

## CHAPTER 3

# Analysis of Financial Statements

*To guide or not to guide, that is the question. Or at least it's the question many companies are wrestling with regarding earnings forecasts. Should a company provide earnings estimates to investors? In 2006, Best Buy answered this question by announcing that it would no longer provide quarterly earnings forecasts. It's no coincidence that Best Buy's decision came shortly after its actual earnings came in just 2 cents below the forecast, yet its stock price fell by 12%. Coca-Cola, Motorola, and Citigroup are among the growing number of companies that no longer provide quarterly earnings forecasts.*

*Virtually no one disputes that investors need as much information as possible to accurately evaluate a company, and academic studies show that companies with greater transparency have higher valuations. However, greater disclosure often brings the possibility of lawsuits if investors have reason to believe that the disclosure is fraudulent. Although the Private Securities Litigation Reform Act of 1995 helped prevent "frivolous" lawsuits, many companies still chose not to provide information directly to all investors. Instead, before 2000, many companies provided earnings information to brokerage firms' analysts, and the analysts then forecast their own earnings expectations. In 2000 the SEC adopted Reg FD (Regulation Fair Disclosure), which prevented companies from disclosing information only to select groups, such as analysts. Reg FD led many companies to begin providing quarterly earnings forecasts directly to the public, and a survey by the National Investors Relations Institute showed that 95% of respondents in 2006 provided either annual or quarterly earnings forecasts, up from 45% in 1999.*

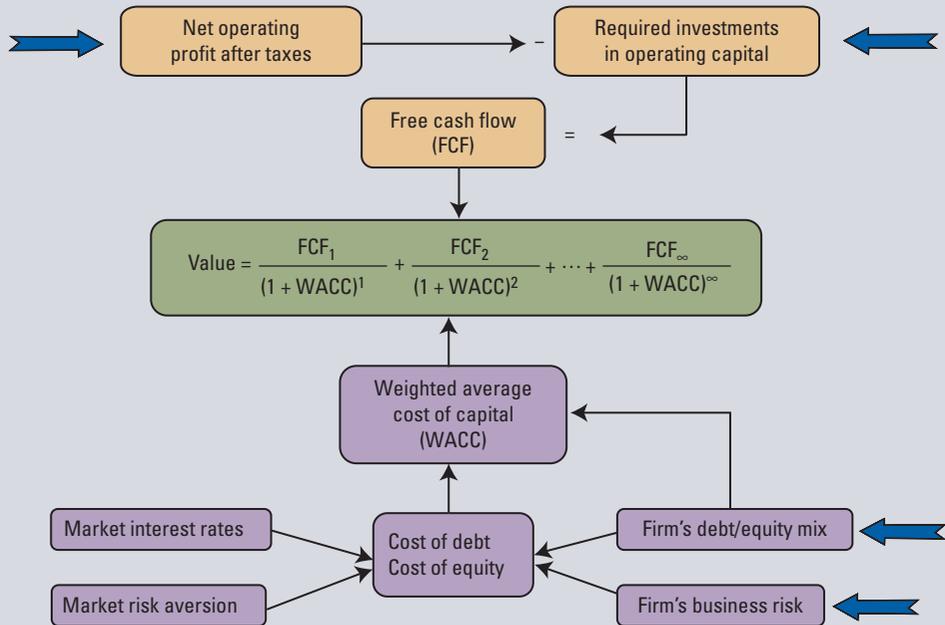
*Two trends are now in evidence. First, the number of companies reporting quarterly earnings forecasts is falling, but the number reporting annual forecasts is increasing. Second, many companies are providing other types of forward-looking information, including key operating ratios plus qualitative information about the company and its industry. Ratio analysis can help investors use such information, so keep that in mind as you read this chapter.*

*Sources: Adapted from Joseph McCafferty, "Guidance Lite," CFO, June 2006, 16–17, and William F. Coffin and Crocker Coulson, "Is Earnings Guidance Disappearing in 2006?" 2006, White Paper, available at [http://www.ccgir.com/ccgir/white\\_papers/pdf/Earnings%20Guidance%202006.pdf](http://www.ccgir.com/ccgir/white_papers/pdf/Earnings%20Guidance%202006.pdf).*

## Intrinsic Value and Analysis of Financial Statements

The intrinsic value of a firm is determined by the present value of the expected future free cash flows (FCF) when discounted at the weighted average cost of capital

(WACC). This chapter explains how to use financial statements to evaluate a company's profitability, required capital investments, business risk, and mix of debt and equity.



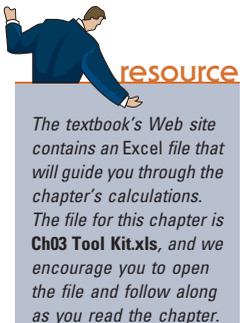
Financial statement analysis involves (1) comparing a firm's performance with that of other firms in the same industry and (2) evaluating trends in the firm's financial position over time. Managers use financial analysis to identify situations needing attention; potential lenders use financial analysis to determine whether a company is creditworthy; and stockholders use financial analysis to help predict future earnings, dividends, and free cash flow. As we explain in this chapter, there are similarities and differences among these uses.<sup>1</sup>

### 3.1 FINANCIAL ANALYSIS

When we perform a financial analysis, we conduct the following steps.

#### Gather Data

The first step in financial analysis is to gather data. As we discussed in Chapter 2, financial statements can be downloaded from many different Web sites. One of our favorites is Zacks Investment Research, which provides financial statements in



<sup>1</sup>Widespread accounting fraud has cast doubt on whether all firms' published financial statements can be trusted. New regulations by the SEC and the exchanges, as well as new laws enacted by Congress, have improved oversight of the accounting industry and increased the criminal penalties on management for fraudulent reporting.

a standardized format. If you cut and paste financial statements from Zacks into a spreadsheet and then perform a financial analysis, you can quickly repeat the analysis on a different company by simply pasting that company's financial statements into the same cells as the original company's statements. In other words, there is no need to reinvent the wheel each time you analyze a company.

## Examine the Statement of Cash Flows

Some financial analysis can be done with virtually no calculations. For example, we always look to the statement of cash flows first, particularly the net cash provided by operating activities. Downward trends or negative net cash flow from operations almost always indicate problems. The statement of cash flows section on investing activities shows whether the company has made a big acquisition, especially when compared with the prior years' net cash flows from investing activities. A quick look at the section on financing activities also reveals whether or not a company is issuing debt or buying back stock; in other words, is the company raising capital from investors or returning it to them?

## Calculate and Examine the Return on Invested Capital

After examining the statement of cash flows, we calculate the return on invested capital (ROIC) as described in Chapter 2. The ROIC provides a vital measure of a firm's overall performance. If ROIC is greater than the company's weighted average cost of capital (WACC), then the company usually is adding value. If ROIC is less than WACC, then the company usually has serious problems. No matter what ROIC tells us about the firm's overall performance, it is important to examine specific areas within the firm, and for that we use ratios.

## Begin Ratio Analysis

Financial ratios are designed to extract important information that might not be obvious simply from examining a firm's financial statements. For example, suppose Firm A owes \$5 million of debt while Firm B owes \$50 million of debt. Which company is in a stronger financial position? It is impossible to answer this question without first standardizing each firm's debt relative to total assets, earnings, and interest. Such standardized comparisons are provided through *ratio analysis*.

We will calculate the 2010 financial ratios for MicroDrive Inc., using data from the balance sheets and income statements given in Table 3-1. We will also evaluate the ratios in relation to the industry averages. Note that dollar amounts are in millions.

## 3.2 LIQUIDITY RATIOS

As shown in Table 3-1, MicroDrive has current liabilities of \$310 million that must be paid off within the coming year. Will it have trouble satisfying those obligations? **Liquidity ratios** attempt to answer this type of question: We discuss two commonly used liquidity ratios in this section.

### The Current Ratio

The **current ratio** is calculated by dividing current assets by current liabilities:

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



TABLE 3-1

MicroDrive Inc.: Balance Sheets and Income Statements for Years Ending December 31 (Millions of Dollars, Except for Per Share Data)

ASSETS	2010	2009	LIABILITIES AND EQUITY	2010	2009
Cash and equivalents	\$ 10	\$ 15	Accounts payable	\$ 60	\$ 30
Short-term investments	0	65	Notes payable	110	60
Accounts receivable	375	315	Accruals	140	130
Inventories	615	415	Total current liabilities	\$ 310	\$ 220
Total current assets	\$1,000	\$ 810	Long-term bonds <sup>a</sup>	754	580
Net plant and equipment	1,000	870	Total liabilities	\$1,064	\$ 800
			Preferred stock (400,000 shares)	40	40
			Common stock (50,000,000 shares)	130	130
			Retained earnings	766	710
			Total common equity	\$ 896	\$ 840
Total assets	<u>\$2,000</u>	<u>\$1,680</u>	Total liabilities and equity	<u>\$2,000</u>	<u>\$1,680</u>
				2010	2009
Net sales				\$3,000.0	\$2,850.0
Operating costs excluding depreciation and amortization <sup>b</sup>				2,616.2	2,497.0
Earnings before interest, taxes, depreciation, and amortization (EBITDA)				<u>\$ 383.8</u>	<u>\$ 353.0</u>
Depreciation				100.0	90.0
Amortization				0.0	0.0
Depreciation and amortization				<u>\$ 100.0</u>	<u>\$ 90.0</u>
Earnings before interest and taxes (EBIT, or operating income)				\$ 283.8	\$ 263.0
Less interest				88.0	60.0
Earnings before taxes (EBT)				\$ 195.8	\$ 203.0
Taxes (40%)				78.3	81.2
Net income before preferred dividends				\$ 117.5	\$ 121.8
Preferred dividends				4.0	4.0
Net income				<u>\$ 113.5</u>	<u>\$ 117.8</u>
Common dividends				\$ 57.5	\$ 53.0
Addition to retained earnings				\$ 56.0	\$ 64.8
<i>Per-Share Data</i>					
Common stock price				\$ 23.00	\$ 26.00
Earnings per share (EPS)				\$ 2.27	\$ 2.36
Book value per share (BVPS)				\$ 17.92	\$ 16.80
Cash flow per share (CFPS)				\$ 4.27	\$ 4.16

<sup>a</sup>The bonds have a sinking fund requirement of \$20 million a year.

<sup>b</sup>The costs include lease payments of \$28 million a year.

$$= \frac{\$1,000}{\$310} = 3.2$$

$$\text{Industry average} = 4.2$$

Current assets normally include cash, marketable securities, accounts receivable, and inventories. Current liabilities consist of accounts payable, short-term notes payable, current maturities of long-term debt, accrued taxes, and other accrued expenses.

