

## CHAPTER 7

### *Earnings and Cash Flow Analysis*

*Cash flow is a company's lifeblood, and for a healthy company the primary source of cash flow is earnings. Little wonder that security analysts are obsessed with both. Their goal is to predict future earnings and cash flow. An analyst who predicts well has a head start in knowing which stocks will go up and which stocks will go down.*

In the previous chapter, we examined some important concepts of stock analysis and valuation. Here, we probe deeper into the topic of common stock valuation through an analysis of earnings and cash flow. In particular, we focus on earnings and cash flow forecasting. This chapter, will acquaint you with financial accounting concepts necessary to understand basic financial statements and perform earnings and cash flow analysis using these financial statements. You may not become an expert analyst yet - this requires experience. But you will have a grasp of the fundamentals, which is a good start.

Unfortunately, most investors have difficulty reading financial statements and instead rely on various secondary sources of financial information. Of course, this is good for those involved with publishing secondary financial information. Bear in mind, however, that no one is paid well just for reading such sources of financial information. By reading this chapter, you take an important step toward becoming financial-statement literate, and an extra course in financial accounting is also helpful. But ultimately you learn to read financial statements by reading financial statements! Like a good game of golf or tennis, financial-statement reading skills require practice. If you have an

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aptitude for it, financial statement analysis is a skill worth mastering. Good analysts are paid well, but good analysis is expected in return. Maybe you too can become one of the few, the proud - a financial analyst.

### ***7.1 Sources of Financial Information***

Good financial analysis begins with good financial information. An excellent primary source of financial information about any company is its annual report to stockholders. Most companies expend considerable resources preparing and distributing annual reports. In addition to their stockholders, companies also make annual reports available to anyone requesting a copy. A convenient way to request copies of annual reports from several companies simultaneously is to use the annual reports service provided by the *Wall Street Journal*. If you open the *Journal* to its daily stock price reports, you will see a shamrock symbol ♣ next to entries for many individual stocks. The shamrock indicates that the company will send annual reports to readers through the *Wall Street Journal*. Requests can be submitted by telephone or by fax.

The Internet is a convenient source of financial information about many companies. For example, the New York Stock Exchange website ([www.nyse.com](http://www.nyse.com)) provides a directory of websites for companies whose stock trades on the exchange. The content of company websites varies greatly, but many provide recent quarterly or annual financial reports.

In addition to company annual reports, a wealth of primary financial information is available to investors through the Securities and Exchange Commission. The SEC requires corporations with publicly traded securities to prepare and submit financial statements on a regular basis. When received, these documents are made available for immediate public access through the SEC's

Electronic Data Gathering and Retrieval (EDGAR) archives. The **EDGAR** archives are accessible free of charge through the Internet ([www.sec.gov](http://www.sec.gov)) and are an excellent source of timely financial information.

*(marg. def. **10K** Annual company report filed with the SEC). **10Q** Quarterly updates of 10K filed with SEC. **EDGAR** Electronic archive of company filings with the SEC.)*

The most important EDGAR document is the annual **10K** report, often simply called the "10K." Companies are required to submit an EDGAR-compatible 10K file to the SEC at the end of each fiscal year. They are also required to file quarterly updates, called 10Qs. The **10Q** is a mini-10K filed each quarter, except when the 10K is filed. Every 10K and 10Q report contains three important financial statements: a balance sheet, an income statement, and a cash flow statement. You must be familiar with these three financial statements to analyze company earnings and cash flow.

*(marg. def. **balance sheet** Accounting statement that provides a snapshot view of a company's assets and liabilities on a particular date.)*

*(marg. def. **income statement** Summary statement of a firm's revenue and cash flow over a specific accounting period, usually a quarter or a year.)*

*(marg. def. **cash flow statement** Analysis of a firm's sources and uses of cash over the accounting period, summarizing operating, investing, and financing cash flows.)*

## ***7.2 Financial Statements***

Financial statements reveal the hard facts about a company's operating and financial performance. This is why the SEC requires timely dissemination of financial statements to the public. It's also why security analysts spend considerable time poring over a firm's financial statements before making an investment recommendation. A firm's balance sheet, the income statement, and cash flow statement are essential reading for security analysts. Each of these interrelated statements offers

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a distinct perspective. The balance sheet provides a snapshot view of a company's assets and liabilities on a particular date. The income statement measures operating performance over an accounting period, usually a quarter or a year, and summarizes company revenues and expenses. The cash flow statement reports how cash was generated and where it was used over the accounting period. Understanding the format and contents of these three financial statements is a prerequisite for understanding earnings and cash flow analysis.

We begin by considering the basic structure and general format of financial statements through a descriptive analysis of the balance sheet, income statement, and cash flow statement of a hypothetical intergalactic company - the Borg Corporation.

*(marg. def. **asset** Anything a company owns that has value. **liability** A firm's financial obligations. **equity** An ownership interest in the company.)*

### **7.2a The Balance Sheet**

Figure 7.1 presents year-end 2535 and 2536 balance sheets for Borg Corporation. The format of these balance sheets is typical of that contained in company annual reports distributed to stockholders and 10K filings with the SEC. Get used to the accounting practice of specifying subtraction with parentheses and calculating subtotals while moving down a column of numbers. For example, Borg's 2536 fixed assets section is reproduced below, with the left numerical column following standard accounting notation and the right numerical column follows standard arithmetic notation.

| <b>Fixed Assets:</b>      | <b>Accounting style</b> | <b>Numeric style</b> |
|---------------------------|-------------------------|----------------------|
| Plant Facilities          | \$35,000                | \$35,000             |
| Production Equipment      | 20,000                  | +20,000              |
| Administrative Facilities | 15,000                  | +15,000              |
| Patents                   | 10,000                  | +10,000              |
| Accumulated Depreciation  | <u>(20,000)</u>         | <u>- 20,000</u>      |
| Total Fixed Assets        | \$60,000                | \$60,000             |

Common to both numerical columns, an underline indicates that the numbers listed above should be summed. However, accounting notation omits the plus "+" sign and subtraction is indicated by parentheses "(" instead of the more familiar minus "-" sign. Referring back to Figure 7.1, notice that total fixed assets is a subtotal used to calculate total assets, which is indicated by a double underline. With these conventions in mind, let us look over these sample balance sheets and try to become familiar with their format and contents.

Figure 7.1 Borg Corporation Balance Sheets, 2535 and 2536

|                              | <u>Year 2536</u>  | <u>Year 2535</u>  |
|------------------------------|-------------------|-------------------|
| Current assets:              |                   |                   |
| Cash                         | \$2,000           | \$1,356           |
| Accounts receivable          | \$1,200           | \$1,200           |
| Prepaid expenses             | \$500             | \$500             |
| Materials & supplies         | \$300             | \$300             |
| Inventory                    | <u>\$6,000</u>    | <u>\$6,000</u>    |
| Total current assets         | \$10,000          | \$9,356           |
| Fixed assets:                |                   |                   |
| Plant facilities             | \$35,000          | \$35,000          |
| Production equipment         | \$20,000          | \$20,000          |
| Administrative facilities    | \$15,000          | \$15,000          |
| Patents                      | \$10,000          | \$10,000          |
| Accumulated depreciation     | <u>(\$20,000)</u> | <u>(\$17,000)</u> |
| Total fixed assets           | \$60,000          | \$63,000          |
| Investments:                 |                   |                   |
| Cardassian Mining            |                   |                   |
| 7% Preferred stock           | \$10,000          | \$10,000          |
| Klingon Enterprises          |                   |                   |
| Common stock                 | \$10,000          |                   |
| Goodwill                     | <u>\$5,000</u>    |                   |
| Total investments            | \$25,000          | \$10,000          |
| Other assets                 | <u>\$5,000</u>    | <u>\$5,000</u>    |
| Total assets                 | \$100,000         | \$87,356          |
| Current liabilities:         |                   |                   |
| Short-term debt              | \$10,000          | \$10,000          |
| Accounts payable             | \$2,000           | \$2,000           |
| Leasing obligations          | <u>\$3,000</u>    | <u>\$3,000</u>    |
| Total current liabilities    | \$15,000          | \$15,000          |
| Long-term debt               | \$30,000          | \$20,000          |
| Other liabilities            | <u>\$5,000</u>    | <u>\$5,000</u>    |
| Total liabilities            | \$50,000          | \$40,000          |
| Stockholder equity:          |                   |                   |
| Paid-in capital              | \$10,000          | \$10,000          |
| Retained earnings            | <u>\$40,000</u>   | <u>\$37,356</u>   |
| Total stockholder equity     | <u>\$50,000</u>   | <u>\$47,356</u>   |
| Total liabilities and equity | <u>\$100,000</u>  | <u>\$87,356</u>   |
| Shares outstanding           | 2,000             | 2,000             |
| Year-end stock price         | \$40              | \$36              |

The Borg Corporation balance sheet has four major asset categories: current assets, fixed assets, investments, and other assets. Current assets are cash or items that will be converted to cash or be used within a year. For example, inventory will be sold, accounts receivable will be collected, and materials and supplies will be used within a year. Cash is, of course, the quintessential current asset. Fixed assets have an expected life longer than one year and are used in normal business operations. Fixed assets may be tangible or intangible. Property, plant, and equipment are the most common tangible fixed assets. Rights, patents, and licenses are common intangible assets. Except for land, all fixed assets normally depreciate in value over time. Investments include various securities held for investment purposes. Goodwill measures the premium paid over market value to acquire an asset. For example, a company may pay \$50 per share for stock with a market price of \$40 per share when acquiring a very large block of stock. Other assets include miscellaneous items not readily fitting into any of the other asset categories. The sum of these four categories of assets is the firm's total assets

The Borg balance sheet has three major liability categories: current liabilities, long-term debt, and other liabilities. Current liabilities normally require payment or other action within a one-year period. These include accounts payable and accrued taxes. Long-term debt includes notes, bonds, or other loans with a maturity longer than one year. Other liabilities include miscellaneous items not belonging to any other liability category. Stockholder equity is the difference between total assets and total liabilities. It includes paid-in capital, which is the amount received by the company from issuing common stock, and retained earnings, which represent accumulated income not paid out as dividends but instead used to finance company growth.

