CHAPTER 4

ANALYSIS OF FINANCIAL STATEMENTS[1]

Lessons Learned from Enron and WorldCom

Enron, WorldCom

In early 2001, Enron appeared to be on top of the world. The high-flying energy firm had a market capitalization of $60 billion, and its stock was trading at $80 a share. Wall Street analysts were touting its innovations and management success and strongly recommending the stock. Less than a year later, Enron had declared bankruptcy, its stock was basically worthless, and investors had lost billions of dollars. This dramatic and sudden collapse left many wondering how so much value could be destroyed in such a short period of time.

While Enron's stock fell steadily throughout the first part of 2001, most analysts voiced no concerns. The general consensus was that it was simply caught up in a sell-off that was affecting the entire stock market and that its long-run prospects remained strong. However, a hint of trouble came when Enron's CEO, Jeffrey Skilling, unexpectedly resigned in August 2001; he was replaced by its chairman and previous CEO, Ken Lay. By the end of August, its stock had fallen to $35 a share. Two months later, Enron stunned the financial markets by announcing a $638 million loss, along with a $1.2 billion write-down in its book value equity. The write-down, which turned out to be grossly inadequate, stemmed primarily from losses realized on a series of partnerships set up by its CFO, Andrew Fastow. Shortly thereafter, it was revealed that Enron had

[1] We have covered this chapter both early in the course and toward the end. Early coverage gives students an overview of how financial decisions affect financial statements and results, and thus of what financial management is all about. If it is covered later, after coverage of bond and stock valuation, risk analysis, capital budgeting, capital structure, and working capital management, students can better understand the logic of the ratios and see how they are used for different purposes. Depending on students' backgrounds, instructors may want to cover the chapter early or late.

guaranteed the partnerships' debt, so its true liabilities were far higher than the financial statements indicated. These revelations destroyed Enron's credibility, caused its customers to flee, and led directly to its bankruptcy.

Not surprisingly, Enron's investors and employees were enraged to learn that its senior executives had received $750 million in salaries, bonuses, and profits from stock options for good performance in the same year before the company went bankrupt. During that year, senior executives were bailing out of the stock as fast as they could, even as they put out misleading statements touting the stock to their employees and outside investors. Fastow has since pleaded guilty to fraud and is cooperating with authorities in the cases against his former bosses, Lay and Skilling, who have been indicted for their roles in Enron's collapse and await trial.

After Enron declared bankruptcy, critics turned their attention to the company's auditor, Arthur Andersen, and to certain Wall Street analysts who had blindly recommended the stock over the years. Critics contended that the auditors and analysts neglected their responsibilities because of conflicts of interest. Andersen partners looked the other way because they didn't want to compromise their lucrative consulting contracts with Enron, and the analysts kept recommending the stock because they wanted to help the investment banking side of their firms get more Enron business.

As if the Enron debacle was not enough, in June 2002 it was learned that WorldCom, an even larger company, had "cooked its books" and inflated its profits and cash flows by more than $11 billion. Shortly thereafter, WorldCom collapsed, with many more billions of investor losses and thousands unemployed. Enron had set up complicated partnerships to deceive investors, but WorldCom simply lied, reporting normal operating costs as capital expenditures and thus boosting its reported profits. Interestingly, Enron and WorldCom used the same auditing firm, Arthur Andersen, which was itself put out of business, causing about 70,000 employees to lose their jobs. It is also interesting to note that Citigroup's investment banking subsidiary, Salomon Smith Barney, earned many millions in fees from WorldCom, and that Salomon's lead telecom analyst, Jack Grubman, who helped bring in this business, did not downgrade WorldCom to a sell until the very day the fraud was announced. At that point the stock was selling for less than a dollar, down from a high of $64.50.

The Enron and WorldCom collapses caused investors throughout the world to wonder if these companies' misdeeds were isolated situations or were symptomatic of undiscovered problems lurking in many other companies. Those fears led to a broad decline in stock prices, and President Bush expressed outrage at executives whose actions were imperiling our financial markets and economic system. In response to these and other abuses, Congress passed the Sarbanes-Oxley Act of 2002. One of its provisions requires the CEO and the CFO to sign a statement certifying that the "financial statements and disclosures fairly represent, in all material respects, the operations and financial condition" of the company. This will make it easier to haul off in handcuffs a CEO or CFO who has misled investors.

Financial statements have undoubtedly improved in the last few years, and they now provide a wealth of good information that can be used by managers, investors, lenders, customers, suppliers, and regulators. As you will see in this chapter, a careful analysis of a company's statements can highlight its strengths and shortcomings. Also, as you will see, financial analysis can be used to predict how such strategic decisions as the sale of a division, a change in credit or inventory policy, or a plant expansion will affect a firm's future performance.

Putting Things In Perspective

The primary goal of financial management is to maximize shareholders' wealth over the long run, not to maximize accounting measures such as net income or EPS. However, accounting data influence stock prices, and these data can be used to understand why a company is performing the way it is and to forecast where it is heading. Chapter 3 described the key financial statements and showed how they change as a firm's operations undergo change. Now, in Chapter 4, we show how the statements are used by managers to improve performance; by lenders to evaluate the likelihood of collecting on loans; and by stockholders to forecast earnings, dividends, and stock prices.

If management is to maximize a firm's value, it must take advantage of the firm's strengths and correct its weaknesses. Financial analysis involves (1) comparing the firm's performance to other firms, especially those in the same industry, and (2) evaluating trends in the firm's financial position over time. These studies help management identify deficiencies and then take corrective actions. We focus here on how financial managers and investors evaluate firms' financial positions. Then, in later chapters, we examine the types of actions management can take to improve future performance and thus increase the firm's stock price.

The most important ratio is the ROE, or return on equity, which is net income to common stockholders divided by total stockholders' equity. Stockholders obviously want to earn a high rate of return on their invested capital, and the ROE tells them the rate they are earning. If the ROE is high, then the stock price will also tend to be high, and actions that increase ROE are likely to increase the stock price. The other ratios provide information about how well such assets as inventory, accounts receivable, and fixed assets are managed, and about how the firm is financed. As we will see, these factors all affect the ROE, and management uses the other ratios primarily to help develop plans to improve the average ROE over the long run.

4.1 RATIO ANALYSIS

Financial statements report both a firm's position at a point in time and its operations over some past period. However, their real value lies in the fact that they can be used to help predict future earnings and dividends. From an investor's standpoint, *predicting the future is what financial statement analysis is all about,* while from management's standpoint, *financial statement analysis is useful both to help anticipate future conditions and, more important, as a starting point for planning actions that will improve future performance.*

Financial ratios are designed to help one evaluate a financial statement. For example, Firm A might have debt of $5,248,760 and interest charges of $419,900, while Firm B might have debt of $52,647,980 and interest charges of $3,948,600. Which company is stronger? The burden of these debts, and the companies' ability to repay them, can best be evaluated (1) by comparing each firm's debt to its assets and (2) by comparing the interest it must pay to the income it has available for payment of interest. Such comparisons involve *ratio analysis*.

In the paragraphs that follow, we will calculate Allied Food Products' financial ratios for 2005, using data from the balance sheets and income statements given in Tables 3-1 and 3-2. We will also evaluate the ratios relative to the industry averages.[2] Note that the dollar amounts in the ratio calculations are generally in millions.

4.2 LIQUIDITY RATIOS

A **liquid asset** is one that trades in an active market and hence can be quickly converted to cash at the going market price, and a firm's "liquidity position" deals with this question: Will the firm be able to pay off its debts as they come due in the coming year? As shown in Table 3-1 in Chapter 3, Allied has $310 million of debt that must be paid off within the coming year. Will it have trouble meeting those obligations? A full liquidity analysis requires the use of cash budgets, but by relating cash and other current assets to current liabilities, ratio analysis provides a quick, easy-to-use measure of liquidity. Two of the most commonly used **liquidity ratios** are discussed here.

Liquid Asset
An asset that can be converted to cash quickly without having to reduce the asset's price very much.

Liquidity Ratios
Ratios that show the relationship of a firm's cash and other current assets to its current liabilities.

Current Ratio

The primary liquidity ratio is the **current ratio,** which is calculated by dividing current assets by current liabilities:

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

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

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

Current Ratio
This ratio is calculated by dividing current assets by current liabilities. It indicates the extent to which current liabilities are covered by those assets expected to be converted to cash in the near future.

Current assets include cash, marketable securities, accounts receivable, and inventories. Allied's current liabilities consist of accounts payable, short-term notes payable, current maturities of long-term debt, accrued taxes, and accrued wages.