MicroDrive has a lower current ratio than the average for its industry. Is this good or bad? Sometimes the answer depends on who is asking the question. For example, suppose a supplier is trying to decide whether to extend credit to MicroDrive. In general, creditors like to see a high current ratio. If a company is getting into financial difficulty, it will begin paying its bills (accounts payable) more slowly, borrowing from its bank, and so on, so its current liabilities will be increasing. If current liabilities are rising faster than current assets then the current ratio will fall, and this could spell trouble. Because the current ratio provides the best single indicator of the extent to which the claims of short-term creditors are covered by assets that are expected to be converted to cash fairly quickly, it is the most commonly used measure of short-term solvency.

Now consider the current ratio from the perspective of a shareholder. A high current ratio could mean that the company has a lot of money tied up in nonproductive assets, such as excess cash or marketable securities. Or perhaps the high current ratio is due to large inventory holdings, which might well become obsolete before they can be sold. Thus, shareholders might not want a high current ratio.

An industry average is not a magic number that all firms should strive to maintain—in fact, some very well-managed firms will be above the average, while other good firms will be below it. However, if a firm's ratios are far removed from the averages for its industry, this is a red flag, and analysts should be concerned about why the variance occurs. For example, suppose a low current ratio is traced to low inventories. Is this a competitive advantage resulting from the firm's mastery of just-in-time inventory management, or is it an Achilles' heel that is causing the firm to miss shipments and lose sales? Ratio analysis doesn't answer such questions, but it does point to areas of potential concern.

## The Quick, or Acid Test, Ratio

The **quick**, or **acid test, ratio** is calculated by deducting inventories from current assets and then dividing the remainder by current liabilities:

$$\text{Quick, or acid test, ratio} = \frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}}$$

$$= \frac{\$385}{\$310} = 1.2$$

$$\text{Industry average} = 2.1$$

A **liquid asset** is one that trades in an active market and hence can be converted quickly to cash at the going market price. Inventories are typically the least liquid of a firm's current assets; hence they are the current assets on which losses are most likely to occur in a bankruptcy. Therefore, a measure of the firm's ability to pay off short-term obligations without relying on the sale of inventories is important.

The industry average quick ratio is 2.1, so MicroDrive's 1.2 ratio is low in comparison with other firms in its industry. Still, if the accounts receivable can be collected, the company can pay off its current liabilities without having to liquidate its inventory.

### Self-Test

Identify two ratios that are used to analyze a firm's liquidity position, and write out their equations.

What are the characteristics of a liquid asset? Give some examples.

Which current asset is typically the least liquid?

A company has current liabilities of \$800 million, and its current ratio is 2.5. What is its level of current assets? (**\$2,000 million**) If this firm's quick ratio is 2, how much inventory does it have? (**\$400 million**)

### 3.3 ASSET MANAGEMENT RATIOS

**Asset management ratios** measure how effectively a firm is managing its assets. If a company has excessive investments in assets, then its operating capital will be unduly high, which will reduce its free cash flow and ultimately its stock price. On the other hand, if a company does not have enough assets then it will lose sales, which will hurt profitability, free cash flow, and the stock price. Therefore, it is important to have the *right* amount invested in assets. Ratios that analyze the different types of assets are described in this section.

#### Evaluating Inventories: The Inventory Turnover Ratio

The **inventory turnover ratio** is defined as sales divided by inventories:

$$\begin{aligned}\text{Inventory turnover ratio} &= \frac{\text{Sales}}{\text{Inventories}} \\ &= \frac{\$3,000}{\$615} = 4.9 \\ \text{Industry average} &= 9.0\end{aligned}$$

As a rough approximation, each item of MicroDrive's inventory is sold out and restocked, or "turned over," 4.9 times per year.<sup>2</sup>

MicroDrive's turnover of 4.9 is much lower than the industry average of 9.0. This suggests that MicroDrive is holding too much inventory. High levels of inventory add to net operating working capital (NOWC), which reduces FCF, which leads to lower stock prices. In addition, MicroDrive's low inventory turnover ratio makes us wonder whether the firm is actually holding obsolete goods not worth their stated value.<sup>3</sup>

Note that sales occur over the entire year, whereas the inventory figure is measured at a single point in time. For this reason, it is better to use an average inventory measure.<sup>4</sup> If the firm's business is highly seasonal, or if there has been a strong upward or downward sales trend during the year, then it is especially useful to make some such adjustment. To maintain comparability with industry averages, however, we did not use the average inventory figure.

<sup>2</sup>"Turnover" is a term that originated many years ago with the old Yankee peddler who would load up his wagon with goods and then go off to peddle his wares. If he made 10 trips per year, stocked 100 pans, and made a gross profit of \$5 per pan, his annual gross profit would be  $(100)(\$5)(10) = \$5,000$ . If he "turned over" (i.e., sold) his inventory faster and made 20 trips per year, then his gross profit would double, other things held constant. So, his turnover directly affected his profits.

<sup>3</sup>A problem arises when calculating and analyzing the inventory turnover ratio. Sales are stated at market prices, so if inventories are carried at cost, as they generally are, then the calculated turnover overstates the true turnover ratio. Therefore, it would be more appropriate to use cost of goods sold in place of sales in the formula's numerator. However, established compilers of financial ratio statistics such as Dun & Bradstreet use the ratio of sales to inventories carried at cost. To develop a figure that can be compared with those published by Dun & Bradstreet and similar organizations, it is necessary to measure inventory turnover with sales in the numerator, as we do here.

<sup>4</sup>Preferably, the average inventory value should be calculated by summing the monthly figures during the year and dividing by 12. If monthly data are not available, one can add the beginning and ending annual figures and divide by 2. However, most industry ratios are calculated as shown here, using end-of-year values.



## THE GLOBAL ECONOMIC CRISIS

### The Price is Right! (Or Wrong!)

How much is an asset worth if no one is buying or selling? The answer to that question matters because an accounting practice called “mark to market” requires that some assets be adjusted on the balance sheet to reflect their “fair market value.” The accounting rules are complicated, but the general idea is that if an asset is available for sale, then the balance sheet would be most accurate if it showed the asset’s market value. For example, suppose a company purchased \$100 million of Treasury bonds and the value of those bonds later fell to \$90 million. With mark to market, the company would report the bonds’ value on the balance sheet as \$90 million, not the original purchase price of \$100 million. Notice that marking to market can have a significant impact on financial ratios and thus on investors’ perception of a firm’s financial health.

But what if the assets are mortgage-backed securities that were originally purchased for \$100 million? As defaults increased during 2008, the value of such securities fell rapidly, and then investors virtually stopped trading them. How should the company report them? At the \$100 million original price, at a \$60 million price that

was observed before the market largely dried up, at \$25 million when a hedge fund in desperate need for cash to avoid a costly default sold a few of these securities, or at \$0, since there are no current quotes? Or should they be reported at a price generated by a computer model or in some other manner?

The answer to this question has vital implications for the global financial crisis. In early 2009, Congress, the SEC, FASB, and the U.S. Treasury all are working to find the right answers. If they come up with a price that is too low, it could cause investors mistakenly to believe that some companies are worth much less than their intrinsic values, and this could trigger runs on banks and bankruptcies for companies that might otherwise survive. But if the price is too high, some “walking dead” or “zombie” companies could linger on and later cause even larger losses for investors, including the U.S. government, which is now the largest investor in many financial institutions. Either way, an error in pricing could perhaps trigger a domino effect that might topple the entire financial system. So let’s hope the price is right!

## Evaluating Receivables: The Days Sales Outstanding

**Days sales outstanding (DSO)**, also called the “average collection period” (ACP), is used to appraise accounts receivable, and it is calculated by dividing accounts receivable by average daily sales to find the number of days’ sales that are tied up in receivables.<sup>5</sup> Thus, the DSO represents the average length of time that the firm must wait after making a sale before receiving cash, which is the average collection period. MicroDrive has 46 DSO, well above the 36-day industry average:

$$\begin{aligned} \text{DSO} &= \frac{\text{Days sales outstanding}}{\text{Average sales per day}} = \frac{\text{Receivables}}{\text{Annual sales}/365} \\ &= \frac{\$375}{\$3,000/365} = \frac{\$375}{\$8.2192} = 45.6 \text{ days} \approx 46 \text{ days} \\ &\qquad\qquad\qquad \text{Industry average} = 36 \text{ days} \end{aligned}$$

MicroDrive’s sales terms call for payment within 30 days. The fact that 46 days of sales are outstanding indicates that customers, on average, are not paying their bills

<sup>5</sup>It would be better to use *average* receivables, but we have used year-end values for comparability with the industry average.

on time. As with inventory, high levels of accounts receivable cause high levels of NOWC, which hurts FCF and stock price.

A customer who is paying late may well be in financial trouble, in which case MicroDrive may have a hard time ever collecting the receivable. Therefore, if the trend in DSO has been rising but the credit policy has not been changed, steps should be taken to review credit standards and to expedite the collection of accounts receivable.

## Evaluating Fixed Assets: The Fixed Assets Turnover Ratio

The **fixed assets turnover ratio** measures how effectively the firm uses its plant and equipment. It is the ratio of sales to net fixed assets:

$$\begin{aligned}\text{Fixed assets turnover ratio} &= \frac{\text{Sales}}{\text{Net fixed assets}} \\ &= \frac{\$3,000}{\$1,000} = 3.0 \\ \text{Industry average} &= 3.0\end{aligned}$$

MicroDrive's ratio of 3.0 is equal to the industry average, indicating that the firm is using its fixed assets about as intensively as are other firms in its industry. Therefore, MicroDrive seems to have about the right amount of fixed assets in relation to other firms.

A potential problem can exist when interpreting the fixed assets turnover ratio. Recall from accounting that fixed assets reflect the historical costs of the assets. Inflation has caused the current value of many assets that were purchased in the past to be seriously understated. Therefore, if we were comparing an old firm that had acquired many of its fixed assets years ago at low prices with a new company that had acquired its fixed assets only recently, we would probably find that the old firm had the higher fixed assets turnover ratio. However, this would be more reflective of the difficulty accountants have in dealing with inflation than of any inefficiency on the part of the new firm. You should be alert to this potential problem when evaluating the fixed assets turnover ratio.

## Evaluating Total Assets: The Total Assets Turnover Ratio

The **total assets turnover ratio** is calculated by dividing sales by total assets:

$$\begin{aligned}\text{Total assets turnover ratio} &= \frac{\text{Sales}}{\text{Total assets}} \\ &= \frac{\$3,000}{\$2,000} = 1.5 \\ \text{Industry average} &= 1.8\end{aligned}$$

MicroDrive's ratio is somewhat below the industry average, indicating that the company is not generating a sufficient volume of business given its total asset investment. Sales should be increased, some assets should be sold, or a combination of these steps should be taken.

### Self-Test

Identify four ratios that are used to measure how effectively a firm is managing its assets, and write out their equations.