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A fundamental accounting identity for balance sheets states that assets are equal to liabilities plus equity:

$$\text{Assets} = \text{Liabilities} + \text{Equity}. \quad [1]$$

This identity implies that the balance sheet always “balances” because the left side is always equal in value to the right side. If an imbalance occurs when a balance sheet is created, then an accounting error has been made and needs to be corrected.

Financial analysts often find it useful to condense a balance sheet down to its principal categories. This has the desirable effect of simplifying further analysis while still revealing the basic structure of the company’s assets and liabilities. How much a balance sheet can be condensed and still be useful is a subjective judgment of the analyst. When making this decision, recall Albert Einstein's famous dictum: "Simplify as much as possible, but no more."

Figure 7.2 **Borg Corporation Condensed Balance Sheet**

|                  |                  |                              |                  |
|------------------|------------------|------------------------------|------------------|
| Cash             | \$2,000          | Current liabilities          | \$15,000         |
| Operating assets | \$8,000          | Long-term debt               | \$30,000         |
| Fixed assets     | \$60,000         | Other liabilities            | \$5,000          |
| Investments      | \$25,000         |                              |                  |
| Other assets     | <u>\$5,000</u>   | Stockholder equity           | <u>\$50,000</u>  |
| Total assets     | <u>\$100,000</u> | Total liabilities and equity | <u>\$100,000</u> |

Figure 7.2 is a condensed version of Borg’s balance sheet that still preserves its basic structure. Notice that current assets are reduced to two components, cash and operating assets. We separate cash from operating assets for a good reason. Later, we show that net cash flow from the cash flow statement is used to adjust cash on the balance sheet. This adjustment is more clearly illustrated by first separating current assets into cash and operating assets.

## CHECK THIS

- 7.2a What are some examples of current assets?
- 7.2b. What are some examples of fixed assets?
- 7.2c. What are some examples of current liabilities?
- 7.2d. Which accounts in Figure 7.1 show changes between 2535 and 2536 balance sheets?

Figure 7.3 **Borg Corporation Condensed Income Statement**

|                           |                 |                |
|---------------------------|-----------------|----------------|
| Net sales                 | \$90,000        | \$90,000       |
| Cost of goods sold        | <u>(70,000)</u> | <u>-70,000</u> |
| Gross profit              | \$20,000        | \$20,000       |
| Operating expenses        | <u>(13,000)</u> | <u>-13,000</u> |
| Operating income          | \$7,000         | \$7,000        |
| Investment income         | 700             | +700           |
| Interest expense          | <u>(2,000)</u>  | <u>-2,000</u>  |
| Pretax income             | \$5,700         | \$5,700        |
| Income taxes <sup>1</sup> | <u>(2,056)</u>  | <u>-2,056</u>  |
| Net income                | <u>\$3,644</u>  | <u>\$3,644</u> |
| Dividends                 | <u>(1,000)</u>  | <u>-1,000</u>  |
| Retained earnings         | \$2,644         | \$2,644        |

1. A tax rate of 40 percent applies to the total of Operating Income less Interest Expense plus the taxable 20% portion of preferred stock dividends, i.e.,  $\$7,000 - \$2,000 + 20\% \times 7\% \times \$10,000 = \$5,140$  and  $40\% \times \$5,140 = \$2,056$ .

(*margin. def. net income* The difference between a company's revenues and expenses, used to either pay dividends to stockholders or kept as retained earnings within the company to finance future growth.)

**7.2b The Income Statement**

Figure 7.3 is a condensed income statement for Borg Corporation. The left column follows standard accounting notation and the right column follows familiar arithmetic notation. Of course, the right column would not appear in an actual financial statement and is included here for

convenience only. This income statement reports revenues and expenses for the corporation over a one-year accounting period. Examine it carefully and be sure you are familiar with its top-down structure.

The income statement begins with net sales, from which cost of goods sold (COGS) is subtracted to yield gross profit. Cost of goods sold represents direct costs of production and sales; that is, costs that vary directly with the level of production and sales. Next, operating expenses are subtracted from gross profit to yield operating income. Operating expenses are indirect costs of administration and marketing; that is, costs that do not vary directly with production and sales.

In addition to operating income from its own business operations, Borg Corporation has investment income from preferred stock dividends. Adding this investment income and then subtracting interest expense on debt yields pretax income. Finally, subtracting income taxes from pretax income yields net income. Net income is often referred to as the “bottom line” because it is normally the last line of the income statement. In this example, however, we have added dividends and retained earnings information, items that often appear in a separate financial statement. To avoid a separate statement, we here show that Borg Corporation paid dividends during the year. The sum of dividends and retained earnings is equal to net income:

$$\text{Net Income} = \text{Dividends} + \text{Retained Earnings}. \quad [2]$$

The footnote to Figure 7.3 explains that only 20 percent of preferred stock dividends are taxable. This feature of the federation tax code allows a company to exclude 80 percent of dividends received from another company from federal income tax.<sup>1</sup> In this case, Borg receives \$700 in

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<sup>1</sup> Actually, the exclusion is either 70 or 80 percent depending on how much of another company’s stock is held.

dividends from Cardassian Mining and pays taxes on only \$140 (20 percent) of this amount.

Assuming a 40 percent tax rate, the actual tax amount is  $\$56 = 40\% \times \$140$ .

### CHECK THIS

- 7.2e. What is cost of goods sold (COGS)?
- 7.2f. What is the difference between gross profit and operating income?
- 7.2g. What is the difference between net income and pretax income?
- 7.2h. What is meant by retained earnings?

*(marg. def. **cash flow** Income realized in cash form.)*

*(marg. def. **noncash items** Income and expense items not realized in cash form.)*

### 7.2c The Cash Flow Statement

The cash flow statement reports where a company generated cash and where cash was used over a specific accounting period. The cash flow statement assigns all cash flows to one of three categories: operating cash flows, investment cash flows, or financing cash flows.

Figure 7.4 **Borg Corporation Condensed Cash Flow Statement**

|                                   |                |               |
|-----------------------------------|----------------|---------------|
| Net Income                        | \$3,644        | \$3,644       |
| Depreciation                      | <u>3,000</u>   | <u>+3,000</u> |
| Operating Cash Flow               | \$6,644        | \$6,644       |
| Investment Cash Flow <sup>1</sup> | (\$15,000)     | -15,000       |
| Financing Cash Flow <sup>2</sup>  | <u>\$9,000</u> | <u>+9,000</u> |
| Net Cash Increase                 | <u>\$644</u>   | <u>\$644</u>  |

1. December 2536 purchase of 50 percent interest in Klingon Enterprises for \$15,000 (including \$5,000 goodwill).

2. Issue of \$10,000 par value 8 percent coupon bonds, less a \$1,000 dividend payout.

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Figure 7.4 is a condensed cash flow statement for Borg Corporation. (This is the last appearance of both accounting and arithmetic notation.) The cash flow statement begins with net income, which is the principal accounting measure of earnings for a corporation. However, net income and cash flow are not the same and often deviate greatly from each other. A primary reason why income differs from cash flow is that income contains noncash items. For example, depreciation is a noncash expense that must be added to net income when calculating cash flow. Adjusting net income for noncash items yields operating cash flow.

*(marg. def. **operating cash flow** Cash generated by a firm's normal business operations.)*

*(marg. def. **investment cash flow** Cash flow resulting from purchases and sales of fixed assets and investments.)*

*(marg. def. **financing cash flow** Cash flow originating from the issuance or repurchase of securities and the payment of dividends.)*

Operating cash flow is the first of three cash flow categories reported in the cash flow statement. The second and third categories are investment cash flow and financing cash flow. Investment cash flow includes any purchases or sales of fixed assets and investments. For example, Borg's purchase of Klingon Enterprises common stock reported in footnote 1 is an investment cash flow. Financing cash flow includes any funds raised by an issuance of securities or expended by a repurchase of outstanding securities. In this example, Borg's \$10,000 debt issue and \$1,000 dividend payout reported in footnote 2 are examples of financing cash flows.

Standard accounting practice specifies that dividend payments to stockholders are financing cash flows, whereas interest payments to bondholders are operating cash flows. One reason is that dividend payments are discretionary, while interest payments are mandatory. Also, interest payments

are tax-deductible expenses, but dividend payouts are not tax deductible. In any case, interest payments are cash expenses reported on the income statement. Since they are cash expenses, they do not appear in the cash flow statement to reconcile the difference between income and cash flow.

