\frac{\text{market price per share}}{\text{earnings per share}}$                     | $\frac{\$36.77}{\$2.06} = 17.85X$                                          | 16.90X       |
| Price book ratio = $\frac{\text{market price per share}}{\text{equity book value per share}}$                | $\frac{\$36.77}{\$11.64} = 3.16X$                                          | 1.95X        |
| EVA = $\left( \text{operating return on assets} - \text{cost of capital} \right) \times \text{total assets}$ | $(0.145 - 0.10) \times \$40.125 \text{ billion} = \$1.806 \text{ billion}$ | Not computed |

## Concept Check

1. What determines whether a firm is creating or destroying shareholder value?
2. What measures can we use to determine whether a firm is creating shareholder value?
3. What is indicated by a price/book ratio that is greater than 1? Less than 1?
4. How does the information provided by a firm's price/book ratio differ from that provided by its price/earnings ratio?
5. How do the profits shown in an income statement differ from economic profits?
6. What is Economic Value Added? What does it tell you?



Describe the limitations of financial ratio analysis.

## The Limitations of Financial Ratio Analysis

We conclude this chapter by offering several caveats about using financial ratios. We have described how financial ratios can be used to understand a company's financial position. That said, anyone who works with these ratios needs to be aware of the limitations related to their use. The following list includes some of the more important pitfalls you will encounter as you compute and interpret financial ratios:

1. It is sometimes difficult to determine the industry to which a firm belongs when the firm engages in multiple lines of business. In this case, you must select your own set of peer firms and construct your own norms.
2. Published peer group or industry averages are only approximations. They provide the user with general guidelines, rather than scientifically determined averages of the ratios for all—or even a representative sample—of the firms within an industry.
3. An industry average is not necessarily a desirable target ratio or norm. There is nothing magical about an industry norm. At best, an industry average indicates the financial position of the average firm within the industry. It does not mean that value is the ideal or best value for the ratio. For various reasons, a well-managed company might be above the average, whereas another equally good firm might choose to be below the average.
4. Accounting practices differ widely among firms. For example, different firms choose different methods to depreciate their fixed assets. Differences such as these can make the computed ratios of different firms difficult to compare.
5. Financial ratios can be too high or too low. For example, a current ratio that exceeds the industry norm might signal the presence of excess liquidity, resulting in lower profits relative to the firm's investment in assets. On the other hand, a current ratio that falls below the norm might indicate that (1) the firm has inadequate liquidity and may at some future date be unable to pay its bills on time, or (2) the firm is managing its accounts receivable and inventories more efficiently than other, similar firms.
6. Many firms experience seasonal changes in their operations. As a result, their balance sheet entries and their corresponding ratios will vary with the time of year the statements are prepared. To avoid this problem, an average account balance should be used (one calculated

on the basis of several months or quarters during the year) rather than the year-end account balance. For example, an average of the firm's month-end inventory balance might be used to compute its inventory turnover ratio versus a year-end inventory balance.

In spite of their limitations, financial ratios are very useful tools for assessing a firm's financial condition. We should, however, be aware of their potential weaknesses. In many cases, the “real” value derived from the ratios is that they tell us what additional questions we need to ask about the firm.

## Concept Check

1. When comparing a firm to its peers, why is it difficult to determine the industry to which the firm belongs?
2. Why do differences in the accounting practices of firms limit the usefulness of financial ratios?
3. Why should you be careful when comparing a firm with industry norms?

## Chapter Summaries

### Explain the purpose and importance of financial analysis. (pgs. 102–106)



**SUMMARY:** A variety of groups find financial ratios useful. For instance, both managers and shareholders use them to measure and track a company's performance over time. Financial analysts outside of the firm who have an interest in its economic well-being also use financial ratios. An example of this group would be a loan officer of a commercial bank who wishes to determine the creditworthiness of a loan applicant and its ability to pay the interest and principal associated with the loan request.

#### KEY TERMS

**Financial ratios, page 103** accounting data restated in relative terms in order to help

people identify some of the financial strengths and weaknesses of a company.

### Calculate and use a comprehensive set of measurements to evaluate a company's performance. (pgs 106–128)



**SUMMARY:** Financial ratios are the principal tool of financial analysis. Sometimes referred to simply as benchmarks, ratios standardize the financial information of firms so that comparisons can be made between firms of varying sizes.

Financial ratios can be used to answer at least five questions: (1) How liquid is the company? (2) Are the company's managers effectively generating profits on the firm's assets? (3) How is the firm financed? (4) Are the firm's managers providing a good return on the capital provided by the shareholders? (5) Are the firm's managers creating or destroying shareholder value?