What problem might arise when comparing different firms' fixed assets turnover ratios? A firm has annual sales of \$200 million, \$40 million of inventory, and \$60 million of accounts receivable. What is its inventory turnover ratio? (5) What is its DSO based on a 365-day year? (109.5 days)

### 3.4 DEBT MANAGEMENT RATIOS

The extent to which a firm uses debt financing, or **financial leverage**, has three important implications: (1) By raising funds through debt, stockholders can maintain control of a firm without increasing their investment. (2) If the firm earns more on investments financed with borrowed funds than it pays in interest, then its shareholders' returns are magnified, or "leveraged," but their risks are also magnified. (3) Creditors look to the equity, or owner-supplied funds, to provide a margin of safety, so the higher the proportion of funding supplied by stockholders, the less risk creditors face. Chapter 15 explains the first two points in detail, while the following ratios examine leverage from a creditor's point of view.

#### How the Firm is Financed: Total Liabilities to Total Assets

The ratio of total liabilities to total assets is called the **debt ratio**, or sometimes the **total debt ratio**. It measures the percentage of funds provided by current liabilities and long-term debt:

$$\begin{aligned}\text{Debt ratio} &= \frac{\text{Total liabilities}}{\text{Total assets}} \\ &= \frac{\$310 + \$754}{\$2,000} = \frac{\$1,064}{\$2,000} = 53.2\% \\ \text{Industry average} &= 40.0\%\end{aligned}$$

Creditors prefer low debt ratios because the lower the ratio, the greater the cushion against creditors' losses in the event of liquidation. Stockholders, on the other hand, may want more leverage because it magnifies their return, as we explain in Section 3.8 when we discuss the Du Pont model.

MicroDrive's debt ratio is 53.2% but its debt ratio in the previous year was 47.6%, which means that creditors are now supplying more than half the total financing. In addition to an upward trend, the level of the debt ratio is well above the industry average. Creditors may be reluctant to lend the firm more money because a high debt ratio is associated with a greater risk of bankruptcy.

Some sources report the debt-to-equity ratio, defined as:

$$\begin{aligned}\text{Debt-to-equity ratio} &= \frac{\text{Total liabilities}}{\text{Total assets} - \text{Total liabilities}} \\ &= \frac{\$310 + \$754}{\$2,000 - (\$310 + \$754)} = \frac{\$1,064}{\$936} = 1.14 \\ \text{Industry average} &= 0.67\end{aligned}$$

The debt-to-equity ratio and the debt ratio contain the same information but present that information slightly differently.<sup>6</sup> The debt-to-equity ratio shows that MicroDrive has \$1.14 of debt for every dollar of equity, whereas the debt ratio shows that 53.2% of MicroDrive's financing is in the form of liabilities. We find it more

<sup>6</sup>The debt ratio and debt-to-equity ratios are simply transformations of each other:

$$\text{Debt-to-equity} = \frac{\text{Debt ratio}}{1 - \text{Debt ratio}} \text{ and } \text{Debt ratio} = \frac{\text{Debt-to-equity}}{1 + \text{Debt-to-equity}}$$

intuitive to think about the percentage of the firm that is financed with debt, so we usually use the debt ratio. However, the debt-to-equity ratio is also widely used, so you should know how to interpret it.

Sometimes it is useful to express debt ratios in terms of market values. It is easy to calculate the market value of equity, which is equal to the stock price multiplied by the number of shares. MicroDrive's market value of equity is  $\$23(50) = \$1,150$ . Often it is difficult to estimate the market value of liabilities, so many analysts define the market debt ratio as

$$\begin{aligned} \text{Market debt ratio} &= \frac{\text{Total liabilities}}{\text{Total liabilities} + \text{Market value of equity}} \\ &= \frac{\$1,064}{\$1,064 + (\$23 \times 50)} = \frac{\$1,064}{\$2,214} = 48.1\% \end{aligned}$$

MicroDrive's market debt ratio in the previous year was 38.1%. The big increase was due to two major factors: Liabilities increased and the stock price fell. The stock price reflects a company's prospects for generating future cash flows, so a decline in stock price indicates a likely decline in future cash flows. Thus, the market debt ratio reflects a source of risk that is not captured by the conventional book debt ratio.

If you use a debt ratio that you did not calculate yourself, be sure to find out how the ratio was defined. Some sources provide the ratio of long-term debt to total assets, and some provide the ratio of all debt to equity, so be sure to check your source's definition.

## Ability to Pay Interest: Times-Interest-Earned Ratio

The **times-interest-earned (TIE) ratio**, also called the **interest coverage ratio**, is determined by dividing earnings before interest and taxes (EBIT in Table 3-1) by the interest expense:

$$\begin{aligned} \text{Times-interest-earned (TIE) ratio} &= \frac{\text{EBIT}}{\text{Interest expense}} \\ &= \frac{\$283.8}{\$88} = 3.2 \\ \text{Industry average} &= 6.0 \end{aligned}$$

The TIE ratio measures the extent to which operating income can decline before the firm is unable to meet its annual interest costs. Failure to meet this obligation can bring legal action by the firm's creditors, possibly resulting in bankruptcy. Note that earnings before interest and taxes, rather than net income, is used in the numerator. Because interest is paid with pre-tax dollars, the firm's ability to pay current interest is not affected by taxes.

MicroDrive's interest is covered 3.2 times. The industry average is 6, so MicroDrive is covering its interest charges by a relatively low margin of safety. Thus, the TIE ratio reinforces the conclusion from our analysis of the debt ratio that MicroDrive would face difficulties if it attempted to borrow additional funds.

## Ability to Service Debt: EBITDA Coverage Ratio

The TIE ratio is useful for assessing a company's ability to meet interest charges on its debt, but this ratio has two shortcomings: (1) Interest is not the only fixed financial charge—companies must also reduce debt on schedule, and many firms lease assets and thus must make lease payments. If they fail to repay debt or meet lease payments, they can be forced into bankruptcy. (2) EBIT does not represent all the cash flow available to service debt, especially if a firm has high depreciation and/or amortization charges. The **EBITDA coverage ratio** accounts for these deficiencies:<sup>7</sup>

$$\begin{aligned} \text{EBITDA coverage ratio} &= \frac{\text{EBITDA} + \text{Lease payments}}{\text{Interest} + \text{Principal payments} + \text{Lease payments}} \\ &= \frac{\$383.8 + \$28}{\$88 + \$20 + \$28} = \frac{\$411.8}{\$136} = 3.0 \\ \text{Industry average} &= 4.3 \end{aligned}$$

MicroDrive had \$383.8 million of earnings before interest, taxes, depreciation, and amortization (EBITDA). Also, lease payments of \$28 million were deducted while calculating EBITDA. That \$28 million was available to meet financial charges; hence it must be added back, bringing the total available to cover fixed financial charges to \$411.8 million. Fixed financial charges consisted of \$88 million of interest, \$20 million of sinking fund payments, and \$28 million for lease payments, for a total of \$136 million.<sup>8</sup> Therefore, MicroDrive covered its fixed financial charges by 3.0 times. However, if EBITDA declines then the coverage will fall, and EBITDA certainly can decline. Moreover, MicroDrive's ratio is well below the industry average, so again the company seems to have a relatively high level of debt.

The EBITDA coverage ratio is most useful for relatively short-term lenders such as banks, which rarely make loans (except real estate-backed loans) for longer than about 5 years. Over a relatively short period, depreciation-generated funds can be used to service debt. Over a longer time, those funds must be reinvested to maintain the plant and equipment or else the company cannot remain in business. Therefore, banks and other relatively short-term lenders focus on the EBITDA coverage ratio, whereas long-term bondholders focus on the TIE ratio.

### Self-Test

How does the use of financial leverage affect current stockholders' control position? Explain the following statement: "Analysts look at both balance sheet and income statement ratios when appraising a firm's financial condition."

Name three ratios that are used to measure the extent to which a firm uses financial leverage, and write out their equations.

A company has EBITDA of \$600 million, interest payments of \$60 million, lease payments of \$40 million, and required principal payments (due this year) of \$30 million. What is its EBITDA coverage ratio? **(4.9)**

<sup>7</sup>Different analysts define the EBITDA coverage ratio in different ways. For example: some omit the lease payment information; others "gross up" principal payments by dividing them by  $1 - T$  since these payments are not tax deductions and hence must be made with after-tax cash flows. We included lease payments because for many firms they are quite important, and failing to make them can lead to bankruptcy just as surely as can failure to make payments on "regular" debt. We did not gross up principal payments because, if a company is in financial difficulty, then its tax rate will probably be zero; hence the gross up is not necessary whenever the ratio is really important.

<sup>8</sup>A sinking fund is a required annual payment designed to reduce the balance of a bond or preferred stock issue.

## 3.5 PROFITABILITY RATIOS

Profitability is the net result of a number of policies and decisions. The ratios examined thus far provide useful clues as to the effectiveness of a firm's operations, but the **profitability ratios** go on to show the combined effects of liquidity, asset management, and debt on operating results.

### Net Profit Margin

The **net profit margin**, which is also called the **profit margin on sales**, is calculated by dividing net income by sales. It gives the profit per dollar of sales:

$$\text{Net profit margin} = \frac{\text{Net income available to common stockholders}}{\text{Sales}}$$

$$= \frac{\$113.5}{\$3,000} = 3.8\%$$

$$\text{Industry average} = 5.0\%$$

MicroDrive's net profit margin is below the industry average of 5%, but why is this so? Is it due to inefficient operations, high interest expenses, or both?

Instead of just comparing net income to sales, many analysts also break the income statement into smaller parts to identify the sources of a low net profit margin. For example, the **operating profit margin** is defined as

$$\text{Operating profit margin} = \frac{\text{EBIT}}{\text{Sales}}$$

The operating profit margin identifies how a company is performing with respect to its operations before the impact of interest expenses is considered. Some analysts drill even deeper by breaking operating costs into their components. For example, the **gross profit margin** is defined as

$$\text{Gross profit margin} = \frac{\text{Sales} - \text{Cost of goods sold}}{\text{Sales}}$$

The gross profit margin identifies the gross profit per dollar of sales before any other expenses are deducted.

Rather than calculate each type of profit margin here, later in the chapter we will use common size analysis and percent change analysis to focus on different parts of the income statement. In addition, we will use the Du Pont equation to show how the ratios interact with one another.

Sometimes it is confusing to have so many different types of profit margins. To help simplify the situation, we will focus primarily on the net profit margin throughout the book and simply call it the "profit margin."

### Basic Earning Power (BEP) Ratio

The **basic earning power (BEP) ratio** is calculated by dividing earnings before interest and taxes (EBIT) by total assets:

## The World Might be Flat, but Global Accounting is Bumpy! The Case of IFRS versus FASB

In a flat world, distance is no barrier. Work flows to where it can be accomplished most efficiently, and capital flows to where it can be invested most profitably. If a radiologist in India is more efficient than one in the United States, then images will be e-mailed to India for diagnosis; if rates of return are higher in Brazil, then investors throughout the world will provide funding for Brazilian projects. One key to “flattening” the world is agreement on common standards. For example, there are common Internet standards so that users throughout the world are able to communicate.

