

# Introduction to Financial Statement Analysis

# 2

## LEARNING OBJECTIVES

- Know why the disclosure of financial information through financial statements is critical to investors
- Understand the function of the statement of financial position
- Understand how the income statement is used
- Interpret a statement of cash flows
- Know what management's discussion and analysis and the statement of shareholders' equity are
- Use financial statement information to analyze a company's profitability, liquidity, asset efficiency, working capital, interest coverage, leverage, valuation, and operating returns
- Understand the main purpose and aspects of the Sarbanes-Oxley reforms following Enron and other financial scandals

**As we discussed in Chapter 1,** anyone with money to invest is a potential investor who can own shares in a corporation. As a result, corporations are often widely held, with investors ranging from individuals who hold one share to large financial institutions that own millions of shares. For example, in 2012, International Business Machines Corporation (ticker symbol: IBM) had about 1.14 billion shares outstanding held by over 500,000 shareholders. Although the corporate organizational structure greatly facilitates the firm's access to investment capital, it also means that stock ownership is most investors' sole tie to the company. How, then, do investors learn enough about a company to know whether or not they should invest in it? One way firms evaluate their performance and communicate this information to investors is through their *financial statements*. Financial statements also enable financial managers to assess the success of their own firm and compare it to competitors.

Firms regularly issue financial statements to communicate financial information to the investment community. A detailed description of the preparation and analysis of these statements is sufficiently complicated that to do it justice would require an entire book. In this chapter, we briefly review the subject, emphasizing only the material that investors and corporate financial managers need in order to make the corporate finance decisions we discuss in the text.

We review the four main types of financial statements, present examples of these statements for a firm, and discuss where an investor or manager might find various types of information about the company. We also discuss some of the financial ratios used to assess a firm's performance and value. We close the chapter with a look at highly publicized financial reporting abuses at Enron.

## 2.1

## Firms' Disclosure of Financial Information

**financial statements**

Accounting reports issued by a firm quarterly and/or annually present past performance information and a snapshot of the firm's assets and financing of those assets.

**annual reports** The yearly summary of business sent by public companies to their shareholders; accompanies or includes the financial statements.

**Generally Accepted Accounting Principles (GAAP)**

A common set of rules and a standard format for companies to use when they prepare their financial reports.

**auditor** A neutral third party, which corporations are required to hire, that checks a firm's annual financial statements to ensure they are prepared according to GAAP and provide evidence to support the reliability of the information.

**Financial statements** are accounting reports issued by a firm periodically (usually quarterly and annually) that present past performance information and a snapshot of the firm's assets and the financing of those assets. Canadian public companies are required to file these reports (called interim financial statements and **annual reports**) with their provincial securities commissions. This process is centralized nationally through the System for Electronic Document Analysis and Retrieval (SEDAR). At [www.sedar.com](http://www.sedar.com), Canadian company filings can be easily accessed. U.S. public companies are required to file their financial statements with the U.S. Securities and Exchange Commission (SEC) on a quarterly basis on form 10-Q and annually on form 10-K.<sup>1</sup> Companies in Canada and the United States must also send an annual report with their financial statements to their shareholders each year. Often, private companies also prepare financial statements, but they usually do not have to disclose these reports to the public. Financial statements are important tools with which investors, financial analysts, and other interested outside parties (such as creditors) obtain information about a corporation. They are also useful for managers within the firm as a source of information for the corporate financial decisions we discussed in the previous chapter. In this section, we examine the guidelines for preparing financial statements and introduce the different types of financial statements.

**Types of Financial Statements**

Under IFRS, every public company is required to produce a *statement of financial position* (also known as a *balance sheet*), *statement of comprehensive income* (which includes the *income statement*), *statement of cash flows*, *statement of changes in equity*, and *notes including accounting policies*. These financial statements provide investors and creditors with an overview of the firm's financial performance. In the sections that follow, we take a close look at the content of these financial statements.

**PREPARATION OF FINANCIAL STATEMENTS**

Reports about a company's performance must be understandable and accurate. **Generally Accepted Accounting Principles (GAAP)** provide a framework including a common set of rules and a standard format for public companies to use when they prepare their reports. This standardization also makes it easier to compare the financial results of different firms. The Accounting Standards Board of Canada has adopted International Financial Reporting Standards (IFRS) for GAAP in

Canada for publicly accountable enterprises. Using IFRS makes financial statements for Canadian companies comparable to those for companies in other countries that have adopted IFRS.

Investors also need some assurance that the financial statements are prepared accurately. Corporations are required to hire a neutral third party, known as an **auditor**, to check the annual financial statements, ensure they are prepared according to GAAP, and verify that the information is reliable.

<sup>1</sup>The SEC was established by Congress in 1934 to regulate securities (e.g., stocks and bonds) issued to the public and the financial markets (exchanges) on which those securities trade.

## INTERNATIONAL FINANCIAL REPORTING STANDARDS

Because GAAP differ among countries, companies face tremendous accounting complexities when they operate internationally. Investors also face difficulty interpreting financial statements of foreign companies, which is often considered a major barrier to international capital mobility. As companies and capital markets become more global, however, interest in harmonization of accounting standards across countries has increased.

The most important harmonization project began in 1973 when representatives of 10 countries (including Canada) established the International Accounting Standards Committee. This effort led to the creation of the International Accounting Standards Board (IASB) in 2001, with headquarters in London. Now the IASB has issued a set of International Financial Reporting Standards (IFRS).

The IFRS are taking root throughout the world. The European Union (EU) approved an accounting regulation in 2002 requiring all publicly traded EU companies to follow IFRS in their consolidated financial statements starting in 2005. Canadian publicly accountable enterprises (we will simply refer to them as public companies from this point on) must follow IFRS in their financial statements for fiscal years beginning January 1, 2011, or later. Many other countries have adopted IFRS for all listed companies, including Australia

and several countries in Latin America and Africa. Indeed, all major stock exchanges around the world accept IFRS except the United States and Japan, which maintain their local GAAP. In November 2007, the United States' SEC allowed foreign companies listed on U.S. exchanges to use IFRS rather than U.S. GAAP. This will be important for Canadian companies, as they will no longer have to reconcile their statements with U.S. GAAP if their filings correspond to IFRS.

The main conceptual difference between U.S. GAAP and IFRS is that U.S. GAAP are based primarily on accounting rules with specific guidance in applying them, whereas IFRS are based more on principles requiring professional judgment by accountants, and specific guidance in application is limited. In implementation, the main difference is how assets and liabilities are valued. Whereas U.S. GAAP are based primarily on historical cost accounting, IFRS places more emphasis on "fair value" of assets and liabilities, or estimates of market values. Effort to achieve convergence between U.S. GAAP and IFRS was spurred by the Sarbanes-Oxley Act (SOX) of 2002 in the United States. It included a provision that U.S. accounting standards move toward international convergence on high-quality accounting standards. This process is ongoing and the expectation is that U.S. GAAP will use IFRS by 2016.

### CONCEPT CHECK

1. What is the role of an auditor?
2. What are the four financial statements that all public companies must produce?

## 2.2 The Statement of Financial Position or Balance Sheet

### statement of financial position or balance sheet

A list of a firm's assets, liabilities and equity that provides a snapshot of the firm's financial position at a given point in time.

The **statement of financial position** or **balance sheet**,<sup>2</sup> lists the firm's *assets, liabilities, and equity*, providing a snapshot of the firm's financial position at a given point in time. Table 2.1 shows the statement of financial position for a fictitious company, Global Corporation. Notice that the statement of financial position is divided into two parts, with one part including the assets and the other part including the liabilities and equity.

<sup>2</sup>In IFRS, the balance sheet is referred to as the *statement of financial position*; however, some companies still use the balance sheet terminology in their statements.

**assets** The cash, inventory, property, plant and equipment, and other investments a company has made.

**liabilities** A firm's obligations to its creditors.

**shareholders' equity** An accounting measure of a firm's net worth that represents the difference between the firm's assets and its liabilities.

**common stock** The amount that shareholders have directly invested in the firm through purchasing stock from the company.

1. The **assets** list the firm's cash, inventory, property, plant and equipment, and any other investments the company has made.
2. The **liabilities** show the firm's obligations to its creditors.
3. Also shown with liabilities on the right side of the statement of financial position is the *shareholders' equity*. **Shareholders' equity**, the difference between the firm's assets and liabilities, is an accounting measure of the firm's net worth. For Global, the shareholders' equity has two parts: (1) **common stock**, the amount that shareholders have directly invested in the firm through purchasing stock from the company and (2) *retained earnings*, which are profits made by the firm but retained within the firm and reinvested in assets or held as cash. We will take a more detailed look at retained earnings in our discussion of the statement of cash flows later in this chapter.

The assets on the left side show how the firm uses its capital (its investments), and the information on the right side summarizes the sources of capital, or how the firm raises the money it needs. Because of the way shareholders' equity is calculated, the left and right sides must balance:

#### The Statement of Financial Position Identity

$$\text{Assets} = \text{Liabilities} + \text{Shareholders' Equity} \quad (2.1)$$

In Table 2.1, total assets for 2015 (\$170.1 million) are equal to total liabilities (\$147.9 million) plus shareholders' equity (\$22.2 million).

**TABLE 2.1**

**Global Corporation Statement of Financial Position for 2015 and 2014**

Assets	2015	2014	Liabilities and Shareholders' Equity	2015	2014
Current Assets					
Cash	23.2	20.5	Accounts payable	29.2	26.5
Accounts receivable	18.5	13.2	Notes payable/ short-term debt	5.5	3.2
Inventories	15.3	14.3			
Total current assets	57.0	48.0	Total current liabilities	34.7	29.7
Long-Term Assets					
Net property, plant, and equipment	113.1	80.9	Long-Term Liabilities		
			Long-term debt	113.2	78.0
Total long-term assets	113.1	80.9	Total long-term liabilities	113.2	78.0
			<b>Total Liabilities</b>	<b>147.9</b>	<b>107.7</b>
			Shareholders' Equity		
			Common stock	8.0	8.0
			Retained earnings	14.2	13.2
			<b>Total Shareholders' Equity</b>	<b>22.2</b>	<b>21.2</b>
<b>Total Assets</b>	<b>170.1</b>	<b>128.9</b>	<b>Total Liabilities and Shareholders' Equity</b>	<b>170.1</b>	<b>128.9</b>

We now examine the firm's assets, liabilities, and shareholders' equity in more detail. Finally, we evaluate the firm's financial standing by analyzing the information contained in the statement of financial position.

## Assets

In Table 2.1, Global's assets are divided into *current* and *long-term assets*. We discuss each in turn.

**Current Assets.** **Current assets** are either cash or assets that could be converted into cash within one year. This category includes the following:

1. Cash and other **marketable securities**, which are short-term, low-risk investments that can be easily sold and converted to cash (such as money market investments, like government debt, that mature within a year)
2. **Accounts receivable**, which are amounts owed to the firm by customers who have purchased goods or services on credit
3. **Inventories**, which are composed of raw materials as well as work in progress and finished goods
4. Other current assets, which is a catch-all category that includes items such as pre-paid expenses (expenses that have been paid in advance, such as rent or insurance)

**Long-Term Assets.** Assets such as real estate or machinery that produce tangible benefits for more than one year are called **long-term assets**. If Global spends \$2 million on new equipment, this \$2 million will be included with net property, plant, and equipment under long-term assets on the statement of financial position. Because equipment tends to wear out or become obsolete over time, Global will reduce the value recorded for this equipment through a yearly deduction called **depreciation** according to a depreciation schedule that depends on an asset's life span. Depreciation is not an actual cash expense that the firm pays; it is a way of recognizing that buildings and equipment wear out and, thus, become less valuable the older they get. The **book value** of an asset is equal to its acquisition cost less accumulated depreciation. The figures for net property, plant, and equipment show the total book value of these assets.

Other long-term assets can include such items as property not used in business operations, start-up costs in connection with a new business, trademarks and patents, property held for sale, and goodwill. The sum of all the firm's assets is the total assets at the bottom of the left side of the statement of financial position in Table 2.1.

## Liabilities

We now examine the liabilities shown on the right side of the statement of financial position, which are divided into *current* and *long-term liabilities*.

**Current Liabilities.** Liabilities that will be satisfied within one year are known as **current liabilities**. They include the following:

1. **Accounts payable**, the amounts owed to suppliers for products or services purchased with credit.
2. **Notes payable** and **short-term debt**, loans that must be repaid in the next year. Any repayment of long-term debt that will occur within the next year would also be listed here as current maturities of long-term debt.

**current assets** Cash or assets that could be converted into cash within one year.

**marketable securities** Short-term, low-risk investments that can be easily sold and converted to cash.

**accounts receivable** Amounts owed to a firm by customers who have purchased goods or services on credit.

**inventories** A firm's raw materials as well as its work in progress and finished goods.

**long-term assets** Assets that produce tangible benefits for more than one year.

**depreciation** A yearly deduction a firm makes from the value of its fixed assets (other than land) over time, according to a depreciation schedule that depends on an asset's life span.

**book value** The acquisition cost of an asset less its accumulated depreciation.

**current liabilities** Liabilities that will be satisfied within one year.

**accounts payable** The amounts owed to creditors for products or services purchased with credit.

**notes payable and short-term debt** Loans that must be repaid in the next year.

**net working capital** The difference between a firm's current assets and current liabilities that represents the capital available in the short term to run the business.

**long-term debt** Any loan or debt obligation with a maturity of more than a year.

**book value of equity** The difference between the book value of a firm's assets and its liabilities; also called shareholders' equity, it represents the net worth of a firm from an accounting perspective.

**liquidation value** The value of a firm after its assets are sold and liabilities paid.

**market capitalization** The total market value of equity; equals the market price per share times the number of shares.

3. Accrual items, such as salary or taxes, that are owed but have not yet been paid, and deferred or unearned revenue, which is revenue that has been received for products that have not yet been delivered.

The difference between current assets and current liabilities is the firm's **net working capital**, the capital available in the short term to run the business:

$$\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities} \quad (2.2)$$

For example, in 2015, Global's net working capital totalled \$22.3 million (\$57.0 million in current assets – \$34.7 million in current liabilities). Firms with low (or negative) net working capital may face a shortage of funds. In such cases, the liabilities due in the short term exceed the company's cash and expected payments on receivables.

**Long-Term Liabilities.** Long-term liabilities are liabilities that extend beyond one year. When a firm needs to raise funds to purchase an asset or make an investment, it may borrow those funds through a long-term loan. That loan would appear on the statement of financial position as **long-term debt**, which is any loan or debt obligation with a maturity of more than a year.