Two methods can be used to analyze a firm's financial ratios. (1) We can examine the firm's ratios across time (say, for the past 5 years) to compare its current and past performance, and (2) we can compare the firm's ratios with those of other firms. In our example, Lowe's was chosen as a comparison firm for analyzing the financial position of Home Depot.

Financial ratios provide a popular way to evaluate a firm's financial performance. However, when evaluating a company's use of its assets (capital) to create firm value, a financial ratio analysis based entirely on the firm's financial statements may not be enough. If we want to understand how the market assesses the performance of a company's managers, we can use the market price of the firm's stock relative to its accounting earnings and equity book value.

Economic Value Added (EVA™) provides another approach for evaluating a firm's performance in terms of shareholder value creation. EVA is equal to the difference between the return on a company's invested capital and the investors' opportunity cost of the funds times the total amount of the capital invested.

**KEY TERMS**

**Liquidity, page 107** a firm's ability to pay its bills on time. Liquidity is related to the ease and speed with which a firm can convert its noncash assets into cash, as well as to the size of the firm's investment in noncash assets relative to its short-term liabilities.

**Current ratio, page 107** a firm's current assets divided by its current liabilities. This ratio indicates the firm's degree of liquidity by comparing its current assets to its current liabilities.

**Acid-test (quick) ratio, page 108** the sum of a firm's cash and accounts receivable divided by its current liabilities. This ratio is a more stringent measure of liquidity than the current ratio because it excludes inventories and other current assets (those that are least liquid) from the numerator.

**Days in receivables (average collection period), page 108** a firm's accounts receivable divided by the company's average daily credit sales (annual credit sales  $\div$  365). This ratio expresses how many days on average it takes to collect receivables.

**Accounts receivable turnover ratio, page 109** a firm's credit sales divided by its accounts receivable. This ratio expresses how often accounts receivable are "rolled over" during a year.

**Days in inventory, page 109** inventory divided by daily cost of goods sold. This ratio measures the number of days a firm's inventories are held on average before being sold; it also indicates the quality of the inventory.

**Inventory turnover, page 110** a firm's cost of goods sold divided by its inventory. This ratio measures the number of times a firm's inventories are sold and replaced during the year (that is, the relative liquidity of the inventories).

**Operating return on assets (OROA), page 112** the ratio of a firm's operating profits divided by its total assets. This ratio indicates the rate of return being earned on the firm's assets.

**Operations management, page 112** how effectively management is performing in the day-to-day operations in terms of how well management is generating revenues and controlling costs and expenses; in other words, how well is the firm managing the activities that directly affect the income statement?

**Asset management, page 113** how efficiently management is using the firm's assets to generate sales.

**Operating profit margin, page 113** a firm's operating profits divided by sales. This ratio serves as an overall measure of operating effectiveness.

**Total asset turnover, page 113** a firm's sales divided by its total assets. This ratio is an overall measure of asset efficiency based on the relation between a firm's sales and the total assets.

**Fixed asset turnover, page 114** a firm's sales divided by its net fixed assets. This ratio indicates how efficiently the firm is using its fixed assets.

**Debt ratio, page 117** a firm's total liabilities divided by its total assets. This ratio measures the extent to which a firm has been financed with debt.

**Times interest earned, page 117** a firm's operating profits divided by interest expense. This ratio measures a firm's ability to meet its interest payments from its annual operating earnings.

**Return on equity, page 119** a firm's net income divided by its total common book equity. This ratio is the accounting rate of return earned on the common stockholders' investment.

**Price/earnings ratio, page 123** the price the market places on \$1 of a firm's earnings. For example, if a firm has an earnings per share of \$2, and a stock price of \$30 per share, its price/earnings ratio is 15. ( $\$30 \div \$2$ ).

**Price/book ratio, page 123** the market value of a share of the firm's stock divided by the book value per share of the firm's reported equity in the balance sheet. Indicates the market price placed on \$1 of capital that was invested by shareholders.

**Economic value added, page 125** measures a company's economic profits, as compared to its accounting profits, by including not only interest expense as a cost but also the shareholders' required rate of return on their investment.