A glaring exception to standardization is in accounting. The Securities and Exchange Commission (SEC) in the United States requires firms to comply with standards set by the Financial Accounting Standards Board (FASB). But the European Union requires all EU-listed companies to comply with the International Financial Reporting Standards (IFRS) as defined by the International Accounting Standards Board (IASB).

IFRS tends to rely on general principles, whereas FASB standards are rules-based. As the recent accounting scandals demonstrate, many U.S. companies have been able to comply with U.S. rules while violating the principle, or intent, underlying the rules. The United States is likely to adopt IFRS, or a slightly modified IFRS, but the question is “When?” The SEC estimated that a large company is likely to incur costs of up to \$32 million when switching to IFRS. So even though a survey by the accounting firm KPMG indicates that most investors and analysts favor adoption of IFRS, the path to adoption is likely to be bumpy.

*Sources:* See the Web sites of the IASB and the FASB, <http://www.iasb.org.uk> and <http://www.fasb.org>. Also see David M. Katz and Sarah Johnson, “Top Obama Advisers Clash on Global Accounting Standards,” January 15, 2009, at <http://www.cfo.com>; and “Survey Favors IFRS Adoption,” February 3, 2009, at <http://www.webcpa.com>.

$$\text{Basic earning power (BEP) ratio} = \frac{\text{EBIT}}{\text{Total assets}}$$

$$= \frac{\$283.8}{\$2,000} = 14.2\%$$

$$\text{Industry average} = 17.2\%$$

This ratio shows the raw earning power of the firm’s assets before the influence of taxes and leverage, and it is useful for comparing firms with different tax situations and different degrees of financial leverage. Because of its low turnover ratios and low profit margin on sales, MicroDrive is not getting as high a return on its assets as is the average company in its industry.<sup>9</sup>

### Return on Total Assets

The ratio of net income to total assets measures the **return on total assets (ROA)** after interest and taxes. This ratio is also called the **return on assets** and is defined as follows:

<sup>9</sup>Notice that EBIT is earned throughout the year, whereas the total assets figure is an end-of-the-year number. Therefore, it would be better, conceptually, to calculate this ratio as  $\text{EBIT}/(\text{Average assets}) = \text{EBIT}/[(\text{Beginning assets} + \text{Ending assets})/2]$ . We have not made this adjustment because the published ratios used for comparative purposes do not include it. However, when we construct our own comparative ratios, we do make this adjustment. The same adjustment would also be appropriate for the next two ratios, ROA and ROE.

$$\text{Return on total assets} = \text{ROA} = \frac{\text{Net income available to common stockholders}}{\text{Total assets}}$$

$$= \frac{\$113.5}{\$2,000} = 5.7\%$$

$$\text{Industry average} = 9.0\%$$

MicroDrive's 5.7% return is well below the 9% average for the industry. This low return is due to (1) the company's low basic earning power and (2) high interest costs resulting from its above-average use of debt; both of these factors cause MicroDrive's net income to be relatively low.

## Return on Common Equity

The ratio of net income to common equity measures the **return on common equity (ROE)**:

$$\text{Return on common equity} = \text{ROE} = \frac{\text{Net income available to common stockholders}}{\text{Common equity}}$$

$$= \frac{\$113.5}{\$896} = 12.7\%$$

$$\text{Industry average} = 15.0\%$$

Stockholders invest to earn a return on their money, and this ratio tells how well they are doing in an accounting sense. MicroDrive's 12.7% return is below the 15% industry average, but not as far below as its return on total assets. This somewhat better result is due to the company's greater use of debt, a point that we explain in detail later in the chapter.

### Self-Test

Identify and write out the equations for four profitability ratios.

Why is the basic earning power ratio useful?

Why does the use of debt lower ROA?

What does ROE measure?

A company has \$200 billion of sales and \$10 billion of net income. Its total assets are \$100 billion, financed half by debt and half by common equity. What is its profit margin? **(5%)** What is its ROA? **(10%)** What is its ROE? **(20%)** Would ROA increase if the firm used less leverage? **(Yes)** Would ROE increase? **(No)**

## 3.6 MARKET VALUE RATIOS

**Market value ratios** relate a firm's stock price to its earnings, cash flow, and book value per share. Market value ratios are a way to measure the value of a company's stock relative to that of another company.

### Price/Earnings Ratio

The **price/earnings (P/E) ratio** shows how much investors are willing to pay per dollar of reported profits. MicroDrive's stock sells for \$23, so with an earnings per share (EPS) of \$2.27 its P/E ratio is 10.1:

$$\text{Price/earnings (P/E) ratio} = \frac{\text{Price per share}}{\text{Earnings per share}}$$

$$= \frac{\$23.00}{\$2.27} = 10.1$$

$$\text{Industry average} = 12.5$$

Price/earnings ratios are higher for firms with strong growth prospects, other things held constant, but they are lower for riskier firms. Because MicroDrive's P/E ratio is below the average, this suggests that the company is regarded as being somewhat riskier than most, as having poorer growth prospects, or both. In early 2009, the average P/E ratio for firms in the S&P 500 was 12.54, indicating that investors were willing to pay \$12.54 for every dollar of earnings.

### Price/Cash Flow Ratio

Stock prices depend on a company's ability to generate cash flows. Consequently, investors often look at the **price/cash flow ratio**, where cash flow is defined as net income plus depreciation and amortization:

$$\text{Price/cash flow ratio} = \frac{\text{Price per share}}{\text{Cash flow per share}}$$

$$= \frac{\$23.00}{\$4.27} = 5.4$$

$$\text{Industry average} = 6.8$$

MicroDrive's price/cash flow ratio is also below the industry average, once again suggesting that its growth prospects are below average, its risk is above average, or both.

The **price/EBITDA ratio** is similar to the price/cash flow ratio, except the price/EBITDA ratio measures performance before the impact of interest expenses and taxes, making it a better measure of operating performance. MicroDrive's EBITDA per share is  $\$383.8/50 = \$7.676$ , so its price/EBITDA is  $\$23/\$7.676 = 3.0$ . The industry average price/EBITDA ratio is 4.6, so we see again that MicroDrive is below the industry average.

Note that some analysts look at other multiples as well. For example, depending on the industry, some may look at measures such as price/sales or price/customers. Ultimately, though, value depends on free cash flows, so if these "exotic" ratios do not forecast future free cash flow, they may turn out to be misleading. This was true in the case of the dot-com retailers before they crashed and burned in 2000, costing investors many billions.

### Market/Book Ratio

The ratio of a stock's market price to its book value gives another indication of how investors regard the company. Companies with relatively high rates of return on equity generally sell at higher multiples of book value than those with low returns. First, we find MicroDrive's book value per share:

$$\begin{aligned}\text{Book value per share} &= \frac{\text{Common equity}}{\text{Shares outstanding}} \\ &= \frac{\$896}{50} = \$17.92\end{aligned}$$

Now we divide the market price by the book value to get a **market/book (M/B) ratio** of 1.3 times:

$$\begin{aligned}\text{Market/book ratio} = M/B &= \frac{\text{Market price per share}}{\text{Book value per share}} \\ &= \frac{\$23.00}{\$17.92} = 1.3 \\ \text{Industry average} &= 1.7\end{aligned}$$

Investors are willing to pay relatively little for a dollar of MicroDrive's book value.

The average company in the S&P 500 had a market/book ratio of about 2.50 in early 2009. Since M/B ratios typically exceed 1.0, this means that investors are willing to pay more for stocks than their accounting book values. The book value is a record of the past, showing the cumulative amount that stockholders have invested, either directly by purchasing newly issued shares or indirectly through retaining earnings. In contrast, the market price is forward-looking, incorporating investors' expectations of future cash flows. For example, in early 2009 Alaska Air had a market/book ratio of only 0.81, reflecting the airline industry's problems, whereas Apple's market/book ratio was 3.45, indicating that investors expected Apple's past successes to continue.

Table 3-2 summarizes MicroDrive's financial ratios. As the table indicates, the company has many problems.

#### Self-Test

Describe three ratios that relate a firm's stock price to its earnings, cash flow, and book value per share, and write out their equations.

What does the price/earnings (P/E) ratio show? If one firm's P/E ratio is lower than that of another, what are some factors that might explain the difference?

How is book value per share calculated? Explain why book values often deviate from market values.

A company has \$6 billion of net income, \$2 billion of depreciation and amortization, \$80 billion of common equity, and 1 billion shares of stock. If its stock price is \$96 per share, what is its price/earnings ratio? **(16)** Its price/cash flow ratio? **(12)** Its market/book ratio? **(1.2)**

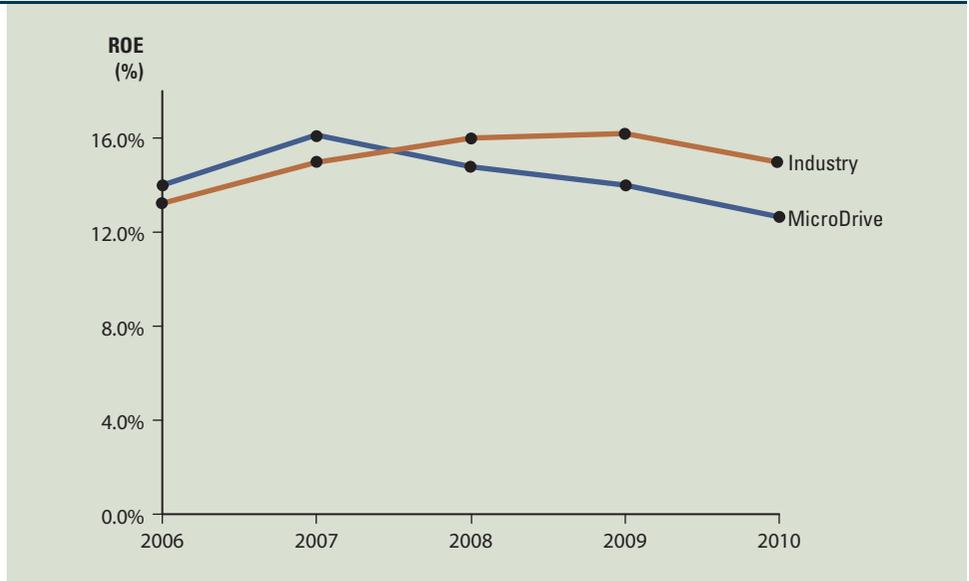
## 3.7 TREND ANALYSIS, COMMON SIZE ANALYSIS, AND PERCENTAGE CHANGE ANALYSIS

Trends give clues as to whether a firm's financial condition is likely to improve or deteriorate. To do a **trend analysis**, you examine a ratio over time, as shown in Figure 3-1. This graph shows that MicroDrive's rate of return on common equity has been declining since 2007, even though the industry average has been relatively stable. All the other ratios could be analyzed similarly.