## Shareholders' Equity

The sum of the current liabilities and long-term liabilities is total liabilities. The difference between the firm's assets and liabilities is the *shareholders' equity*; it is also called the **book value of equity**. As we stated earlier, it represents the net worth of the firm from an accounting perspective.

Ideally, the statement of financial position would provide us with an accurate assessment of the true value of the firm's equity. Unfortunately, this is unlikely to be the case. First, many of the assets listed on the statement of financial position are valued based on their historical cost rather than their true value today. For example, an office building is listed on the statement of financial position according to its historical cost less its accumulated depreciation. But the actual value of the office building today may be very different than this amount; in fact, it may be much *more* than the amount the firm paid for it years ago. The same is true for other property, plant, and equipment: the true value today of an asset may be very different from, and even exceed, its book value. A second, and probably more important, problem is that *many of the firm's valuable assets are not captured on the statement of financial position*. Consider, for example, the expertise of the firm's employees, the firm's reputation in the marketplace, the relationships with customers and suppliers, and the quality of the management team. All these assets add to the value of the firm but do not appear on the statement of financial position. Although the book value of a firm's equity is not a good estimate of its true value as an ongoing firm, it is sometimes used as an estimate of the **liquidation value** of the firm, the value that would be left after its assets were sold and liabilities paid.

## Market Value Versus Book Value

For these reasons, the book value of equity is an inaccurate assessment of the actual value of the firm's equity. Thus, it is not surprising that the book value of equity will often differ substantially from the amount investors are willing to pay for the equity. The total market value of a firm's equity equals the market price per share times the number of shares, referred to as the company's **market capitalization**. The market value of a stock does not depend on the historical cost of the firm's assets; instead, it depends on what investors expect those assets to produce in the future. To see the difference, think about what happens when a company like Bombardier unveils a new plane. If investors

have favourable expectations about future cash flows from selling those planes, the stock price will increase immediately, elevating Bombardier's market value. However, the revenue from selling the planes will be reflected in Bombardier's financial statements only when the company actually sells them.

## EXAMPLE 2.1 Market Versus Book Value

### PROBLEM

If Global has 3.6 million shares outstanding, and these shares are trading for a price of \$10.00 per share, what is Global's market capitalization? How does the market capitalization compare to Global's book value of equity?

### SOLUTION

#### ■ Plan

Market capitalization is equal to price per share times shares outstanding. We can find Global's book value of equity at the bottom of the right side of its statement of financial position.

#### ■ Execute

Global's market capitalization is 3.6 million shares  $\times$  10.00/share = \$36 million. This market capitalization is significantly higher than Global's book value of equity of \$22.2 million.

#### ■ Evaluate

Global must have sources of value that do not appear on the statement of financial position. These include potential opportunities for growth, the quality of the management team, relationships with suppliers and customers, etc.

Finally, we note that the book value of equity can be negative (liabilities exceed assets) and that a negative book value of equity is not necessarily an indication of poor performance. Successful firms are often able to borrow in excess of the book value of their assets because creditors recognize that the market value of the assets is far higher. For example, in June 2005, Amazon.com had total liabilities of \$2.6 billion and a book value of equity of -\$64 million. At the same time, the market value of its equity was over \$15 billion. Clearly, investors recognized that Amazon's assets were worth far more than the book value reported on the balance sheet. By September 30, 2013, several years of strong growth had brought its book value of equity to over \$9 billion and its market value of equity to more than \$140 billion!

## Market-to-Book Ratio

In Example 2.1, we compared the market and book values of Global's equity. A common way to make this comparison is to compute the **market-to-book ratio (price-to-book (P/B) ratio)**, which is the ratio of a firm's market capitalization to the book value of shareholders' equity:

$$\text{Market-to-Book Ratio} = \frac{\text{Market Value of Equity}}{\text{Book Value of Equity}} \quad (2.3)$$

It is one of many financial ratios used to evaluate a firm. The market-to-book ratio for most successful firms substantially exceeds 1, indicating that the value of the firm's assets when put to use exceeds their historical cost (or liquidation value). The ratio will

**market-to-book ratio (price-to-book [P/B] ratio)** The ratio of a firm's market (equity) capitalization to the book value of its shareholders' equity.

vary across firms due to differences in fundamental firm characteristics as well as the value added by management. Thus, this ratio is one way a company's stock price provides feedback to its managers on the market's assessment of their decisions.

In mid-2006, Ford Motor Company (ticker symbol: F) had a market-to-book ratio of 0.89, a reflection of investors' assessment that many of Ford's plants and other assets were unlikely to be profitable and were worth less than their book value. In the following years, Ford had such large losses that its book value of equity fell below zero and the market-to-book ratio fell to  $-35.57$  by late 2010. In 2010, the average market-to-book ratio for large U.S. firms was close to 4.0. By January, 2014, Ford's market-to-book ratio was about 3.0 and the average for large U.S. firms was about 2.6. Analysts often classify firms with low market-to-book ratios as **value stocks**, and those with high market-to-book ratios as **growth stocks**. Negative market-to-book ratios (like Ford's in 2010) are not considered meaningful, because we normally associate a higher ratio with a better assessment of a firm's future performance. With a negative market-to-book ratio, a higher ratio (close to zero) can occur when the market value of a firm is close to zero or when the book value of equity is far below zero. A near-zero market-to-book value is consistent with expectations that the firm will probably not survive. In contrast, a firm with a book value of equity far below zero may be a turnaround prospect and its future may be quite bright. The implication of a negative market-to-book value ratio is simply not clear.

**value stocks** Firms with low market-to-book ratios.

**growth stocks** Firms with high market-to-book ratios.

## Enterprise Value

A firm's market capitalization measures the market value of the firm's equity, or the value that remains after the firm has paid its debts. But what is the value of the business itself? The **enterprise value** of a firm assesses the value of the underlying business assets, unencumbered by debt and separate from any cash and marketable securities. We compute it as follows:

$$\text{Enterprise Value} = \text{Market Value of Equity} + \text{Debt} - \text{cash} \quad (2.4)$$

For example, given its market capitalization from Example 2.1, Global's enterprise value in 2015 is  $36 + 118.7 - 23.2 = \$131.5$  million. We can interpret the enterprise value as the cost to take over the business. That is, it would cost  $36 + 118.7 = \$154.7$  million to buy all of Global's equity and pay off its debts. Because we would acquire Global's \$23.2 million in cash, the net cost is only  $154.7 - 23.2 = \$131.5$  million.

**enterprise value** The total market value of a firm's equity and debt, less the value of its cash and marketable securities. It measures the value of the firm's underlying business.

### EXAMPLE 2.2

#### Computing Enterprise Value

##### PROBLEM

On December 31, 2011, BCE Inc. had a share price of \$42.47, 775.4 million shares outstanding, a market-to-book ratio of 2.23, a book debt-equity ratio of 1.0046, and cash of \$130 million. What was BCE's market capitalization? What was its enterprise value?

##### SOLUTION

###### ■ Plan

We will solve the problem using Equation 2.5:  $\text{Enterprise Value} = \text{Market Value of Equity} + \text{Debt} - \text{Cash}$ . We can compute the market capitalization by multiplying the share price by the shares outstanding. We are given the amount of cash. We are not given the debt directly, but we are given the book debt-equity ratio. If we knew the book value of equity, we could use the ratio to infer the value of the debt. Since we can compute the market value of equity (market capitalization) and we



have the market-to-book ratio, we can compute the book value of equity, so that is the last piece of information we will need.

#### ■ Execute

BCE had a market capitalization of  $\$42.47/\text{share} \times 775.4 \text{ million shares} = \$32.931238 \text{ billion}$  (*Note: we are carrying many decimal places so that all our numbers will be consistent with each other and will result in the actual numbers reported by BCE.*)

We divide the market value of equity by BCE's market-to-book ratio to calculate BCE's book value of equity as  $32.931238/2.23 = \$14.767371 \text{ billion}$ . Given a book debt-equity ratio of 1.0046, BCE had total debt of  $1.0046 \times 14.767371 = \$14.835301 \text{ billion}$ . Thus, BCE's enterprise value was  $32.931238 + 14.835301 - 0.130 = \$47.636539 \text{ billion}$ .

#### ■ Evaluate

As you can see, BCE's enterprise value is larger than its market capitalization. This is because enterprise value shows the value of all assets (not including cash) financed by all sources. These assets are not just financed with equity; a significant portion of the assets are financed with debt.

### CONCEPT CHECK

3. What is depreciation designed to capture?
4. The book value of a company's assets usually does not equal the market value of those assets. What are some reasons for this difference?

## 2.3

### The Statement of Comprehensive Income and Income Statement

**income statement** A list of a firm's revenues and expenses over a period of time.

**net income or earnings** The last or "bottom" line of a firm's income statement that is a measure of the firm's income over a period of time.

When you want someone to get to the point, you might ask them for the "bottom line." This expression comes from the *income statement*. The **income statement** lists the firm's revenues and expenses over a period of time. The last or bottom line of the income statement shows the firm's **net income** or **earnings**, which is a measure of its profitability during the period. The income statement is sometimes called a *statement of profit and loss*, or "*P&L*" statement. Under IFRS, the statement of comprehensive income includes the income statement and adds "other comprehensive income" to get overall comprehensive income. This other comprehensive income includes unrealized gains or losses that result from applying fair value accounting (or marking to market) of various financial instruments. In this section, we examine the components of the income statement in detail and introduce ratios we can use to analyze this data.

Table 2.2 shows Global's income statement for 2015 and 2014.

**TABLE 2.2** Global Corporation

GLOBAL CORPORATION		
Income Statement		
Year ended December 31 (in \$ millions)		
	2015	2014
Net sales	186.7	176.1
Cost of sales	-153.4	-147.3

(continued)

TABLE 2.2 (Continued)

GLOBAL CORPORATION		
Income Statement		
Year ended December 31 (in \$ millions)		
	2015	2014
<b>Gross Profit</b>	<b>33.3</b>	<b>28.8</b>
Selling, general, and administrative expenses	-13.5	-13
Research and development	-8.2	-7.6
Depreciation and amortization	-1.2	-1.1
<b>Operating Income</b>	<b>10.4</b>	<b>7.1</b>
Other income	—	—
<b>Earnings Before Interest and Taxes (EBIT)</b>	<b>10.4</b>	<b>7.1</b>
Interest income (expense)	-7.7	-4.6
<b>Pre-tax Income</b>	<b>2.7</b>	<b>2.5</b>
Taxes	-0.7	-0.6
<b>Net Income</b>	<b>2.0</b>	<b>1.9</b>
Earnings per share:	\$0.56	\$0.53
Diluted earnings per share:	\$0.53	\$0.50

## Earnings Calculations

Whereas the statement of financial position shows the firm's assets and liabilities at a given point in time, the income statement shows the flow of revenues and expenses generated by those assets and liabilities between two dates. We examine each category on Global's statement.

**Gross Profit.** The first two lines of the income statement list the revenues from sales of products and the costs incurred to make and sell the products. Note that in accounting terms *revenues* and *net sales* are often used interchangeably. Net sales is simply gross sales minus any returns, discounts, and allowances. We will simply use the term *sales* from here on. The third line is **gross profit**, the difference between sales revenues and the costs.

**Operating Expenses.** The next group of items is operating expenses. These are expenses from the ordinary course of running the business that are not directly related to producing the goods or services being sold. They include administrative expenses and overhead, salaries, marketing costs, and research and development expenses. The third type of operating expense, depreciation and amortization (a charge that captures the change in value of acquired assets), is not an actual cash expense but represents an estimate of the costs that arise from wear and tear or obsolescence of the firm's assets.<sup>3</sup> The firm's gross profit net of operating expenses is called **operating income**.

**Earnings Before Interest and Taxes.** We next include other sources of income or expenses that arise from activities that are not the central part of a company's business.

**gross profit** The third line of an income statement that represents the difference between a firm's sales revenues and its costs.

**operating income** A firm's gross profit less its operating expenses.

<sup>3</sup>Depreciation and amortization are not deductible for tax purposes. Instead, the Canada Revenue Agency (CRA) uses capital cost allowance (CCA) for tax purposes. CCA rates vary depending on the asset type (or class) and cover tangible and intangible assets (e.g., patents).

**EBIT** A firm's earnings before interest and taxes are deducted.

**earnings per share (EPS)** A firm's net income divided by the total number of shares outstanding.

**stock options** Right to buy a certain number of shares of stock by a specific date at a specific price.

**convertible bonds** Corporate bonds with a provision that gives the bondholder an option to convert each bond owned into a fixed number of shares of common stock.

**dilution** An increase in the total number of shares that will divide a fixed amount of earnings.

**diluted EPS** A firm's disclosure of its potential for dilution from options it has awarded.

**EBITDA** A computation of a firm's earnings before interest, taxes, depreciation, and amortization are deducted.

Cash flows from the firm's financial investments are one example of other income that would be listed here. After we have adjusted for other sources of income or expenses, we have the firm's earnings before interest and taxes, or **EBIT**.

**Pre-tax and Net Income.** From EBIT, we deduct the interest paid on outstanding debt to compute Global's pre-tax income, and then we deduct corporate taxes to determine the firm's net income.

Net income represents the total earnings of the firm's equity holders. It is often reported on a per-share basis as the firm's **earnings per share (EPS)**, which we compute by dividing net income by the total number of shares outstanding:

$$\text{EPS} = \frac{\text{Net Income}}{\text{Shares Outstanding}} = \frac{\$2.0 \text{ million}}{3.6 \text{ million shares}} = 0.56 \text{ per share} \quad (2.5)$$

Although Global has only 3.6 million shares outstanding as of the end of 2015, the number of shares outstanding may grow if Global has made commitments that would cause it to issue more shares. Consider these two examples:

1. Suppose Global compensates its employees or executives with **stock options** that give the holder the right to buy a certain number of shares by a specific date at a specific price. If employees "exercise" these options, the company issues new stock and the number of shares outstanding will grow.
2. The number of shares may also grow if the firm issues **convertible bonds**, a form of debt that can be converted to shares of common stock.

In the cases of stock options and convertible bonds, because there will be more total shares to divide the same earnings, this growth in the number of shares is referred to as **dilution**. Firms disclose the potential for dilution from options they have awarded by reporting **diluted EPS**, which shows the earnings per share the company would have if the stock options were exercised. For example, if Global has awarded options for 200,000 shares of stock to its key executives, its diluted EPS is  $\$2.0 \text{ million} / 3.8 \text{ million shares} = \$0.53$ .