**KEY EQUATIONS**

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

$$\text{Acid-test ratio} = \frac{\text{cash} + \text{accounts receivable}}{\text{current liabilities}}$$

$$\text{Days in receivable} = \frac{\text{accounts receivable}}{\text{daily credit sales}} = \frac{\text{accounts receivable}}{\text{annual credit sales} \div 365}$$

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

$$\text{Days in inventory} = \frac{\text{inventory}}{\text{daily cost of goods sold}} = \frac{\text{inventory}}{\text{annual cost of goods sold} \div 365}$$

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

$$\text{Operating return on assets} = \frac{\text{operating profits}}{\text{total assets}}$$

$$\text{Operation return on assets} = \text{operating profit margin} \times \text{total asset turnover}$$

$$\text{Operation return on assets} = \frac{\text{operating profits}}{\text{sales}} \times \frac{\text{sales}}{\text{total assets}}$$

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

$$\text{Total asset turnover} = \frac{\text{sales}}{\text{total assets}}$$

$$\text{Fixed asset turnover} = \frac{\text{sales}}{\text{net fixed assets}}$$

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

$$\text{Times interest earned} = \frac{\text{operating profits}}{\text{interest expense}}$$

$$\text{Return on equity} = \frac{\text{net income}}{\text{total common equity}}$$

$$\text{Price/earnings ratio} = \frac{\text{market price per share}}{\text{earnings per share}}$$

$$\text{Price/book ratio} = \frac{\text{market price per share}}{\text{equity book value per share}}$$

$$\text{EVA} = \left( \text{operating return on assets} - \text{cost of capital} \right) \times \text{total assets}$$

### Describe the limitations of financial ratio analysis. (pgs. 128–129)



**SUMMARY:** The following are some of the limitations that you will encounter as you compute and interpret financial ratios:

1. It is sometimes difficult to determine an appropriate industry within which to place the firm.
2. Published industry averages are only approximations, not scientifically determined averages.
3. Accounting practices differ widely among firms and can lead to differences in computed ratios.
4. An industry average may not be a desirable target ratio or norm.
5. Many firms experience seasonal business conditions. As a result, the ratios calculated for them will vary with the time of year the statements are prepared.

In spite of their limitations, financial ratios provide us with a very useful tool for assessing a firm's financial condition.

## Review Questions

*All Review Questions are available in MyFinanceLab.*

- 4-1. Describe the “five-question approach” to using financial ratios.
- 4-2. Discuss briefly the two perspectives that can be taken when performing a ratio analysis.
- 4-3. Where can we obtain industry norms?
- 4-4. What are the limitations of industry average ratios? Discuss briefly.
- 4-5. What is liquidity, and what is the rationale for its measurement?
- 4-6. Distinguish between a firm’s operating return on assets and operating profit margin.
- 4-7. Why is a firm’s operating return on assets a function of its operating profit margin and total asset turnover?
- 4-8. What is the difference between a firm’s gross profit margin, operating profit margin, and net profit margin?
- 4-9. What information do the price/earnings ratio and the price/book ratio give us about the firm and its investors?
- 4-10. Explain what determines a company’s return on equity.
- 4-11. What is Economic Value Added? Why is it used?
- 4-12. Go to the Web site for IBM at [www.ibm.com/investor](http://www.ibm.com/investor). Click “Investor tools” and then “Investment guides” for a guide to reading financial statements. How does the guide differ from the presentation in Chapter 3 and this chapter?

## Study Problems

*All Study Problems are available in MyFinanceLab.*



- 4-1. (*Evaluating liquidity*) Brashear Inc. currently has \$2,145,000 in current assets and \$858,000 in current liabilities. The company’s managers want to increase the firm’s inventory, which will be financed by a short-term note with the bank. What level of inventories can the firm carry without its current ratio falling below 2.0?
- 4-2. (*Evaluating profitability*) The Allen Corporation had sales in 2013 of \$65 million, total assets of \$42 million, and total liabilities of \$20 million. The interest rate on the company’s debt is 6 percent and its tax rate is 30 percent. The operating profit margin was 12 percent. What were the company’s operating profits and net income? What was the operating return on assets and return on equity? Assume that interest must be paid on all of the debt.
- 4-3. (*Evaluating profitability*) Last year, Davies Inc. had sales of \$400,000 with a cost of goods sold of \$112,000. The firm’s operating expenses were \$130,000, and its increase in retained earnings was \$58,000. There are currently 22,000 common stock shares outstanding and the firm pays a \$1.60 dividend per share.
  - a. Assuming the firm’s earnings are taxed at 34 percent, construct the firm’s income statement.
  - b. Compute the firm’s operating profit margin.
  - c. What was the times interest earned?
- 4-4. (*Price book*) Greene Inc.’s balance sheet shows a stockholders’ equity book value (total common equity) of \$750,500. The firm’s earnings per share were \$3, resulting in a price/earnings ratio of 12.25X. There are 50,000 shares of common stock outstanding. What is the price/book ratio? What does this indicate about how shareholders view Greene Inc.?
- 4-5. (*Evaluating liquidity*) The Mitchem Marble Company has a target current ratio of 2.0 but has experienced some difficulties financing its expanding sales in the past few months. At present, the firm has current assets of \$2.5 million and a current ratio of 2.5. If Mitchem expands its receivables and inventories using its short-term line of credit, how much additional short-term funding can it borrow before its current ratio standard is reached?