The sum of operating cash flow, investment cash flow, and financing cash flow yields the net change in the firm's cash. This change is the "bottom line" of the cash flow statement and reveals how much cash flowed into or out of the company's cash account during an accounting period.

#### CHECK THIS

- 7.2i. What is the difference between net income and operating cash flow?
- 7.2j. What are some noncash items used to calculate operating cash flow?
- 7.2k. What is the difference between an investment cash flow and a financing cash flow?
- 7.2l. What is meant by net increase in cash?
- 7.2m. Can you explain why a cash item like interest expense does not appear on the cash flow statement?

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(*margin definition*. **return on assets (ROA)** Net income stated as a percentage of total income.)

(*margin definition*. **return on equity (ROE)** Net income stated as a percentage of stockholder equity.)

### 7.2d Performance Ratios and Price Ratios

Annual reports and 10Ks normally contain various items of supplemental information about the company. For example, certain profitability ratios may be reported to assist interpretation of the company's operating efficiency. For Borg Corporation, some standard profitability ratios are calculated as follows.

| <b>Ratio</b>           | <b>Formula</b>                  | <b>Calculation</b>               |
|------------------------|---------------------------------|----------------------------------|
| Gross margin           | Gross profit / Net sales        | $\$20,000 / \$90,000$<br>= 22.2% |
| Operating margin       | Operating income / Net sales    | $\$7,000 / \$90,000$<br>= 7.8%   |
| Return on assets (ROA) | Net income / Total assets       | $\$3,644 / \$100,000$<br>= 3.64% |
| Return on equity (ROE) | Net income / Stockholder equity | $\$3,644 / \$50,000$<br>= 7.29%  |

Notice that **return on assets (ROA)** and **return on equity (ROE)** are calculated using current year-end values for total assets and stockholder equity. It could be argued that prior-year values should be used for these calculations. However, standard practice calls for the use of current year-end values.

Annual reports and 10Ks may also report per-share calculations of book value, earnings, and operating cash flow, respectively. Per-share calculations require the number of common stock shares

outstanding. Borg's balance sheet reports 2,000 shares of common stock outstanding. Thus for Borg Corporation, these per-share values are calculated as follows.

| <b>Ratio</b>                | <b>Formula</b>                           | <b>Calculation</b>         |
|-----------------------------|--|----------------------------|
| Book value per share (BVPS) | Stockholder equity / Shares outstanding  | $\$50,000 / 2,000 = \$25$  |
| Earnings per share (EPS)    | Net income / Shares outstanding          | $\$3,644 / 2,000 = \$1.82$ |
| Cash flow per share (CFPS)  | Operating cash flow / Shares outstanding | $\$6,644 / 2,000 = \$3.32$ |

Notice that cash flow per share (CFPS) is calculated using operating cash flow - *NOT* the bottom line on the cash flow statement! Most of the time when you hear the term "cash flow," it refers to operating cash flow.

Recall that in the previous chapter, we made extensive use of price ratios to analyze stock values. Using per-share values calculated immediately above, and Borg's year-end stock price of \$40 per share, we get the following price ratios:

| <b>Ratio</b>           | <b>Formula</b>     | <b>Calculation</b>   |
|------------------------|--------------------|----------------------|
| Price-book (P/B)       | Stock price / BVPS | $\$40 / \$25 = 1.6$  |
| Price-earnings (P/E)   | Stock price / EPS  | $\$40 / \$1.82 = 22$ |
| Price-cash flow (P/CF) | Stock price / CFPS | $\$40 / \$3.32 = 12$ |

We use these price ratios later when assessing the potential impact of a sales campaign on Borg Corporation's future stock price.

CHECK THIS

- 7.2n. What is the difference between gross margin and operating margin?
- 7.2m. What is the difference between return on assets (ROA) and return on equity (ROE)?
- 7.2o. What is the difference between earnings per share (EPS) and cash flow per share (CFPS)?
- 7.2p. How is cash flow per share (CFPS) calculated?

*(marg. def. **pro forma financial statements** Statements prepared using certain assumptions about future income, cash flow, and other items. Pro forma literally means according to prescribed form.)*

### ***7.3 Financial Statement Forecasting***

In December 2536, Borg publicly announced the completed acquisition of a 50 percent financial interest in Ferengi Traders. However, half the acquired shares do not carry voting rights, so the acquisition is treated as a simple investment on the balance sheet. The stated purpose of the acquisition was to expand sales outlets. Complementing the acquisition, Borg also announced plans for a marketing campaign to increase next year's net sales to a targeted \$120,000. As a Borg analyst, you must examine the potential impact of these actions. You immediately contact Borg management to inquire about the details of the acquisition and the marketing campaign. Armed with this additional information, you decide to construct pro forma financial statements for Borg Corporation for the year 2537. You also decide to formulate your analysis by considering two scenarios: an optimistic sales scenario and a pessimistic sales scenario. Under the optimistic scenario, the marketing campaign is successful and targeted Net Sales of \$120,000 are realized with an assumed cost of goods sold of \$90,000. Under the pessimistic scenario, only \$100,000 of net sales are realized with a cost of goods sold of \$80,000. Operating expenses will be \$17,000 under both scenarios, reflecting the costs of the

marketing campaign. The appropriate sequence for your analysis is to construct pro forma income statements, then pro forma cash flow statements, followed by pro forma balance sheets.

Figure 7.5 **Borg Corp. Pro Forma Income Statements**

| Scenario:                      | Optimistic      | Pessimistic     |
|--------------------------------|-----------------|-----------------|
| Net Sales                      | \$120,000       | \$100,000       |
| Cost of Goods Sold             | <u>(90,000)</u> | <u>(80,000)</u> |
| Gross Profit                   | \$30,000        | \$20,000        |
| Operating Expenses             | <u>(17,000)</u> | <u>(17,000)</u> |
| Operating Income               | \$13,000        | \$3,000         |
| Investment Income <sup>1</sup> | 2,200           | 700             |
| Interest Expense <sup>2</sup>  | <u>(2,800)</u>  | <u>(2,800)</u>  |
| Pretax Income                  | \$12,400        | \$900           |
| Income Taxes <sup>3</sup>      | <u>(4,136)</u>  | <u>(136)</u>    |
| Net Income                     | <u>\$8,264</u>  | <u>\$764</u>    |
| Dividends <sup>4</sup>         | \$1,000         | \$1,000         |
| Retained Earnings              | \$7,264         | (\$236)         |

1. Preferred stock dividends of \$700 plus \$1,500 investment income from Ferengi Traders under optimistic sales results and \$0 under pessimistic sales results, i.e.,  $\$700 + \$1,500 = \$2,200$ .
2. Prior-year interest expense of \$2,000 plus payment of 8 percent coupons on the December 2536 debt issue of \$10,000, i.e.,  $\$2,000 + 8\% \times \$10,000 = \$2,800$ .
3. Tax rate of 40 percent applied to the sum of Operating Income less Interest Expense plus the 20% taxable portion of preferred stock dividends, i.e.,  $(\$13,000 - \$2,800 + 20\% \times 7\% \times \$10,000) \times 40\% = \$4,136$ .
4. Assumes no change in dividends from prior year.

### 7.3a The Pro Forma Income Statement

Figure 7.5 contains side-by-side pro forma income statements for Borg Corporation corresponding to optimistic and pessimistic sales scenarios in the coming year. These begin with the assumed net sales and cost of goods sold values for both scenarios. They then proceed with the standard top-down calculations of income where several calculation methods and additional

assumptions are explained in footnotes. The optimistic sales scenario produces a net income of \$8,264, of which \$1,000 is paid as dividends and \$7,264 is kept as retained earnings. Under the pessimistic sales scenario net income is only \$764, with \$1,000 of dividends and -\$236 of retained earnings.

Footnote 1 explains that investment income is \$2,200 under optimistic sales and \$700 under pessimistic sales. This reflects constant preferred stock dividends of \$700 and assumed noncash investment income from Ferengi Traders of \$1,500 under optimistic sales and \$0 under pessimistic sales. The difference in scenario investment incomes stems from the fact that Ferengi is involved with the sales campaign.

Footnote 3 explains that taxes are paid on operating income less interest expense plus the taxable portion of preferred stock dividends. Notice that Borg's noncash investment income from Ferengi Traders is not taxed because Ferengi paid no dividends. In this situation, Borg records the value of its investment in Ferengi as its share of Ferengi's stockholder equity value. Thus when Ferengi adds retained earnings to its equity value, Borg records its share of the addition as noncash income and changes the balance sheet value of its investment in Ferengi accordingly. The next step of your analysis is construction of pro forma cash flow statements.

#### CHECK THIS

- 7.3a. Create a pro forma income statement for Borg Corporation corresponding to pessimistic sales results assuming noncash investment losses of \$1,000.