In a **common size analysis**, all income statement items are divided by sales and all balance sheet items are divided by total assets. Thus, a common size income state-

**TABLE 3-2** MicroDrive Inc.: Summary of Financial Ratios (Millions of Dollars)

RATIO	FORMULA	CALCULATION	RATIO	INDUSTRY AVERAGE	COMMENT
<i>Liquidity</i>					
Current	$\frac{\text{Current assets}}{\text{Current liabilities}}$	$\frac{\$1,000}{\$310} =$	3.2	4.2	Poor
Quick	$\frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}}$	$\frac{\$385}{\$310} =$	1.2	2.1	Poor
<i>Asset Management</i>					
Inventory turnover	$\frac{\text{Sales}}{\text{Inventories}}$	$\frac{\$3,000}{\$615} =$	4.9	9.0	Poor
Days sales outstanding (DSO)	$\frac{\text{Receivables}}{\text{Annual sales}/365}$	$\frac{\$375}{\$8,219} =$	45.6	36.0	Poor
Fixed assets turnover	$\frac{\text{Sales}}{\text{Net fixed assets}}$	$\frac{\$3,000}{\$1,000} =$	3.0	3.0	OK
Total assets turnover	$\frac{\text{Sales}}{\text{Total assets}}$	$\frac{\$3,000}{\$2,000} =$	1.5	1.8	Poor
<i>Debt Management</i>					
Debt ratio	$\frac{\text{Total liabilities}}{\text{Total assets}}$	$\frac{\$1,064}{\$2,000} =$	53.2%	40.0%	High (risky)
Times-interest-earned (TIE)	$\frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Interest charges}}$	$\frac{\$283.8}{\$88} =$	3.2	6.0	Low (risky)
EBITDA coverage	$\frac{\text{EBITDA} + \text{Lease pmts.}}{\text{Interest} + \text{Principal payments} + \text{Lease pmts.}}$	$\frac{\$411.8}{\$136} =$	3.0	4.3	Low (risky)
<i>Profitability</i>					
Profit margin on sales	$\frac{\text{Net income available to common stockholders}}{\text{Sales}}$	$\frac{\$113.5}{\$3,000} =$	3.8%	5.0%	Poor
Basic earning power (BEP)	$\frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Total assets}}$	$\frac{\$283.8}{\$2,000} =$	14.2%	17.2%	Poor
Return on total assets (ROA)	$\frac{\text{Net income available to common stockholders}}{\text{Total assets}}$	$\frac{\$113.5}{\$2,000} =$	5.7%	9.0%	Poor
Return on common equity (ROE)	$\frac{\text{Net income available to common stockholders}}{\text{Common equity}}$	$\frac{\$113.5}{\$896} =$	12.7%	15.0%	Poor
<i>Market Value</i>					
Price/earnings (P/E)	$\frac{\text{Price per share}}{\text{Earnings per share}}$	$\frac{\$23.00}{\$2.27} =$	10.1	12.5	Low
Price/cash flow	$\frac{\text{Price per share}}{\text{Cash flow per share}}$	$\frac{\$23.00}{\$4.27} =$	5.4	6.8	Low
Market/book (M/B)	$\frac{\text{Market price per share}}{\text{Book value per share}}$	$\frac{\$23.00}{\$17.92} =$	1.3	1.7	Low

**FIGURE 3-1** Rate of Return on Common Equity, 2006–2010

ment shows each item as a percentage of sales, and a common size balance sheet shows each item as a percentage of total assets.<sup>10</sup> The advantage of common size analysis is that it facilitates comparisons of balance sheets and income statements over time and across companies.



Common size statements are easy to generate if the financial statements are in a spreadsheet. In fact, if you obtain your data from a source that uses standardized financial statements, then it is easy to cut and paste the data for a new company over your original company's data, and all of your spreadsheet formulas will be valid for the new company. We generated Figure 3-2 in the *Excel* file *Ch03 Tool Kit.xls*. Figure 3-2 shows MicroDrive's 2009 and 2010 common size income statements, along with the composite statement for the industry. (*Note:* Rounding may cause addition/subtraction differences in Figures 3-2, 3-3, and 3-4.) MicroDrive's EBIT is slightly below average, and its interest expenses are slightly above average. The net effect is a relatively low profit margin.

Figure 3-3 shows MicroDrive's common size balance sheets along with the industry composite. Its accounts receivable are significantly higher than the industry average, its inventories are significantly higher, and it uses much more debt than the average firm.

In **percentage change analysis**, growth rates are calculated for all income statement items and balance sheet accounts relative to a base year. To illustrate, Figure 3-4 contains MicroDrive's income statement percentage change analysis for 2010 relative to 2009. Sales increased at a 5.3% rate during 2010, but EBITDA increased by 8.7%. This "good news" was offset by a 46.7% increase in interest expense. The significant growth in interest expense caused growth in net income to be negative. Thus, the percentage change analysis points out that the decrease in net income in 2010 resulted almost exclusively from an increase in interest expense. This conclusion could be reached by analyzing dollar

<sup>10</sup>Some sources of industry data, such as Risk Management Associates (formerly known as Robert Morris Associates), are presented exclusively in common size form.

FIGURE 3-2 MicroDrive Inc.: Common Size Income Statement

	A	B	C	D	E	F
				Industry Composite	MicroDrive	
				2010	2010	2009
167						
168						
169	Net sales			100.0%	100.0%	100.0%
170	Operating costs			<u>87.6%</u>	<u>87.2%</u>	<u>87.6%</u>
171	Earnings before interest, taxes, depr. & amort. (EBITDA)			12.4%	12.8%	12.4%
172	Depreciation and amortization			<u>2.8%</u>	<u>3.3%</u>	<u>3.2%</u>
173	Earnings before interest and taxes (EBIT)			9.6%	9.5%	9.2%
174	Less interest			<u>1.3%</u>	<u>2.9%</u>	<u>2.1%</u>
175	Earnings before taxes (EBT)			8.3%	6.5%	7.1%
176	Taxes (40%)			<u>3.3%</u>	<u>2.6%</u>	<u>2.8%</u>
177	Net income before preferred dividends			5.0%	3.9%	4.3%
178	Preferred dividends			<u>0.0%</u>	<u>0.1%</u>	<u>0.1%</u>
179	Net income available to common stockholders (profit margin)			<u>5.0%</u>	<u>3.5%</u>	<u>4.1%</u>
180						

FIGURE 3-3 MicroDrive Inc.: Common Size Balance Sheet

	A	B	C	D	E	
				Industry Composite	MicroDrive	
				2010	2010	2009
185						
186						
187	Assets					
188	Cash and equivalents			1.0%	0.5%	0.9%
189	Short-term investments			2.2%	0.0%	3.9%
190	Accounts receivable			17.8%	18.8%	18.8%
191	Inventories			<u>19.8%</u>	<u>30.8%</u>	<u>24.7%</u>
192	Total current assets			40.8%	50.0%	48.2%
193	Net plant and equipment			<u>59.2%</u>	<u>50.0%</u>	<u>51.8%</u>
194	Total assets			<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>
195						
196	Liabilities and equity					
197	Accounts payable			1.8%	3.0%	1.8%
198	Notes payable			4.4%	5.5%	3.6%
199	Accruals			<u>3.6%</u>	<u>7.0%</u>	<u>7.7%</u>
200	Total current liabilities			9.8%	15.5%	13.1%
201	Long-term bonds			<u>30.2%</u>	<u>37.7%</u>	<u>34.5%</u>
202	Total liabilities			40.0%	53.2%	47.6%
203	Preferred stock			0.0%	2.0%	2.4%
204	Total common equity			<u>60.0%</u>	<u>44.8%</u>	<u>50.0%</u>
205	Total liabilities and equity			<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>
206						



amounts, but percentage change analysis simplifies the task. We apply the same type of analysis to the balance sheets (see the file *Ch03 Tool Kit.xls*), which shows that inventories grew at a whopping 48.2% rate. With only a 5.3% growth in sales, the extreme growth in inventories should be of great concern to MicroDrive's managers.

#### Self-Test

- What is a trend analysis, and what important information does it provide?
- What is common size analysis?
- What is percentage change analysis?

FIGURE 3-4 MicroDrive Inc.: Income Statement Percentage Change Analysis



	A	B	C	D
213	Base Year = 2009			Percent
214				Change in
				2010
215	Net sales			5.3%
216	Operating costs			<u>4.8%</u>
217	Earnings before interest, taxes, depr. & amort. (EBITDA)			8.7%
218	Depreciation and amortization			<u>11.1%</u>
219	Earnings before interest and taxes (EBIT)			7.9%
220	Less interest			<u>46.7%</u>
221	Earnings before taxes (EBT)			(3.5%)
222	Taxes (40%)			<u>(3.5%)</u>
223	Net income before preferred dividends			(3.5%)
224	Preferred dividends			<u>0.0%</u>
225	Net income available to common stockholders			<u>(3.7%)</u>
226				

### 3.8 TYING THE RATIOS TOGETHER: THE DU PONT EQUATION

In ratio analysis, it is sometimes easy to miss the forest for all the trees. The **Du Pont equation** provides a framework that ties together a firm's profitability, asset efficiency, and use of debt. The return on assets (ROA) can be expressed as the profit margin multiplied by the total assets turnover ratio:

$$\begin{aligned} \text{ROA} &= \text{Profit margin} \times \text{Total assets turnover} \\ &= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \end{aligned}$$

(3-1)

For MicroDrive, the ROA is

$$\text{ROA} = 3.8\% \times 1.5 = 5.7\%$$

MicroDrive made 3.8%, or 3.8 cents, on each dollar of sales, and its assets were turned over 1.5 times during the year. Therefore, the company earned a return of 5.7% on its assets.

To find the return on equity (ROE), multiply the ROA by the *equity multiplier*, which is the ratio of assets to common equity:

$$\text{Equity multiplier} = \frac{\text{Total assets}}{\text{Common equity}}$$

(3-2)

Firms that have a lot of leverage (i.e., a lot of liabilities or preferred stock) have a high equity multiplier because the assets are financed with a relatively smaller amount of equity. Therefore, the return on equity (ROE) depends on the ROA and the use of leverage:

$$\begin{aligned} \text{ROE} &= \text{ROA} \times \text{Equity multiplier} \\ &= \frac{\text{Net income}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Common equity}} \end{aligned} \quad (3-3)$$

MicroDrive's ROE is

$$\begin{aligned} \text{ROE} &= 5.7\% \times \$2,000/\$896 \\ &= 5.7\% \times 2.23 \\ &= 12.7\% \end{aligned}$$

Combining Equations 3-1 and 3-3 gives the *extended, or modified, Du Pont equation*, which shows how the profit margin, the total assets turnover ratio, and the equity multiplier combine to determine the ROE:

$$\begin{aligned} \text{ROE} &= (\text{Profit margin})(\text{Total assets turnover})(\text{Equity multiplier}) \\ &= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Common equity}} \end{aligned} \quad (3-4)$$

For MicroDrive, we have

$$\begin{aligned} \text{ROE} &= (3.8\%)(1.5)(2.23) \\ &= 12.7\% \end{aligned}$$

The insights provided by the Du Pont model are valuable, and the model can be used for “quick and dirty” estimates of the impact that operating changes have on returns. For example, holding all else equal, if MicroDrive can implement lean production techniques and increase to 1.8 its ratio of sales to total assets, then its ROE will improve to  $(3.8\%)(1.8)(2.23) = 15.25\%$ . For a more complete “what if” analysis, most companies use a forecasting model such as the one described in Chapter 12.