**4-6. (Ratio analysis)** The balance sheet and income statement for the J. P. Robard Mfg. Company are as follows:

**BALANCE SHEET (\$000)**

|                                      |                |
|--------------------------------------|----------------|
| Cash                                 | \$ 500         |
| Accounts receivable                  | 2,000          |
| Inventories                          | 1,000          |
| Current assets                       | \$3,500        |
| Net fixed assets                     | 4,500          |
| Total assets                         | <u>\$8,000</u> |
| Accounts payable                     | \$1,100        |
| Accrued expenses                     | 600            |
| Short-term notes payable             | 300            |
| Current liabilities                  | \$2,000        |
| Long-term debt                       | 2,000          |
| Owners' equity                       | 4,000          |
| Total liabilities and owners' equity | <u>\$8,000</u> |

**INCOME STATEMENT (\$000)**

|                                                  |                |
|--------------------------------------------------|----------------|
| Sales (all credit)                               | \$8,000        |
| Cost of goods sold                               | <u>(3,300)</u> |
| Gross profit                                     | 4,700          |
| Operating expenses (includes \$500 depreciation) | <u>(3,000)</u> |
| Operating profits                                | \$1,700        |
| Interest expense                                 | <u>(367)</u>   |
| Earnings before taxes                            | \$1,333        |
| Income taxes (40%)                               | <u>(533)</u>   |
| Net income                                       | <u>\$ 800</u>  |

Calculate the following ratios:

|                         |                            |
|-------------------------|----------------------------|
| Current ratio           | Operating return on assets |
| Times interest earned   | Debt ratio                 |
| Inventory turnover      | Average collection period  |
| Total asset turnover    | Fixed-asset turnover       |
| Operating profit margin | Return on equity           |

**4-7. (Analyzing operating return on assets)** The R. M. Smithers Corporation earned an operating profit margin of 10 percent based on sales of \$10 million and total assets of \$5 million last year.

- What was Smithers' total asset turnover ratio?
- During the coming year the company president has set a goal of attaining a total asset turnover of 3.5. How much must firm sales rise, other things being the same, for the goal to be achieved? (State your answer in both dollars and percentage increase in sales.)
- What was Smithers' operating return on assets last year? Assuming the firm's operating profit margin remains the same, what will the operating return on assets be next year if the total asset turnover goal is achieved?

**4-8. (Evaluating liquidity)** The Brenmar Sales Company had a gross profit margin (gross profits ÷ sales) of 30 percent and sales of \$9 million last year. Seventy-five percent of the firm's sales are on credit and the remainder are cash sales. Brenmar's current assets equal \$1.5 million, its current liabilities equal \$300,000, and it has \$100,000 in cash plus marketable securities.

- If Brenmar's accounts receivable are \$562,500, what is its average collection period?
- If Brenmar reduces its days in receivable (average collection period) to 20 days, what will be its new level of accounts receivable?
- Brenmar's inventory turnover ratio is 9 times. What is the level of Brenmar's inventories?

- 4-9. (Ratio analysis)** The financial statements and industry norms are shown below for Pamplin, Inc.:
- Compute the financial ratios for Pamplin to compare both for 2012 and 2013 against the industry norms.
  - How liquid is the firm?
  - Are its managers generating an adequate operating profit on the firm's assets?
  - How is the firm financing its assets?
  - Are its managers generating a good return on equity?

|                           | INDUSTRY NORM |
|---------------------------|---------------|
| Current ratio             | 5.00          |
| Acid-test (quick) ratio   | 3.00          |
| Inventory turnover        | 2.20          |
| Average collection period | 90.00         |
| Debt ratio                | 0.33          |
| Times interest earned     | 7.00          |
| Total asset turnover      | 0.75          |
| Fixed-asset turnover      | 1.00          |
| Operating profit margin   | 20%           |
| Return on common equity   | 9%            |