Figure 7.6 **Borg Corp. Pro Forma Cash Flow Statements**

| Scenario:                                 | Optimistic       | Pessimistic      |
|---|------------------|------------------|
| Net income                                | \$8,264          | \$764            |
| Depreciation/amortization <sup>1</sup>    | 3,200            | 3,200            |
| Increase in operating assets <sup>2</sup> | (2,000)          | (3,000)          |
| Noncash investment income                 | <u>(1,500)</u>   | <u>(0)</u>       |
| Operating cash flow                       | \$7,964          | \$964            |
| Investment cash flow <sup>3</sup>         | \$0              | \$0              |
| Financing cash flow <sup>4</sup>          | <u>(\$1,000)</u> | <u>(\$1,000)</u> |
| Net cash increase                         | <u>\$6,964</u>   | <u>(\$36)</u>    |

1. Assumes the same \$3,000 depreciation as in the prior year and annual goodwill amortization of \$200 based on a 25-year amortization schedule.
2. Assumes an increase in operating assets of \$2,000 under optimistic sales and \$3,000 under pessimistic sales.
3. Assumes no new investments.
4. Assumes no change in dividend payouts.

### ***7.3b The Pro Forma Cash Flow Statement***

Figure 7.6 contains side-by-side pro forma cash flow statements for Borg Corporation under optimistic and pessimistic sales scenarios. Under the optimistic sales scenario net cash increase is \$6,964; under the pessimistic scenario net cash flow is -\$36. The net cash increase is applied to adjust the cash account on the pro forma balance sheet. This adjustment is now more convenient since you separated cash from operating assets in Borg's condensed balance sheet.

Footnote 1 explains that goodwill amortization is \$200 per year based on a 25-year amortization schedule. This amortization is applied to the \$5,000 of goodwill on Borg's prior-year balance sheet associated with its purchase of a 50 percent stake in Ferengi Traders. Footnote 2 explains that operating assets are assumed to increase by \$2,000 under optimistic sales and \$3,000 under pessimistic sales. These increases are realistic since a sales campaign will surely require

additional inventory. The increase is bigger under pessimistic sales because more inventory goes unsold. Your next step is to create the pro forma balance sheet for Borg Corporation.

### CHECK THIS

- 7.3b. Create a pro forma cash flow statement for Borg Corporation under pessimistic sales results assuming noncash investment losses of \$1,000.

**Figure 7.7 Borg Corporation Pro Forma Balance Sheets**

| Scenario:                       | Optimistic       | Pessimistic     |
|---------------------------------|------------------|-----------------|
| Cash <sup>1</sup>               | \$8,964          | \$1,964         |
| Operating assets <sup>2</sup>   | 10,000           | 11,000          |
| Fixed assets <sup>3</sup>       | 57,000           | 57,000          |
| Investments <sup>4</sup>        | 26,300           | 24,800          |
| Other assets                    | <u>5,000</u>     | <u>5,000</u>    |
| Total assets                    | <u>\$107,264</u> | <u>\$99,764</u> |
| Current liabilities             | \$15,000         | \$15,000        |
| Long-term debt                  | 30,000           | 30,000          |
| Other liabilities               | 5,000            | 5,000           |
| Stockholder equity <sup>5</sup> | <u>57,264</u>    | <u>49,764</u>   |
| Total liabilities and equity    | <u>\$107,264</u> | <u>\$99,764</u> |

1. Prior-year cash of \$2,000 plus \$6,964 net cash flow from the pro forma cash flow statement.
2. Prior-year operating assets of \$8,000 plus an additional \$2,000 under optimistic sales and \$3,000 under pessimistic sales.
3. Prior-year fixed assets of \$60,000 less the assumed \$3,000 depreciation.
4. Prior-year investments of \$25,000 plus noncash investment income of \$1,500 under optimistic sales only less \$200 goodwill amortization.
5. Prior-year equity of \$50,000 plus \$7,264 retained earnings from the pro forma income statement.

### ***7.3c The Pro Forma Balance Sheet***

Figure 7.7 contains side-by-side pro forma balance sheets for Borg Corporation as they might result from optimistic and pessimistic sales scenarios. This balance sheet is created by starting with the prior-year condensed balance sheet and then making the following adjustments consistent with the pro forma income statements and cash flow statements.

1. Cash of \$2,000 is adjusted by net cash increase of \$6,964 under the optimistic sales scenario and -\$36 under the pessimistic sales scenario.
2. Current assets of \$8,000 are increased by \$2,000 under the optimistic sales scenario and increased by \$3,000 under the pessimistic sales scenario.
3. Fixed assets of \$60,000 are adjusted by depreciation of \$3,000, which is the same under both sales scenarios.
4. Investments of \$25,000 are increased by the assumed noncash investment income from Ferengi Traders of \$1,500 under optimistic sales and \$0 under pessimistic sales, less \$200 of goodwill amortization. As noted earlier, the difference by scenario is based on the fact that Ferengi is involved with the sales campaign.
5. Equity of \$50,000 is adjusted for retained earnings of \$7,264 under optimistic sales and -\$236 under pessimistic sales.

All other accounts remain unchanged, which is a simplifying assumption made to focus attention on the immediate impact of the sales campaign.

#### **CHECK THIS**

- 7.3c. Create a pro forma balance sheet for Borg under a pessimistic sales scenario assuming noncash investment losses of \$1,000.

**7.3d Projected Profitability and Price Ratios**

In addition to preparing pro forma financial statements, you decide to also calculate projected profitability ratios and per-share values under optimistic and pessimistic sales scenarios. These are reported immediately below and compared with their original year-end values.

| <b>Scenario</b>             | <b>Original</b> | <b>Optimistic</b> | <b>Pessimistic</b> |
|-----------------------------|-----------------|-------------------|--------------------|
| Gross margin                | 22.22%          | 25%               | 20%                |
| Operating margin            | 7.78%           | 10.83%            | 3%                 |
| Return on assets (ROA)      | 3.64%           | 7.70%             | .7%                |
| Return on equity (ROE)      | 7.29%           | 14.43%            | 1.54%              |
| Book value per share (BVPS) | \$25            | \$28.63           | \$24.88            |
| Earnings per share (EPS)    | \$1.82          | \$4.13            | \$0.38             |
| Cash flow per share (CFPS)  | \$3.32          | \$3.98            | \$.48              |

One common method of analysis is to calculate projected stock prices under optimistic and pessimistic sales scenarios using prior-period price ratios and projected per-share values from pro forma financial statements. Similar procedures were performed in the previous chapter using prior-period average price ratios and per-share values based on growth rate projections. For Borg Corporation, you decide to take year-end 2536 price ratios and multiply each ratio by its corresponding pro forma per-share value. The results of these projected stock price calculations are shown immediately below.

| Scenario           | Projected stock prices |             |
|--------------------|------------------------|-------------|
|                    | Optimistic             | Pessimistic |
| BVPS $\times$ P/B  | \$45.81                | \$39.81     |
| EPS $\times$ P/E   | \$90.86                | \$8.36      |
| CFPS $\times$ P/CF | \$47.76                | \$5.76      |

These projected stock prices reflect widely varying degrees of sensitivity to optimistic and pessimistic sales scenario outcomes. For example, projected prices based on EPS and CFPS are especially sensitive to which scenario is realized. On the other hand, projected stock prices based on BVPS are far less sensitive to scenario realization.

Which projected stock price is correct? Well, it clearly depends on which sales scenario is realized and which price ratio the financial markets will actually use to value Borg Corporation's stock. This is where experience and breadth of knowledge count immensely. Of course no one can make perfectly accurate predictions, but the analyst's job is to expertly assess the situation and make an investment recommendation supported by reasonable facts and investigation. But some analysts are better than others. Like professional baseball players, professional stock analysts with better batting averages can do well financially.

#### ***7.4 Adolph Coors Company Case Study***

After carefully reading the analysis of Borg Corporation, you should have a reasonably clear picture of how earnings and cash flow analyses might proceed using pro forma financial statements. To further illustrate the use of pro forma financial statements in earnings and cash flow analysis, this

section presents an analysis based on the 1995 financial statements for Adolph Coors Company.

Using data for a real company provides a real challenge (You didn't believe Borg was real?).

This section begins with a review of Coors 1995 financial statements. We then proceed to analyze the effects on earnings and cash flow that might result from product sales either rising or falling by 10 percent. The analysis is similar to that for Borg Corporation, but there are a few important differences. Amounts shown are in thousands of dollars (except earnings per share).