#### Self-Test

Explain how the extended, or modified, Du Pont equation can be used to reveal the basic determinants of ROE.

What is the equity multiplier?

A company has a profit margin of 6%, a total asset turnover ratio of 2, and an equity multiplier of 1.5. What is its ROE? **(18%)**

## 3.9 COMPARATIVE RATIOS AND BENCHMARKING

Ratio analysis involves comparisons. A company's ratios are compared with those of other firms in the same industry—that is, with industry average figures. However, like most firms, MicroDrive's managers go one step further: they also compare their ratios with those of a smaller set of the leading computer companies. This technique is called **benchmarking**, and the companies used for the comparison are called **benchmark companies**. For example, MicroDrive benchmarks against five other firms that its management considers to be the best-managed companies with operations similar to its own.

Many companies also benchmark various parts of their overall operation against top companies, whether they are in the same industry or not. For example, MicroDrive has a division that sells hard drives directly to consumers through catalogs and the Internet. This division's shipping department benchmarks against L.L.Bean, even though they are in different industries, because L.L.Bean's shipping department is one of the best. MicroDrive wants its own shippers to strive to match L.L.Bean's record for on-time shipments.

TABLE 3-3

Comparative Ratios for Apple Inc., the Computer Hardware Industry, the Technology Sector, and the S&amp;P 500

RATIO	APPLE	COMPUTER HARDWARE INDUSTRY <sup>a</sup>	TECHNOLOGY SECTOR <sup>b</sup>	S&P 500
P/E ratio	15.92	7.88	8.75	17.93
Market to book	3.60	3.12	2.90	6.84
Price to tangible book	3.70	4.41	3.87	8.73
Price to cash flow	14.30	6.70	4.58	12.01
Net profit margin	14.88	3.32	4.92	11.18
Quick ratio	2.43	1.86	1.97	1.04
Current ratio	2.46	2.21	2.36	1.28
Long-term debt to equity	0.00	20.05	18.28	151.80
Total debt to equity	0.00	30.32	27.38	197.45
Interest coverage (TIE) <sup>c</sup>	—	0.15	1.12	31.97
Return on assets	14.89	4.07	4.90	8.05
Return on equity	27.19	8.27	7.68	19.09
Inventory turnover	49.90	12.99	3.09	9.71
Asset turnover	1.00	0.37	0.46	0.79

<sup>a</sup>The computer hardware industry is composed of fifty firms, including IBM, Dell, Apple, Sun Microsystems, Gateway, and Silicon Graphics.

<sup>b</sup>The technology sector contains eleven industries, including communications equipment, computer hardware, computer networks, semiconductors, and software and programming.

<sup>c</sup>Apple had more interest income than interest expense.

Source: Adapted from <http://www.investor.reuters.com>, January 17, 2009.



To find quick information about a company, go to <http://www.investor.reuters.com>. Here you can find company profiles, stock price and share information, and several key ratios.

Comparative ratios are available from a number of sources, including *Value Line*, Dun and Bradstreet (D&B), and the *Annual Statement Studies* published by Risk Management Associates, which is the national association of bank loan officers. Table 3-3 reports selected ratios from Reuters for Apple and its industry, revealing that Apple has a much higher profit margin and lower debt ratio than its peers.

Each data-supplying organization uses a somewhat different set of ratios designed for its own purposes. For example, D&B deals mainly with small firms, many of which are proprietorships, and it sells its services primarily to banks and other lenders. Therefore, D&B is concerned largely with the creditor's viewpoint, and its ratios emphasize current assets and liabilities, not market value ratios. So, when you select a comparative data source, you should be sure that your own emphasis is similar to that of the agency whose ratios you plan to use. Additionally, there are often definitional differences in the ratios presented by different sources, so before using a source, be sure to verify the exact definitions of the ratios to ensure consistency with your own work.

#### Self-Test

Differentiate between trend analysis and comparative ratio analysis. What is benchmarking?

### 3.10 USES AND LIMITATIONS OF RATIO ANALYSIS

Ratio analysis provides useful information concerning a company's operations and financial condition, but it has limitations that necessitate care and judgment. Some potential problems include the following.

## Ratio Analysis on the Web

A great source for comparative ratios is <http://www.investor.reuters.com>. You have to register to use the site, but registration is free. Once you register and log in, select Stocks; enter a company's ticker symbol, select the Symbol ratio button, and then click the Go button. This

brings up a table with the stock quote, company information, and additional links. Select Ratios, which brings up a page with a detailed ratio analysis for the company and includes comparative ratios for other companies in the same sector, the same industry, and the S&P 500.

1. Many large firms operate different divisions in different industries, and for such companies it is difficult to develop a meaningful set of industry averages. Therefore, industry averages are more applicable to small, narrowly focused firms than to large, multidivisional ones.
2. To set goals for high-level performance, it is best to benchmark on the industry *leaders'* ratios rather than the industry *average* ratios.
3. Inflation may have badly distorted firms' balance sheets—reported values are often substantially different from “true” values. Further, because inflation affects depreciation charges and inventory costs, reported profits are also affected. Thus, inflation can distort a ratio analysis for one firm over time or a comparative analysis of firms of different ages.
4. Seasonal factors can also distort a ratio analysis. For example, the inventory turnover ratio for a food processor will be radically different if the balance sheet figure used for inventory is the one just before versus the one just after the close of the canning season. This problem can be minimized by using monthly averages for inventory (and receivables) when calculating turnover ratios.
5. Firms can employ “**window dressing**” techniques to make their financial statements look stronger. To illustrate, suppose a company takes out a 2-year loan in late December. Because the loan is for more than one year, it is not included in current liabilities even though the cash received through the loan is reported as a current asset. This improves the current and quick ratios and makes the year-end balance sheet look stronger. If the company pays the loan back in January, then the transaction was strictly window dressing.
6. Companies' choices of different accounting practices can distort comparisons. For example, choices of different inventory valuation and depreciation methods affect financial statements differently, making comparisons among companies less meaningful. As another example, if one firm leases a substantial amount of its productive equipment, then its assets may appear low relative to sales (because leased assets often do not appear on the balance sheet) and its debt may appear low (because the liability associated with the lease obligation may not be shown as debt).<sup>11</sup>

In summary, conducting ratio analysis in a mechanical, unthinking manner is dangerous, but when ratio analysis is used intelligently and with good judgment, it can provide useful insights into a firm's operations and identify the right questions to ask.

<sup>11</sup>This may change when FASB and IASB complete their joint project on leasing. But it may be a while before this happens; in early 2009, the estimated project completion date was 2011. See <http://72.3.243.42/project/leases.shtml> for updates.

**Self-Test**

List several potential problems with ratio analysis.

### 3.11 LOOKING BEYOND THE NUMBERS

Sound financial analysis involves more than just calculating and comparing ratios—qualitative factors must be considered. Here are some questions suggested by the American Association of Individual Investors (AAII).

1. To what extent are the company's revenues tied to one key customer or to one key product? To what extent does the company rely on a single supplier? Reliance on single customers, products, or suppliers increases risk.
2. What percentage of the company's business is generated overseas? Companies with a large percentage of overseas business are exposed to risk of currency exchange volatility and political instability.
3. What are the probable actions of current competitors and the likelihood of additional new competitors?
4. Do the company's future prospects depend critically on the success of products currently in the pipeline or on existing products?
5. How does the legal and regulatory environment affect the company?

**Self-Test**

What are some qualitative factors that analysts should consider when evaluating a company's likely future financial performance?

## Summary

This chapter explained techniques used by investors and managers to analyze financial statements. The key concepts covered are listed below.

- **Liquidity ratios** show the relationship of a firm's current assets to its current liabilities and thus its ability to meet maturing debts. Two commonly used liquidity ratios are the **current ratio** and the **quick**, or **acid test**, **ratio**.
- **Asset management ratios** measure how effectively a firm is managing its assets. These ratios include **inventory turnover**, **days sales outstanding**, **fixed assets turnover**, and **total assets turnover**.
- **Debt management ratios** reveal (1) the extent to which the firm is financed with debt and (2) its likelihood of defaulting on its debt obligations. They include the **debt ratio**, the **times-interest-earned ratio**, and the **EBITDA coverage ratio**.
- **Profitability ratios** show the combined effects of liquidity, asset management, and debt management policies on operating results. They include the **net profit margin** (also called the **profit margin on sales**), the **basic earning power ratio**, the **return on total assets**, and the **return on common equity**.
- **Market value ratios** relate the firm's stock price to its earnings, cash flow, and book value per share, thus giving management an indication of what investors think of the company's past performance and future prospects. These include the **price/earnings ratio**, the **price/cash flow ratio**, and the **market/book ratio**.
- **Trend analysis**, in which one plots a ratio over time, is important because it reveals whether the firm's condition has been improving or deteriorating over time.
- The **Du Pont system** is designed to show how the profit margin on sales, the assets turnover ratio, and the use of debt all interact to determine the rate of

return on equity. The firm's management can use the Du Pont system to analyze ways of improving performance.

- **Benchmarking** is the process of comparing a particular company with a group of similar successful companies.

Ratio analysis has limitations, but when used with care and judgment it can be very helpful.

## Questions

- (3-1) Define each of the following terms:
- Liquidity ratios*: current ratio; quick, or acid test, ratio
  - Asset management ratios: inventory turnover ratio; days sales outstanding (DSO); fixed assets turnover ratio; total assets turnover ratio
  - Financial leverage ratios*: debt ratio; times-interest-earned (TIE) ratio; coverage ratio
  - Profitability ratios*: profit margin on sales; basic earning power (BEP) ratio; return on total assets (ROA); return on common equity (ROE)
  - Market value ratios: price/earnings (P/E) ratio; price/cash flow ratio; market/book (M/B) ratio; book value per share
  - Trend analysis; comparative ratio analysis; benchmarking
  - Du Pont equation; window dressing; seasonal effects on ratios
- (3-2) Financial ratio analysis is conducted by managers, equity investors, long-term creditors, and short-term creditors. What is the primary emphasis of each of these groups in evaluating ratios?
- (3-3) Over the past year, M. D. Ryngaert & Co. has realized an increase in its current ratio and a drop in its total assets turnover ratio. However, the company's sales, quick ratio, and fixed assets turnover ratio have remained constant. What explains these changes?
- (3-4) Profit margins and turnover ratios vary from one industry to another. What differences would you expect to find between a grocery chain such as Safeway and a steel company? Think particularly about the turnover ratios, the profit margin, and the Du Pont equation.
- (3-5) How might (a) seasonal factors and (b) different growth rates distort a comparative ratio analysis? Give some examples. How might these problems be alleviated?
- (3-6) Why is it sometimes misleading to compare a company's financial ratios with those of other firms that operate in the same industry?