## EBITDA

As will become clear when we discuss the statement of cash flows in the next section, neither EBIT nor net income are the same as the firm's cash flow. So, financial analysts often compute a firm's earnings before interest, taxes, depreciation, and amortization, or **EBITDA**. Because depreciation and amortization are not cash expenses for the firm, EBITDA reflects the cash a firm has earned from its operations. Global's EBITDA in 2015 was  $10.4 + 1.2 = \$11.6$  million.

### CONCEPT CHECK

5. What do a firm's earnings measure?
6. What is meant by dilution?

## 2.4 The Statement of Cash Flows

The income statement provides a measure of the firm's profit over a given time period. However, it does not indicate the amount of *cash* the firm has earned. There are two reasons that net income does not correspond to cash earned. First, there are non-cash entries on the income statement, such as depreciation and amortization. Second, certain uses, such as the purchase of a building or expenditures on inventory, and sources of cash,

**statement of cash flows**

An accounting statement that shows how a firm has used the cash it earned during a set period.

such as the collection of accounts receivable, are not reported on the income statement. The firm's **statement of cash flows** uses the information from the income statement and statement of financial position to determine how much cash the firm has generated, and how that cash has been allocated, during a set period. Cash is important because it is needed to pay bills and maintain operations and is the source of any return of investment for investors. Thus, from the perspective of an investor attempting to value the firm or a financial manager concerned about cash flows (vs. earnings), the statement of cash flows provides what may be the most important information of the four financial statements.

The statement of cash flows is divided into three sections: operating activities, investment activities, and financing activities. These sections roughly correspond to the three major jobs of the financial manager.

1. Operating activity starts with net income from the income statement. It then adjusts this number by adding back all non-cash entries related to the firm's operating activities.
2. Investment activity lists the cash used for investment.
3. Financing activity shows the flow of cash between the firm and its investors.

Global's statement of cash flows is shown in Table 2.3. In this section, we take a close look at each component of the statement of cash flows.

**TABLE 2.3** Global Corporation's Statement of Cash Flows for 2015 and 2014

GLOBAL CORPORATION		
Statement of Cash Flows		
Year ended December 31 (in \$ millions)		
	2015	2014
Operating activities		
Net income	2.0	1.9
Depreciation and amortization	1.2	1.1
Cash effect of changes in		
Accounts receivable	-5.3	-0.3
Accounts payable	2.7	-0.5
Inventory	-1.0	-1.0
Cash from operating activities	-0.4	1.2
Investment activities		
Capital expenditures	-33.4	-4.0
Acquisitions and other investing activity		
Cash from investing activities	-33.4	-4.0
Financing activities		
Dividends paid	-1.0	-1.0
Sale or purchase of stock	—	—
Increase in short-term borrowing	2.3	3.0
Increase in long-term borrowing	35.2	2.5
Cash from financing activities	36.5	4.5
Change in cash and cash equivalents	2.7	1.7

Source: Compustat.

## Operating Activity

The first section of Global's statement of cash flows adjusts net income by all non-cash items related to operating activity. For instance, depreciation is deducted when computing net income, but it is not an actual cash expense. Thus, we add it back to net income when determining the amount of cash the firm has generated. Similarly, we add back any other non-cash expenses (e.g., future income taxes).

Next, we adjust for changes to net working capital that arise from changes to accounts receivable, accounts payable, or inventory. When a firm sells a product, it records the revenue as income even though it may not receive the cash from that sale immediately. Instead, it may grant the customer credit and let the customer pay in the future. The customer's obligation adds to the firm's accounts receivable. We use the following guidelines to adjust for changes in working capital:

1. Accounts receivable: When a sale is recorded as part of net income, but the cash has not yet been received from the customer, we must adjust the cash flows by *deducting* the increases in accounts receivable. These increases represent additional lending by the firm to its customers and it reduces the cash available to the firm.
2. Accounts payable: Similarly, we *add* increases in accounts payable. Accounts payable represents borrowing by the firm from its suppliers. This borrowing increases the cash available to the firm.
3. Inventory: Finally, we *deduct* increases in inventory. Increases in inventory are not recorded as an expense and do not contribute to net income (the cost of the goods are included in net income only when the goods are actually sold). However, the cost of increasing inventory is a cash expense for the firm and must be deducted.

Working capital adjustments address the difference between the time when sales and costs is recorded on the income statement and when the cash actually goes in and out of the firm. For example, in 2015, we subtracted the \$5.3 million increase in accounts receivable from net income as part of the operating cash flow calculation. What happened? From Table 2.3, we see that Global had \$10.6 million more in sales in 2015 than in 2014. However, from Table 2.1, we also see that Global's accounts receivable increased to \$18.5 million in 2015 from \$13.2 million in 2014. So, even though Global's sales were up considerably, the company has not yet collected all the cash flow for those sales; instead Global's customers owe the company \$5.3 million more at the end of 2015 than they did at the end of 2014. Because the statement of cash flows starts with net income, which includes sales for which Global has not yet been paid, we deduct the additional \$5.3 million in sales Global is still owed when computing the actual cash flows it generated.

We must make a similar adjustment for inventory. Global does not record the cost of the inventory until it is sold, when it is in cost of goods sold. However, when the company actually pays for the inventory, cash has flowed out of Global, decreasing operating cash flow. The opposite is true for accounts payable—Global has recorded additional expenses without actually paying for them yet. Those expenses reduce net income but do not represent cash outflows.

Finally, we add depreciation to net income before calculating operating cash flow. Depreciation is an accounting adjustment to book value that is an expense but not a cash outflow; that is, when Global's property, plant, and equipment depreciate by \$1.2 million, the loss does not literally cost Global \$1.2 million in cash flow. Because this is an expense that reduces net income but is not an actual cash outflow, we must add it back to calculate cash flow. We will talk more about depreciation when we do capital budgeting in Chapter 9. All these adjustments mean that cash flows can be very different from net income. Although Global showed positive net income on the income statement, it actually had a negative \$0.4 million cash flow from operating activity, in large part because of the increase in accounts receivable.

**capital expenditures**

Purchases of new property, plant, and equipment.

**retained earnings** The difference between a firm's net income and the amount it spends on dividends.

**payout ratio** The ratio of a firm's dividends to its net income.

## Investment Activity

The next section of the statement of cash flows shows the cash required for investment activities. Purchases of new property, plant, and equipment are referred to as **capital expenditures**. Recall that capital expenditures do not appear immediately as expenses on the income statement. Instead, the firm depreciates these assets and deducts depreciation expenses over time. To determine the firm's cash flow, we have already added back depreciation, because it is not an actual cash expense. Now, we subtract the actual capital expenditure that the firm made. Similarly, we also deduct other assets purchased or investments made by the firm, such as acquisitions. In Table 2.3, we see that in 2015 Global spent \$33.4 million in cash on investing activities.

## Financing Activity

The last section of the statement of cash flows shows the cash flows from financing activities. Dividends paid to shareholders are a cash outflow. Global paid \$1 million to its shareholders as dividends in 2015.

The difference between a firm's net income and the amount it spends on dividends is referred to as the firm's **retained earnings** for that year:

$$\text{Retained Earnings} = \text{Net Income} - \text{Dividends} \quad (2.6)$$

Global retained \$2 million – \$1 million = \$1 million, or 50% of its earnings in 2015. This makes its *payout ratio* for 2015 equal to 50%. A firm's **payout ratio** is the ratio of its dividends to its net income:

$$\text{Payout Ratio} = \frac{\text{Dividends}}{\text{Net Income}} \quad (2.7)$$

Also listed under financing activity is any cash the company received from the sale of its own stock, or cash spent buying (repurchasing) its own stock. Global did not issue or repurchase stock during this period.

The last items to include in this section result from changes to Global's short-term and long-term borrowing. Global raised money by issuing debt, so the increases in short-term and long-term borrowing represent cash inflows. The last line of the statement of cash flows combines the cash flows from these three activities to calculate the overall change in the firm's cash balance over the period of the statement. In this case, Global had cash inflows of \$2.7 million. By looking at the statement in Table 2.3 as a whole, we can determine that Global chose to borrow (mainly in the form of long-term debt) to cover the cost of its investment and operating activities. Although the firm's cash balance has increased, Global's negative operating cash flows and relatively high expenditures on investment activities might give investors some reasons for concern. If that pattern continues, Global will need to continue to borrow to remain in business.

### EXAMPLE 2.3

### The Impact of Depreciation on Cash Flow

#### PROBLEM

Suppose Global had an additional \$1 million depreciation expense in 2015. If Global's tax rate on pre-tax income is 26%, what would be the impact of this expense on Global's earnings? How would it impact Global's cash at the end of the year?

**SOLUTION****■ Plan**

Depreciation is an operating expense, so Global's operating income, EBIT, and pre-tax income would be affected. With a tax rate of 26%, Global's tax bill will decrease by 26 cents for every dollar that pre-tax income is reduced. In order to determine how Global's cash would be affected, we have to determine the effect of the additional depreciation on cash flows. Recall that depreciation is not an actual cash outflow, even though it is treated as an expense, so the only effect on cash flow is through the reduction in taxes.

**■ Execute**

Global's operating income, EBIT, and pre-tax income would fall by \$1 million because of the \$1 million in additional operating expense due to depreciation.

This \$1 million decrease in pre-tax income would reduce Global's tax bill by  $26\% \times \$1 \text{ million} = \$0.26 \text{ million}$ . Therefore, net income would fall by  $1 - 0.26 = \$0.74 \text{ million}$ .

On the statement of cash flows, net income would fall by \$0.74 million, but we would add back the additional depreciation of \$1 million, because it is not a cash expense. Thus, cash from operating activities would rise by  $-0.74 + 1 = \$0.26 \text{ million}$ . Therefore, Global's cash balance at the end of the year would increase by \$0.26 million, the amount of the tax savings that resulted from the additional depreciation deduction.

**■ Evaluate**

The increase in cash balance comes completely from the reduction in taxes. Because Global pays \$0.26 million less in taxes even though its cash expenses have not increased, it has \$0.26 million more in cash at the end of the year.

**CONCEPT CHECK**

7. Why does a firm's net income not correspond to cash earned?
8. What are the components of the statement of cash flows?

**2.5****Other Financial Statement Information**

The most important elements of a firm's financial statements are the statement of financial position, income statement, and the statement of cash flows, which we have already discussed. Several other pieces of information contained in the financial statements warrant brief mention: the *management discussion and analysis*, the *statement of shareholders' equity*, and *notes to the financial statements*.

**statement of shareholders' equity**

An accounting statement that breaks down the shareholders' equity computed on the statement of financial position into the amount that came from issuing new shares versus retained earnings.

**Statement of Shareholders' Equity**

The **statement of shareholders' equity** breaks down the shareholders' equity computed on the statement of financial position into the amount that came from issuing new shares versus retained earnings. Because the book value of shareholders' equity is not a useful assessment of value for financial purposes, the information contained in the statement of shareholders' equity is also not particularly revealing, so we do not spend time on the statement here.

**management discussion and analysis (MD&A)**

A preface to the financial statements in which a company's management discusses the recent year (or quarter), providing a background on the company and any significant events that may have occurred.

**off-balance sheet**

**transactions** Transactions or arrangements that can have a material impact on a firm's future performance yet do not appear on the statement of financial position.

## Management Discussion and Analysis

The **management discussion and analysis (MD&A)** is a preface to the financial statements in which the company's management discusses the recent year (or quarter), providing a background on the company and any significant events that may have occurred. Management may also discuss the coming year and outline goals and new projects.

Management must also discuss any important risks that the firm faces or issues that may affect the firm's liquidity or resources. Management is also required to disclose any **off-balance sheet transactions**, which are transactions or arrangements that can have a material impact on the firm's future performance yet do not appear on the statement of financial position. For example, if a firm has made guarantees that it will compensate a buyer for losses related to an asset purchased from the firm, these guarantees represent a potential future liability for the firm that must be disclosed as part of the MD&A.

## Notes to the Financial Statements

In addition to the four financial statements, companies provide extensive notes with additional details on the information provided in the statements. For example, the notes document important accounting assumptions that were used in preparing the statements. They often provide information specific to a firm's subsidiaries or its separate product lines. They show the details of the firm's stock-based compensation plans for employees and the different types of debt the firm has outstanding. Details of acquisitions, spinoffs, leases, taxes, and risk management activities are also given. The information provided in the notes is often very important to a full interpretation of the firm's financial statements.

### CONCEPT CHECK

9. Where do off-balance sheet transactions appear in a firm's financial statements?
10. What information does the notes to financial statements provide?

## 2.6

## Financial Statement Analysis

Investors often use accounting statements to evaluate a firm in one of two ways:

1. Compare the firm with itself by analyzing how the firm has changed over time.
2. Compare the firm to other similar firms using a common set of financial ratios.

In this section we will describe the most commonly used ratios—those related to profitability, liquidity, asset efficiency, working capital, interest coverage, leverage, valuation, and operating returns—and explain how each one is used in practice.

### Profitability Ratios

We introduce three profitability ratios: *gross margin*, *operating margin*, and *net profit margin*.

**gross margin** The ratio of gross profit to revenues (sales); it reflects the ability of the company to sell a product for more than the sum of the direct costs of making it.

**Gross Margin.** The **gross margin** of a firm is the ratio of gross profit to revenues (sales):

$$\text{Gross Margin} = \frac{\text{Gross Profit}}{\text{Sales}} \quad (2.8)$$

The gross margin simply reflects the ability of the company to sell a product for more than the sum of the direct costs of making it. All the firm's other expenses of doing



business (those not directly related to producing the goods sold) must be covered by this margin. In 2015, Global's gross profit was \$33.3 million and its sales were \$186.7 million, for a gross margin of  $33.3/186.7 = 17.84\%$ .

**operating margin** The ratio of operating income to revenues; it reveals how much a company has earned from each dollar of sales before interest and taxes are deducted.

**Operating Margin.** Because operating income reflects all of the expenses of doing business, another important profitability ratio is the **operating margin**, the ratio of operating income to revenues:

$$\text{Operating Margin} = \frac{\text{Operating Income}}{\text{Total Sales}} \quad (2.9)$$

The operating margin reveals how much a company earns before interest and taxes from each dollar of sales. Global's operating margin in 2015 was  $10.4/186.7 = 5.57\%$ , an increase from its 2014 operating margin of  $7.1/176.1 = 4.03\%$ . By comparing operating margins across firms within an industry, we can assess the relative efficiency of firms' operations. For example, in September 2013, Air Canada (ticker symbol: AC.B) had an operating margin of 11.96%. However, competitor WestJet (ticker symbol: WJA) had an operating margin of 10.7%.