Figure 7.8 *Adolph Coors Company 1995 Balance Sheet*

|                              |                    |
|------------------------------|--------------------|
| Cash and cash equivalents    | \$32,386           |
| Operating assets             | 330,134            |
| Property, plant, equipment   | 887,409            |
| Goodwill                     | 26,470             |
| Other assets                 | <u>110,458</u>     |
| Total assets                 | <u>\$1,386,857</u> |
| Current liabilities          | \$323,663          |
| Long-term debt               | 195,000            |
| Other liabilities            | <u>173,178</u>     |
| Total liabilities            | <u>\$691,841</u>   |
| Paid-in capital              | \$43,726           |
| Retained earnings            | <u>651,290</u>     |
| Total shareholder equity     | \$695,016          |
| Total liabilities and equity | <u>\$1,386,857</u> |

Figure 7.9 *Adolph Coors Company 1995 Income Statement*

|                      |                    |
|----------------------|--------------------|
| Net sales            | \$1,675,379        |
| Cost of goods sold   | <u>(1,091,763)</u> |
| Gross profit         | \$583,616          |
| Operating expenses   | <u>(503,688)</u>   |
| Operating income     | \$79,928           |
| Other income         | 3,868              |
| Net interest expense | <u>(10,518)</u>    |
| Pretax income        | \$73,278           |
| Income tax           | <u>30,100</u>      |
| Net income           | <u>\$43,178</u>    |
| Earnings per share   | \$1.13             |
| Shares outstanding   | 38,170             |

Figure 7.10 *Adolph Coors Company 1995 Cash Flow Statement*

|  |                 |
|--|-----------------|
| Net income   | \$43,178        |
| Depreciation and amortization                                      | 122,830         |
| Loss on Sale of properties   | 1,274           |
| Change in deferred taxes   | (1,744)         |
| Changes in operating assets  | (19,122)        |
| Changes in current liabilities                                     | <u>(56,319)</u> |
| Operating cash flow  | \$90,097        |
| Net additions to properties  | (\$101,349)     |
| Changes in other assets  | <u>(14,823)</u> |
| Investing cash flow  | (\$116,172)     |
| Issuance/redemption of long-term debt                              | \$56,000        |
| Issuance/purchase of stock   | (5,819)         |
| Dividends paid   | (19,066)        |
| Other financing  | <u>(116)</u>    |
| Financing cash flow  | \$30,999        |
| Net cash increase  | \$4,924         |
| Net cash increase after foreign<br>currency translation adjustment | <u>\$5,218</u>  |

Adolph Coors 1995 condensed balance sheet is shown in Figure 7.8, where all numbers are scaled to represent thousands of dollars. This balance sheet shows that at year-end 1995 Coors had \$1.39 billion of total assets and \$695 million of stockholder equity. In Figure 7.9, the Adolph Coors 1995 condensed income statement, the bottom line reveals that Coors earned \$43 million in net income from \$1,675 million net sales. From these values, we calculate Adolph Coors return on assets as 3.1 percent and return on equity as 6.2 percent. Also, with 38.17 million shares outstanding, Coors realized 1995 earnings per share of \$1.13. Finally, based on Coors 1995 year-end stock price of \$23.25, we obtain a price-book ratio of 1.28 and a price-earnings ratio of 20.58.

The operating cash flow section of Adolph Coors condensed 1995 cash flow statement (Figure 7.10) shows that in 1995 deferred taxes increased and losses were realized on property sales. Also, operating assets increased while current liabilities decreased. The investing cash flow section reveals net purchases of properties and other assets. The financing cash flow section shows that cash was raised by issuing more long-term debt than was redeemed, but cash was expended by buying more stock shares than were sold. Finally, notice the adjustment to net cash flow due to the effects of foreign currency translation. This is a commonly encountered item for companies with assets denominated in foreign currencies. The adjustment reflects revaluations due to changes in exchange rates. However, the exact method of adjustment is not important here. The bottom line of the cash flow statement is that Coors realized a 1995 operating cash flow of \$90.1 million, with cash flow per share of \$2.36 and a price-cash flow ratio of 9.85.

We now move on to what-if analyses of earnings and cash flow. Specifically, what might happen to earnings and cash flow if product sales increased or decreased by 10 percent? To perform this analysis, we proceed through the same sequence of operations as before. That is, we first create

a pro forma income statement, then a pro forma cash flow statement, and finally a pro forma balance sheet.

Figure 7.11 *Adolph Coors Company Pro Forma 1996 Income Statements*

|  |                    |                  |
|--|--------------------|------------------|
| Sales growth (%)                       | +10%               | -10%             |
| Net sales                              | \$1,842,917        | \$1,507,841      |
| Cost of goods sold <sup>1</sup>        | <u>(1,200,939)</u> | <u>(982,587)</u> |
| Gross profit                           | \$641,978          | \$525,254        |
| <i>Operating expenses</i> <sup>*</sup> | <u>(503,688)</u>   | <u>(503,688)</u> |
| Operating income                       | \$138,290          | \$21,566         |
| <i>Other income</i>                    | 3,868              | 3,868            |
| <i>Net interest expense</i>            | <u>(10,518)</u>    | <u>(10,518)</u>  |
| Pretax income                          | \$131,640          | \$14,916         |
| Income tax <sup>2</sup>                | <u>(53,972)</u>    | <u>(6,116)</u>   |
| Net income                             | <u>\$77,668</u>    | <u>\$8,800</u>   |
| <i>Dividends</i>                       | 19,066             | 19,066           |
| Retained earnings                      | 58,602             | (10,266)         |
| Earnings per share                     | \$2.03             | \$0.23           |
| <i>Shares outstanding</i>              | 38,170             | 38,170           |

1. Assumes a constant 1995 gross margin, which implies that cost of goods sold changes by the same  $\pm 10\%$  as net sales.

2. Assumes a constant 1995 average tax rate of 41 percent.

\* Italics indicate items with constant 1995 values.

Pro forma income statements corresponding to a 10 percent increase and a 10 percent decrease in net sales and cost of goods sold for Coors are shown in Figure 7.11. For convenience, italics indicate items for which constant 1995 values are used. The  $\pm 10$  percent changes in net sales and cost of goods sold cause gross profit to increase and decrease by 10 percent also. However, since operating expenses are assumed to be a constant 1995 value across the two sales scenarios, operating income varies considerably. Carrying forward 1995 other income and net interest expense yields pretax incomes that vary significantly across sales scenarios. By assuming the same average tax rate

as in 1995, we obtain net income values across both sales scenarios. Then, letting 1995 dividends continue unchanged, we get positive and negative pro forma retained earnings values. These retained earnings values from the pro forma income statement will be used to adjust cumulative retained earnings on the pro forma balance sheet. But first we take these pro forma net income values as starting points to create pro forma cash flow statements.

Figure 7.12 *Adolph Coors Company Pro Forma Cash Flow Statements*

|                                       |                  |                 |
|---------------------------------------|------------------|-----------------|
| Sales growth (%)                      | +10%             | -10%            |
| Net income                            | \$77,668         | \$8,800         |
| <i>Depreciation/amortization*</i>     | 122,830          | 122,830         |
| <i>Changes in operating assets</i>    | (19,122)         | (19,122)        |
| <i>Changes in current liabilities</i> | <u>(56,319)</u>  | <u>(56,319)</u> |
| Operating cash flow                   | \$125,057        | \$56,189        |
| Investing cash flow <sup>1</sup>      | 0                | 0               |
| Financing cash flow <sup>2</sup>      | <u>(19,066)</u>  | <u>(19,066)</u> |
| Net cash flow                         | <u>\$105,991</u> | <u>\$37,123</u> |

1. Assumes zero investment cash flows.

2. Assumes a zero change in shares outstanding, long-term debt and other financing, but constant 1995 dividends of \$19,066.

\* Italics indicate items with constant 1995 values.

Pro forma cash flow statements for Coors appear in Figure 7.12, where italics indicate that constant 1995 values are used. These statements begin with pro forma net income values, to which we add back constant 1995 depreciation and amortization expenses and also adjust for constant 1995 changes in operating assets and current liabilities. This yields operating cash flows across both sales scenarios. Since our intention is to isolate the impacts of changes in net sales, we set investment cash flow equal to zero in both sales scenarios. Similarly for financing cash flows, we set the change in long-term debt to zero. Then, summing operating, investment, and financing cash flows yields net

cash increases for the two sales scenarios. Since currency translation effects are unrelated to sales, we exclude them from our analysis. Now, we move on to the pro forma balance sheets.

Figure 7.13 *Adolph Coors Company Pro Forma Balance Sheet*

|   |                    |                    |
|---|--------------------|--------------------|
| Sales growth (%)                        | +10%               | -10%               |
| Cash                                    | \$138,377          | \$69,509           |
| Operating assets <sup>1</sup>           | 349,256            | 349,256            |
| Property, plant, equipment <sup>2</sup> | 767,226            | 767,226            |
| Goodwill                                | 23,823             | 23,823             |
| <i>Other assets</i> *                   | <u>110,458</u>     | <u>110,458</u>     |
| Total assets                            | <u>\$1,389,140</u> | <u>\$1,320,272</u> |
| Current liabilities <sup>3</sup>        | \$267,344          | \$267,344          |
| <i>Long-term debt</i>                   | 195,000            | 195,000            |
| <i>Other liabilities</i>                | <u>173,178</u>     | <u>173,178</u>     |
| Total liabilities                       | <u>\$635,522</u>   | <u>\$635,522</u>   |
| <i>Paid-in capital</i>                  | \$43,726           | \$43,726           |
| Retained earnings                       | <u>709,892</u>     | <u>641,024</u>     |
| Total shareholder equity                | \$753,618          | \$684,750          |
| Total liabilities and equity            | <u>\$1,389,140</u> | <u>\$1,320,272</u> |

1. 1995 Operating assets of \$330,134 plus an increase of \$19,122
2. Depreciation and amortization of \$122,830 is allocated as \$2,647 of amortization (10 percent of 1995 goodwill) and \$120,183 of depreciation.
3. 1995 Current liabilities of \$323,663 less \$56,319.

\* Italics indicate items with constant 1995 values.