If a company is getting into financial difficulty, it begins paying its bills (accounts payable) more slowly, borrowing from its bank, and so on, all of which increase current liabilities. If current liabilities are rising faster than current assets, the current ratio will fall, and this is a sign of possible trouble. Allied's current ratio of 3.2 is well below the industry average, 4.2, so its liquidity position is rather weak. Still, since its current assets are supposed to be converted to

[2] In addition to the ratios discussed in this section, financial analysts sometimes employ a tool known as *common size analysis*. To form a common size balance sheet, simply divide each asset and liability item by total assets and then express the results as percentages. The resultant percentage statement can be compared with statements of larger or smaller firms, or with those of the same firm over time. To form a common size income statement, divide each income statement item by sales. With a spreadsheet, which most analysts use, this is trivially easy.

cash within a year, it is likely that they could be liquidated at close to their stated value. With a current ratio of 3.2, Allied could liquidate current assets at only 31 percent of book value and still pay off current creditors in full.[3]

Although industry average figures are discussed later in some detail, note that an industry average is not a magic number that all firms should strive to maintain—in fact, some very well-managed firms may be above the average while other good firms are below it. However, if a firm's ratios are far removed from the averages for its industry, an analyst should be concerned about why this variance occurs. Thus, a deviation from the industry average should signal the analyst (or management) to check further.

Quick, or Acid Test, Ratio

Quick (Acid Test) Ratio
This ratio is calculated by deducting inventories from current assets and then dividing the remainder by current liabilities.

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

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

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

$$\text{Industry average} = 2.2\times$$

Inventories are typically the least liquid of a firm's current assets, hence they are the assets on which losses are most likely to occur in the event of liquidation. Therefore, this measure of a firm's ability to pay off short-term obligations without relying on the sale of inventories is important.

The industry average quick ratio is 2.2, so Allied's 1.2 ratio is quite 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 inventories.

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

What two ratios are used to analyze a firm's liquidity position? Write out their equations.

Why is the current ratio the most commonly used measure of short-term solvency?

Which current asset is typically the least liquid?

A company has current liabilities of $500 million, and its current ratio is 2.0. What is its level of current assets? ($1,000 million) If this firm's quick ratio is 1.6, how much inventory does it have? ($200 million)

Asset Management Ratios
A set of ratios that measure how effectively a firm is managing its assets.

4.3 ASSET MANAGEMENT RATIOS

A second group of ratios, the **asset management ratios,** measures how effectively the firm is managing its assets. These ratios answer this question: Does the amount of each type of asset seem reasonable, too high, or too low in view of

[3] 1/3.2 = 0.31, or 31%. Note also that 0.31($1,000) = $310, the current liabilities balance.

current and projected sales? When they acquire assets, Allied and other companies must obtain capital from banks or other sources. If a firm has too many assets, its cost of capital will be too high and its profits will be depressed. On the other hand, if assets are too low, profitable sales will be lost. The asset management ratios described in this section are important.

Inventory Turnover Ratio

"Turnover ratios" are ratios where sales are divided by some asset, and as the name implies, they show how many times the item is "turned over" during the year. Thus, the **inventory turnover ratio** is defined as sales divided by inventories:

Inventory Turnover Ratio
This ratio is calculated by dividing sales by inventories.

$$\text{Inventory turnover ratio} = \frac{\text{Sales}}{\text{Inventories}}$$

$$= \frac{\$3{,}000}{\$615} = 4.9\times$$

$$\text{Industry average} = 10.9\times$$

As a rough approximation, each item of Allied's inventory is sold out and restocked, or "turned over," 4.9 times per year. "Turnover" is a term that originated many years ago with the old Yankee peddler, who would load up his wagon with goods, then go off on his route to peddle his wares. The merchandise was called "working capital" because it was what he actually sold, or "turned over," to produce his profits, whereas his "turnover" was the number of trips he took each year. Annual sales divided by inventory equaled turnover, or trips per year. 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 went faster and made 20 trips per year, his gross profit would double, other things held constant. So, his turnover directly affected his profits.

Allied's turnover of 4.9 is much lower than the industry average of 10.9. This suggests that it is holding too much inventory. Excess inventory is, of course, unproductive and represents an investment with a low or zero rate of return. Allied's low inventory turnover ratio also makes us question the current ratio. With such a low turnover, the firm may be holding obsolete goods not worth their stated value.[4]

Note that sales occur over the entire year, whereas the inventory figure is for one point in time. For this reason, it might be better to use an average inventory measure.[5] If the business is highly seasonal, or if there has been a strong upward or downward sales trend during the year, it is especially useful to make an adjustment. To maintain comparability with industry averages, however, we did not use the average inventory figure.

[4] 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, the calculated turnover overstates the true turnover ratio. Therefore, it might be more appropriate to use cost of goods sold in place of sales in the formula's numerator. However, some established compilers of financial ratio statistics such as Dun & Bradstreet use the ratio of sales to inventories carried at cost. To have 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.

[5] 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, the beginning and ending figures can be added and then divided by 2. Both methods adjust for growth but not for seasonal effects.

Days Sales Outstanding

Days Sales Outstanding (DSO)
This ratio is calculated by dividing accounts receivable by average sales per day; it indicates the average length of time the firm must wait after making a sale before it receives cash.

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 how many days' sales are tied up in receivables. Thus, the DSO represents the average length of time that the firm must wait after making a sale before receiving cash. Allied has 46 days sales outstanding, well above the 36-day industry average:

$$\text{DSO} = \begin{matrix}\text{Days}\\ \text{sales}\\ \text{outstanding}\end{matrix} = \frac{\text{Receivables}}{\text{Average sales per day}} = \frac{\text{Receivables}}{\text{Annual sales}/365}$$

$$= \frac{\$375}{\$3{,}000/365} = \frac{\$375}{\$8.2192} = 45.625 \text{ days} \approx 46 \text{ days}$$

$$\text{Industry average} = 36 \text{ days}$$

Note that in this calculation we used a 365-day year. Some analysts use a 360-day year; on this basis Allied's DSO would have been slightly lower, 45 days.[6]

The DSO can also be evaluated by comparing it with the terms on which the firm sells its goods. For example, Allied's sales terms call for payment within 30 days, so the fact that 46 days' sales, not 30 days', are outstanding indicates that customers, on the average, are not paying their bills on time. This deprives the company of funds that could be used to reduce bank loans or some other type of costly capital. Moreover, with a high average DSO, it is likely that a number of customers are paying very late, and those customers may well be in financial trouble, in which case Allied may never be able to collect the receivable.[7] Therefore, if the trend in DSO over the past few years has been rising, but the credit policy has not been changed, this would be strong evidence that steps should be taken to expedite the collection of accounts receivable.

Fixed Assets Turnover Ratio

Fixed Assets Turnover Ratio
The ratio of sales to net fixed assets.

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:

$$\text{Fixed assets turnover ratio} = \frac{\text{Sales}}{\text{Net fixed assets}}$$

$$= \frac{\$3{,}000}{\$1{,}000} = 3.0\times$$

$$\text{Industry average} = 2.8\times$$

[6] It would be somewhat better to use *average* receivables, either an average of the monthly figures or (Beginning receivables + Ending receivables)/2 = ($315 + $375)/2 = $345 in the formula. Had average annual receivables been used, Allied's DSO on a 365-day basis would have been $345/$8.2192 = 41.975 days, or approximately 42 days. The 42-day figure is a more accurate one, but our interest is in comparisons, and because the industry average was based on year-end receivables, the 46-day number is better for our purposes. The DSO is discussed further in Part 6.

[7] For example, if further analysis along the lines suggested in Part 6 indicated that 85 percent of the customers pay in 30 days, then for the DSO to average 46 days, the remaining 15 percent must be paying on average in 136.67 days. Paying that late suggests financial difficulties. In Part 6 we also discuss refinements into this analysis, but a DSO of 46 days would alert a good analyst of the need to dig deeper.

Allied's ratio of 3.0 times is slightly above the 2.8 industry average, indicating that it is using its fixed assets at least as intensively as other firms in the industry. Therefore, Allied seems to have about the right amount of fixed assets relative to its sales.

Potential problems may arise when interpreting the fixed assets turnover ratio. Recall that fixed assets are shown on the balance sheet at their historical costs, less depreciation. Inflation has caused the value of many assets that were purchased in the past to be seriously understated. Therefore, if we compared an old firm that had acquired many of its fixed assets years ago at low prices with a new company with similar operations 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 when the assets were acquired than of inefficiency on the part of the new firm. The accounting profession is trying to develop procedures for making financial statements reflect current values rather than historical values, which would help us make better comparisons. However, at the moment the problem still exists, so financial analysts must recognize that a problem exists and deal with it judgmentally. In Allied's case, the issue is not serious because all firms in the industry have been expanding at about the same rate, hence the balance sheets of the comparison firms are reasonably comparable.[8]

Total Assets Turnover Ratio

Total Assets Turnover Ratio
This ratio is calculated by dividing sales by total assets.