## Self-Test Problems

Solutions Appear in Appendix A

- (ST-1) Argent Corporation had earnings per share of \$4 last year, and it paid a \$2 dividend. Total retained earnings increased by \$12 million during the year, and book value per share at year-end was \$40. Argent has no preferred stock, and no new common stock was issued during the year. If Argent's year-end debt (which equals its total liabilities) was \$120 million, what was the company's year-end debt/assets ratio?

**(ST-2)** The following data apply to Jacobus and Associates (millions of dollars):  
Ratio Analysis

Cash and marketable securities	\$ 100.00
Fixed assets	\$ 283.50
Sales	\$1,000.00
Net income	\$ 50.00
Quick ratio	2.0
Current ratio	3.0
DSO	40.55 days
ROE	12%

Jacobus has no preferred stock—only common equity, current liabilities, and long-term debt.

- Find Jacobus's (1) accounts receivable, (2) current liabilities, (3) current assets, (4) total assets, (5) ROA, (6) common equity, and (7) long-term debt.
- In part a, you should have found Jacobus's accounts receivable = \$111.1 million. If Jacobus could reduce its DSO from 40.55 days to 30.4 days while holding other things constant, how much cash would it generate? If this cash were used to buy back common stock (at book value), thus reducing the amount of common equity, how would this affect (1) the ROE, (2) the ROA, and (3) the ratio of total debt to total assets?

## Problems

Answers Appear in Appendix B

### EASY PROBLEMS 1–5

- (3-1)** Greene Sisters has a DSO of 20 days. The company's average daily sales are \$20,000. What is the level of its accounts receivable? Assume there are 365 days in a year.  
Days Sales Outstanding
- (3-2)** Vigo Vacations has an equity multiplier of 2.5. The company's assets are financed with some combination of long-term debt and common equity. What is the company's debt ratio?  
Debt Ratio
- (3-3)** Winston Washers's stock price is \$75 per share. Winston has \$10 billion in total assets. Its balance sheet shows \$1 billion in current liabilities, \$3 billion in long-term debt, and \$6 billion in common equity. It has 800 million shares of common stock outstanding. What is Winston's market/book ratio?  
Market/Book Ratio
- (3-4)** A company has an EPS of \$1.50, a cash flow per share of \$3.00, and a price/cash flow ratio of 8.0. What is its P/E ratio?  
Price/Earnings Ratio
- (3-5)** Needham Pharmaceuticals has a profit margin of 3% and an equity multiplier of 2.0. Its sales are \$100 million and it has total assets of \$50 million. What is its ROE?  
ROE

### INTERMEDIATE PROBLEMS

#### 6–10

- (3-6)** Donaldson & Son has an ROA of 10%, a 2% profit margin, and a return on equity equal to 15%. What is the company's total assets turnover? What is the firm's equity multiplier?  
Du Pont Analysis
- (3-7)** Ace Industries has current assets equal to \$3 million. The company's current ratio is 1.5, and its quick ratio is 1.0. What is the firm's level of current liabilities? What is the firm's level of inventories?  
Current and Quick Ratios

**(3-8)** Assume you are given the following relationships for the Clayton Corporation:

Profit Margin and Debt Ratio	Sales/total assets	1.5
	Return on assets (ROA)	3%
	Return on equity (ROE)	5%

Calculate Clayton's profit margin and debt ratio.

**(3-9)** The Nelson Company has \$1,312,500 in current assets and \$525,000 in current liabilities. Its initial inventory level is \$375,000, and it will raise funds as additional notes payable and use them to increase inventory. How much can Nelson's short-term debt (notes payable) increase without pushing its current ratio below 2.0? What will be the firm's quick ratio after Nelson has raised the maximum amount of short-term funds?

**(3-10)** The Manor Corporation has \$500,000 of debt outstanding, and it pays an interest rate of 10% annually: Manor's annual sales are \$2 million, its average tax rate is 30%, and its net profit margin on sales is 5%. If the company does not maintain a TIE ratio of at least 5 to 1, then its bank will refuse to renew the loan and bankruptcy will result. What is Manor's TIE ratio?

**CHALLENGING PROBLEMS**  
11-14

**(3-11)** Complete the balance sheet and sales information in the table that follows for Hoffmeister Industries using the following financial data:

Debt ratio: 50%  
Quick ratio: 0.80  
Total assets turnover: 1.5  
Days sales outstanding: 36.5 days<sup>a</sup>  
Gross profit margin on sales: (Sales – Cost of goods sold)/Sales = 25%  
Inventory turnover ratio: 5.0

<sup>a</sup>Calculation is based on a 365-day year.

**Balance Sheet**

Cash		Accounts payable	
Accounts receivable		Long-term debt	60,000
Inventories		Common stock	
Fixed assets		Retained earnings	97,500
Total assets	\$300,000	Total liabilities and equity	
Sales		Cost of goods sold	

**(3-12)** The Kretovich Company had a quick ratio of 1.4, a current ratio of 3.0, an inventory turnover of 6 times, total current assets of \$810,000, and cash and marketable securities of \$120,000. What were Kretovich's annual sales and its DSO? Assume a 365-day year.

**(3-13)** Data for Morton Chip Company and its industry averages follow.

- a. Calculate the indicated ratios for Morton.
- b. Construct the extended Du Pont equation for both Morton and the industry.
- c. Outline Morton's strengths and weaknesses as revealed by your analysis.
- d. Suppose Morton had doubled its sales as well as its inventories, accounts receivable, and common equity during 2010. How would that information affect the validity of your ratio analysis? (*Hint*: Think about averages and the effects of rapid growth on ratios if averages are not used. No calculations are needed.)

**Morton Chip Company: Balance Sheet as of December 31, 2010**  
(Thousands of Dollars)

Cash	\$ 77,500	Accounts payable	\$129,000
Receivables	336,000	Notes payable	84,000
Inventories	241,500	Other current liabilities	117,000
Total current assets	\$655,000	Total current liabilities	\$330,000
Net fixed assets	292,500	Long-term debt	256,500
		Common equity	361,000
Total assets	<u>\$947,500</u>	Total liabilities and equity	<u>\$947,500</u>

**Morton Chip Company: Income Statement for Year Ended December 31, 2010** (Thousands of Dollars)

Sales	\$1,607,500
Cost of goods sold	1,392,500
Selling, general, and administrative expenses	145,000
Earnings before interest and taxes (EBIT)	\$ 70,000
Interest expense	24,500
Earnings before taxes (EBT)	\$ 45,500
Federal and state income taxes (40%)	18,200
Net income	<u>\$ 27,300</u>

Ratio	Morton	Industry Average
Current assets/Current liabilities	_____	2.0
Days sales outstanding <sup>a</sup>	_____	35.0 days
Sales/Inventory	_____	6.7
Sales/Fixed assets	_____	12.1
Sales/Total assets	_____	3.0
Net income/Sales	_____	1.2%
Net income/Total assets	_____	3.6%
Net income/Common equity	_____	9.0%
Total debt/Total assets	_____	60.0%

<sup>a</sup>Calculation is based on a 365-day year.

**(3-14)**

Comprehensive Ratio  
Analysis

The Jimenez Corporation's forecasted 2011 financial statements follow, along with some industry average ratios.

- Calculate Jimenez's 2011 forecasted ratios, compare them with the industry average data, and comment briefly on Jimenez's projected strengths and weaknesses.
- What do you think would happen to Jimenez's ratios if the company initiated cost-cutting measures that allowed it to hold lower levels of inventory and substantially decreased the cost of goods sold? No calculations are necessary: Think about which ratios would be affected by changes in these two accounts.

### Jimenez Corporation: Forecasted Balance Sheet as of December 31, 2011

<i>Assets</i>	
Cash	\$ 72,000
Accounts receivable	439,000
Inventories	894,000
Total current assets	<u>\$1,405,000</u>
Fixed assets	431,000
Total assets	<u><u>\$1,836,000</u></u>
<i>Liabilities and Equity</i>	
Accounts and notes payable	\$ 432,000
Accruals	170,000
Total current liabilities	<u>\$ 602,000</u>
Long-term debt	404,290
Common stock	575,000
Retained earnings	254,710
Total liabilities and equity	<u><u>\$1,836,000</u></u>

### Jimenez Corporation: Forecasted Income Statement for 2011

Sales	\$4,290,000
Cost of goods sold	3,580,000
Selling, general, and administrative expenses	370,320
Depreciation	159,000
Earnings before taxes (EBT)	<u>\$ 180,680</u>
Taxes (40%)	72,272
Net income	<u><u>\$ 108,408</u></u>

<i>Per Share Data</i>	
EPS	\$ 4.71
Cash dividends per share	\$ 0.95
P/E ratio	5
Market price (average)	\$ 23.57
Number of shares outstanding	23,000

<i>Industry Financial Ratios (2010)<sup>a</sup></i>	
Quick ratio	1.0
Current ratio	2.7
Inventory turnover <sup>b</sup>	7.0
Days sales outstanding <sup>c</sup>	32 days
Fixed assets turnover <sup>b</sup>	13.0
Total assets turnover <sup>b</sup>	2.6
Return on assets	9.1%
Return on equity	18.2%
Debt ratio	50.0%
Profit margin on sales	3.5%
P/E ratio	6.0
Price/Cash flow ratio	3.5

<sup>a</sup>Industry average ratios have been constant for the past 4 years.

<sup>b</sup>Based on year-end balance sheet figures.

<sup>c</sup>Calculation is based on a 365-day year.

## SPREADSHEET PROBLEM

(3-15)

Build a Model: Ratio  
Analysis

resource

Start with the partial model in the file *Ch03 P15 Build a Model.xls* from the textbook's Web site. Joshua & White (J&W) Technologies's financial statements are also shown below. Answer the following questions. (*Note:* Industry average ratios are provided in *Ch03 P15 Build a Model.xls*.)

- Has J&W's liquidity position improved or worsened? Explain.
- Has J&W's ability to manage its assets improved or worsened? Explain.
- How has J&W's profitability changed during the last year?
- Perform an extended Du Pont analysis for J&W for 2009 and 2010. What do these results tell you?
- Perform a common size analysis. What has happened to the composition (that is, percentage in each category) of assets and liabilities?
- Perform a percentage change analysis. What does this tell you about the change in profitability and asset utilization?