Differences in operating margins can also result from differences in strategy. For example, in late 2013, Canadian Tire Corporation (ticker symbol: CTC) had an operating margin of 7.82% while Lululemon Athletica Inc. had an operating margin of 24.31%. In this case, Canadian Tire's lower operating margin is not a result of its inefficiency but is part of its strategy of offering lower prices to sell common products in high volume. Indeed, Canadian Tire's sales were about 7.8 times higher than those of Lululemon.

**net profit margin** The ratio of net income to revenues, it shows the fraction of each dollar in revenues that is available to equity holders after the firm pays its expenses, plus interest and taxes.

**Net Profit Margin.** A firm's **net profit margin** is the ratio of net income to revenues:

$$\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Total Sales}} \quad (2.10)$$

The net profit margin shows the fraction of each dollar in revenues that is available to equity holders after the firm pays its expenses, plus interest and taxes. Global's net profit margin in 2015 was  $2.0/186.7 = 1.07\%$ . Differences in net profit margins can be due to differences in efficiency, but they can also result from differences in leverage (the firm's reliance on debt financing), which determines the amount of interest payments.

## Liquidity Ratios

Creditors often compare a firm's current assets and current liabilities to assess whether the firm has sufficient working capital to meet its short-term needs. This comparison is sometimes summarized in the firm's **current ratio**, the ratio of current assets to current liabilities, or its **quick ratio** ("**acid-test**" ratio), the ratio of current assets other than inventory to current liabilities. A higher current or quick ratio implies better liquidity for the firm in that there is less risk of the firm experiencing a cash shortfall in the near future:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} \quad (2.11)$$

$$\text{Quick Ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}} \quad (2.12)$$

The quick ratio may be better to use than the current ratio as a measure of liquidity when there is concern the firm may not be able to easily liquidate its inventory. Example 2.4 illustrates the use of these ratios.

**current ratio** The ratio of current assets to current liabilities.

**quick ratio ("acid-test" ratio)** The ratio of current assets other than inventory to current liabilities.

## EXAMPLE 2.4 Analyzing Liquidity

### PROBLEM

You are considering buying the stock of two companies, Highlev Corp. (HC) and Stabilizer Products Corp. (SPC), and as part of your analysis of the companies you want to ensure their short-term viability by looking at their liquidity ratios. The following financial information is available about the two companies:

Selected data from the most recent quarterly report (\$ millions)	Highlev Corp.	Stabilizer Products Corp.
<b>Current Assets</b>		
Cash	25.6	42.9
Accounts Receivable	17.3	31.4
Inventories	48.1	39.6
<b>Total Current Assets</b>	<b>91.0</b>	<b>113.9</b>
<b>Current Liabilities</b>		
Accounts Payable	29.2	35.8
Notes payable/short-term debt	19.7	11.6
<b>Total Current Liabilities</b>	<b>48.9</b>	<b>47.4</b>

Calculate the current and quick ratios for the two companies and indicate whether there are concerns about their short-term viability.

### SOLUTION

#### Plan

We will use Equations 2.11 and 2.12 for each of the two firms. Lower ratios indicate a greater concern about short-term viability.

#### Execute

The ratios are calculated as follows:

$$\text{Current Ratio}_{JE} = \frac{91.0}{48.9} = 1.86$$

$$\text{Current Ratio}_{URE} = \frac{113.9}{47.4} = 2.40$$

$$\text{Quick Ratio}_{JE} = \frac{91.0 - 48.1}{48.9} = 0.88$$

$$\text{Quick Ratio}_{URE} = \frac{113.9 - 39.6}{47.4} = 1.57$$

#### Evaluate

Stabilizer Products Corp. would not cause you concern regarding short-term viability because both the current and quick ratios are substantially above 1.0 and this indicates that there would be enough liquid assets to pay off upcoming liabilities. Highlev Corp. also has a current ratio above 1.0 and this would be reassuring as long as the inventory it holds could be expected to sell. However its quick ratio is only 0.88, so if Highlev's inventories could not be sold, then Highlev would not have enough liquid assets to pay off upcoming liabilities—this would cause concern about Highlev's short-term viability.

## Asset Efficiency

A financial manager can use the combined information in the firm's income statement and statement of financial position to gauge how efficiently his or her firm is using its assets. A first broad measure of efficiency is asset turnover, the ratio of sales to total assets:

$$\text{Asset Turnover} = \frac{\text{Sales}}{\text{Total Assets}} \quad (2.13)$$

Low values of asset turnover indicate that the firm is not generating much revenue (sales) per dollar of assets. In 2015, Global's \$170.1 million in assets generated \$186.7 million in sales, for an asset turnover ratio of 1.1. Since total assets includes assets, such as cash, that are not directly involved in generating sales, Global's manager might also look at Global's fixed asset turnover, which is equal to sales divided by fixed assets:

$$\text{Fixed Asset Turnover} = \frac{\text{Sales}}{\text{Fixed Assets}} \quad (2.14)$$

Global's fixed assets in 2015 were \$113.1 million worth of property, plant, and equipment, yielding a fixed asset turnover of 1.7 ( $= \$186.7/\$113.1$ ). Low asset turnover ratios indicate that the firm is generating relatively few sales given the amount of assets it employs.

### accounts receivable days (average collection period or days sales outstanding)

An expression of a firm's accounts receivable in terms of the number of days' worth of sales that the accounts receivable represents.

### accounts payable days

An expression of a firm's accounts payable in terms of the number of days' worth of cost of goods sold that the accounts payable represents.

### inventory days

An expression of a firm's inventory in terms of the number of days' worth of cost of goods sold that the inventory represents.

### inventory turnover ratio

Sales divided by either the latest cost of inventory or the average inventory over the year; it shows how efficiently companies turn their inventory into sales.

## Working Capital Ratios

Global's managers might be further interested in how efficiently they are managing their net working capital. We can express the firm's accounts receivable in terms of the number of days' worth of sales that it represents, called the **accounts receivable days (average collection period or days sales outstanding)**.<sup>4</sup>

$$\text{Accounts Receivable Days} = \frac{\text{Accounts Receivable}}{\text{Average Daily Sales}} \quad (2.15)$$

Given average daily sales of  $\$186.7 \text{ million}/365 = \$0.51 \text{ million}$  in 2015, Global's receivables of \$18.5 million represent  $18.5/0.51 = 36$  days' worth of sales. In other words, Global takes a little over one month to collect payment from its customers, on average. In 2014, Global's accounts receivable represented only 27 days' worth of sales. Although the number of receivable days can fluctuate seasonally, a significant unexplained increase could be a cause for concern (perhaps indicating the firm is doing a poor job collecting from its customers or is trying to boost sales by offering generous credit terms). Similar ratios exist for accounts payable and inventory. Those ratios are called **accounts payable days** (accounts payable divided by average daily cost of goods sold) and **inventory days** (inventory divided by average daily cost of goods sold).

We can also compute how efficiently firms use inventory. The **inventory turnover ratio** is equal to cost of goods sold divided by the average inventory over the year:

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} \quad (2.16)$$

<sup>4</sup>Accounts receivable days can also be calculated based on the average accounts receivable at the end of the current and prior years. This is generally an acceptable approach whenever a ratio compares an income statement figure to a statement of financial position figure. Since the income statement figure is measured over a period of time, taking the simple average of the statement of financial position figure can approximate its amount over the same period of time.

A normal level for this ratio, similar to the others in this section, can vary substantially for different industries, although a higher level (more dollars of sales per dollar of inventory) is generally better.

## EXAMPLE 2.5 Computing Working Capital Ratios

### PROBLEM

Compute Global's accounts payable days, inventory days, and inventory turnover for 2015.

### SOLUTION

#### ■ Plan

Working capital ratios require information from both the statement of financial position and the income statement. For these ratios, we need inventory and accounts payable from the statement of financial position, and cost of goods sold from the income statement (often listed as cost of sales). Inventory = 15.3, Accounts payable = 29.2, Cost of goods sold (Cost of sales) = 153.4

#### ■ Execute

$$\text{Accounts payable days} = \frac{\text{Accounts Payable}}{\text{Average Daily Cost of Goods Sold}} = \frac{29.2}{(153.4/365)} = 69.48$$

$$\text{Inventory days} = \frac{\text{Inventory}}{\text{Average Daily Cost of Goods Sold}} = \frac{15.3}{(153.4/365)} = 36.40$$

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Inventory}} = \frac{153.4}{15.3} = 10.03$$

#### ■ Evaluate

Assuming that Global's accounts payable at year end on its statement of financial position is representative of the normal amount during the year, Global is able, on average to take about 69.5 days to pay its suppliers. This compares with the 27.5 days we calculated that it waits on average to be paid (its accounts receivable days). Global typically takes 36 days to sell its inventory. Note that inventory turnover and inventory days tell us the same thing in different ways—if it takes Global about 36 days to sell its inventory, then it turns over its inventory about 10 times per 365-day year. In Chapter 19 on working capital management, we'll see how a company's receivable, inventory, and payable days make up its operating cycle.

**interest coverage ratio or times interest earned (TIE) ratio** An assessment by lenders of a firm's leverage, it is equal to a measure of earnings divided by interest.

## Interest Coverage Ratios

Lenders often assess a firm's leverage by computing an **interest coverage ratio** or **times interest earned (TIE) ratio**, which is equal to a measure of earnings divided by interest. Financial managers watch these ratios carefully, using them to assess how easily the firm will be able to cover its interest payments. There is no single accepted measure of earnings for these ratios; it is common to consider operating income, EBIT, or EBITDA as a multiple of the firm's interest expenses. When this ratio is high, it indicates that the firm is earning much more than is necessary to meet its required interest payments.

## EXAMPLE 2.6

## Computing Interest Coverage Ratios

**PROBLEM**

Assess Global's ability to meet its interest obligations by calculating interest coverage ratios using both EBIT and EBITDA.

**SOLUTION****Plan**

Gather the EBIT, depreciation, and amortization and Interest expense for each year from Global's income statement.

2014: EBIT = 7.1, EBITDA = 7.1 + 1.1, Interest expense = 4.6

2015: EBIT = 10.4, EBITDA = 10.4 + 1.2, Interest expense = 7.7

**Execute**

In 2014 and 2015, Global had the following interest coverage ratios:

$$2014: \frac{\text{EBIT}}{\text{Interest}} = \frac{7.1}{4.6} = 1.54 \quad \text{and} \quad \frac{\text{EBITDA}}{\text{Interest}} = \frac{7.1 + 1.1}{4.6} = 1.78$$

$$2015: \frac{\text{EBIT}}{\text{Interest}} = \frac{10.4}{7.7} = 1.35 \quad \text{and} \quad \frac{\text{EBITDA}}{\text{Interest}} = \frac{10.4 + 1.2}{7.7} = 1.51$$

**Evaluate**

The coverage ratios indicate that Global is generating enough cash to cover its interest obligations. However, Global's low—and declining—interest coverage could be a source of concern for its creditors.

**leverage** A measure of the extent to which a firm relies on debt as a source of financing.

**debt-equity ratio** The ratio of a firm's total amount of short- and long-term debt (including current maturities) to the value of its equity, which may be calculated based on market or book values.

**Leverage Ratios**

Another important piece of information that we can learn from a firm's statement of financial position is the firm's **leverage**, or the extent to which it relies on debt as a source of financing. The **debt-equity ratio** is a common ratio used to assess a firm's leverage, which we calculate by dividing the total amount of short- and long-term debt (including current maturities) by the total stockholders' equity:

$$\text{Debt-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}} \quad (2.17)$$

We can calculate this ratio using either book or market values for equity and debt. From Table 2.1, Global's debt in 2015 includes notes payable of \$5.5 million and long-term debt of \$113.2 million, for a total of \$118.7 million. Therefore, using the book value of equity, its *book* debt-equity ratio is  $118.7/22.2 = 5.3$ . Note the large increase from 2014, when the book debt-equity ratio was only  $(3.2 + 78)/21.2 = 3.8$ .

Because of the difficulty interpreting the book value of equity, the book debt-equity ratio is not especially useful. It is more informative to compare the firm's debt to the market value of its equity. Global's debt-equity ratio in 2015, using the market value of equity (from Example 2.1), is  $118.7/36 = 3.3$ , which means Global's debt is a bit more than triple the market value of its equity.<sup>5</sup> As we will see later in the text, a firm's *market* debt-equity ratio has important consequences for the risk and return of its stock.

<sup>5</sup>In this calculation, we have compared the market value of equity to the book value of debt. Strictly speaking, it would be best to use the market value of debt. But because the market value of debt is generally not very different from its book value, this distinction is often ignored in practice.

**debt-to-capital ratio** The ratio of total debt to total debt plus total equity.

We can also calculate the fraction of the firm financed by debt in terms of its **debt-to-capital ratio**:

$$\text{Debt-to-Capital Ratio} = \frac{\text{Total Debt}}{\text{Total Equity} + \text{Total Debt}} \quad (2.18)$$

Again, this ratio can be computed using book or market values.

While leverage increases the risk to the firm's equity holders, firms may also hold cash reserves in order to reduce risk. Thus, another useful measure to consider is the firm's **net debt**, or debt in excess of its cash reserves:

**net debt** Debt in excess of a firm's cash reserves.

$$\text{Net Debt} = \text{Total Debt} - \text{Excess Cash \& Short-Term Investments} \quad (2.19)$$

To understand why net debt may be a more relevant measure of leverage, consider a firm with more cash than debt outstanding. Because such a firm could pay off its debts immediately using its available cash, it has not increased its risk and has no effective leverage.

Analogous to the debt-to-capital ratio is the concept of net debt, which we can use to compute the firm's **debt-to-enterprise value ratio**:

**debt-to-enterprise value ratio** The ratio of a firm's net debt to its enterprise value.

$$\begin{aligned} \text{Debt-to-Enterprise Value Ratio} &= \frac{\text{Net Debt}}{\text{Market Value of Equity} + \text{Net Debt}} \\ &= \frac{\text{Net Debt}}{\text{Enterprise Value}} \end{aligned} \quad (2.20)$$

Given Global's 2015 cash balance of \$23.2 million, and total long- and short-term debt of \$118.7 million, its net debt is  $118.7 - 23.2 = \$95.5$  million.<sup>6</sup> Given its market value of equity of \$36.0 million, Global's enterprise value in 2015 is  $36.0 + 95.5 = \$131.5$  million, and thus its debt-to-enterprise value ratio is  $95.5/131.5 = 72.6\%$ . That is, 72.6% of Global's underlying business activity is financed via debt.

**equity multiplier** A measure of leverage equal to total assets divided by total equity.

A final measure of leverage is a firm's **equity multiplier**, measured in book value terms as Total Assets/Book Value of Equity. As we will see shortly, this measure captures the amplification of the firm's accounting returns that results from leverage. The market value equity multiplier, which is generally measured as Enterprise Value/Market Value of Equity, indicates the amplification of shareholders' financial risk that results from leverage.