To create Coors pro forma balance sheets as in Figure 7.12, the first two steps should be:

1. Adjust retained earnings on the balance sheet with retained earnings from the income statement.
2. Adjust cash on the balance sheet with net cash increase from the cash flow statement.

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Since retained earnings and the net cash increase are not equal, at this point the balance sheets will not balance. However, all items making up the difference between retained earnings and the net cash increase appear on the cash flow statement. Therefore, all subsequent adjustments will come from the cash flow statement. In this example, two adjustments are needed.

First, property, plant, and equipment and goodwill accounts must be adjusted to reflect depreciation and amortization. For realistic detail, notice that constant 1995 depreciation and amortization of \$122,830 is allocated in 1996 as \$2,647 of amortization (10 percent of 1995 goodwill) and \$120,183 of depreciation as follows.

|                                     |                  |
|-------------------------------------|------------------|
| 1995 Property, plant, and equipment | \$887,409        |
| 1996 Depreciation                   | <u>(120,183)</u> |
| 1996 Property, plant, and equipment | \$767,226        |
| <br>                                |                  |
| 1995 Goodwill                       | \$26,470         |
| 1996 Amortization                   | <u>(2,647)</u>   |
| 1996 Goodwill                       | \$23,823         |

Since depreciation and amortization are part of the difference between retained earnings and net cash flow, these adjustments move the balance sheet closer to balancing. Second, the operating assets line is increased by \$19,122 and current liabilities decreased by \$56,319. This brings the balance sheet to a complete balance.

To complete the analysis of Adolph Coors, projected profitability ratios and per-share values under increased and decreased sales scenarios are reported immediately below and compared with their original year-end 1995 values.

| <b>Scenario</b>             | <b>Original</b> | <b>+10 percent</b> | <b>-10 percent</b> |
|-----------------------------|-----------------|--------------------|--------------------|
| Gross margin                | 34.83%          | 34.83%             | 34.83%             |
| Operating margin            | 4.77%           | 7.50%              | 1.43%              |
| Return on assets (ROA)      | 3.11%           | 5.59%              | 0.67%              |
| Return on equity (ROE)      | 6.21%           | 10.31%             | 1.29%              |
| Book value per share (BVPS) | \$18.21         | \$19.74            | \$17.94            |
| Earnings per share (EPS)    | \$1.13          | \$2.03             | \$0.23             |
| Cash flow per share (CFPS)  | \$2.36          | \$3.28             | \$1.47             |

For Adolph Coors Company, taking year-end 1995 price ratios and multiplying each ratio by its corresponding projected 1996 per-share value results in the following projected stock price calculations:

| <b>Projected stock prices</b> |                    |                    |
|-------------------------------|--------------------|--------------------|
| <b>Scenario</b>               | <b>+10 percent</b> | <b>-10 percent</b> |
| BVPS × P/B                    | \$25.27            | \$22.96            |
| EPS × P/E                     | \$41.78            | \$4.73             |
| CFPS × P/CF                   | \$32.31            | \$14.48            |

These projected stock prices reflect widely varying degrees of sensitivity to sales scenario outcomes. Earnings per share and cash flow per share are especially sensitive to which scenario is realized, while book value per share is less sensitive to scenario realization.

### 7.5 Summary and Conclusions

This chapter focuses on earnings and cash flow analysis using financial statement information.

Several important aspects of financial statements and their use were covered. These are summarized as follows.

1. A primary source of financial information is a company's annual report. In addition, the annual 10K report and quarterly 10Q updates filed with the SEC are available from the EDGAR archives.
2. Three financial statements are essential reading for securities analysts: the balance sheet, the income statement, and the cash flow statement.
3. The balance sheet has three sections: assets, which are used to generate earnings; liabilities, which are financial obligations; and equity representing ownership claims. A fundamental accounting identity for balance sheets states that assets are equal to liabilities plus equity:

$$\text{Assets} = \text{Liabilities} + \text{Equity}.$$

4. The balance sheet has four major asset categories: current assets, fixed assets, investments, and other assets.
5. The balance sheet has three major liability categories: current liabilities, long-term debt, and other liabilities.
6. The income statement reports revenues and expenses. Income is used to pay dividends or retained to finance future growth. Net income is the “bottom line” for a company.
7. The cash flow statement reports how cash was generated and where it was used. The cash flow statement assigns all cash flows to one of three categories: operating cash flow, investment cash flow, or financing cash flow. The sum of operating cash flow, investment cash flow, and financing cash flow yields the net cash increase.
8. Profitability ratios based on financial statement information are often reported to assist interpretation of a company's operating efficiency. Some standard profitability ratios are calculated as follows.

$$\text{Gross margin} = \text{Gross profit} / \text{Net sales}$$

$$\text{Operating margin} = \text{Operating income} / \text{Net sales}$$

$$\text{Return on assets (ROA)} = \text{Net income} / \text{Total assets}$$

$$\text{Return on equity (ROE)} = \text{Net income} / \text{Stockholder equity}$$

9. Annual reports and 10Ks may also report per-share calculations of book value, earnings, and operating cash flow, respectively. These per-share values are calculated as follows:

**Book value per share (BVPS) = Stockholder equity / Shares outstanding**

**Earnings per share (EPS) = Net Income / Shares outstanding**

**Cash flow per share (CFPS) = Operating cash flow / Shares outstanding**

Dividing the common stock price by the preceding per-share values, we get the following price ratios:

**Price-book ratio (P/B) = Stock price / BVPS**

**Price-earnings ratio (P/E) = Stock price / EPS**

**Price--Cash flow ratio (P/CF) = Stock price / CFPS**

10. One common method of analysis is to calculate projected stock prices using prior-period price ratios and projected per-share values from pro forma financial statements. These projected stock prices are calculated as follows.

**BVPS × P/B = Projected price based on pro forma book value**

**EPS × P/E = Projected price based on pro forma earnings**

**CFPS × P/CF = Projected price based on pro forma cash flow**

*Key terms*

|                            |                                       |
|----------------------------|---------------------------------------|
| <b>EDGAR</b>               | <b>asset</b>                          |
| <b>10K, 10Q</b>            | <b>liability</b>                      |
| <b>balance sheet</b>       | <b>equity</b>                         |
| <b>income statement</b>    | <b>income</b>                         |
| <b>cash flow statement</b> | <b>retained earnings</b>              |
| <b>cash flow</b>           | <b>operating cash flow</b>            |
| <b>noncash items</b>       | <b>investing cash flow</b>            |
| <b>financing cash flow</b> | <b>pro forma financial statements</b> |

### ***Get Real!***

This chapter builds on the preceding chapter by going deeper into earnings and cash flow, two of the most important tools of fundamental analysis. It focuses on using financial statement information to develop pro forma numbers to use in stock valuation. How should you, as an investor or investment manager, put this information to work?

The answer is you need to get your fingers dirty! Financial statement information is easy to get, either on the web through EDGAR (or any number of other sources) or through the mail, using, for example, *The Wall Street Journal's* statement service. As with all forms of financial analysis, the only way to gain experience is through practice. Nowhere is that more true than the examination of financial statements. The only way to learn to read with an expert eye is to study a large number of them.

To get started, pick a stock that you like, perhaps because it appears cheap based on our last chapter, and examine its financial statements. Follow this chapter's Coors analysis to do this. When you are finished, you will have created your own pro forma statements, and you will have an idea of the possible range of values for the stock price next year. Does the stock still look cheap?

As you read a company's financial statements, an important exercise is to try to understand what each number really represents. Why is it there? Is it a cash or market value? Or is it just an accounting number (like depreciation)? Financial analysts spend a great deal of time "adjusting" the numbers on financial statements, trying to make them correspond more closely to current market conditions than to historical costs.

## Chapter 7

### Earnings and Cash Flow Analysis

End of Chapter Questions and Problems

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#### *Review Problems and Self-Test*

1. **Margin calculations** Use the following income statement for McGwire-Sosa Lumber Co. to calculate gross and operating margins.

#### *McGwire-Sosa Limber 1999 Income Statement*

|                      |                |
|----------------------|----------------|
| Net sales            | \$4,000        |
| Cost of goods sold   | <u>(3,200)</u> |
| Gross profit         | \$800          |
| Operating expenses   | <u>(200)</u>   |
| Operating income     | \$600          |
| Other income         | 40             |
| Net interest expense | <u>( 60)</u>   |
| Pretax income        | \$580          |
| Income tax           | <u>232</u>     |
| Net income           | <u>\$348</u>   |
| Earnings per share   | \$1.74         |
| <br>                 |                |
| Recent price         | \$38.28        |

2. **Return calculations** Use the following balance sheet for McGwire-Sosa Lumber Co. along with the income statement in the previous question to calculate return on assets and return on equity.

*McGwire-Sosa Lumber 1999 Balance Sheet*

|                                |                |
|--------------------------------|----------------|
| Cash and cash equivalents      | \$ 200         |
| Operating assets               | 200            |
| Property, plant, and equipment | 1,580          |
| Other assets                   | <u>108</u>     |
| Total assets                   | <u>\$2,088</u> |
|                                |                |
| Current liabilities            | \$ 370         |
| Long-term debt                 | 306            |
| Other liabilities              | <u>20</u>      |
| Total liabilities              | <u>\$696</u>   |
|                                |                |
| Paid-in capital                | \$ 300         |
| Retained earnings              | <u>1,092</u>   |
| Total shareholder equity       | \$1,392        |
|                                |                |
| Total liabilities and equity   | <u>\$2,088</u> |

3. **Pro forma income statements** Prepare a pro forma income statement for McGwire-Sosa Lumber Co. assuming a 5 percent increase in sales. Based only on the pro forma income statement, what is the projected stock price (hint: what is the price-earnings ratio?).