The final asset management ratio, the **total assets turnover ratio,** measures the turnover of all the firm's assets, and it is calculated by dividing sales by total assets:

$$\text{Total assets turnover ratio} = \frac{\text{Sales}}{\text{Total assets}}$$

$$= \frac{\$3{,}000}{\$2{,}000} = 1.5\times$$

$$\text{Industry average} = 1.8\times$$

Allied's ratio is somewhat below the industry average, indicating that it is not generating enough sales given its total assets. Sales should be increased, some assets should be disposed of, or a combination of these steps should be taken.

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

If one firm is growing rapidly and another is not, how might this distort a comparison of their inventory turnover ratios?

If you wanted to evaluate a firm's DSO, with what would you compare it?

What potential problem might arise when comparing different firms' fixed assets turnover ratios?

A firm has annual sales of $100 million, $20 million of inventory, and $30 million of accounts receivable. What is its inventory turnover ratio? (5×) What is its DSO based on a 365-day year? (109.5 days)

[8] See FASB #89, *Financial Reporting and Changing Prices* (December 1986), for a discussion of the effects of inflation on financial statements. The report's age indicates how difficult the problem is.

4.4 DEBT MANAGEMENT RATIOS

Financial Leverage
The use of debt financing.

The extent to which a firm uses debt financing, or **financial leverage,** has three important implications: (1) By raising funds through debt, stockholders can control a firm with a limited amount of equity investment. (2) Creditors look to the equity, or owner-supplied funds, to provide a margin of safety, so the higher the proportion of the total capital provided by stockholders, the less the risk faced by creditors. (3) If the firm earns more on its assets than the interest rate it pays on debt, then using debt "leverages," or magnifies, the return on equity, ROE.

Table 4-1 illustrates both the potential benefits and risks resulting from the use of debt.[9] Here we analyze two companies that are identical except for how they are financed. Firm U (for "Unleveraged") has no debt and thus 100 percent common equity, whereas Firm L (for "Leveraged") is financed with half debt at a 10 percent interest rate and half equity. Both companies have $100 of assets. Their sales will range from $150 down to $75, depending on business conditions, with an expected level of $100. Some of their operating costs (rent, the president's salary, and so on) are fixed and will be there regardless of the level of sales, while other costs (some labor costs, materials, and so forth) will vary with sales.[10] When we deduct total operating costs from sales revenues, we are left with operating income, or earnings before interest and taxes (EBIT).

Notice in the table that everything is the same for the leveraged and unleveraged firms down through operating income—thus, they have the same EBIT under the three states of the economy. However, things then begin to differ. Firm U has no debt so it pays no interest, and its taxable income is the same as its operating income, and it then pays a 40 percent state and federal tax to get to its net income, which is $27 under good conditions and $0 under bad conditions. When net income is divided by common equity, we get the ROE, which ranges from 27 percent to 0 percent for Firm U.

Firm L has the same EBIT under each condition, but it uses $50 of debt with a 10 percent interest rate, so it has $5 of interest charges regardless of business conditions. This amount is deducted from EBIT to get to taxable income, taxes are then taken out, and the result is net income, which ranges from $24 to −$5, depending on conditions.[11] At first blush it looks like Firm U is better off under all conditions, but this is not correct—we need to consider how much the two firms' stockholders have invested. Firm L's stockholders have put up only $50, so when that investment is divided into net income, we see that their ROE under good conditions is a whopping 48 percent (versus 27 percent for U) and is 12 percent (versus 9 percent for U) under expected conditions. However, L's ROE falls to −10 percent under bad conditions, which means that it would go bankrupt if those conditions last for several years.

There are two reasons for the leveraging effect: (1) Because interest is deductible, the use of debt lowers the tax bill and leaves more of the firm's operating income available to its investors. (2) If operating income as a percentage of

[9] We discuss ROE in more depth later in the chapter, and we examine the effects of leverage in detail in the chapter on capital structure.

[10] The financial statements do not show the breakdown between fixed and variable operating costs, but companies can and do make this breakdown for internal purposes. Of course, the distinction is not always clear, because what's a fixed cost in the very short run can become a variable cost over a longer time horizon. It's interesting to note that companies are moving toward making more of their costs variable, using such techniques as increasing bonuses rather than base salaries, switching to profit-sharing plans rather than fixed-pension plans, and outsourcing various parts and materials.

[11] As we discussed in the last chapter, firms can carry losses back or forward for several years. Therefore, if Firm L had profits and thus paid taxes in recent prior years, it could carry its loss under bad conditions back and receive a credit (a check from the government). In Table 4-1 we assume that the firm cannot use the carry-back/carry-forward provision.

TABLE 4-1 *Effects of Financial Leverage on Stockholder Returns*

FIRM U [UNLEVERAGED (NO DEBT)]

Current assets	$ 50	Debt	$ 0
Fixed assets	50	Common equity	100
Total assets	$100	Total liabilities and equity	$100

		BUSINESS CONDITIONS		
		Good	**Expected**	**Bad**
Sales revenues		$150.0	$100.0	$75.0
Operating costs	Fixed	45.0	45.0	45.0
	Variable	60.0	40.0	30.0
Total operating costs		105.0	85.0	75.0
Operating income (EBIT)		$ 45.0	$ 15.0	$ 0.0
Interest (Rate = 10%)		0.0	0.0	0.0
Earnings before taxes (EBT)		$ 45.0	$ 15.0	$ 0.0
Taxes (Rate = 40%)		18.0	6.0	0.0
Net income (NI)		$ 27.0	$ 9.0	$ 0.0
ROE_U		27.0%	9.0%	0.0%

FIRM L [LEVERAGED (SOME DEBT)]

Current assets	$ 50	Debt	$ 50
Fixed assets	50	Common equity	50
Total assets	$100	Total liabilities and equity	$100

		BUSINESS CONDITIONS		
		Good	**Expected**	**Bad**
Sales revenues		$150.0	$100.0	$75.0
Operating costs	Fixed	45.0	45.0	45.0
	Variable	60.0	40.0	30.0
Total operating costs		105.0	85.0	75.0
Operating income (EBIT)		$ 45.0	$ 15.0	$ 0.0
Interest (Rate = 10%)		5.0	5.0	5.0
Earnings before taxes (EBT)		$ 40.0	$ 10.0	−$ 5.0
Taxes (Rate = 40%)		16.0	4.0	0.0
Net income (NI)		$ 24.0	$ 6.0	−$ 5.0
ROE_L		48.0%	12.0%	−10.0%

assets exceeds the interest rate on debt, as it generally is expected to do, then a company can use debt to acquire assets, pay the interest on the debt, and have something left over as a "bonus" for its stockholders. Under the expected conditions, our hypothetical firms expect to earn 15 percent on assets versus a 10 percent cost of debt, and this, combined with the tax benefit of debt, pushes Firm L's expected rate of return on equity up far above that of Firm U.

We see, then, that firms with relatively high debt ratios have higher expected returns when the economy is normal, but they are exposed to risk of loss when the economy enters a recession. Therefore, decisions about the use of debt require firms to balance higher expected returns against increased risk. Determining the optimal amount of debt is a complicated process, and we defer a discussion of

that subject to a later chapter on capital structure. For now, we simply look at two procedures analysts use to examine the firm's debt: (1) They check the balance sheet to determine the proportion of total funds represented by debt, and (2) they review the income statement to see the extent to which fixed charges are covered by operating profits.

Total Debt to Total Assets

Debt Ratio
The ratio of total debt to total assets.

The ratio of total debt to total assets, generally called the **debt ratio,** measures the percentage of funds provided by creditors:

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

$$= \frac{\$310 + \$750}{\$2{,}000} = \frac{\$1{,}060}{\$2{,}000} = 53.0\%$$

$$\text{Industry average} = 40.0\%$$

Total debt includes all current liabilities and long-term debt. 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 can magnify expected earnings.

Allied's debt ratio is 53.0 percent, which means that its creditors have supplied more than half the total financing. As we will discuss in the capital structure chapter, a number of factors affect a company's optimal debt ratio. Nevertheless, the fact that Allied's debt ratio exceeds the industry average raises a red flag, and this will make it relatively costly for Allied to borrow additional funds without first raising more equity. Creditors will be reluctant to lend the firm more money, and management would probably be subjecting the firm to the risk of bankruptcy if it sought to borrow a substantial amount of additional funds.[12]

Times-Interest-Earned Ratio

Times-Interest-Earned (TIE) Ratio
The ratio of earnings before interest and taxes (EBIT) to interest charges; a measure of the firm's ability to meet its annual interest payments.

The **times-interest-earned (TIE)** ratio is determined by dividing earnings before interest and taxes (EBIT in Table 3-2) by the interest charges:

$$\text{Times-interest-earned (TIE) ratio} = \frac{\text{EBIT}}{\text{Interest charges}}$$

$$= \frac{\$283.8}{\$88} = 3.2\times$$

$$\text{Industry average} = 6.0\times$$

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 pay interest will bring legal action by the firm's creditors and probably result 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.