## Valuation Ratios

Analysts and investors use a number of ratios to gauge the market value of the firm. The most important is the firm's **price-earnings ratio (P/E)**:

**price-earnings ratio (P/E)** The ratio of the market value of equity to the firm's earnings, or of its share price to its earnings per share.

$$\text{P/E Ratio} = \frac{\text{Market Capitalization}}{\text{Net Income}} = \frac{\text{Share Price}}{\text{Earnings per Share}} \quad (2.21)$$

That is, the P/E ratio is the ratio of the value of equity to the firm's earnings, either on a total basis or on a per-share basis. For example, Global's P/E ratio in 2015 was  $36/2.0 = 10/0.56 = 18$ . The P/E ratio is a simple measure that is used to assess whether a stock is over- or under-valued, based on the idea that the value of a stock should be proportional to the level of earnings it can generate for its shareholders. P/E ratios can

<sup>6</sup>While net debt should ideally be calculated by deducting cash in excess of the firm's operating needs, absent additional information, it is typical in practice to deduct all cash on the statement of financial position.

**COMMON MISTAKE****Mismatched Ratios**

When considering valuation (and other) ratios, be sure that the items you are comparing both represent amounts related to the entire firm or that both represent amounts related solely to equity holders. For example, a firm's share price and market capitalization are values associated with the firm's equity. Thus, it makes sense to compare them to the firm's earnings per share or net income, which are amounts paid out to equity holders after interest has been paid to debt holders. We must be careful, however, if we compare a firm's market capitalization to its revenues, operating income, or EBITDA. These amounts are related to the whole firm, and both debt and equity holders have a claim to them. Therefore, it is better to compare revenues, operating income, or EBITDA to the enterprise value of the firm, which includes both debt and equity.

**PEG ratio** The ratio of a firm's P/E to its expected earnings growth rate.

vary widely across industries and tend to be higher for industries with high growth rates. One way to capture the idea that a higher P/E ratio can be justified by a higher growth rate is to compare it to the company's expected earnings growth rate. For example, if Global's expected growth rate is 18%, then it would have a P/E to Growth, or **PEG ratio**, of 1. Some investors consider PEG ratios of one or below as indicating the stock is fairly priced, but would question whether the company is potentially overvalued if the PEG is higher than 1. P/E ratios also vary widely across time and tend to be low when the economy is headed for a downturn but high when an economy starts rebounding.

The P/E ratio considers the value of the firm's equity and so depends on its leverage. Recall that the amount of assets controlled by the equity holders can be increased through the use of leverage. To assess the market value of the underlying business, it is common to consider valuation ratios based on the firm's enterprise value. Typical ratios include the ratio of enterprise value to revenue, or enterprise value to operating income or EBITDA. These ratios compare the value of the business to its sales, operating profits, or cash flow. Similar to the P/E ratio, these ratios are used to make intra-industry comparisons of how firms are priced in the market.

The P/E ratio is not useful when the firm's earnings are negative. In this case, it is common to look at the firm's enterprise value relative to sales. The risk in doing so, however, is that earnings might be negative because the firm's underlying business model is fundamentally flawed, as was the case for many internet firms in the late 1990s.

**EXAMPLE 2.7****Computing Profitability and Valuation Ratios****PROBLEM**

Consider the following data for Canadian Pacific Railway (ticker symbol: CP) and Canadian National Railway (ticker symbol: CNR):

	Canadian Pacific Railway Limited (CP) (\$ millions)	Canadian National Railway Company (CNR) (\$ millions)
Sales	4303	7367
Operating Income	900	2406
Net Income	612	1854
Market Capitalization	9569	25,604
Cash	679	352
Debt	4495	6461

Compare CP's and CN's operating margin, net profit margin, P/E ratio, and the ratio of enterprise value to operating income and sales.

### SOLUTION

#### ■ Plan

The table contains all of the raw data, but we need to compute the ratios using the inputs in the table.

Operating Margin = Operating Income / Sales

Net Profit Margin = Net Income / Sales P/E ratio = Price / Earnings

Enterprise value to operating income = Enterprise Value / Operating Income

Enterprise value to sales = Enterprise Value / Sales

#### ■ Execute

CP had an operating margin of  $900/4303 = 20.9\%$ , a net profit margin of  $612/4303 = 14.2\%$ , and a P/E ratio of  $9569/612 = 15.6$ . Its enterprise value was  $9569 + 4495 - 679 = \$13,385$  million, which has a ratio of  $13,385/900 = 14.9$  to operating income and  $13,385/4303 = 3.1$  to sales.

CN had an operating margin of  $2406/7367 = 32.7\%$ , a net profit margin of  $1854/7367 = 25.2\%$ , and a P/E ratio of  $25,604/1854 = 13.8$ . Its enterprise value was  $25,604 + 6461 - 352 = \$31,713$  million, which has a ratio of  $31,713/2406 = 13.2$  to operating income and  $31,713/7367 = 4.3$  to sales.

#### ■ Evaluate

Note that despite their large difference in size, CP's and CN's P/E and enterprise value to operating income ratios were similar, with CP's results slightly higher in both cases. CN's profitability was somewhat higher than CP's, however, explaining the difference in the ratio of enterprise value to sales.

## Operating Returns

Analysts and financial managers often evaluate the firm's return on investment by comparing its income to its investment using ratios such as the firm's **return on equity (ROE)**<sup>7</sup>:

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Book Value of Equity}} \quad (2.22)$$

Global's ROE in 2015 was  $2.0/22.2 = 9.0\%$ . The ROE provides a measure of the return that the firm has earned on its past investments. A high ROE may indicate the firm is able to find investment opportunities that are very profitable. Of course, one weakness of this measure is the difficulty in interpreting the book value of equity.

Another common measure is the **return on assets (ROA)**, which is net income divided by the total assets. A firm must earn both a positive ROE and ROA to grow.

As a performance measure, ROA has the benefit that it is less sensitive to leverage than ROE. However, it is sensitive to working capital—for example, an equal increase in the firm's receivables and payables will increase total assets and, thus, lower ROA. To avoid this problem, we can consider the firm's **return on invested capital (ROIC)**:

$$\text{Return on Invested Capital} = \frac{\text{EBIT} (1 - \text{tax rate})}{\text{Book Value of Equity} + \text{Net Debt}} \quad (2.23)$$

<sup>7</sup>As indicated earlier, because net income is measured over the year, the ROE can also be calculated based on the average book value of equity at the end of the current and prior years.

#### return on equity (ROE)

The ratio of a firm's net income to the book value of its equity.

#### return on assets (ROA)

The ratio of net income to the total book value of the firm's assets.

#### return on invested capital (ROIC)

The ratio of the after-tax profit before interest to the book value of invested capital not being held as cash (book equity plus net debt).



The ROIC measures the after-tax profit generated by the business itself, excluding any interest expenses (or interest income), and compares it to the capital raised from equity and debt holders that has already been deployed (i.e., is not held as cash). Of the three measures of operating returns, ROIC is the most useful in assessing the performance of the underlying business.

**EXAMPLE 2.8****Computing Operating Returns****PROBLEM**

Assess how Global's ability to use its assets effectively has changed in the last year by computing the change in its ROA.

**SOLUTION****■ Plan and Organize**

In order to compute ROA, we need net income, interest expense and total assets.

	2014	2015
Net Income	1.9	2.0
Interest Expense	4.6	7.7
Total Assets	128.9	170.1

**■ Execute**

In 2015, Global's ROA was  $(2.0 + 7.7)/170.1 = 5.7\%$ , compared to an ROA in 2014 of  $(1.9 + 4.6)/128.9 = 5.0\%$ .

**■ Evaluate**

The improvement in Global's ROA from 2014 to 2015 suggests that Global was able to use its assets more effectively and increase its return over this period.

**The DuPont Identity**

Global's financial manager will need to know that its ROE is 9%, but that financial manager would also need to understand the drivers of his or her firm's ROE. High margins, efficient use of assets, or even simply high leverage could all lead to a higher ROE. By delving deeper into the sources of ROE, the financial manager can gain a clear sense of the firm's financial picture. One common tool for doing so is the **DuPont Identity**, named for the company that popularized it, which expresses ROE as the product of profit margin, asset turnover, and a measure of leverage.

To understand the DuPont Identity, we start with ROE and decompose it in steps into the drivers identified in the identity. First, we simply multiply ROE by (sales/sales), which is just 1, and rearrange terms:

$$\text{ROE} = \left( \frac{\text{Net Income}}{\text{Total Equity}} \right) \left( \frac{\text{Sales}}{\text{Sales}} \right) = \left( \frac{\text{Net Income}}{\text{Sales}} \right) \left( \frac{\text{Sales}}{\text{Total Equity}} \right) \quad (2.24)$$

This expression says that ROE can be thought of as net income per dollar of sales (profit margin) times the amount of sales per dollar of equity. For example, Global's ROE comes from its profit margin of 1.1% multiplied by its sales per dollar of equity of

**DuPont Identity** Expresses return on equity as the product of profit margin, asset turnover, and a measure of leverage.

( $186.7/22.2 = 8.41$ ) so we have  $1.1\% \times 8.41 = 9\%$ .<sup>8</sup> While this can be a useful insight into ROE, we can take the decomposition further by multiplying Equation 2.17 by assets/assets, which again is just 1, and rearranging the terms:

$$\begin{aligned} \text{ROE} &= \left( \frac{\text{Net Income}}{\text{Sales}} \right) \left( \frac{\text{Sales}}{\text{Total Equity}} \right) \left( \frac{\text{Total Assets}}{\text{Total Assets}} \right) \\ &= \left( \frac{\text{Net Income}}{\text{Sales}} \right) \left( \frac{\text{Sales}}{\text{Total Assets}} \right) \left( \frac{\text{Total Assets}}{\text{Total Equity}} \right) \end{aligned} \quad (2.25)$$

This final expression says that ROE is equal to net income per dollar of sales (profit margin) times sales per dollar of assets (asset turnover) times assets per dollar of equity (equity multiplier). Equation 2.25 is the DuPont Identity, expressing ROE as the product of profit margin, asset turnover, and the equity multiplier. Turning to Global, its equity multiplier is 7.7 ( $= 170.1/22.2$ ). A financial manager at Global looking for ways to increase ROE could turn to the DuPont Identity to assess the drivers behind its current ROE. With a profit margin of 1.1%, asset turnover of 1.1, and an equity multiplier of 7.7, we have

$$\text{ROE} = 9\% = (1.1\%)(1.1)(7.7)$$

This decomposition of ROE shows that leverage is already high (confirmed by the fact that the book debt-equity ratio shows that Global's debt is more than five times its equity). However, Global is operating with only 1% profit margins and relatively low asset turnover. Thus, Global's manager could pursue lowering costs to increase profit margin and utilizing the firm's existing assets more efficiently.<sup>9</sup>

## EXAMPLE 2.9

### DuPont Analysis

#### PROBLEM

The following table contains hypothetical information about Canadian Tire (ticker symbol: CTC.A) and Lululemon Athletica (ticker symbol: LLL). Compute their respective ROEs and then determine how much Canadian Tire would need to increase its profit margin in order to match Lululemon's ROE.

	Profit Margin	Asset Turnover	Equity Multiplier
Canadian Tire	3.9%	0.99	2.38
Lululemon	12.9%	1.47	1.32

#### SOLUTION

##### ■ Plan

The table contains all the relevant information to use the DuPont Identity to compute the ROE. We can compute the ROE of each company by multiplying together its profit margin, asset turnover, and equity multiplier. In order to determine how much Canadian Tire would need to increase its

<sup>8</sup>Due to rounding to two decimal places in the financial statements and our calculations, the calculations for Global will not exactly match the ROE we computed.

<sup>9</sup>Although the DuPont Identity gives the impression that you can increase ROE just by increasing leverage, it is not quite that simple. An increase in leverage will increase your interest expense, decreasing your profit margin.

margin to match Lululemon's ROE, we can set Canadian Tire's ROE equal to Lululemon's, keep its turnover and equity multiplier fixed, and solve for the profit margin.

■ **Execute**

Using the DuPont Identity, we have:

$$ROE_{CTC.A} = 3.9\% \times 0.99 \times 2.38 = 9.2\%$$

$$ROE_{LLL} = 12.9\% \times 1.47 \times 1.32 = 25.0\%$$

Now, using Lululemon's ROE but Canadian Tire's asset turnover and equity multiplier, we can solve for the margin that Canadian Tire needs to achieve Lululemon's ROE:

$$25.0\% = \text{Margin} \times 0.99 \times 2.38$$

$$\text{Margin} = \frac{25.0\%}{2.36} = 10.6\%$$

■ **Evaluate**

Canadian Tire would have to increase its profit margin from 3.9% to 10.6% in order to match Lululemon's ROE. It would be able to achieve Lululemon's ROE even with a lower margin than Lululemon (10.6% vs. 12.9%) and lower turnover (0.99 vs. 1.47) because of its higher leverage.

Table 2.4 summarizes financial ratios and provides typical values of those ratios for the manufacturing, retail, and service sectors along with the 500 firms in the S&P 500 index.