**Pamplin Inc. Balance Sheet at 12/31/2012 and 12/31/2013**

| ASSETS                                | 2012           | 2013           |
|---------------------------------------|----------------|----------------|
| Cash                                  | \$ 200         | \$ 150         |
| Accounts receivable                   | 450            | 425            |
| Inventory                             | 550            | 625            |
| Current assets                        | \$1,200        | \$1,200        |
| Plant and equipment                   | \$2,200        | \$ 2,600       |
| Less accumulated depreciation         | (1,000)        | (1,200)        |
| Net plant and equipment               | \$1,200        | \$1,400        |
| Total assets                          | <u>\$2,400</u> | <u>\$2,600</u> |
| <b>LIABILITIES AND OWNERS' EQUITY</b> |                |                |
| Accounts payable                      | \$ 200         | \$ 150         |
| Notes payable—current (9%)            | 0              | 150            |
| Current liabilities                   | \$ 200         | \$ 300         |
| Bonds (8.33% interest)                | 600            | 600            |
| Total debt                            | \$ 800         | \$ 900         |
| Owners' equity Common stock           | \$ 300         | \$ 300         |
| Paid-in capital                       | 600            | 600            |
| Retained earnings                     | 700            | 800            |
| Total owners' equity                  | \$1,600        | \$1,700        |
| Total liabilities and owners' equity  | <u>\$2,400</u> | <u>\$2,600</u> |

**Pamplin Inc. Income Statement for Years Ending 12/31/2012 and 12/31/2013**

|                         | 2012                 | 2013                 |
|-------------------------|----------------------|----------------------|
| Sales*                  | \$1,200              | \$1,450              |
| Cost of goods sold      | <u>700</u>           | <u>850</u>           |
| Gross profit            | <u>\$ 500</u>        | <u>\$ 600</u>        |
| Operating expenses      | 30                   | 40                   |
| Depreciation            | <u>220</u>           | <u>200</u>           |
| Operating profits       | <u>\$ 250</u>        | <u>\$ 360</u>        |
| Interest expense        | <u>50</u>            | <u>64</u>            |
| Net income before taxes | <u>\$ 200</u>        | <u>\$ 296</u>        |
| Taxes (40%)             | <u>80</u>            | <u>118</u>           |
| Net income              | <u><u>\$ 120</u></u> | <u><u>\$ 178</u></u> |

\* 15% of sales are cash sales, with the remaining 85% being credit sales.

**4-10. (Evaluating current and proforma profitability)** (Financial ratios—investment analysis) The annual sales for Salco Inc. were \$4.5 million last year. All sales are on credit. The firm's end-of-year balance sheet was as follows:

|                  |                           |                |                           |
|------------------|---------------------------|----------------|---------------------------|
| Current assets   | \$ 500,000                | Liabilities    | \$1,000,000               |
| Net fixed assets | <u>1,500,000</u>          | Owners' equity | <u>1,000,000</u>          |
|                  | <u><u>\$2,000,000</u></u> |                | <u><u>\$2,000,000</u></u> |

The firm's income statement for the year was as follows:

|                         |                          |
|-------------------------|--------------------------|
| Sales                   | \$4,500,000              |
| Less cost of goods sold | <u>(3,500,000)</u>       |
| Gross profit            | \$1,000,000              |
| Less operating expenses | <u>(500,000)</u>         |
| Operating profits       | \$ 500,000               |
| Less interest expense   | <u>(100,000)</u>         |
| Earnings before taxes   | \$ 400,000               |
| Less taxes (50%)        | <u>(200,000)</u>         |
| Net income              | <u><u>\$ 200,000</u></u> |

- Calculate Salco's total asset turnover, operating profit margin, and operating return on assets.
- Salco plans to renovate one of its plants, which will require an added investment in plant and equipment of \$1 million. The firm will maintain its present debt ratio of 0.5 when financing the new investment and expects sales to remain constant. The operating profit margin will rise to 13 percent. What will be the new operating return on assets for Salco after the plant's renovation?
- Given that the plant renovation in part (b) occurs and Salco's interest expense rises by \$50,000 per year, what will be the return earned on the common stockholders' investment? Compare this rate of return with that earned before the renovation.

**4-11. (Financial analysis)** The T. P. Jarmon Company manufactures and sells a line of exclusive sportswear. The firm's sales were \$600,000 for the year just ended, and its total assets exceeded \$400,000. The company was started by Mr. Jarmon just 10 years ago and has been profitable every year since its inception. The chief financial officer for the firm, Brent Vehlim, has decided to seek a line of credit totaling \$80,000 from the firm's bank. In the past, the company has relied on its suppliers to finance a large part of its needs for inventory. However, in recent months tight money conditions have led the firm's suppliers to offer sizable cash discounts to speed up payments for purchases. Mr. Vehlim wants to use the line of credit to replace a large portion of the firm's payables during the summer, which is the firm's peak seasonal sales period.