[12] The ratio of debt to equity is also used in financial analysis. The debt-to-assets (D/A) and debt-to-equity (D/E) ratios are simply transformations of each other:

$$\text{D/E} = \frac{\text{D/A}}{1 - \text{D/A}} \quad \text{and} \quad \text{D/A} = \frac{\text{D/E}}{1 + \text{D/E}}$$

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

EBITDA Coverage Ratio

The TIE ratio is useful for assessing the ability to meet interest charges on debt, but it has two shortcomings: (1) Interest is not the only fixed financial charge—companies must also retire debt on a fixed schedule, and many firms also 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. To account for these deficiencies, bankers and others also use the **EBITDA coverage ratio,** which shows all of the cash flow available for payments in the numerator and all of the required financial payments in the denominator. This ratio is defined as follows:[13]

EBITDA Coverage Ratio
A ratio whose numerator includes all cash flows available to meet fixed financial charges and whose denominator includes all fixed financial charges.

$$\text{EBITDA coverage ratio} = \frac{\text{EBITDA} + \text{Lease payments}}{\text{Interest} + \text{Principal payments} + \text{Lease payments}}$$

$$= \frac{\$383.8 + \$28}{\$88 + \$20 + \$28} = \frac{\$411.8}{\$136} = 3.0\times$$

$$\text{Industry average} = 4.3\times$$

Regarding the numerator, Allied had EBITDA of $383.8 million, consisting of $283.8 million of operating income (EBIT) and $100 million of depreciation. However, $28 million of lease payments were deducted when we calculated EBITDA, yet that $28 million was available to meet financial charges. Therefore, we must add it back to EBITDA, giving a total of $411.8 million that is available for fixed financial charges.[14] Fixed financial charges consisted of $88 million of interest, $20 million of sinking fund payments, and $28 million of lease payments, for a total of $136 million.[15] Therefore, Allied covered its fixed financial charges by 3.0 times. However, if operating income declines, the coverage will fall, and operating income certainly can decline. As Allied's ratio is well below the industry average, we again see that the company has a relatively high level of debt.

[13] Different analysts define the EBITDA coverage ratio in different ways. For example, some would omit the lease payment information, and others would "gross up" principal payments by dividing them by (1 − T) because these payments are not tax deductions, 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, its tax rate will probably be zero, hence the gross up is not necessary whenever the ratio is really important.

[14] Lease payments are included in the numerator because, unlike interest, they were deducted when EBITDA was calculated. We want to find all the funds that were available to service fixed charges, so lease payments must be added to the EBIT and DA to find the funds that could be used to service debt and meet lease payments.

[15] A sinking fund is a required annual payment designed to reduce the balance of a bond or preferred stock issue. A sinking fund payment is like the principal repayment portion of the payment on an amortized loan, but sinking funds are used for publicly traded bond issues, whereas amortization payments are used for bank loans and other private loans.

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 five 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.

What are three important implications of financial leverage?

How does the use of financial leverage affect stockholders' control position?

How does the U.S. tax structure influence a firm's willingness to finance with debt?

How does the decision to use debt involve a risk-versus-return trade-off?

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 financial leverage, and write out their equations.

A company has EBITDA of $500 million, interest payments of $50 million, lease payments of $40 million, and required principal payments (due this year) of $30 million. What is its EBITDA coverage ratio? (4.5×)

4.5 PROFITABILITY RATIOS

Accounting statements reflect things that happened in the past, but they also give us clues about what's really important—what's likely to happen in the future. The liquidity, asset management, and debt ratios covered thus far tell us something about the firm's policies and operations. Now we turn to the **profitability ratios,** which reflect the net result of all of the financing policies and operating decisions.

Profitability Ratios
A group of ratios that show the combined effects of liquidity, asset management, and debt on operating results.

Profit Margin on Sales

The **profit margin on sales,** calculated by dividing net income by sales, gives the profit per dollar of sales:

Profit Margin on Sales
This ratio measures net income per dollar of sales; it is calculated by dividing net income by sales.

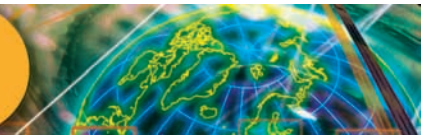
$$\text{Profit margin on sales} = \frac{\text{Net income}}{\text{Sales}}$$

$$= \frac{\$117.5}{\$3{,}000} = 3.9\%$$

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

Allied's profit margin is below the industry average of 5 percent. This sub-par result occurs because costs are too high. High costs, in turn, generally occur because of inefficient operations. However, Allied's low profit margin is also a

GLOBAL PERSPECTIVES



Global Accounting Standards: Can One Size Fit All?

These days you must be a good financial detective to analyze financial statements, especially if the company operates overseas. Despite attempts to standardize accounting practices, there are still many differences in financial reporting in different countries that create headaches for investors making cross-border company comparisons. However, as businesses become more global and more foreign companies list on U.S. stock exchanges, accountants and regulators are realizing the need for a global convergence of accounting standards. As a result, the writing is on the wall regarding accounting standards, and differences are disappearing.

The effort to internationalize accounting standards began in 1973 with the formation of the International Accounting Standards Committee. However, in 1998 it became apparent that a full-time rule-making body with global representation was necessary, so the International Accounting Standards Board (IASB), with members representing nine major countries, was established. The IASB was charged with the responsibility for creating a set of International Financial Reporting Standards (IFRS) for European Union (EU) companies by January 1, 2005, when more than 7,000 publicly listed European companies were supposed to conform to these standards. In contrast, only 350 European companies were using international standards as of 2003. A number of other countries, including Australia and other Pacific Rim countries, South Africa, Canada, Russia, Japan, and China are interested in adopting IFRS.

A survey of senior executives from 85 financial institutions worldwide found that 92 percent of those responding favored a single set of international standards but only 55 percent thought universal adoption was achievable. Obviously, the globalization of accounting standards is a huge endeavor—one that will involve compromises between the IASB and FASB. Part of the problem is that U.S. GAAP takes a rules-based approach, while the IASB insists on using a principles-based approach. With a rules-based system, companies can tell whether or not they are in compliance, but they can also develop ways to get around a rule and thus subvert its intent. With a principles-based system, there is greater uncertainty about whether certain border-line procedures will be allowed, but such a system makes it easier to prosecute on the basis of intent.

A global accounting structure would enable investors and practitioners around the world to read and understand financial reports produced anywhere in the world. In addition, it would enhance all companies' access to all capital markets, which would improve investor diversification, reduce risk, and lower the cost of capital. However, it remains to be seen whether the IASB's lofty goal can be achieved.

Sources: "All Accountants Soon May Speak the Same Language," *The Wall Street Journal,* August 29, 1995, p. A15; Jim Cole, "Global Standards Loom for Accounting," *East Bay Business Times,* November 12, 2001; "Accountants Struggle to Reconcile Rules," *BestWire,* April 28, 2003; "For and Against; Standards Need Time to Work," *Accountancy Age,* June 5, 2003, p. 16; Larry Schlesinger, "Overview; Bringing about a New Dawn," *Accountancy Age,* September 4, 2003, p. 18; Cassell Bryan-Low, "Deals & Deal Makers: Accounting Changes Are in Store," *The Wall Street Journal,* September 10, 2003, p. C4; and Fay Hansen, "Get Ready for New Global Accounting Standards," January 2004, **www.BusinessFinanceMag.com**.

result of its heavy use of debt. Recall that net income is income *after interest*. Therefore, if two firms have identical operations in the sense that their sales, operating costs, and EBIT are the same, but if one firm uses more debt than the other, it will have higher interest charges. Those interest charges will pull net income down, and as sales are constant, the result will be a relatively low profit margin. In this situation, the low profit margin would indicate a difference in financing strategies, not an operating problem. Thus, the firm with the low profit margin might end up with a higher rate of return on its stockholders' investment due to its use of financial leverage.

Note too that while a high return on sales is good, other things held constant, other things may not be held constant—we must also be concerned with turnover. If a firm sets a very high price on its products, it may get a high return on each sale but not make many sales. That might result in a high profit margin but still not be optimal because total sales are low.

We will see exactly how profit margins, the use of debt, and turnover interact to affect overall stockholder returns shortly, when we examine the Du Pont equation.

Return on Total Assets

Return on Total Assets (ROA)
The ratio of the net income to total assets.