**TABLE 2.4** A Summary of Key Financial Ratios

Ratio	Formula	Manufacturing	Retail	Service	S&P 500
<b>Profitability Ratios</b>					
Gross margin	$\frac{\text{Gross Profit}}{\text{Sales}}$	45.3%	33.9%	56.4%	43.3%
Operating margin	$\frac{\text{Operating Income}}{\text{Sales}}$	21.2%	12.6%	28.2%	24.3%
Net Profit margin	$\frac{\text{Net Income}}{\text{Sales}}$	10.1%	5.5%	12.3%	9.6%
<b>Liquidity Ratios</b>					
Current ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	2.17	1.7	1.75	1.82
Quick ratio	$\frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$	1.67	0.84	1.70	1.43
<b>Efficiency and Working Capital Ratios</b>					
Accounts receivable days	$\frac{\text{Accounts Receivable}}{\text{Average Daily Sales}}$	57.66	11.52	61.54	64.36
Fixed asset turnover	$\frac{\text{Sales}}{\text{Fixed Assets}}$	6.37	5.94	10.17	8.38

(continued)

**TABLE 2.4** (Continued)

Ratio	Formula	Manufacturing	Retail	Service	S&P 500
Total asset turnover	$\frac{\text{Sales}}{\text{Total Assets}}$	0.91	1.91	0.71	0.84
Inventory turnover	$\frac{\text{Cost of Goods Sold}}{\text{Inventory}}$	6.75	10.80	29.78	11.58
<b>Interest Coverage Ratios</b>					
EBIT/Interest coverage	$\frac{\text{EBIT}}{\text{Interest Expense}}$	16.35	20.46	15.73	14.25
EBITDA/Interest coverage	$\frac{\text{EBITDA}}{\text{Interest Expense}}$				
<b>Leverage Ratios</b>					
Book debt-to-equity ratio	$\frac{\text{Total Debt}}{\text{Book Value of Total Equity}}$	83.5%	65.7%	90.9%	90.1%
Market debt-to-equity ratio	$\frac{\text{Total Debt}}{\text{Market Value of Total Equity}}$	27.1%	24.4%	35.7%	40.2%
Debt-to-capital ratio	$\frac{\text{Total Debt}}{\text{Total Equity} + \text{Total Debt}}$	37.4%	31.7%	37.2%	39.1%
Debt-to-enterprise value	$\frac{\text{Net Debt}}{\text{Enterprise Value}}$	7.9%	10.5%	9.7%	13.1%
Equity multiplier	$\frac{\text{Total Assets}}{\text{Total Equity}}$	3.98	2.74	3.28	4.18
<b>Operating Returns</b>					
Return on equity	$\frac{\text{Net Income}}{\text{Book Value of Equity}}$	17.1%	18.8%	16.8%	11.6%
Return on assets	$\frac{\text{Net Income} + \text{Interest Expense}}{\text{Total Assets}}$	21.2%	22.2%	22.2%	17.0%
Return on invested capital (ROIC)	$\frac{\text{EBIT}(1 - \text{Tax Rate})}{\text{Book Value of Equity} + \text{Net Debt}}$	13.0%	15.0%	13.3%	11.5%
<b>Valuation Ratios</b>					
Market-to-book ratio	$\frac{\text{Market Value of Equity}}{\text{Book Value of Equity}}$	4.0	4.4	4.2	3.4
Price-to-earnings ratio	$\frac{\text{Share Price}}{\text{Earnings per Share}}$	17.2	17.9	20.1	17.5
Enterprise value ratio (typical values based on EV/EBITDA)	$\frac{\text{Enterprise Value}}{\text{EBIT or EBITDA or Sales}}$	9.2	9.6	9.5	9.1

Source: Standard and Poors' Compustat.

**CONCEPT CHECK**

11. What does a high debt-to-equity ratio tell you?
12. What is a firm's enterprise value?
13. How can a financial manager use the DuPont Identity to assess the firm's ROE?
14. How do you use the price-earnings (P/E) ratio to gauge the market value of a firm?

## 2.7

**Financial Reporting in Practice**

The various financial statements we have examined are of critical importance to investors and financial managers alike. Even with safeguards such as GAAP and auditors, financial reporting abuses unfortunately do take place. We now review one of the most infamous recent examples and offer some concluding thoughts to guide financial managers through the complexities of financial statements.

**Enron**

Enron is the most well-known of the accounting scandals of the early 2000s. Enron started as an operator of natural gas pipelines but evolved into a global trader dealing in a range of products including gas, oil, electricity, and even broadband internet capacity. A series of events unfolded that led Enron to file the largest bankruptcy filing in U.S. history in December 2001. By the end of 2001, the market value of Enron's shares had fallen by over \$60 billion.

Interestingly, throughout the 1990s and up to late 2001, Enron was touted as one of the most successful and profitable companies in the United States. *Fortune* magazine rated Enron “The Most Innovative Company in America” for six straight years, from 1995 to 2000. But while many aspects of Enron's business were successful, subsequent investigations suggest that Enron executives had been manipulating Enron's financial statements to mislead investors and artificially inflate the price of Enron's stock and to maintain its credit rating. In 2000, for example, 96% of Enron's reported earnings were the result of accounting manipulation.<sup>10</sup>

Although the accounting manipulations that Enron used were quite sophisticated, the essence of most of the deceptive transactions was surprisingly simple. Enron sold assets at inflated prices to other firms (or, in many cases, business entities that Enron's CFO Andrew Fastow had created) together with a promise to buy back those assets at an even higher future price. Thus, Enron was effectively borrowing money, receiving cash today in exchange for a promise to pay more cash in the future. But Enron recorded the incoming cash as revenue and then, in a variety of ways, hid the promises to buy the assets back.<sup>11</sup> In the end, much of Enron's revenue growth and profits in the late 1990s were the result of this type of manipulation.

**The Sarbanes-Oxley Act**

The Enron case highlights the importance to investors of accurate and up-to-date financial statements for firms they choose to invest in. Many of the problems at Enron and elsewhere were kept hidden from boards and shareholders until it was too late. In the wake of these scandals, many people felt that the accounting statements of these companies, while often remaining true to the letter of GAAP, did not present an accurate picture of the financial health of a company. In 2002, the United States Congress passed the **Sarbanes-Oxley Act (SOX)** that requires, among other things, that CEOs and CFOs certify the accuracy and appropriateness of their firm's financial statements and increases the penalties against them if the financial statements later prove to be fraudulent.

**Sarbanes-Oxley Act**

**(SOX)** Legislation passed by the U.S. Congress in 2002, intended to improve the accuracy of financial information given to both boards and shareholders.

<sup>10</sup>John R. Kroger, “Enron, Fraud and Securities Reform: An Enron Prosecutor's Perspective,” *University of Colorado Law Review*, December, 2005, pp. 57–138.

<sup>11</sup>In some cases, these promises were called “price risk management liabilities” and hidden with other trading activities; in other cases they were off-balance sheet transactions that were not fully disclosed.

Auditing firms are supposed to ensure that a company's financial statements accurately reflect the financial state of the firm. In reality, most auditors have a long-standing relationship with their audit clients; this extended relationship and the auditors' desire to keep the lucrative auditing fees make auditors less willing to challenge management. More importantly perhaps, most accounting firms have developed large and extremely profitable consulting divisions. Obviously, if an audit team refuses to accommodate a request by a client's management, that client will be less likely to choose the accounting firm's consulting division for its next consulting contract. SOX addressed this concern by putting strict limits on the amount of non-audit fees (consulting or otherwise) that an accounting firm can earn from the same firm that it audits. It also required that audit partners rotate every five years to limit the likelihood that auditing relationships become too cozy over long periods of time. Finally, SOX called on the SEC to force companies to have audit committees that are dominated by outside directors, and required that at least one outside director have a financial background.

Following the Sarbanes-Oxley Act in the United States, Canada adopted similar measures through Bill C198 that came into effect in 2005. In Canada, the response and implementation of changes were somewhat measured in comparison with those in the United States, partly due to the fact that the same scale of corporate fraud had yet to be experienced in Canada. Additional differences between Canada and the United States also contributed to differences in adoption. For example, Canada does not have a national securities commission, whereas the United States does. Creating uniform change across Canada is problematic, as agreement among 13 different authorities would be needed. Canada also has a much larger percentage of public firms with a controlling shareholder. Implementing SOX requirements such as increasing the proportion of independent directors might be unworkable in Canada, as many controlling shareholders may desire to name board representatives. Finally, Canadian companies tend to have lower market capitalization compared to U.S. firms. Forcing companies to validate their financial control processes, another measure introduced in SOX, in a more formalized way can increase costs significantly, putting a greater burden on smaller firms than on larger ones.

**Sue Frieden is Ernst & Young's Global Managing Partner, Quality & Risk Management. A member of the Global Executive board, she is responsible for every aspect of quality and risk management—employees, services, procedures, and clients.**

**Q** Do today's financial statements give the investing public what they need?

**A** Globally, we are seeing an effort to provide more forward-looking information to investors. But fundamental questions remain, such as how fully do investors understand financial statements and how fully do they read them? Research shows that most individual investors don't rely on financial statements much at all. We need to

## INTERVIEW WITH SUE FRIEDEN



determine how the financial statements can be improved. To do that we will need a dialogue involving investors, regulators, analysts, auditors, stock exchanges, academics, and others to ensure that financial statements are as relevant as they can be.

**Q** Ernst & Young is a global organization. How do accounting standards in the U.S. compare to those elsewhere?

**A** In January of 2005, 100 countries outside the United States began the process of adopting new accounting standards (International Financial Reporting Standards) that would in large measure be based on principles rather than rules. As global markets become more complex, we all need to be playing by the same set of rules. As a first step we need consistency from country

to country. There are definite challenges to overcome in reconciling principle-based and rules-based systems, but we are optimistic that these challenges will inevitably get resolved. At the same time, there are efforts under way to ensure that auditing standards are globally consistent. Ultimately, financial statements prepared under global standards and audited under consistent global auditing standards will better serve investors.

**Q** What role does the audit firm play in our financial markets, and how has that changed since the collapse of Arthur Andersen?

**A** The accounting profession has seen unprecedented change in the past few years as well. The passage of Sarbanes-Oxley and other changes are helping to restore public trust. We're now engaging on a regular basis with a wider range of stakeholders—companies, boards, policymakers, opinion leaders, investors, and academia. And we've had the chance to step back and ask ourselves why we do what we do as accounting professionals, and why it matters. In terms of the services we offer, much of what we do helps companies comply with regulations, guard against undue risks, and implement sound transactions. Part of the value in what we do is providing the basis to all stakeholders to understand whether companies are playing by the rules—whether it

is accounting rules, financial reporting rules, or tax rules. The public may not fully understand precisely what auditors do or how we do it, but they care that we exist because it provides them the confidence they so badly need and want.

**Q** Accounting standards seem to be shifting from historical cost-based methods to methods that rely on current market values of assets. During the financial crisis, however, many financial institutions complained that “mark-to-market” rules exacerbated their financial difficulties. Do you believe accounting professionals should rethink the wisdom of moving to market-based accounting methods?

**A** Fair value accounting can certainly be improved, particularly in light of the difficulty in applying fair value in illiquid markets, which the financial crisis highlighted, and because of some of the anomalies that fair value accounting can produce. But by and large, fair value accounting provided transparency into reality for investors. It is the most transparent way to reflect the economic reality of prevailing market conditions and provide investors and companies with current financial information on which they can base investment and management decisions. Fair value accounting did not cause the economic crisis; it simply kept a fair scorecard.

### The Financial Statements: A Useful Starting Point

In this chapter, we have highlighted the role of the financial statements in informing outside analysts, investors, and the financial managers themselves about the performance, position, and financial condition of the firm. However, especially from the financial manager's perspective, financial statements are only a starting point. For example, we have emphasized the importance of market values over book values. We have also shown that while much can be learned through ratio analysis, these ratios are only markers that point the financial manager toward areas where the firm is doing well or where he or she needs to focus effort for improvement. No single ratio tells the whole story. However, by studying all of the financial statements and considering ratios that assess profitability, leverage, and efficiency, you should be able to develop a clear sense of the health and performance of the firm. Finally, using the case of Enron, we emphasize that the usefulness of the financial statements to investors relies on the ethics of those constructing them. Even in these cases of deception, however, an informed reader of the financial statements could have spotted the warning signs by focusing on the statement of cash flows and carefully reading the notes to the financial statements.

#### CONCEPT CHECK

15. Describe the transactions Enron used to increase its reported earnings.
16. What is the Sarbanes-Oxley Act?

#### MyFinanceLab

Here is what you should know after reading this chapter. MyFinanceLab will help you identify what you know, and where to go when you need to practice.

KEY POINTS AND EQUATIONS	TERMS	ONLINE PRACTICE OPPORTUNITIES
<p><b>2.1 Firms' Disclosure of Financial Information</b></p> <ul style="list-style-type: none"> <li>■ Financial statements are accounting reports that a firm issues periodically to describe its past performance.</li> <li>■ Investors, financial analysts, managers, and other interested parties, such as creditors, rely on financial statements to obtain reliable information about a corporation.</li> <li>■ The main types of financial statements are the statement of financial position, the income statement, the statement of cash flows, and the statement of stockholders' equity.</li> <li>■ Most countries in the world are standardizing their accounting systems around International Financial Reporting Standards.</li> </ul>	<p>annual report, p. 26  auditor, p. 26  financial statements, p. 26  Generally Accepted Accounting Principles (GAAP), p. 26</p>	<p>MyFinanceLab Study Plan 2.1</p>
<p><b>2.2 The Statement of Financial Position or Balance Sheet</b></p> <ul style="list-style-type: none"> <li>■ The statement of financial position shows the current financial position (assets, liabilities, and stockholders' equity) of the firm at a single point in time.</li> <li>■ The two sides of the statement of financial position must balance:</li> </ul> $\text{Assets} = \text{Liabilities} + \text{Stockholders' Equity} \quad (2.1)$ <ul style="list-style-type: none"> <li>■ Stockholders' equity is the book value of the firm's equity. It differs from the market value of the firm's equity, its market capitalization, because of the way assets and liabilities are recorded for accounting purposes.</li> <li>■ A successful firm's market-to-book ratio typically exceeds 1.</li> <li>■ The enterprise value of a firm is the total value of its underlying business operations:</li> </ul> $\text{Enterprise Value} = \text{Market Value of Equity} + \text{Debt} - \text{Cash} \quad (2.4)$	<p>accounts payable, p. 29  accounts receivable, p. 29  assets, p. 28  statement of financial position or balance sheet, p. 27  book value, p. 29  book value of equity, p. 30  common stock, p. 28  current assets, p. 29  current liabilities, p. 29  depreciation, p. 29  inventories, p. 29  liabilities, p. 28  long-term assets, p. 29  long-term debt, p. 30  market capitalization, p. 30  marketable securities, p. 32  net working capital, p. 30  notes payable and short-term debt, p. 29  retained earnings, p. 38  shareholders' equity, p. 28</p>	<p>MyFinanceLab Study Plan 2.2</p>