*Answers to Self-Test Problems*

1. Gross margin is  $\$800/\$4,000 = 20\%$   
Operating margin is  $\$600/\$4,000 = 15\%$ .
2. Return on assets is  $\$348/\$2,088 = 16.7\%$ .  
Return on equity is  $\$348/\$1,392 = 25\%$ .
3. With 5 percent sales growth, sales will rise to \$4,200 from \$4,000. The pro forma income statement follows. A constant gross margin is assumed, implying that Cost of Goods Sold will also rise by 5 percent. A constant tax rate of 40 percent is used. Items in italics are carried over unchanged.

**McGwire-Sosa Lumber pro forma 2000 Income Statement**

|                             |                |
|-----------------------------|----------------|
| Net sales                   | \$4,200        |
| Cost of goods sold          | <u>(3,360)</u> |
| Gross profit                | \$840          |
| <i>Operating expenses</i>   | <u>(200)</u>   |
| Operating income            | \$640          |
| <i>Other income</i>         | 40             |
| <i>Net interest expense</i> | <u>( 60)</u>   |
| Pretax income               | \$620          |
| Income tax                  | <u>248</u>     |
| Net income                  | <u>\$372</u>   |
| Earnings per share          | \$1.86         |

To get a projected stock price, notice that the price-earnings ratio was  $\$38.28/\$1.74 = 22$ . Using this ratio as a benchmark, the pro forma earnings of \$1.86 imply a stock price of  $22 \times \$1.86 = \$40.92$ .

**Test Your IQ (Investments Quotient)**

- Cash flow** Cash flow per share is calculated as
  - net cash flow / shares outstanding
  - operating cash flow / shares outstanding
  - investing cash flow / shares outstanding
  - financing cash flow / shares outstanding
- Cash flow** Which of the following is not an adjustment to net income used to obtain Operating Cash Flow?
  - changes in operating assets
  - changes in current liabilities
  - loss on sale of assets
  - dividends paid
- Financial ratios** Which of the following profitability ratios is incorrect?
  - Gross margin = Gross profit / Cost of goods sold
  - Operating margin = Operating income / Net sales
  - Return on assets = Net income / Total assets
  - Return on equity = Net income / Stockholder equity

- 4. Financial ratios** Which of the following per-share ratios is incorrect?
- Book value per share = Total assets / Shares outstanding
  - Earnings per share = Net income / Shares outstanding
  - Cash Flow per share = Operating cash flow / Shares outstanding
  - Dividends per share = Dividends paid / Shares outstanding
- 5. Stock repurchase** A company repurchase of common stock outstanding has which of the following effects on the balance sheet?
- an increase in shares outstanding
  - an increase in stockholder equity
  - a decrease in paid-in capital
  - a positive investment cash flow

Use the following raw data to answer the next four questions:

|  |     |
|--|-----|
| Net income                             | \$8 |
| Depreciation/amortization              | \$2 |
| Repurchase of outstanding common stock | \$5 |
| Issuance of new debt                   | \$9 |
| Sale of property                       | \$6 |
| Purchase of equipment                  | \$7 |
| Dividend payments                      | \$2 |

- 6. Cash flow analysis** Operating cash flow is
- \$10
  - \$8
  - \$6
  - \$15
- 7. Cash flow analysis** Investing cash flow is
- \$1
  - \$(1)
  - \$6
  - \$(6)

**8. Cash flow analysis** Financing cash flow is

- a. \$4
- b. \$(4)
- c. \$2
- d. \$(2)

**9. Cash flow analysis** Net cash flow is

- a. \$9
- b. \$10
- c. \$11
- d. \$12

Use the following financial data to answer the next three questions:

|  |        |
|--|--------|
| Cash payments for interest             | \$(12) |
| Retirement of common stock             | \$(32) |
| Cash payments to merchandise suppliers | \$(85) |
| Purchase of land                       | \$( 8) |
| Sale of equipment                      | \$ 30  |
| Payments of dividends                  | \$(37) |
| Cash payment for salaries              | \$(35) |
| Cash collection from customers         | \$260  |
| Purchase of equipment                  | \$(40) |

**10. Cash flow analysis** Cash flows from operating activities are (*1994 CFA exam*)

- a. \$91
- b. \$128
- c. \$140
- d. \$175

**11. Cash flow analysis** Cash flows from investing activities are (*1994 CFA exam*)

- a. \$(67)
- b. \$(48)
- c. \$(18)
- d. \$(10)

- 12. Cash flow analysis** Cash flows from financing activities are (*1994 CFA exam*)
- a. \$(81)
  - b. \$(69)
  - c. \$(49)
  - d. \$(37)
- 13. Cash flow analysis** A firm has net sales of \$3,000, cash expenses (including taxes) of \$1,400 and depreciation of \$500. If accounts receivable increase over the period by \$400, cash flow from operations equals (*1994 CFA exam*)
- a. \$1,200
  - b. \$1,600
  - c. \$1,700
  - d. \$2,100
- 14. Cash flow analysis** A firm using straight-line depreciation reports gross investment in fixed assets of \$80 million, accumulated depreciation of \$45 million, and annual depreciation expense of \$5 million. The approximate average age of fixed assets is (*1994 CFA exam*)
- a. 7 years
  - b. 9 years
  - c. 15 years
  - d. 16 years
- 15. Preferred dividends** What proportion of preferred stock dividends received by a corporation is normally exempt from federal income taxation?
- a. 25 percent
  - b. 50 percent
  - c. 80 percent
  - d. 100 percent

### *Questions and Problems*

#### Core Questions

- 1. 10K and 10Q** What are the 10K and 10Q reports? Who are they filed by? What do they contain? Who are they filed with? What is the easiest way to retrieve one?
- 2. Financial Statements** In very broad terms, what is the difference between an income statement and a balance sheet?

3. **Current Events** What makes current assets and liabilities “current?” Are operating assets “current?”
4. **Income and EPS** What is the relationship between net income and earnings per share (EPS)?
5. **Noncash Items** Why do we say depreciation is a “noncash item”?
6. **Cash Flow** What are the three sections on a standard cash flow statement?
7. **Operating cash flow** In the context of the standard cash flow statement, what is operating cash flow?
8. **Pro formas** What is a pro forma financial statement?
9. **Retained earnings** What is the difference between the “retained earnings” number on the income statement and the balance sheet?
10. **Gross!** What is the difference between gross margin and operating margin? What do they tell us? Generally speaking, are larger or smaller values better?
11. **More Gross** Which is larger, gross margin or operating margin? Can either be negative? Can both?
12. **Dividends and Taxes** Are dividends paid a tax-deductible expense to the paying company? Suppose a company receives dividends from another. How are these taxed?

Intermediate Questions

13. **Cash Flows** The bottom line on a standard cash flow statement is calculated how? What exactly does it represent?
14. **Cash Flow** Cash flow per share is a commonly evaluated number. How is it conventionally computed?
15. **Retained Earnings** Take a look at the Balance Sheet for Coors (Figure 7.8). On it, retained earnings are about \$651 million. How do you interpret this amount? Does it mean that Coors has \$651 million in cash available to spend?

Use the following financial statement information to answer the next four questions. Amounts are in thousands of dollars (except number of shares and price per share):

***Dixie Chickens 2000 Balance Sheet***

|                                |                       |
|--------------------------------|-----------------------|
| Cash and cash equivalents      | \$100                 |
| Operating assets               | 300                   |
| Property, plant, and equipment | 800                   |
| Other assets                   | <u>40</u>             |
| Total assets                   | <u><u>\$1,240</u></u> |
|                                |                       |
| Current liabilities            | \$100                 |
| Long-term debt                 | 400                   |
| Other liabilities              | <u>20</u>             |
| Total liabilities              | <u>\$520</u>          |
|                                |                       |
| Paid-in capital                | \$ 30                 |
| Retained earnings              | <u>690</u>            |
| Total shareholder equity       | <u><u>\$720</u></u>   |
|                                |                       |
| Total liabilities and equity   | <u><u>\$1,240</u></u> |

***Dixie Chickens 2000 Income Statement***

|                      |                     |
|----------------------|---------------------|
| Net sales            | \$2,480             |
| Cost of goods sold   | <u>(1,660)</u>      |
| Gross profit         | \$820               |
| Operating expenses   | <u>(600)</u>        |
| Operating income     | \$220               |
| Other income         | 90                  |
| Net interest expense | <u>( 70)</u>        |
| Pretax income        | \$240               |
| Income tax           | <u>(96)</u>         |
| Net income           | <u><u>\$144</u></u> |
| Earnings per share   | \$1.20              |
|                      |                     |
| Shares outstanding   | 120,000             |
| Recent price         | \$24                |

*Dixie Chickens 2000 Cash Flow Statement*

|                                       |             |
|---------------------------------------|-------------|
| Net income                            | \$144       |
| Depreciation and amortization         | 100         |
| Changes in operating assets           | (50)        |
| Changes in current liabilities        | <u>40</u>   |
| Operating cash flow                   | \$234       |
| <br>                                  |             |
| Net additions to properties           | \$(200)     |
| Changes in other assets               | <u>(40)</u> |
| Investing cash flow                   | \$(240)     |
| <br>                                  |             |
| Issuance/redemption of long-term debt | \$94        |
| Dividends paid                        | <u>(72)</u> |
| Financing cash flow                   | \$22        |
| <br>                                  |             |
| Net cash increase                     | <u>\$16</u> |

- 16. Calculating Margins** Calculate the gross and operating margins for Dixie Chickens:
- 17. Calculating Profitability Measures** Calculate ROA and ROE for Dixie Chickens. How do you interpret these ratios?
- 18. Calculating Per Share Measures** Calculate the price=book, price-earnings, and price-cash flow ratios for Dixie Chickens.
- 19. Pro forma Financial Statements** Following the Coors example in the chapter, prepare a pro forma income statement, balance sheet, and cash flow statement for Dixie Chickens assuming a 10 percent increase in sales.
- 20. Projected Share Prices** Based on the previous two questions, what is the projected stock price assuming a 10 percent increase in sales?