The firm's two most recent balance sheets were presented to the bank in support of its loan request. In addition, the firm's income statement for the year just ended was provided. These statements are found in the following tables:

**T. P. Jarmon Company, Balance Sheet for 12/31/2012 and 12/31/2013**

|                              | 2012             | 2013             |
|------------------------------|------------------|------------------|
| Cash                         | \$ 15,000        | \$ 14,000        |
| Marketable securities        | 6,000            | 6,200            |
| Accounts receivable          | 42,000           | 33,000           |
| Inventory                    | 51,000           | 84,000           |
| Prepaid rent                 | 1,200            | 1,100            |
| Total current assets         | \$115,200        | \$138,300        |
| Net plant and equipment      | 286,000          | 270,000          |
| Total assets                 | <u>\$401,200</u> | <u>\$408,300</u> |
| Accounts payable             | \$ 48,000        | \$ 57,000        |
| Notes payable                | 15,000           | 13,000           |
| Accruals                     | 6,000            | 5,000            |
| Total current liabilities    | \$ 69,000        | \$ 75,000        |
| Long-term debt               | 160,000          | 150,000          |
| Common stockholders' equity  | 172,200          | 183,300          |
| Total liabilities and equity | <u>\$401,200</u> | <u>\$408,300</u> |

**T. P. Jarmon Company, Income Statement for the Year Ended 12/31/2013**

|                                             |                  |
|---------------------------------------------|------------------|
| Sales (all credit)                          | \$600,000        |
| Less cost of goods sold                     | <u>460,000</u>   |
| Gross profit                                | \$140,000        |
| Less operating and interest expenses        |                  |
| General and administrative                  | \$30,000         |
| Interest                                    | 10,000           |
| Depreciation                                | <u>30,000</u>    |
| Total                                       | <u>70,000</u>    |
| Earnings before taxes                       | \$ 70,000        |
| Less taxes                                  | <u>27,100</u>    |
| Net income available to common stockholders | \$ 42,900        |
| Less cash dividends                         | <u>31,800</u>    |
| Change in retained earnings                 | <u>\$ 11,100</u> |

Jan Fama, associate credit analyst for the Merchants National Bank of Midland, Michigan, was assigned the task of analyzing Jarmon's loan request.

- a. Calculate the financial ratios for 2013 corresponding to the industry norms provided as follows:

| RATIO                                            | NORM  |
|--------------------------------------------------|-------|
| Current ratio                                    | 1.8   |
| Acid-test ratio                                  | 0.9   |
| Debt ratio                                       | 0.5   |
| Times interest earned                            | 10.0  |
| Average collection period                        | 20.0  |
| Inventory turnover (based on cost of goods sold) | 7.0   |
| Return on common equity                          | 12.0% |
| Operating return on assets                       | 16.8% |
| Operating profit margin                          | 14.0% |
| Total asset turnover                             | 1.20  |
| Fixed asset turnover                             | 1.80  |

- b. Which of the ratios reported in the industry norms do you feel should be most crucial in determining whether the bank should extend the line of credit?
- c. Prepare Jarmon's statement of cash flows for the year ended December 31, 2013. Interpret your findings.
- d. Use the information provided by the financial ratios and the cash flow statement to decide if you would support making the loan.

**4-12. (Economic Value Added)** Stegemoller Inc.'s managers want to evaluate the firm's prior-year performance in terms of its contribution to shareholder value. This past year, the firm earned an operating return on investment of 12 percent, compared to an industry norm of 11 percent. It has been estimated that the firm's investors have an opportunity cost on their funds of 14 percent, which is the same as its overall cost of capital. The firm's total assets for the year were \$100 million. Compute the amount of economic value created or destroyed by the firm. How does your finding support or fail to support what you would conclude using ratio analysis to evaluate the firm's performance?

**4-13.** Being able to identify an industry to use for benchmarking your firm's results with similar companies is frequently not easy. Choose a type of business and go to [www.naics.com](http://www.naics.com). This Web site allows you to do a free search for the NAICS (North American Industry Classification System, pronounced "Nakes") number for different types of businesses. Choose keywords such as "athletic shoes" or "auto dealers" and others to see to which industry they have been assigned.

**4-14. (Market-value ratios)** Bremmer Industries has a price/earnings ratio of 16.29X.

- a. If Bremmer's earnings per share are \$1.35, what is the price per share of Bremmer's stock?
- b. Using the price per share you found in part (a), determine the price/book ratio if Bremmer's equity book value per share is \$9.58.

**4-15. (Financing decisions)** Ellie's Electronics Incorporated has total assets of \$63 million and total debt of \$42 million. The company also has operating profits of \$21 million with interest expenses of \$6 million.

- a. What is Ellie's debt ratio?
- b. What is Ellie's times interest earned?
- c. Based on the information above, would you recommend to Ellie's management that the firm is in a strong enough position to assume more debt and increase interest expense to \$9 million?