KEY POINTS AND EQUATIONS	TERMS	ONLINE PRACTICE OPPORTUNITIES
<p><b>2.3 The Statement of Comprehensive Income and Income Statement</b></p> <ul style="list-style-type: none"> <li>The income statement reports the firm's revenues and expenses, and it computes the firm's bottom line of net income, or earnings.</li> <li>Net income is often reported on a per-share basis as the firm's earnings per share:           <math display="block">\text{Earnings per Share (EPS)} = \frac{\text{Net Income}}{\text{Shares Outstanding}} \quad (2.5)</math> </li> <li>We compute diluted EPS by adding to the number of shares outstanding the possible increase in the number of shares from the exercise of stock options the firm has awarded.</li> </ul>	convertible bonds, p. 35 diluted EPS, p. 35 dilution, p. 35 earnings per share (EPS), p. 35 EBIT, p. 35 gross profit, p. 34 income statement, p. 33 net income or earnings, p. 33 operating income, p. 34 stock options, p. 35	MyFinanceLab Study Plan 2.3
<p><b>2.4 The Statement of Cash Flows</b></p> <ul style="list-style-type: none"> <li>The statement of cash flows reports the sources and uses of the firm's cash. It shows the adjustments to net income for non-cash expenses and changes to net working capital, as well as the cash used (or provided) from investing and financing activities.</li> </ul>	capital expenditures, p. 38 payout ratio, p. 38 statement of cash flows, p. 36	MyFinanceLab Study Plan 2.4
<p><b>2.5 Other Financial Statement Information</b></p> <ul style="list-style-type: none"> <li>The management discussion and analysis section of the financial statement contains management's overview of the firm's performance, as well as disclosure of risks the firm faces, including those from off-balance sheet transactions.</li> <li>The statement of stockholders' equity breaks down the stockholders' equity computed on the statement of financial position into the amount that came from issuing new shares versus retained earnings. It is not particularly useful for financial valuation purposes.</li> <li>The notes to a firm's financial statements generally contain important details regarding the numbers used in the main statements.</li> </ul>	management discussion and analysis (MD&A), p. 40 off-balance sheet transactions, p. 40 statement of shareholders' equity, p. 39	MyFinanceLab Study Plan 2.5
<p><b>2.6 Financial Statement Analysis</b></p> <ul style="list-style-type: none"> <li>Profitability ratios show the firm's operating or net income as a fraction of sales, and they are an indication of a firm's efficiency and its pricing strategy.</li> <li>Liquidity ratios help creditors assess whether the firm has enough cash to meet its short-term needs.</li> </ul>	current ratio, p. 41 debt-equity ratio, p. 45 enterprise value, p. 42 growth stocks, p. 42 leverage, p. 45 liquidation value, p. 30	MyFinanceLab Study Plan 2.6

## KEY POINTS AND EQUATIONS

- Asset efficiency ratios assess how efficiently the firm is using its assets by showing how many dollars of revenues the firm produces per dollar of assets.
- Working capital ratios express the firm's working capital as a number of days of sales (for receivables) or cost of sales (for inventory or payables).
- Interest coverage ratios indicate the ratio of the firm's income or cash flows to its interest expenses, and they are a measure of financial strength.
- A common ratio used to assess a firm's leverage is:

$$\text{Debt-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}} \quad (2.19)$$

- This ratio is most informative when computed using the market value of equity. It indicates the degree of leverage of the firm.
- Valuation ratios compute market capitalization or enterprise value of the firm relative to its earnings or operating income.
- The P/E ratio computes the value of a share of stock relative to the firm's EPS. P/E ratios tend to be high for fast-growing firms.
- When comparing valuation ratios, it is important to be sure both the numerator and denominator match in terms of whether they include debt.
- ROE and ROA are typical operating return ratios. ROE express the firm's net income as a return on the book value of its equity. ROA expresses net income plus interest as a return on total assets.
- The DuPont Identity says that

$$= \left( \frac{\text{Net Income}}{\text{Sales}} \right) \left( \frac{\text{Sales}}{\text{Total Assets}} \right) \left( \frac{\text{Total Assets}}{\text{Total Equity}} \right) \quad (2.27)$$

### 2.7 Financial Reporting in Practice

- Recent accounting scandals have drawn attention to the importance of financial statements. New legislation has increased the penalties for fraud and tightened the procedures firms must use to ensure that statements are accurate.

## TERMS

market-to-book ratio (price-to-book [P/B] ratio), p. 31  
 quick ratio ("acid-test" ratio), p. 41  
 value stocks, p. 32  
 accounts payable days, p. 43  
 accounts receivable days (average collection period or days sales outstanding), p. 43  
 DuPont Identity, p. 49  
 EBITDA, p. 35  
 equity multiplier, p. 46  
 gross margin, p. 40  
 interest coverage ratio or times interest earned (TIE) ratio, p. 44  
 inventory days, p. 43  
 inventory turnover ratio, p. 43  
 net profit margin, p. 41  
 operating margin, p. 41  
 PEG ratio, p. 47  
 price-earnings ratio (P/E), p. 46  
 return on assets (ROA), p. 48  
 return on equity (ROE), p. 48  
 return on invested capital (ROIC), p. 48  
 net debt, p. 46  
 debt-to-capital ratio, p. 46  
 debt-to-enterprise value ratio, p. 46

## ONLINE PRACTICE OPPORTUNITIES

MyFinanceLab Study Plan 2.7

## REVIEW QUESTIONS

1. Why do firms disclose financial information?
2. Who reads financial statements? List at least three different categories of people. For each category, provide an example of the type of information they might be interested in and discuss why.
3. What four financial statements can be found in a firm's filing with its provincial securities commission? What checks exist to ensure the accuracy of these statements?
4. What is the purpose of the statement of financial position?
5. How can you use the statement of financial position to assess the health of the firm?
6. What is the purpose of the income statement?
7. How are the statement of financial position and the income statement related?
8. What is the DuPont Identity and how can a financial manager use it?
9. How does the statement of cash flows differ from the income statement?
10. Can a firm with positive net income run out of cash? Explain.
11. What can you learn from management's discussion or the notes to the financial statements?
12. How did accounting fraud contribute to the collapse of Enron?

## PROBLEMS

*All problems in this chapter are available in MyFinanceLab. An asterisk (\*) indicates problems with a higher level of difficulty.*

### Firms' Disclosure of Financial Information

1. What financial statements can be found in a firm's annual report? What checks exist to ensure the accuracy of these statements?
2. Find the most recent financial statements for Starbucks's Corporation (stock symbol: SBUX) using the following sources:
  - a. From the company's webpage, [www.starbucks.com](http://www.starbucks.com) (*Hint:* Search for "investor relations").
  - b. From the SEC website, [www.sec.gov](http://www.sec.gov) (*Hint:* Search for company filings in the EDGAR database).
  - c. From the Yahoo finance website, [finance.yahoo.com](http://finance.yahoo.com).
  - d. From at least one other source (*Hint:* Enter "SBUX 10K" at [www.google.com](http://www.google.com)).
3. Repeat the analysis for Tim Hortons ([www.timhortons.com](http://www.timhortons.com)). In addition to the EDGAR site, check [www.sedar.com](http://www.sedar.com) for Canadian filings.

### The Statement of Financial Position or Balance Sheet

4. Consider the following potential events that might have occurred at Global on December 30, 2015. For each one, indicate which line items in Global's statement of financial position would be affected and by how much. Also indicate the change to Global's book value of equity.

- a. Global used \$20 million of its available cash to repay \$20 million of its long-term debt.
  - b. A warehouse fire destroyed \$5 million worth of uninsured inventory.
  - c. Global used \$5 million in cash and \$5 million in new long-term debt to purchase a \$10 million building.
  - d. A large customer owing \$3 million for products it already received declared bankruptcy, leaving no possibility that Global would ever receive payment.
  - e. Global's engineers discover a new manufacturing process that will cut the cost of its flagship product by over 50%.
  - f. A key competitor announces a radical new pricing policy that will drastically undercut Global's prices.
5. What was the change in Global's book value of equity from 2014 to 2015 according to Table 2.1? Does this imply that the market price of Global's shares increased in 2015? Explain.
  6. Use Google Finance ([www.google.com/finance](http://www.google.com/finance)) to find the statement of financial position data for Qualcomm as of the end of September 2012.
    - a. How much did Qualcomm have in cash and short-term investments?
    - b. What were Qualcomm's total accounts receivable?
    - c. What were Qualcomm's total assets?
    - d. What were Qualcomm's total liabilities? How much of this was long-term debt?
    - e. What was the book value of Qualcomm's equity?
  7. Find the annual 10-K report for Green Mountain Coffee Roasters (GMCR) online for 2012 (filed in September 2012). Answer the following questions from its statement of financial position:
    - a. How much cash did Green Mountain have at the end of 2011?
    - b. What were Green Mountain total assets?
    - c. What were Green Mountain total liabilities? How much debt did Green Mountain have?
    - d. What was the book value of Green Mountain's equity?

#### The Statement of Comprehensive Income and Income Statement






8. Find online the annual 10-K report for Green Mountain Coffee Roasters (GMCR) for 2012. Answer the following questions from the income statement:
  - a. What were Green Mountain's revenues for 2012? By what percentage did revenues grow from 2011?
  - b. What were Green Mountain's operating and net profit margins in 2012? How do they compare with its margins in 2011?
  - c. What were Green Mountain's diluted earnings per share in 2012? What number of shares is this EPS based on?

#### 2009–2013 Financial Statement Data and Stock Price Data for Mydeco Corp.


Mydeco Corp. 2009–2013 (All data as of fiscal year end; \$ in millions)

Income Statement	2009	2010	2011	2012	2013
Revenue	404.3	363.8	424.6	510.7	604.1
Cost of Goods Sold	(188.3)	(173.8)	(206.2)	(246.8)	(293.4)
<b>Gross Profit</b>	215.9	190.0	218.3	263.9	310.7
Sales and Marketing	(66.7)	(66.4)	(82.8)	(102.1)	(120.8)
Administration	(60.6)	(59.1)	(59.4)	(66.4)	(78.5)
Depreciation & Amortization	(27.3)	(27.0)	(34.3)	(38.4)	(38.6)
<b>EBIT</b>	61.3	37.4	41.8	57.0	72.8

Interest Income (Expense)	(33.7)	(32.9)	(32.2)	(37.4)	(39.4)
<b>Pretax Income</b>	27.7	4.5	9.6	19.6	33.4
Income Tax	(9.7)	(1.6)	(3.4)	(6.9)	(11.7)
<b>Net Income</b>	18.0	2.9	6.2	12.7	21.7
<i>Share outstanding (millions)</i>	55.0	55.0	55.0	55.0	55.0
<i>Earnings per share</i>	\$0.33	\$0.05	\$0.11	\$0.23	\$0.39
<b>Balance Sheet</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
<b>Assets</b>					
Cash	48.8	68.8	86.2	77.4	84.9
Accounts Receivable	88.6	69.8	69.8	76.9	86.1
Inventory	33.7	30.9	28.4	31.7	35.3
<b>Total Current Assets</b>	171.1	169.4	184.4	186.1	206.3
Net Property, Plant & Equip.	245.3	243.2	308.9	345.5	347.0
Goodwill & Intangibles	361.7	361.7	361.7	361.7	361.7
<b>Total Assets</b>	778.1	774.3	855.0	893.3	914.9
<b>Liabilities &amp; Stockholders' Equity</b>					
Accounts Payable	18.7	17.9	22.0	26.8	31.7
Accrued Compensation	6.7	6.4	7.0	8.1	9.7
<b>Total Current Liabilities</b>	25.5	24.2	29.0	34.9	41.4
Long-term Debt	500.0	500.0	575.0	600.0	600.0
<b>Total Liabilities</b>	525.5	524.2	604.0	634.9	641.4
Stockholders' Equity	252.6	250.1	251.0	258.3	273.5
<b>Total Liabilities &amp; Stockholders' Equity</b>	778.1	774.3	855.0	893.3	914.9
<b>Statement of Cash Flows</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Net Income	18.0	2.9	6.2	12.7	21.7
Depreciation & Amortization	27.3	27.0	34.3	38.4	38.6
Chg. in Accounts Receivable	3.9	18.8	(0.0)	(7.2)	(9.1)
Chg. in Inventory	(2.9)	2.9	2.5	(3.3)	(3.6)
Chg. in Payables & Accrued Comp.	2.2	(1.3)	4.8	5.9	6.5
<b>Cash from Operations</b>	48.4	50.4	47.8	46.6	54.0
Capital Expenditures	(25.0)	(25.0)	(100.0)	(75.0)	(40.0)
<b>Cash from Investing Activities</b>	(25.0)	(25.0)	(100.0)	(75.0)	(40.0)
Dividends Paid	(5.4)	(5.4)	(5.4)	(5.4)	(6.5)
Sale (or purchase) of stock	–	–	–	–	–
Debt Issuance (Pay Down)	–	–	75.0	25.0	–
<b>Cash from Financing Activities</b>	(5.4)	(5.4)	69.6	19.6	(6.5)
<b>Change in Cash</b>	18.0	20.0	17.4	(8.8)	7.5
<b>Mydeco Stock Price</b>	<b>\$7.90</b>	<b>\$3.29</b>	<b>\$5.23</b>	<b>\$8.70</b>	<b>\$10.87</b>

-  **9.** See Table 2.5 showing financial statement data and stock price data for Mydeco Corp.
- By what percentage did Mydeco's revenues grow each year from 2010 to 2013?
  - By what percentage did net income grow each year?
  - Why might the growth rates of revenues and net income differ?
-  **10.** See Table 2.5 showing financial statement data and stock price data for Mydeco Corp. Suppose Mydeco repurchases 2 million shares each year from 2010 to 2013. What would its earnings per share be in 2013?
-  **11.** See Table 2.5 showing financial statement data and stock price data for Mydeco Corp. Suppose Mydeco had purchased additional equipment for \$12 million at the end of 2010, and this equipment was depreciated by \$4 million per year in 2011, 2012, and 2013. Given Mydeco's tax rate of 35%, what impact would this additional purchase have had on Mydeco's net income in years 2010–2013?
-  **12.** See Table 2.5 showing financial statement data and stock price data for Mydeco Corp. Suppose Mydeco's costs and expenses had been the same fraction of revenues in 2010–2013 as they were in 2009. What would Mydeco's EPS have been each year in this case?
- 13.** Suppose a firm's tax rate is 35%.
- What effect would a \$10 million operating expense have on this year's earnings? What effect would it have on next year's earnings?
  - What effect would a \$10 million capital expense have on this year's earnings if the capital is depreciated at a rate of \$2 million per year for five years? What effect would it have on next year's earnings?
-  **\*14.** Quisco Systems has 6.5 billion shares outstanding and a share price of \$18. Quisco is considering developing a new networking product in-house at a cost of \$500 million. Alternatively, Quisco can acquire a firm that already has the technology for \$900 million worth (at the current price) of Quisco stock. Suppose that, absent the expense of the new technology, Quisco will have EPS of \$0.80.
- Suppose Quisco develops the product in-house. What impact would the development cost have on Quisco's EPS? Assume all costs are incurred this year and are treated as an R&D expense, Quisco's tax rate is 35%, and the number of shares outstanding is unchanged.
  - Suppose Quisco does not develop the product in-house but instead acquires the technology. What effect would the acquisition have on Quisco's EPS this year? (Note that acquisition expenses do not appear directly on the income statement. Assume the firm was acquired at the start of the year and has no revenues or expenses of its own so that the only effect on EPS is due to the change in the number of shares outstanding.)
  - Which method of acquiring the technology has a smaller impact on earnings? Is this method cheaper? Explain.