The ratio of net income to total assets measures the **return on total assets (ROA)** after interest and taxes:

$$\text{Return on total assets} = \text{ROA} = \frac{\text{Net income}}{\text{Total assets}}$$

$$= \frac{\$117.5}{\$2{,}000} = 5.9\%$$

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

Allied's 5.9 percent return is well below the 9 percent industry average. This is not good, but a low return on assets is not necessarily bad—it could result from a conscious decision to use a lot of debt, in which case high interest expenses will cause net income to be relatively low. Debt is part of the reason for Allied's low ROA. Never forget—you must look at a number of ratios, see what each suggests, and then look at the overall situation when you judge the performance of a company and try to figure out what it should do to improve.

Basic Earning Power (BEP) Ratio

Basic Earning Power (BEP) Ratio
This ratio indicates the ability of the firm's assets to generate operating income; calculated by dividing EBIT by total assets.

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

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

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

$$\text{Industry average} = 18.0\%$$

This ratio shows the raw earning power of the firm's assets, before the influence of taxes and leverage, and it is useful when comparing firms with different degrees of financial leverage and tax situations. Because of its low turnover ratios and poor profit margin on sales, Allied is not earning as high a return on assets as the average food-processing company.[16]

[16] A related ratio is the return on investors' capital, defined as follows:

$$\text{Return on investors' capital} = \frac{\text{Net income} + \text{Interest}}{\text{Debt} + \text{Equity}}$$

The numerator shows the dollar returns to investors, the denominator shows the money investors have put up, and the ratio itself shows the rate of return on all investors' capital. This ratio is especially important in regulated industries such as electric utilities, where regulators are concerned about companies' using their monopoly power to earn excessive returns on investors' capital. In fact, regulators try to set electric rates at levels that will force the return on investors' capital to equal a company's cost of capital as defined in Chapter 10.

Return on Common Equity

The "bottom-line" accounting ratio is the **return on common equity (ROE),** found as follows:

Return on Common Equity (ROE)
The ratio of net income to common equity; measures the rate of return on common stockholders' investment.

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

$$= \frac{\$117.5}{\$940} = 12.5\%$$

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

Stockholders expect to earn a return on their money, and this ratio tells how well they are doing in an accounting sense. Allied's 12.5 percent return is below the 15 percent industry average, but not as far below as the return on total assets. This somewhat better ROE is due to the company's greater use of debt, a point that we discussed earlier in the chapter.

Identify four profitability ratios, and write out their equations.

Why is the basic earning power ratio useful?

Why does the use of debt lower the ROA?

What does ROE measure? Since interest expense lowers profits and thus the ROA, does using debt necessarily lower the ROE? Explain.

A company has $20 billion of sales and $1 billion of net income. Its total assets are $10 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)

4.6 MARKET VALUE RATIOS

The ROE reflects the effects of all the other ratios and is the best single measure of performance in an accounting sense. Investors obviously like to see a high ROE, and high ROEs are generally positively correlated with high stock prices. However, other things come into play. As we saw earlier, financial leverage generally increases the ROE but leverage also increases the firm's risk, which investors dislike. So, if a high ROE is achieved by the use of a very large amount of debt, the stock price might well be lower than it would be with less debt and a lower ROE. Similarly, investors are interested in growth, and if the current ROE was achieved by holding back on research and development costs, which will constrain future growth, this will not be regarded favorably.

This takes us to a final group of ratios, the **market value ratios,** which relate the firm's stock price to its earnings, cash flow, and book value per share. These ratios give management an indication of what investors think of the company's risk and future prospects. If the liquidity, asset management, debt management, and profitability ratios all look good, and if these conditions have been stable over time, then the market value ratios will be high, the stock price will probably be as high as can be expected, and management has been doing a good job and should be rewarded. Otherwise, changes might be needed.

Market Value Ratios
A set of ratios that relate the firm's stock price to its earnings, cash flow, and book value per share.

Price/Earnings Ratio

Price/Earnings (P/E) Ratio
The ratio of the price per share to earnings per share; shows the dollar amount investors will pay for $1 of current earnings.

The **price/earnings (P/E) ratio** shows how much investors are willing to pay per dollar of reported profits. Allied's stock sells for $23, so with an EPS of $2.35 its P/E ratio is 9.8:

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

$$= \frac{\$23.00}{\$2.35} = 9.8\times$$

$$\text{Industry average} = 11.3\times$$

As we will see in Chapter 9, P/E ratios are higher for firms with strong growth prospects and relatively little risk. Allied's P/E ratio is below the average for other food processors, so this suggests that the company is regarded as being somewhat riskier than most, as having poor growth prospects, or both.

Price/Cash Flow Ratio

Price/Cash Flow Ratio
The ratio of price per share divided by cash flow per share; shows the dollar amount investors will pay for $1 of cash flow.

In some industries, stock price is tied more closely to cash flow rather than net income. Consequently, investors often look at the **price/cash flow ratio**:

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

$$= \frac{\$23.00}{\$4.35} = 5.3\times$$

$$\text{Industry average} = 5.4\times$$

The calculation for cash flow per share was discussed in Chapter 3, but to refresh your memory, it is equal to net income plus depreciation and amortization divided by common shares outstanding. Allied's price/cash flow ratio is slightly below the industry average, once again suggesting that its growth prospects are below average, its risk is above average, or both.

Note that for some purposes analysts look at multiples beyond just the price/earnings and the price/cash flow ratios. For example, depending on the industry, analysts may look at price/sales, price/customers, or price/(EBITDA per share). Ultimately, though, value depends on earnings and cash flows, so if these "exotic" ratios do not forecast future levels of EPS and cash flow, they may turn out to be misleading.[17]

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 that are well regarded by investors—which means companies with safe and growing earnings and cash

[17] During the "Internet bubble" of the late 1990s and early 2000s, some Internet companies were valued by multiplying the number of "hits" to a Web site times some sort of multiple. If those hits translated to sales and profits, this procedure would have made sense, but generally they did not, and the result was a vast overvaluation of stocks and a subsequent huge crash. Keep your eye on earnings and cash flows.

flows—sell at higher multiples of book value than those with low returns. First, we find Allied's book value per share:

$$\text{Book value per share} = \frac{\text{Common equity}}{\text{Shares outstanding}} = \frac{\$940}{50} = \$18.80$$

Then we divide the market price per share by the book value per share to get the **market/book (M/B) ratio,** which for Allied is 1.2 times:

Market/Book (M/B) Ratio
The ratio of a stock's market price to its book value.

$$\text{Market/book ratio} = \text{M/B} = \frac{\text{Market price per share}}{\text{Book value per share}} = \frac{\$23.00}{\$18.80} = 1.2\times$$

$$\text{Industry average} = 1.7\times$$

Investors are willing to pay less for a dollar of Allied's book value than for one of an average food-processing company. This is consistent with our other findings.

In today's market (September 2005), the average Standard & Poor's (S&P) 500 company had a market/book ratio of about 2.87.[18] Because M/B ratios typically exceed 1.0, this means that investors are willing to pay more for stocks than their accounting book values. This situation occurs primarily because asset values, as reported by accountants on corporate balance sheets, do not reflect either inflation or "goodwill." Thus, assets purchased years ago at preinflation prices are carried at their original costs, even though inflation might have caused their actual values to rise substantially, and successful going concerns have a value greater than their historical costs.

If a company earns a low rate of return on its assets, then its M/B ratio will be relatively low versus an average company. Some airlines, which have not fared well in recent years, sell at M/B ratios well below 1.0, while very successful firms such as Microsoft achieve high rates of return on their assets, resulting in market values far in excess of their book values. In September 2005 Microsoft's book value per share was about $4.49 versus a market price of $26.28, so its market/book ratio was $26.28/$4.49 = 5.9 times.

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.

How do these market value ratios reflect investor's opinions about a stock's risk and expected future growth?

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 how inflation and "goodwill" built up over time could cause book values to deviate from market values.

[18] This was obtained from the key ratios section shown in **http://moneycentral.msn.com**.

4.7 TREND ANALYSIS

Trend Analysis
An analysis of a firm's financial ratios over time; used to estimate the likelihood of improvement or deterioration in its financial condition.

It is important to analyze trends in ratios as well as their absolute levels, for trends give clues as to whether a firm's financial condition is likely to improve or to deteriorate. To do a **trend analysis,** simply plot a ratio over time, as shown in Figure 4-1. This graph shows that Allied's rate of return on common equity has been declining since 2002, even though the industry average has been relatively stable. All the other ratios could be analyzed similarly.

How is a trend analysis done?

What important information does a trend analysis provide?

4.8 TYING THE RATIOS TOGETHER: THE DU PONT EQUATIONS

Basic Du Pont Equation
A formula that shows that the rate of return on assets can be found as the product of the profit margin times the total assets turnover.

Table 4-2 summarizes Allied's ratios. The profit margin times the total assets turnover is called the **basic Du Pont equation,** and it gives the rate of return on assets (ROA):

$$\begin{aligned} \text{ROA} &= \text{Profit margin} \times \text{Total assets turnover} \\ &= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \\ &= 3.9\% \times 1.5 = 5.9\% \end{aligned} \tag{4-1}$$

Allied made 3.9 percent, or 3.9 cents, on each dollar of sales, and assets were "turned over" 1.5 times during the year. Therefore, the company earned a return of 5.9 percent on its assets.