**4-16. (Economic Value Added)** Callaway Concrete uses Economic Value Added as a financial performance measure. Callaway has \$240 million in assets, and the firm has financed its assets with 37 percent equity and 63 percent debt with an interest rate of 6 percent. The firm's opportunity cost on its funds is 12 percent, while the operating return on the firm's assets is 14 percent.

- a. What is the Economic Value Added created or destroyed by Callaway Concrete?
- b. What does Economic Value Added measure?

**4-17. (Ratio analysis)** Seward, Inc.'s financial statements for 2013 are shown below:

|                                                   |                |
|---------------------------------------------------|----------------|
| Sales                                             | \$ 4,500       |
| Cost of goods sold                                | <u>(2,800)</u> |
| Gross profits                                     | \$ 1,700       |
| Operating expenses:                               |                |
| Marketing and general and administrative expenses | \$ (1,000)     |
| Depreciation expenses                             | <u>(200)</u>   |
| Total operating expenses                          | \$ (1,200)     |
| Operating profits                                 | \$ 500         |
| Interest expense                                  | <u>(60)</u>    |
| Earnings before taxes (taxable income)            | \$ 440         |
| Income taxes                                      | <u>(125)</u>   |
| Net Income                                        | \$ 315         |
| Cash                                              | \$ 500         |
| Account receivables                               | 600            |

(Continued)

|                                        |          |
|----------------------------------------|----------|
| Inventories                            | 900      |
| Total current assets                   | \$ 2,000 |
| Gross fixed assets                     | \$ 2,100 |
| Accumulated depreciation               | (800)    |
| Net fixed assets                       | \$ 1,300 |
| Total assets                           | \$ 3,300 |
| <b>LIABILITIES (DEBT) AND EQUITY</b>   |          |
| Accounts payable                       | \$ 500   |
| Short-term notes payable               | 300      |
| Total current liabilities              | \$ 800   |
| Long-term debt                         | 400      |
| Total liabilities                      | \$1,200  |
| Common equity:                         |          |
| Common stock (par and paid in capital) | \$ 500   |
| Retained earnings                      | 1,600    |
| Total common equity                    | \$2,100  |
| Total liabilities and equity           | \$3,300  |

The chief financial officer for Seward has acquired industry averages for the following ratios:

|                            |       |
|----------------------------|-------|
| Current ratio              | 3.0   |
| Acid-test ratio            | 1.50  |
| Days in receivables        | 40.0  |
| Days in inventories        | 70.2  |
| Operating return on assets | 12.5% |
| Operating profit margin    | 8.0%  |
| Total asset turnover       | 1.6   |
| Fixed-asset turnover       | 3.1   |
| Debt ratio                 | 33%   |
| Times interest earned      | 6.0   |
| Return on equity           | 11.0% |

- a. Compute the ratios listed above for Seward.
- b. Compared to the industry:
  1. How liquid is the firm?
  2. Are its managers generating attractive operating profit on the firm's assets?
  3. How is the firm financing its assets?
  4. Are its managers generating a good return on equity?

**4-18. (Computing ratios)** Use the information from the balance sheet and income statement below to calculate the following ratios:

|                         |                            |
|-------------------------|----------------------------|
| Current ratio           | Days in receivables        |
| Acid-test ratio         | Operating return on assets |
| Times interest earned   | Debt ratio                 |
| Inventory turnover      | Return on equity           |
| Total asset turnover    | Fixed asset turnover       |
| Operating profit margin |                            |

|                                               |                  |
|-----------------------------------------------|------------------|
| Cash                                          | \$100,000        |
| Accounts receivable                           | 30,000           |
| Inventory                                     | 50,000           |
| Prepaid expenses                              | 10,000           |
| Total current assets                          | \$190,000        |
| Gross plant and equipment                     | 401,000          |
| Accumulated depreciation                      | (66,000)         |
| Total assets                                  | <u>\$525,000</u> |
| Accounts payable                              | \$ 90,000        |
| Accrued liabilities                           | 63,000           |
| Total current debt                            | \$153,000        |
| Long-term debt                                | 120,000          |
| Common stock                                  | 205,000          |
| Retained earnings                             | 47,000           |
| Total debt and equity                         | <u>\$525,000</u> |
| Sales*                                        | \$210,000        |
| Cost of goods sold                            | (90,000)         |
| Gross profit                                  | \$120,000        |
| Selling, general, and administrative expenses | (29,000)         |
| Depreciation expense                          | (26,000)         |
| Operating profits                             | \$65,000         |
| Interest expense                              | (8,000)          |
| Earnings before taxes                         | \$57,000         |
| Taxes                                         | (16,000)         |
| Net income                                    | <u>\$41,000</u>  |

\*12% of sales are cash sales.