### The Statement of Cash Flows

-  **15.** Find online the 2012 annual 10-K report Green Mountain Coffee Roasters (GMCR), filed in September 2012. Answer the following questions from its cash flow statement:
- How much cash did Green Mountain generate from operating activities in 2012?
  - What was Green Mountain's depreciation expense in 2012?
  - How much cash was invested in new property and equipment (net of any sales) in 2012?
  - How much did Green Mountain raise from the sale of shares of its stock (net of any purchases) in 2012?



16. See the cash flow statement below (all values in thousands of dollars) (*see MyFinanceLab for the data in Excel format*):

- a. What were the company's cumulative earnings over these four quarters? What were its cumulative cash flows from operating activities?

Quarter	4	3	2	1
<b>Net Income</b>	<b>276,710</b>	<b>228,964</b>	<b>194,062</b>	<b>218,532</b>
<b>Operating Activities, Cash Flows Provided By or Used In</b>				
Depreciation	69,997	75,733	74,570	73,173
Adjustments to net income	14,359	(13,142)	48,826	(47,993)
Changes in accounts receivables	(38,869)	(53,218)	100,732	(84,711)
Changes in liabilities	82,816	(111,577)	201,725	39,949
Changes in inventories	(195,186)	(114,121)	85,028	57,681
Changes in other operating activities	17,675	(26,574)	12,692	(2,097)
<b>Total Cash Flow from Operating Activities</b>	<b>227,502</b>	<b>(13,935)</b>	<b>717,635</b>	<b>254,534</b>
<b>Investing Activities, Cash Flows Provided By or Used In</b>				
Capital expenditures	(82,584)	(41,634)	(100,109)	(69,170)
Investments	(5,465)	5,465	(93,153)	(48,330)
Other cash flows from investing activities	(108,903)	732	(58,069)	20,652
<b>Total Cash Flows from Investing Activities</b>	<b>(196,952)</b>	<b>(35,437)</b>	<b>(251,331)</b>	<b>(96,848)</b>
<b>Financing Activities, Cash Flows Provided By or Used In</b>				
Dividends paid	(131,483)	(131,333)	(119,452)	(121,404)
Sale purchase of stock	78,774	1,210	(76,807)	(79,288)
Net borrowings	515,709	114,766	(283,696)	64,885
Other cash flows from financing activities	(282)	2,000	(46,234)	39,763
<b>Total Cash Flows from Financing Activities</b>	<b>462,718</b>	<b>(13,357)</b>	<b>(526,189)</b>	<b>(96,044)</b>
Effect of exchange rate changes	(119,960)	(610)	32,807	6,890
<b>Change In Cash and Cash Equivalents</b>	<b>\$373,308</b>	<b>(63,339)</b>	<b>(27,078)</b>	<b>\$68,532</b>

- b. What fraction of the cash from operating activities was used for investment over the four quarters?
- c. What fraction of the cash from operating activities was used for financing activities over the four quarters?
17. Suppose your firm receives a \$5 million order on the last day of the year. You fill the order with \$2 million worth of inventory. The customer picks up the entire order the same day and pays \$1 million up front in cash; you also issue a bill for the customer to pay the remaining balance of \$4 million within 40 days. Suppose your firm's tax rate is 0% (i.e., ignore taxes). Determine the consequences of this transaction for each of the following:
- Revenues
  - Earnings
  - Receivables
  - Inventory
  - Cash
18. Nokela Industries purchases a \$40 million cyclo-converter. The cyclo-converter will be depreciated by \$10 million per year over four years, starting this year. Suppose Nokela's tax rate is 40%.

- a. What impact will the cost of the purchase have on earnings for each of the next four years?
- b. What impact will the cost of the purchase have on the firm's cash flow for the next four years?

### Financial Statement Analysis

19. In April 2013, General Electric (GE) had a book value of equity of \$123 billion, 10.3 billion shares outstanding, and a market price of \$23 per share. GE also had cash of \$90 billion, and total debt of \$397 billion.
  - a. What was GE's market capitalization? What was GE's market-to-book ratio?
  - b. What was GE's book debt-equity ratio? What was GE's market debt-equity ratio?
  - c. What was GE's enterprise value?
20. In April 2013, Apple had cash of \$39.14 billion, current assets of \$63.34 billion, and current liabilities of \$35.51 billion. It also had inventories of \$1.25 billion.
  - a. What was Apple's current ratio?
  - b. What was Apple's quick ratio?
  - c. In April 2013, Dell had a quick ratio of 1.13 and a current ratio of 1.19. What can you say about the asset liquidity of Apple relative to Dell?
21. In mid-2012, the following information was true about Abercrombie and Fitch (ANF) and The Gap (GPS), both clothing retailers. Values (except price per share) are in millions of dollars.

	Book Equity	Price Per Share	Number of Shares (millions)
ANF	1,693	35.48	82.55
GPS	3,017	27.90	489.22

- a. What is the market-to-book ratio of each company?
  - b. What conclusions do you draw from comparing the two ratios?
22. In fiscal year 2011, Starbucks Corporation (SBUX) had revenue of \$11.70 billion, gross profit of \$6.75 billion, and net income of \$1.25 billion. Peet's Coffee and Tea (PEET) had revenue of \$372 million, gross profit of \$72.7 million, and net income of \$17.8 million.
    - a. Compare the gross margins for Starbucks and Peet's.
    - b. Compare the net profit margins for Starbucks and Peet's.
    - c. Which firm was more profitable in 2011?
  23. Local Co. has sales of \$10 million and cost of sales of \$6 million. Its selling, general, and administrative expenses are \$500,000 and its research and development is \$1 million. It has annual depreciation charges of \$1 million and a tax rate of 35%.
    - a. What is Local's gross margin?
    - b. What is Local's operating margin?
    - c. What is Local's net profit margin?
  24. If Local Co., the company in Problem 23, had an increase in selling expenses of \$300,000, how would that affect each of its margins?
  25. If Local Co., the company in Problem 23, had interest expense of \$800,000, how would that affect each of its margins?



26. Chutes & Co. has interest expense of \$1 million and an operating margin of 10% on total sales of \$30 million. What is Chutes' interest coverage ratio?

27. Ladders, Inc. has a net profit margin of 5% on sales of \$50 million. It has book value of equity of \$40 million and total liabilities with a book value of \$30 million. What is Ladders' ROE? ROA?



28. JPJ Corp has sales of \$1 million, accounts receivable of \$50,000, total assets of \$5 million (of which \$3 million are fixed assets), inventory of \$150,000, and cost of goods sold of \$600,000. What is JPJ's accounts receivable days? Fixed asset turnover? Total asset turnover? Inventory turnover?



29. If JPJ Corp (the company from the previous question) is able to increase sales by 10% but keep its total and fixed asset growth to only 5%, what will its new asset turnover ratios be?



\*30. Suppose that in 2015, Global launched an aggressive marketing campaign that boosted sales by 15%. However, its operating margin fell from 5.57% to 4.50%. Suppose that the company had no other income, interest expenses were unchanged, and the corporate tax rate for 2015 is 25%.

a. What was Global's EBIT in 2015?

b. What was Global's income in 2015?

c. If Global's P/E ratio and number of shares outstanding remained unchanged, what was Global's share price in 2015?



31. You are analyzing the leverage of two firms and you note the following (all values in millions of dollars):

	Debt	Book Equity	Market Equity	Operating Income	Interest Expense
Firm A	500	300	400	100	50
Firm B	80	35	40	8	7

a. What is the market debt-to-equity ratio of each firm?

b. What is the book debt-to-equity ratio of each firm?

c. What is the interest coverage ratio of each firm?

d. Which firm will have more difficulty meeting its debt obligations?






32. For 2012, Wal-Mart Stores Inc. and Target Corporation had the following information (all values are in millions of dollars):

	Sales (Income Statement)	Cost of Goods Sold (Income Statement)	Accounts Receivable (Statement of Financial Position)	Inventory (Statement of Financial Position)
Wal-Mart	469,162	352,488	6,768	43,803
Target	73,301	50,568	6,857	7,903


a. What is each company's accounts receivable days?

b. What is each company's inventory turnover?

c. Which company is managing its accounts receivable and inventory more efficiently?

-  **33.** In January 2013, United Airlines (UAL) had a market capitalization of \$8.0 billion, debt of \$13.2 billion, and cash of \$4.8 billion. United Airlines had revenues of \$37.2 billion. Southwest Airlines (LUV) had a market capitalization of \$7.6 billion, debt of \$3.2 billion, cash of \$3.0 billion, and revenues of \$17.1 billion.
- Compare the market capitalization-to-revenue ratio (also called the price-to-sales ratio) for United Airlines and Southwest Airlines.
  - Compare the enterprise value-to-revenue ratio for United Airlines and Southwest Airlines.
  - Which of these comparisons is more meaningful? Explain.
- 34.** Consider a retail firm with a net profit margin of 3.5%, a total asset turnover of 1.8, total assets of \$44 million, and a book value of equity of \$18 million.
- What is the firm's current ROE?
  - If the firm increased its net profit margin to 4%, what would its ROE be?
  - If, in addition, the firm increased its revenues by 20% (while maintaining this higher profit margin and without changing its assets or liabilities), what would its ROE be?
-  **\*35.** Find online the annual 10-K report for Green Mountain Coffee Roasters (GMCR) for 2012.
- Compute Green Mountain's net profit margin, total asset turnover, and equity multiplier.
  - Verify the DuPont Identity for Green Mountain's ROE.
  - If Green Mountain's managers wanted to increase its ROE by one percentage point, how much higher would their asset turnover need to be?
-  **36.** Repeat the analysis from parts a and b of the previous problem using Starbucks Corporation (SBUX) instead. Based on the DuPont Identity, what explains the difference between the two firms' ROEs?

#### Other Financial Statement Information

-  **37.** Some statement of financial position information is shown here (all values in millions of dollars) (see *MyFinanceLab* for the data in Excel format):

Statement of Financial Position:	2013	2012	2011	2010
<b>Assets</b>				
Current Assets				
Cash and cash equivalents	293	300	255	232
Net receivables	401	362	385	460
Inventory	374	342	437	306
Other current assets	60	43	53	45
<b>Total Current Assets</b>	<b>1,128</b>	<b>1,047</b>	<b>1,130</b>	<b>1043</b>
Long-term investments	128	97	—	200
Property, plant, and equipment	979	991	995	1052
Goodwill	744	748	736	742
Other assets	777	827	911	797
<b>Total Assets</b>	<b>3,756</b>	<b>3,710</b>	<b>3,772</b>	<b>3834</b>

<b>Liabilities</b>				
Current Liabilities				
Accounts payable	876	1,467	922	980
Short/current long-term debt	410	2	173	288
Other current liabilities	—	—	—	—
<b>Total Current Liabilities</b>	<b>1,286</b>	<b>1,469</b>	<b>1,095</b>	<b>1268</b>
<b>Liabilities</b>				
Long-term debt	2,381	2,124	474	475
Other liabilities	435	574	559	551
<b>Total Liabilities</b>	<b>4,102</b>	<b>4,167</b>	<b>2,128</b>	<b>2,294</b>
<b>Total Stockholder Equity</b>	<b>-346</b>	<b>-457</b>	<b>1,644</b>	<b>1,540</b>
<b>Total Liabilities and Stockholder Equity</b>	<b>\$3,756</b>	<b>\$3,710</b>	<b>\$3,772</b>	<b>\$3,834</b>

- What change in the book value of the company's equity took place at the end of 2012?
- For 2012 and 2013, is the company's market-to-book ratio meaningful? Is its book debt-equity ratio meaningful? Explain.
- Does the company's book value of equity in 2013 imply that it is unprofitable? Explain.

### Financial Reporting in Practice

- Find online the annual 10-K report for Green Mountain Coffee Roasters (GMCR) for 2012, filed in September 2012.
  - Which auditing firm certified these financial statements?
  - Which officers of Green Mountain certified the financial statements?

## DATA CASE

This is your second interview with a prestigious brokerage firm for a job as an equity analyst. You survived the morning interviews with the department manager and the vice-president of equity. Everything has gone so well that they want to test your ability as an analyst. You are seated in a room with a computer and a list with the names of two companies—Caterpillar (CAT) and Microsoft (MSFT). You have 90 minutes to complete the following tasks:

- Download the annual income statements, statements of financial position, and cash flow statements for the last four fiscal years from MarketWatch ([www.marketwatch.com](http://www.marketwatch.com)). Enter each company's ticker symbol and then go to "financials." Copy and paste the financial statements into Excel.
- Find historical stock prices for each firm from Yahoo! Finance ([finance.yahoo.com](http://finance.yahoo.com)). Enter the ticker symbol, click on "Historical Prices" in the left column, and enter the proper date range to cover the last day of the month corresponding to the date of each financial statement. Use the closing stock prices (not the adjusted close). To calculate the firm's market capitalization at each date, multiply

the number of shares outstanding (see “Basic Weighted Shares Outstanding” on the income statement) by the firm’s historic stock price.

3. For each of the four years of statements, compute the following ratios for each firm:

#### Valuation Ratios

Price-earnings ratio (for EPS use diluted EPS total)

Market-to-book ratio

Enterprise value-to-EBITDA

(For debt, include long-term and short-term debt; for cash, include marketable securities.)

#### Profitability Ratios

Operating margin (use operating income after depreciation)

Net profit margin

Return on equity

#### Financial Strength Ratios

Current ratio

Book debt-equity ratio

Market debt-equity ratio

Interest coverage ratio ( $\text{EBIT} \div \text{interest expense}$ )

4. Obtain industry averages for each firm from Reuters.com ([www.reuters.com/finance/stocks](http://www.reuters.com/finance/stocks)). Enter the ticker symbol at the top of the page in the “Symbol lookup” and then click on the “Financials” button, and then click on “Search.”
  - a. Scroll down to “Valuation Ratios,” and compare each firm’s ratios to the available industry ratios for the most recent year. (Ignore the “Company” column as your calculations will be different.)
  - b. Analyze the performance of each firm versus the industry and comment on any trends in each individual firm’s performance. Identify any strengths or weaknesses you find in each firm.
5. Examine the market-to-book ratios you calculated for each firm. Which, if either, of the two firms can be considered “growth firms” and which, if either, can be considered “value firms”?
6. Compare the valuation ratios across the two firms. How do you interpret the difference between them?
7. Consider the enterprise value of both firms for each of the four years. How have the values of both firms changed over the time period?