FIGURE 4-1 *Rate of Return on Common Equity, 2001–2005*

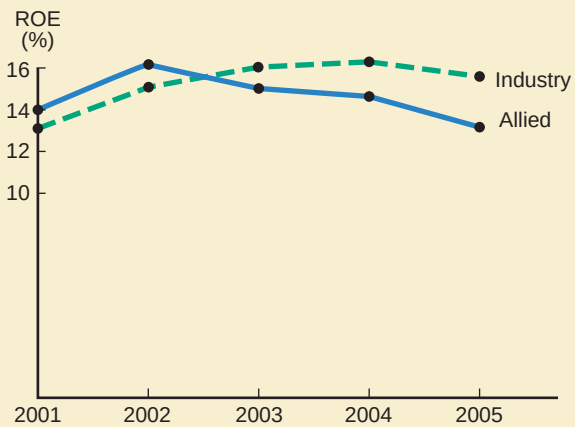


TABLE 4-2 *Allied Food Products: Summary of Financial Ratios (Millions of Dollars)*

Ratio	Formula	Calculation	Ratio	Industry Average	Comment
Liquidity					
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×	2.2×	Poor
Asset Management					
Inventory turnover	$\frac{\text{Sales}}{\text{Inventories}}$	$\frac{\$3{,}000}{\$615}$	=4.9×	10.9×	Poor
Days sales outstanding (DSO)	$\frac{\text{Receivables}}{\text{Annual sales}/365}$	$\frac{\$375}{\$8.2192}$	=46 days	36 days	Poor
Fixed assets turnover	$\frac{\text{Sales}}{\text{Net fixed assets}}$	$\frac{\$3{,}000}{\$1{,}000}$	=3.0×	2.8×	OK
Total assets turnover	$\frac{\text{Sales}}{\text{Total assets}}$	$\frac{\$3{,}000}{\$2{,}000}$	=1.5×	1.8×	Somewhat low
Debt Management					
Total debt to total assets	$\frac{\text{Total debt}}{\text{Total assets}}$	$\frac{\$1{,}060}{\$2{,}000}$	=53.0%	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	$\frac{\text{EBITDA} + \text{Lease payments}}{\text{Interest} + \text{Principal payments} + \text{Lease payments}}$	$\frac{\$411.8}{\$136}$	=3.0×	4.3×	Low (risky)
Profitability					
Profit margin on sales	$\frac{\text{Net income}}{\text{Sales}}$	$\frac{\$117.5}{\$3{,}000}$	=3.9%	5.0%	Poor
Return on total assets (ROA)	$\frac{\text{Net income}}{\text{Total assets}}$	$\frac{\$117.5}{\$2{,}000}$	=5.9%	9.0%	Poor
Basic earning power (BEP)	$\frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Total assets}}$	$\frac{\$283.8}{\$2{,}000}$	=14.2%	18.0%	Poor
Return on common equity (ROE)	$\frac{\text{Net income}}{\text{Common equity}}$	$\frac{\$117.5}{\$940}$	=12.5%	15.0%	Poor
Market Value					
Price/earnings (P/E)	$\frac{\text{Price per share}}{\text{Earnings per share}}$	$\frac{\$23.00}{\$2.35}$	=9.8×	11.3×	Low
Price/cash flow	$\frac{\text{Price per share}}{\text{Cash flow per share}}$	$\frac{\$23.00}{\$4.35}$	=5.3×	5.4×	Low
Market/book (M/B)	$\frac{\text{Market price per share}}{\text{Book value per share}}$	$\frac{\$23.00}{\$18.80}$	=1.2×	1.7×	Low

If the company were financed only with common equity, the rate of return on assets (ROA) and the return on equity (ROE) would be the same because total assets would equal common equity:

$$\text{ROA} = \frac{\text{Net income}}{\text{Total assets}} = \frac{\text{Net income}}{\text{Common equity}} = \text{ROE}$$

This equality holds if and only if the company uses no debt. Allied does use debt, so its common equity is less than its total assets. Therefore, the return to the common stockholders (ROE) must be greater than the ROA of 5.9 percent. Specifically, to go from the rate of return on assets (ROA) to the return on equity (ROE) we multiply by the *equity multiplier*, which is the ratio of total assets to common equity:

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

Firms that use large amounts of debt (more leverage) will necessarily have a high equity multiplier—the greater the debt, the less the equity, hence the higher the equity multiplier. For example, if a firm has $1,000 of assets and finances with $800, or 80 percent debt, then its equity will be $200 and its equity multiplier will be $1,000/$200 = 5. Had it used only $200 of debt, its equity would have been $800, and its equity multiplier would have been only $1,000/$800 = 1.25.[19]

Allied's return on equity (ROE) depends on its ROA and its use of leverage:[20]

$$\begin{aligned}\text{ROE} &= \text{ROA} \times \text{Equity multiplier} \qquad \textbf{(4-2)}\\ &= \frac{\text{Net income}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Common equity}}\\ &= 5.9\% \times \$2{,}000/\$940\\ &= 5.9\% \times 2.13\\ &= 12.5\%\end{aligned}$$

When they are combined, Equations 4-1 and 4-2 form the *extended Du Pont equation*, which shows how the profit margin, the total assets turnover ratio, and the equity multiplier combine to determine the ROE:

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

[19] Expressed algebraically,

$$\text{Debt ratio} = \frac{D}{A} = \frac{A - E}{A} = \frac{A}{A} - \frac{E}{A} = 1 - \frac{1}{\text{Equity multiplier}}$$

Here D is debt, E is equity, A is total assets, and A/E is the equity multiplier. This equation ignores preferred stock.

[20] Note that we could also find the ROE by "grossing up" the ROA, that is, by dividing the ROA by the common equity fraction: ROE = ROA/Equity fraction = 5.9%/0.47 = 12.5%. The two procedures are algebraically equivalent.

For Allied, we have

$$\text{ROE} = (3.9\%)(1.5)(2.13)$$
$$= 12.5\%$$

The 12.5 percent rate of return could, of course, be calculated directly: both Sales and Total assets cancel, leaving Net income/Common equity = \$117.5/\$940 = 12.5%. However, the extended Du Pont equation shows how the profit margin, total assets turnover, and use of debt combine to determine the return on equity.

Allied's management can use the extended Du Pont equation to analyze ways of improving performance. Focusing on the profit margin, marketing people can study the effects of raising sales prices (or lowering them to increase volume), of moving into new products or markets with higher margins, and so on. Cost accountants can study various expense items and, working with engineers, purchasing agents, and other operating personnel, seek ways to hold down costs. Regarding the "turnover" term, the financial staff, working with both production and marketing people, can investigate ways to reduce the investment in various types of assets. Finance people can also analyze the effects of alternative financing strategies, seeking ways to hold down interest expense and the risk associated with debt while still using leverage to increase the return on equity.

As a result of such an analysis, Ellen Jackson, Allied's president, recently announced a series of moves that are expected to cut operating costs by more than 20 percent per year. Jackson and Allied's other executives have a strong incentive for improving its financial performance because their compensation is based to a large extent on how well the company does. Its executives receive a salary that is sufficient to cover their living costs, but their compensation package also includes stock options that will be awarded if and only if Allied meets or exceeds target levels for earnings and the stock price. These target levels are based on its performance relative to other food companies. So, if it does well, then Jackson and the other executives—and the stockholders—will also do well. But if things deteriorate, Jackson could be looking for a new job.

Write out the equation for the basic Du Pont equation.

What is the equity multiplier?

How can management use the extended Du Pont equation to analyze ways of improving the firm's performance?