**Chapter 7**  
**Earnings and Cash Flow Analysis**  
Answers and solutions

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**Answers to Multiple Choice Questions**

1. B
2. D
3. A
4. A
5. A
6. A
7. A
8. C
9. C
10. B
11. C
12. B
13. A
14. B
15. C

**Answers to Questions and Problems**

Core Questions

1. The 10K and 10Q are reports public firms must file with the SEC. They contain, among other things, financial statements including balance sheets, income statements, and cash flow statements. The easiest way to retrieve them is on-line from EDGAR.
2. A balance sheet is a summary, at a point in time, of what a firm owns and owes. An income statement depicts revenues and costs that accrue over some period in time.
3. They are current in the sense that they are expected to convert to cash (or otherwise be used up) within the next 12 months. Operating assets are current because they simply consist of current assets other than cash.
4. Earnings per share are equal to net income divided by the number of shares outstanding. Net income is sometimes called “total earnings.” There are some issues concerning how to measure shares outstanding, but these go beyond the scope of this chapter.

5. Depreciation is a “noncash item” because the depreciation deduction does not literally represent a cash outflow. It is instead purely an accounting entry.
6. Operating cash flow; investment cash flow, and financing cash flow.
7. It is the cash generated by ordinary business activity, meaning the everyday, routine functioning of the business.
8. A pro forma financial statement is essentially a hypothetical financial statement, meaning that it is a financial statement that is based on specific sets of assumptions and/or events that have not occurred (and may not ever occur). The term “pro forma” literally means “according to a particular form,” but a better translation in this context is “hypothetical.”
9. The retained earnings number on the income statement is amount retained that year. The number on the balance sheet is the cumulative amount from all previous years. Put differently, the income statement number is the increment or addition to the balance sheet number.
10. Gross margin is gross profit divided by sales, where gross profit is sales less cost of goods sold. Operating margin is operating profit divided by sales, where operating profit is equal to gross profit less operating expenses. Thus, the difference is that operating margin considers both costs of goods sold and operating expenses. They indicate how much of each sales dollar is left after accounting for costs of goods sold (gross margin) and, additionally, for operating expenses (operating margin). Generally speaking, larger values are better.
11. Gross margin will be larger (why?). Both can be negative. Also, gross margin can be positive while operating margin is negative, but not the other way around (why?).
12. No, but dividend paying companies certainly wish they were! Dividends received from another company are taxed preferentially. Depending on the circumstances, only 20 percent or 30 percent are subject to taxes; the rest is not taxed.

### Intermediate Questions

13. The bottom line on the cash flow statement is operating cash flow, less money spent on fixed assets and other investments, less the net amount paid or raised due to financial transactions (i.e., things like borrowing money, paying dividends, or paying interest). It actually measures the change in the amount of cash the firm has available from one period to the next.
14. It’s conventionally computed as *operating* cash flow divided by the number of shares outstanding.

15. The literal interpretation is that it is the sum of all the yearly retained earnings numbers. There are two important things to recognize. First, in any given year, the retained earnings number on the income statement is simply what's left over after dividends are subtracted from net income. Dividends are paid in cash, but net income is not a cash flow (because, for example, it includes noncash deductions). As a result, the retained earnings are not cash flows either. The actual cash flow that is "retained" is some very different number. Second, to the extent that Coors does "retain" cash, that cash doesn't just sit there. Instead, it is used to do things like purchase assets and pay off debts. Thus, cash or earnings aren't so much "retained" as they are "reinvested." Thus, the retained earnings number isn't cash, and even it were, it would just be a pile of cash sitting around somewhere.
16. Gross margin is  $\$820/\$2,480 = 33.1\%$ . Operating margin is  $\$220/\$2,480 = 8.9\%$ .
17. Return on assets (ROA) is  $\$144/\$1240 = 11.6\%$ . Return on equity (ROE) is  $\$144/\$720 = 20\%$ .
18. Note that, measured in thousands, there are 120 shares. Book value per share (BVPS) is thus  $\$720/120 = \$6$ . Earnings per share (EPS) is  $\$144/120 = \$1.20$  (as shown on the income statement). Cash flow per share (CFPS) is  $\$234/120 = \$1.95$ . The recent price per share is \$24, so the Price/Book ratio is 4; the Price/Earnings ratio is 20; and the Price/Cash flow ratio is 12.31.
19. With 10% sales growth, sales will rise to \$2,728 from \$2,480. The pro forma income statement follows. A constant gross margin is assumed, implying that Cost of Goods Sold will also rise by 10%. A constant tax rate of 40% is used. Items in italics are carried over unchanged.

***Dixie Chickens pro forma 2001 Income Statement***

|                             |                |
|-----------------------------|----------------|
| Net sales                   | \$2,728        |
| Cost of goods sold          | <u>(1,826)</u> |
| Gross profit                | \$902          |
| <i>Operating expenses</i>   | <u>(600)</u>   |
| Operating income            | \$302          |
| <i>Other income</i>         | 90             |
| <i>Net interest expense</i> | <u>( 70)</u>   |
| Pretax income               | \$322          |
| Income tax                  | <u>129</u>     |
| Net income                  | <u>\$193</u>   |
| Earnings per share          | \$1.61         |
| <br>                        |                |
| Shares outstanding          | 120,000        |
| Recent price                | \$n/a          |

Next, we prepare the cash flow statement. Notice that we pick up the \$193 net income from the pro forma income statement. Items in italics are carried over unchanged. By assumption, no investments occur, and no long-term debt is issued or redeemed.

***Dixie Chickens pro forma 2001 Cash Flow Statement***

|                                       |              |
|---------------------------------------|--------------|
| Net income                            | \$193        |
| <i>Depreciation and amortization</i>  | 100          |
| <i>Changes in operating assets</i>    | (50)         |
| <i>Changes in current liabilities</i> | <u>40</u>    |
| Operating cash flow                   | \$283        |
| <br>                                  |              |
| Net additions to properties           | \$0          |
| Changes in other assets               | <u>0</u>     |
| Investing cash flow                   | \$0          |
| <br>                                  |              |
| Issuance/redemption of long-term debt | \$0          |
| <i>Dividends paid</i>                 | <u>(72)</u>  |
| Financing cash flow                   | \$(72)       |
| <br>                                  |              |
| Net cash flow                         | <u>\$211</u> |

Finally, we have the balance sheet. Cash rises by the \$211 Net Cash Flow from the cash flow statement. The \$50 increases in Operating Assets and the \$40 increase in Current Liabilities are also from the cash flow statement. The \$100 reduction in Property, Plant, and Equipment is the amount of the depreciation deduction shown on the cash flow statement. The increase in retained earnings is equal to pro forma Net Income less pro forma Dividends.

*Dixie Chickens pro forma 2001 Balance Sheet*

|                                |            |
|--------------------------------|------------|
| Cash and cash equivalents      | \$311      |
| Operating assets               | 350        |
| Property, plant, and equipment | 700        |
| <i>Other assets</i>            | <u>40</u>  |
| Total assets                   | \$1,401    |
|                                |            |
| Current liabilities            | \$140      |
| <i>Long-term debt</i>          | 400        |
| <i>Other liabilities</i>       | <u>20</u>  |
| Total liabilities              | \$560      |
|                                |            |
| <i>Paid-in capital</i>         | \$ 30      |
| Retained earnings              | <u>811</u> |
| Total shareholder equity       | \$841      |
|                                |            |
| Total liabilities and equity   | \$1,401    |

**20.** Using the benchmark from question 18, projected stock prices are:

$$\begin{aligned}
 \text{BVPS} \times \text{P/B} &= (\$841/120) \times 4 &= \$28.03 \\
 \text{EPS} \times \text{P/E} &= \$1.61 \times 20 &= \$32.20 \\
 \text{CFPS} \times \text{P/CF} &= (\$283/120) \times 12.31 &= \$29.03
 \end{aligned}$$

Thus, projected prices assuming a 10% sales increase are in the \$28 - \$32 range.