### Joshua & White Technologies: December 31 Balance Sheets (Thousands of Dollars)

<i>Assets</i>	2010	2009	<i>Liabilities &amp; Equity</i>	2010	2009
Cash and cash equivalents	\$ 21,000	\$ 20,000	Accounts payable	\$ 33,600	\$ 32,000
Short-term investments	3,759	3,240	Accruals	12,600	12,000
Accounts receivable	52,500	48,000	Notes payable	<u>19,929</u>	<u>6,480</u>
Inventories	<u>84,000</u>	<u>56,000</u>	Total current liabilities	\$ 66,129	\$ 50,480
Total current assets	\$161,259	\$127,240	Long-term debt	<u>67,662</u>	<u>58,320</u>
Net fixed assets	<u>218,400</u>	<u>200,000</u>	Total liabilities	\$133,791	\$108,800
Total assets	<u><u>\$379,659</u></u>	<u><u>\$327,240</u></u>	Common stock	183,793	178,440
			Retained earnings	<u>62,075</u>	<u>40,000</u>
			Total common equity	<u>\$245,868</u>	<u>\$218,440</u>
			Total liabilities & equity	<u><u>\$379,659</u></u>	<u><u>\$327,240</u></u>

### Joshua & White Technologies December 31 Income Statements (Thousands of Dollars)

	2010	2009
Sales	\$420,000	\$400,000
Expenses excluding depr. & amort.	<u>327,600</u>	<u>320,000</u>
EBITDA	\$ 92,400	\$ 80,000
Depreciation and amortization	<u>19,660</u>	<u>18,000</u>
EBIT	\$ 72,740	\$ 62,000

	2010	2009
Interest expense	5,740	4,460
EBT	\$67,000	\$57,540
Taxes (40%)	26,800	23,016
Net income	<u>\$40,200</u>	<u>\$34,524</u>
Common dividends	\$18,125	\$17,262
<b>Other Data</b>	<b>2010</b>	<b>2009</b>
Year-end stock price	\$ 90.00	\$ 96.00
Number of shares (Thousands)	4,052	4,000
Lease payment (Thousands of Dollars)	\$20,000	\$20,000
Sinking fund payment (Thousands of Dollars)	\$ 0	\$ 0

## THOMSON ONE Business School Edition Problem

Use the Thomson ONE—Business School Edition online database to work this chapter's questions.

### ANALYSIS OF FORD'S FINANCIAL STATEMENTS WITH THOMSON ONE—BUSINESS SCHOOL EDITION

Use Thomson ONE to analyze Ford Motor Company. Enter Ford's ticker symbol (F) and select GO. By selecting the tab at the top labeled Financials, you can find Ford's key financial statements for the past several years. At the Financials screen on the second line of tabs, select the Fundamental Ratios tab. If you then select the SEC Database Ratios from the pull-down menu, you can select either annual or quarterly ratios.

Under annual ratios, there is an in-depth summary of Ford's various ratios over the past three years.

Click on the Peers tab (on the first line of tabs) near the top of the screen for a summary of financial information for Ford and a few of its peers. If you click on the Peer Sets tab (second line of tabs), you can modify the list of peer firms. The default setup is "Peers set by SIC Code." To obtain a comparison of many of the key ratios presented in the text, just click on Financials (second line of tabs) and select Key Financial Ratios from the drop-down menu.

### Thomson ONE—BSE Discussion Questions

1. What has happened to Ford's liquidity position over the past 3 years? How does Ford's liquidity compare with its peers? (*Hint:* You may use both the peer key financial ratios and liquidity comparison to answer this question.)
2. Take a look at Ford's inventory turnover ratio. How does this ratio compare with its peers? Have there been any interesting changes over time in this measure? Do you consider Ford's inventory management to be a strength or a weakness?
3. Construct a simple Du Pont analysis for Ford and its peers. What are Ford's strengths and weaknesses relative to its competitors?

## Mini Case

The first part of the case, presented in Chapter 2, discussed the situation of Computron Industries after an expansion program. A large loss occurred in 2010, rather than the expected profit. As a result, its managers, directors, and investors are concerned about the firm's survival.

Donna Jamison was brought in as assistant to Fred Campo, Computron's chairman, who had the task of getting the company back into a sound financial position. Computron's 2009 and 2010 balance sheets and income statements, together with projections for 2011, are shown in the following tables. The tables also show the 2009 and 2010 financial ratios, along with industry average data. The 2011 projected financial statement data represent Jamison's and Campo's best guess for 2011 results, assuming that some new financing is arranged to get the company "over the hump."

### Balance Sheets

	2009	2010	2011E
<b>Assets</b>			
Cash	\$ 9,000	\$ 7,282	\$ 14,000
Short-term investments	48,600	20,000	71,632
Accounts receivable	351,200	632,160	878,000
Inventories	715,200	1,287,360	1,716,480
Total current assets	<u>\$1,124,000</u>	<u>\$1,946,802</u>	<u>\$2,680,112</u>
Gross fixed assets	491,000	1,202,950	1,220,000
Less: Accumulated depreciation	146,200	263,160	383,160
Net fixed assets	<u>\$ 344,800</u>	<u>\$ 939,790</u>	<u>\$ 836,840</u>
Total assets	<u><u>\$1,468,800</u></u>	<u><u>\$2,886,592</u></u>	<u><u>\$3,516,952</u></u>
<b>Liabilities and Equity</b>			
Accounts payable	\$ 145,600	\$ 324,000	\$ 359,800
Notes payable	200,000	720,000	300,000
Accruals	136,000	284,960	380,000
Total current liabilities	<u>\$ 481,600</u>	<u>\$1,328,960</u>	<u>\$1,039,800</u>
Long-term debt	323,432	1,000,000	500,000
Common stock (100,000 shares)	460,000	460,000	1,680,936
Retained earnings	203,768	97,632	296,216
Total equity	<u>\$ 663,768</u>	<u>\$ 557,632</u>	<u>\$1,977,152</u>
Total liabilities and equity	<u><u>\$1,468,800</u></u>	<u><u>\$2,886,592</u></u>	<u><u>\$3,516,952</u></u>

Note: "E" denotes "estimated"; the 2011 data are forecasts.

Jamison must prepare an analysis of where the company is now, what it must do to regain its financial health, and what actions should be taken. Your assignment is to help her answer the following questions. Provide clear explanations, not yes or no answers.

- Why are ratios useful? What three groups use ratio analysis and for what reasons?
- Calculate the 2011 current and quick ratios based on the projected balance sheet and income statement data. What can you say about the company's liquidity position in 2009, 2010, and as projected for 2011? We often think of ratios as being useful (1) to managers to help run the business, (2) to bankers for credit analysis, and (3) to stockholders for stock valuation. Would these different types of analysts have an equal interest in the liquidity ratios?
- Calculate the 2011 inventory turnover, days sales outstanding (DSO), fixed assets turnover, and total assets turnover. How does Computron's utilization of assets stack up against that of other firms in its industry?

## Income Statements

	2009	2010	2011E
Sales	\$3,432,000	\$5,834,400	\$7,035,600
Cost of goods sold	2,864,000	4,980,000	5,800,000
Other expenses	340,000	720,000	612,960
Depreciation	18,900	116,960	120,000
Total operating costs	<u>\$3,222,900</u>	<u>\$5,816,960</u>	<u>\$6,532,960</u>
EBIT	\$ 209,100	\$ 17,440	\$ 502,640
Interest expense	62,500	176,000	80,000
EBT	\$ 146,600	(\$ 158,560)	\$ 422,640
Taxes (40%)	58,640	(63,424)	169,056
Net income	<u>\$ 87,960</u>	<u>(\$ 95,136)</u>	<u>\$ 253,584</u>

## Other Data

Stock price	\$ 8.50	\$ 6.00	\$ 12.17
Shares outstanding	100,000	100,000	250,000
EPS	\$ 0.880	(\$ 0.951)	\$ 1.014
DPS	\$ 0.220	0.110	0.220
Tax rate	40%	40%	40%
Book value per share	\$ 6.638	\$ 5.576	\$ 7.909
Lease payments	\$ 40,000	\$ 40,000	\$ 40,000

Note: "E" denotes "estimated"; the 2011 data are forecasts.

## Ratio Analysis

	2009	2010	2011E	Industry Average
Current	2.3	1.5	_____	2.7
Quick	0.8	0.5	_____	1.0
Inventory turnover	4.8	4.5	_____	6.1
Days sales outstanding	37.3	39.6	_____	32.0
Fixed assets turnover	10.0	6.2	_____	7.0
Total assets turnover	2.3	2.0	_____	2.5
Debt ratio	54.8%	80.7%	_____	50.0%
TIE	3.3	0.1	_____	6.2
EBITDA coverage	2.6	0.8	_____	8.0
Profit margin	2.6%	-1.6%	_____	3.6%
Basic earning power	14.2%	0.6%	_____	17.8%
ROA	6.0%	-3.3%	_____	9.0%
ROE	13.3%	-17.1%	_____	17.9%
Price/Earnings (P/E)	9.7	-6.3	_____	16.2
Price/Cash flow	8.0	27.5	_____	7.6
Market/Book	1.3	1.1	_____	2.9

Note: "E" denotes "estimated."

- Calculate the 2011 debt, times-interest-earned, and EBITDA coverage ratios. How does Computron compare with the industry with respect to financial leverage? What can you conclude from these ratios?
- Calculate the 2011 profit margin, basic earning power (BEP), return on assets (ROA), and return on equity (ROE). What can you say about these ratios?
- Calculate the 2011 price/earnings ratio, price/cash flow ratio, and market/book ratio. Do these ratios indicate that investors are expected to have a high or low opinion of the company?

- g. Perform a common size analysis and percentage change analysis. What do these analyses tell you about Computron?
- h. Use the extended Du Pont equation to provide a summary and overview of Computron's financial condition as projected for 2011. What are the firm's major strengths and weaknesses?
- i. What are some potential problems and limitations of financial ratio analysis?
- j. What are some qualitative factors that analysts should consider when evaluating a company's likely future financial performance?

## Selected Additional Cases

*The following cases from Textchoice, Cengage Learning's online library, cover many of the concepts discussed in this chapter and are available at <http://www.textchoice2.com>.*

Klein-Brigham Series:

Case 35, "Mark X Company (A)," which illustrates the use of ratio analysis in the evaluation of a firm's existing and potential financial positions; Case 36, "Garden State Container Corporation," which is similar in content to Case 35; Case 51, "Safe Packaging Corporation," which updates Case 36; Case 68, "Sweet Dreams Inc.," which also updates Case 36; and Case 71, "Swan-Davis, Inc.," which illustrates how financial analysis—based on both historical statements and forecasted statements—is used for internal management and lending decisions.