A good site for comparative ratios is ***http://moneycentral.msn.com****. Here you can find stock quotes, detailed company reports, company ratios, and comparative ratios.*

4.9 COMPARATIVE RATIOS AND "BENCHMARKING"

Ratio analysis almost always involves comparisons—a company's ratios are compared with industry average figures. However, like most firms, Allied's managers go one step further—they also compare their ratios with those of leading food companies. This technique is called **benchmarking,** and the companies used for the comparison are called *benchmark companies*. Allied's management benchmarks against Campbell Soup, a leading manufacturer of canned soups; Dean Foods, a processor of canned and frozen vegetables; Del Monte Foods, a processor of fruits and vegetables; H. J. Heinz, which makes ketchup and other products; Flowers Industries, a producer of bakery and snack-food goods; Sara Lee, a manufacturer of baked goods; and Hershey Foods Corp., a producer of

Benchmarking
The process of comparing a particular company with a group of "benchmark" companies.

chocolates, nonchocolate confectionary products, and pasta. Ratios are calculated for each company, then listed in descending order as shown below for the profit margin (the firms' latest 12 months' results reported by *Yahoo!Finance* as of September 15, 2005):

Company	Profit Margin
Hershey Foods	11.9%
Campbell Soup	9.4
H. J. Heinz	7.9
Allied Food Products	**3.9**
Del Monte Foods	3.9
Sara Lee	3.7
Flowers Industries	3.6
Dean Foods	2.6

TABLE 4-3 *Key Financial Ratios for Selected Industries*[a]

Industry Name	Current Ratio	Inventory Turnover[b]	Total Assets Turnover	Debt Ratio[c]	Days Sales Outstanding[d]	Profit Margin	Return on Assets	Return on Equity
Aerospace/defense	1.1	9.3	0.9	70.8%	49.3	2.8%	2.6%	8.9%
Apparel stores	2.5	4.4	1.6	44.2	12.7	5.0	8.2	14.7
Auto manufacturing—major	1.8	8.2	0.6	85.3	202.8	2.6	1.6	10.9
Beverage (soft drink)	1.0	7.8	0.8	65.0	39.7	10.6	8.5	24.3
Education and training services	1.4	59.4	1.1	40.8	38.4	9.8	10.0	16.9
Electronics—diversified	2.6	4.7	0.7	39.4	70.2	5.7	4.0	6.6
Food processing	2.0	4.6	1.1	52.6	36.1	4.4	4.6	9.7
Food wholesalers	1.2	16.1	3.6	64.1	18.1	2.0	7.1	19.8
Grocery stores	1.1	11.0	2.4	73.9	9.1	0.5	1.2	4.6
Health services—specialized	1.5	27.5	1.6	57.2	47.4	4.3	6.5	15.2
Lodging	1.0	49.4	0.7	56.8	35.1	6.0	4.1	9.5
Metals and minerals—industrial	1.6	4.8	0.6	58.3	42.9	8.4	5.0	12.0
Newspapers	1.1	10.9	0.5	53.4	57.0	9.9	5.4	11.6
Paper and paper products	1.3	6.1	0.7	69.0	71.6	2.7	1.8	5.8
Railroad	0.8	13.2	0.4	64.8	29.2	8.7	3.1	8.8
Restaurant	0.9	30.3	1.1	55.1	11.2	5.7	6.2	13.8
Retail—department stores	1.7	3.6	1.3	65.5	32.6	3.8	4.8	13.9
Scientific and technical instruments	2.6	3.2	0.8	41.1	76.0	5.4	4.3	7.3
Sporting goods	2.0	3.6	1.1	51.9	53.7	3.4	3.8	7.9
Steel and iron	1.7	5.2	1.0	61.9	46.2	3.9	3.7	9.7
Telecommunications equipment	2.2	7.7	0.7	50.0	86.9	0.2	0.2	0.4
Textile manufacturing	2.1	3.9	1.1	51.6	49.3	2.8	3.1	6.4
Tobacco (cigarettes)	1.1	3.4	0.8	77.6	32.3	6.2	5.0	22.3

Notes:

[a] The ratios presented are averages for each industry. Ratios for the individual companies are also available.

[b] The inventory turnover ratio in this table is calculated as the company's latest 12 months of cost of sales divided by the average of its inventory for the last quarter and the comparable year earlier quarter.

[c] The debt ratio in this table is calculated as 1 − (ROA/ROE).

[d] The days sales outstanding ratio in this table was calculated as 365/Receivable turnover. The receivable turnover is calculated as the company's latest 12 months of sales divided by the average of its receivables for the last quarter and the comparable year earlier quarter.

Source: Data obtained from the Key Ratios section, **http://moneycentral.msn.com**, February 25, 2005.

Looking for Warning Signs within the Financial Statements

Enron's decline spurred a renewed interest in financial accounting, and analysts now scour companies' financial statements to see if trouble is lurking. This renewed interest has led to a list of "red flags" to consider when reviewing a company's financial statements. For example, after conferring with New York University Accounting Professor Baruch Lev, *Fortune* magazine's Shawn Tully identified the following warning signs:

- Year after year, a company reports restructuring charges and/or write-downs. This practice raises concerns because companies can use write-downs to mask operating expenses and thus results in overstated earnings.
- A company's earnings have been propped up through a series of acquisitions. Acquisitions can increase earnings if the acquiring company has a higher P/E than the acquired firm, but such "growth" cannot be sustained over the long run.
- A company depreciates its assets more slowly than the industry average. Lower depreciation boosts current earnings, but again, this cannot be sustained because eventually depreciation must be recognized.
- A company routinely has high earnings but low cash flow. As Tully points out, this warning sign would have exposed Enron's problems. In the second quarter of 2001 (a few months before its problems began to unfold), Enron reported earnings of $423 million versus a cash flow of minus $527 million.

Along similar lines, after consulting with various professionals, Ellen Simon of the *Newark Star Ledger* came up with her list of "red flags":

- You wouldn't buy the stock at today's price.
- You don't really understand the company's financial statements.
- The company is in a business that lends itself to "creative accounting."
- The company keeps taking nonrecurring charges.
- Accounts receivable and inventory are increasing faster than sales revenue.
- The company's insiders are selling their stock.
- The company is making aggressive acquisitions, especially in unrelated fields.

There is some overlap between these two lists. Also, none of these items automatically means there is something wrong with the company—instead, the items should be viewed as warning signs that cause you to take a closer look at the company's performance before making an investment.

The benchmarking setup makes it easy for Allied's management to see exactly where it stands relative to the competition. As the data show, Allied is in the middle of its benchmark group relative to its profit margin, so it has lots of room for improvement. Other ratios are analyzed similarly.

Comparative ratios are available from a number of sources, including the MSN Money Web site, **http://moneycentral.msn.com.** Table 4-3 presents a list of key ratios for a variety of industries covered by this site. Useful ratios are also compiled by *Value Line Investment Survey*, Dun and Bradstreet (D&B), and Robert Morris Associates, which is the national association of bank loan officers. Also, financial statement data for thousands of publicly owned corporations are available on other Internet sites, and as brokerage houses, banks, and other financial institutions have access to these data, security analysts can and do generate comparative ratios tailored to their specific needs.

Each of the data-supplying organizations 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 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.

Why is it useful to do comparative ratio analyses?

Differentiate between trend and comparative analyses.

What is benchmarking?

4.10 USES AND LIMITATIONS OF RATIO ANALYSIS

To find quick information about a company, link to ***http://www.investor.reuters.com****. Here you can find company profiles and snapshots, stock price quotes and share information, key ratios, and comparative ratios.*

As noted earlier, ratio analysis is used by three main groups: (1) *managers*, who employ ratios to help analyze, control, and thus improve their firms' operations; (2) *credit analysts*, including bank loan officers and bond rating analysts, who analyze ratios to help judge a company's ability to pay its debts; and (3) *stock analysts*, who are interested in a company's efficiency, risk, and growth prospects. In later chapters we will look more closely at the basic factors that underlie each ratio, which will give you a better idea about how to interpret and use ratios. Note, though, that while ratio analysis can provide useful information concerning a company's operations and financial condition, it does have limitations that necessitate care and judgment. Some potential problems are listed here:

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, ratio analysis is more useful for small, narrowly focused firms than for large, multidivisional ones.
2. Most firms want to be better than average, so merely attaining average performance is not necessarily good. As a target for high-level performance, it is best to focus on the industry leaders' ratios. Benchmarking helps in this regard.
3. Inflation has badly distorted many firms' balance sheets—recorded values are often substantially different from "true" values. Further, because inflation affects both depreciation charges and inventory costs, profits are also affected. Thus, a ratio analysis for one firm over time, or a comparative analysis of firms of different ages, must be interpreted with judgment.
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 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, a Chicago builder borrowed on a two-year basis on December 27, 2005, held the proceeds of the loan as cash for a few days, and then paid off the loan ahead of time on January 2, 2006. This improved his current and quick ratios, and made his year-end 2005 balance sheet look good. However, the improvement was strictly window dressing; a week later the balance sheet was back at the old level.
6. Different accounting practices can distort comparisons. As noted earlier, inventory valuation and depreciation methods can affect financial statements

"Window Dressing" Techniques
Techniques employed by firms to make their financial statements look better than they really are.

and thus distort comparisons among firms. Also, 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. At the same time, the liability associated with the lease obligation may not appear as debt. Therefore, leasing can artificially improve both the turnover and the debt ratios. However, the accounting profession has taken steps to reduce this problem.