## Mini Case

*This Mini Case is available in [MyFinanceLab](#).*

After graduating from college in December 2011, Alyssa Randall started her career at the G&S Corporation, a small- to medium-sized warehouse distributor in Nashville, Tennessee. The company was founded by Jack Griggs and Johnny Stites in 1998, after they had worked together in management at Wal-Mart. Although Randall had an offer from Sam's Club, she became excited about the opportunity with G&S. Griggs and Stites, as CEO and VP-marketing, respectively, assured her that she would be given every opportunity to take a leadership role in the business as quickly as she was ready.

In addition to receiving a competitive salary, Randall will immediately be entitled to a bonus based on how well the company does financially. The bonus is determined by the amount of Economic Value Added (EVA) that is generated in a year. To begin, she would receive 1 percent of the firm's EVA each year, to be paid half in stock and half in cash. In any year that the EVA is negative, she will not receive a bonus. Also, the firm's stock is traded publicly on the American Stock Exchange.

The year of 2012 turned out to be a good year financially for the business. But in the ensuing year, 2013, the company experienced a 5.3 percent sales reduction, where sales declined from \$5.7 million to \$5.4 million. The downturn then led to other financial problems, including a 50 percent reduction in the company's stock price. The share price went from \$36 per share at the end of 2012 to \$18 per share at the conclusion of 2013!

Financial information for G&S for both years is shown below, where all the numbers, except for per-share data, are shown in \$ thousands.

- Using what you have learned in this chapter and Chapter 3, prepare a financial analysis of G&S, comparing the firm's financial performance between the two years. In addition to the financial information provided below, the company's chief financial officer, Mike Stegemoller, has estimated the company's average cost of capital for all its financing to be 10.5 percent.
- What conclusions can you make from your analysis?
- How much will Randall's bonus be in 2012 and 2013, both in the form of cash and stock? How many shares of the stock will Randall receive?
- What recommendations would you make to management?

#### G&S Corporation Income Statements

|                                        | 2012           | 2013           |
|----------------------------------------|----------------|----------------|
| Sales                                  | \$ 5,700       | \$ 5,400       |
| Cost of goods sold                     | <u>(3,700)</u> | <u>(3,600)</u> |
| Gross profits                          | \$ 2,000       | \$ 1,800       |
| Operating expenses:                    |                |                |
| Selling and G&A expenses               | \$ (820)       | \$ (780)       |
| Depreciation expenses                  | <u>(340)</u>   | <u>(500)</u>   |
| Total operating expenses               | \$(1,160)      | \$(1,280)      |
| Operating profits                      | \$ 840         | \$ 520         |
| Interest expense                       | <u>(200)</u>   | <u>(275)</u>   |
| Earnings before taxes (taxable income) | \$ 640         | \$ 245         |
| Income taxes                           | <u>(230)</u>   | <u>(65)</u>    |
| Net Income                             | <u>\$ 410</u>  | <u>\$ 180</u>  |
| Additional information:                |                |                |
| Number of common shares outstanding    | 150            | 150            |
| Dividends paid to stockholders         | \$ 120         | \$ 120         |
| Market price per share                 | \$ 36          | \$ 18          |

**G&S Corporation Balance Sheets**

|                                      | 2012           | 2013           |
|--------------------------------------|----------------|----------------|
| <b>ASSETS</b>                        |                |                |
| Cash                                 | \$ 300         | \$ 495         |
| Accounts receivable                  | 700            | 915            |
| Inventories                          | 600            | 780            |
| Other current assets                 | <u>125</u>     | <u>160</u>     |
| Total current assets                 | \$1,725        | \$2,350        |
| Gross fixed assets                   | \$4,650        | \$4,950        |
| Accumulated depreciation             | <u>(1,700)</u> | <u>(2,200)</u> |
| Net fixed assets                     | <u>\$2,950</u> | <u>\$2,750</u> |
| Total assets                         | <u>\$4,675</u> | <u>\$5,100</u> |
| <b>LIABILITIES (DEBT) AND EQUITY</b> |                |                |
| Accounts payable                     | \$ 400         | \$ 640         |
| Short-term notes payable             | <u>250</u>     | <u>300</u>     |
| Total current liabilities            | \$ 650         | \$ 940         |
| Long-term debt                       | <u>1,250</u>   | <u>1,325</u>   |
| Total liabilities                    | \$1,900        | \$2,265        |
| Common equity:                       |                |                |
| Common stock                         | \$1,100        | \$1,100        |
| Retained earnings                    | <u>1,675</u>   | <u>1,735</u>   |
| Total common equity                  | \$2,775        | \$2,835        |
| Total liabilities and equity         | <u>\$4,675</u> | <u>\$5,100</u> |