7. It is difficult to generalize about whether a particular ratio is "good" or "bad." For example, a high current ratio may indicate a strong liquidity position, which is good, or excessive cash, which is bad (because excess cash in the bank is a nonearning asset). Similarly, a high fixed assets turnover ratio may indicate either that the firm uses its assets efficiently or that it is short of cash and cannot afford to make needed investments.
8. A firm may have some ratios that look "good" and others that look "bad," making it difficult to tell whether the company is, on balance, strong or weak. However, statistical procedures can be used to analyze the *net effects* of a set of ratios. Many banks and other lending organizations use such procedures to analyze firms' financial ratios, and then to classify them according to their probability of getting into financial trouble.[21]

Ratio analysis is useful, but analysts should be aware of these problems and make adjustments as necessary. Ratio analysis conducted in a mechanical, unthinking manner is dangerous, but used intelligently and with good judgment, it can provide useful insights into a firm's operations. Your judgment in interpreting a set of ratios is bound to be weak at this point, but it will improve as you read the remaining chapters of this book.

List three types of users of ratio analysis. Would the different users emphasize the same or different types of ratios? Explain.

List several potential problems with ratio analysis.

4.11 PROBLEMS WITH ROE

In Chapter 1 we said that managers should strive to maximize shareholder wealth. If a firm takes steps to improve its ROE, does it mean that shareholder wealth will also increase? Not necessarily, for despite its widespread use and the fact that ROE and shareholder wealth are often highly correlated, serious problems can arise if a firm uses ROE as its sole performance measure.

First, ROE does not consider risk. While shareholders clearly care about returns, they also care about risk. To illustrate this point, consider two divisions within the same firm. Division S has stable cash flows and a predictable 15 percent ROE. Division R, on the other hand, has a 16 percent expected ROE, but its cash flows are quite risky, so the expected ROE may not materialize. If managers were compensated solely on the basis of ROE, and if the expected ROEs were actually achieved, then Division R's manager would receive a higher bonus than S's, even though S might actually be creating more value for shareholders as a result of its lower risk. Also, as we discussed earlier, financial leverage can increase expected ROE but at the cost of higher risk, so raising ROE through greater use of leverage may not be good.

[21] The technique used is discriminant analysis. The seminal work on this subject was by Edward I. Altman, "Financial Ratios, Discriminant Analysis, and the Prediction of Corporate Bankruptcy," *Journal of Finance*, September 1968, pp. 589–609.

EVA and ROE

To better understand the idea behind EVA and how it is connected to ROE, let's look at Keller Electronics. Keller has $100,000 in investor-supplied operating capital, which, in turn, consists of $50,000 of long-term debt and $50,000 of common equity. The company has no preferred stock or notes payable. The long-term debt has a 10 percent interest rate. However, since the company is in the 40 percent tax bracket and interest expense is tax deductible, the after-tax cost of debt is only 6 percent. On the basis of their assessment of the company's risk, shareholders require a 14 percent return. This 14 percent return is what shareholders could expect to earn if they were to take their money elsewhere and invest in stocks that have the same risk as Keller. Keller's overall cost of capital is a weighted average of the cost of debt and equity, and it is 10 percent, found as 0.50(6%) + 0.50(14%) = 10%. The total dollar cost of capital per year is 0.10($100,000) = $10,000.

Now let's look at Keller's income statement. Its operating income, EBIT, is $20,000, and its interest expense is 0.10($50,000) = $5,000. Therefore, its taxable income is $20,000 − $5,000 = $15,000. Taxes equal 40 percent of taxable income, or 0.4($15,000) = $6,000, so the firm's net income is $9,000, and its return on equity, ROE, is $9,000/$50,000 = 18%.

Now what is Keller's EVA? The basic formula for EVA is

$$\begin{aligned}\text{EVA} &= \text{EBIT}(1 - \text{Corporate tax rate}) - (\text{Total investor-supplied operating capital}) \\ &\quad \times (\text{After-tax percentage cost of capital}) \\ &= \$20{,}000(1 - 0.40) - (\$100{,}000)(0.10) \\ &= \$2{,}000\end{aligned}$$

This $2,000 EVA indicates that Keller provided its shareholders with $2,000 more than they could have earned elsewhere by investing in other stocks with the same risk as Keller's stock. To see where this $2,000 comes from, let's trace what happens to the money:

- The firm generates $20,000 in operating income.
- $6,000 goes to the government to pay taxes, leaving $14,000.
- $5,000 goes to the bondholders in the form of interest payments, thus leaving $9,000.
- $7,000 is what Keller's shareholders expected to earn: (0.14)($50,000) = $7,000. Note that this $7,000 payment is not a requirement to stay in business—companies can stay in business as long as they pay their bills and their taxes. However, this $7,000 is what shareholders *expected to earn*, and it is the amount the firm *must earn* if it is to avoid reducing shareholder wealth.

Second, ROE does not consider the amount of invested capital. To illustrate, consider a large company that has $100 invested in Project A, which has an ROE of 50 percent, and $1,000,000 invested in Project B, which has a 40 percent ROE. The projects are equally risky, and the two returns are both well above the company's cost of the capital invested in the projects. In this example, Project A has a higher ROE, but because it is so small, it does little to enhance shareholder wealth. Project B, on the other hand, has the lower ROE, but it adds much more to shareholder value.

Consider one last problem with ROE. Assume that you manage a division of a large firm. The firm uses ROE as the sole performance measure, and it determines bonuses on the basis of ROE. Toward the end of the year, your division's ROE is an impressive 45 percent. Now you have an opportunity to invest in a large, low-risk project that has an estimated ROE of 35 percent, which is well above the firm's cost of capital. Even though this project is profitable, you might be reluctant to make the investment because it would reduce your division's average ROE, and therefore reduce the size of your year-end bonus.

These three examples suggest that a project's return must be combined with its risk and size to determine its effect on shareholder value:

- What's left over, the $2,000, is EVA. In this case, Keller's management created wealth because it provided shareholders with a return greater than what they presumably would have earned on alternative investments with the same risk as Keller's stock.

Some Additional Points

- In practice, it is often necessary to make several adjustments in order to arrive at a "better" measure of EVA. The adjustments deal with leased assets, depreciation, and other accounting details.
- Shareholders may not immediately receive the $9,000 that Keller made for them this year (the $7,000 that shareholders expected plus the $2,000 of EVA). Keller can either pay its earnings out as dividends or keep them in the firm as retained earnings. In either event, the $9,000 is shareholders' money. The factors influencing the dividend payout decision are discussed in the chapter on dividend policy.

The Connection between ROE and EVA

EVA is different from the traditional accounting measure of profit because EVA explicitly considers not just the interest cost of debt but also the cost of equity. Indeed, using the simple example above, we could also express EVA as net income minus the dollar cost of equity:

$$\begin{aligned}\text{EVA} &= \text{Net Income} - [(\text{Equity capital}) \times (\text{Cost of equity capital})] \\ &= \$9{,}000 - [(\$50{,}000)(0.14)] \\ &= \$2{,}000\end{aligned}$$

Note that this is the same number we calculated before when we used the other formula for calculating EVA. Note also that the expression above could be rewritten as follows:

$$\text{EVA} = (\text{Equity capital})[\text{Net income/Equity capital} - \text{Cost of equity capital}]$$

or simply as

$$\text{EVA} = (\text{Equity capital})(\text{ROE} - \text{Cost of equity capital})$$

This last expression implies that EVA depends on three factors: rate of return, as reflected in ROE; risk, which affects the cost of equity; and size, which is measured by the equity employed. Recall that earlier in this chapter we said that shareholder value depends on risk, return, and capital invested. This final equation illustrates this point.

$$\text{Value} = f(\text{ROE, Risk, Size})$$

ROE is only one dimension of the value equation, and because actions that increase expected ROE may also affect the other two factors, steps designed to increase expected ROE may in some cases be inconsistent with increasing shareholder wealth. Note that we say "expected ROE," not simply ROE. All management decisions are designed to do something in the future, hence to affect *future* outcomes.

With all this in mind, academics, practitioners, and consultants have developed alternative measures that attempt to overcome ROE's potential problems when it is used to gauge performance. One such measure is Economic Value Added (EVA), which was mentioned in Chapter 3 where we calculated EVA. For a discussion of the connection between ROE and EVA, see the accompanying box, "EVA and ROE."

If a firm takes steps that increase its expected future ROE, does this mean that shareholder wealth will also increase? Explain.

4.12 LOOKING BEYOND THE NUMBERS

Students might want to refer to AAII's educational Web site at ***http://www.aaii.com****. The site provides information on investing basics, financial planning, portfolio management, and the like, so individuals can manage their own assets more effectively.*

Hopefully, working through this chapter has increased your ability to understand and interpret financial statements. This is critically important for anyone making business decisions, evaluating performance, or forecasting likely future developments. Moreover, sound financial analysis involves more than just calculating numbers—good analysis requires that certain qualitative factors be considered when evaluating a company. These factors, as summarized by the American Association of Individual Investors (AAII), include the following:

1. *Are the company's revenues tied to one key customer?* If so, the company's performance may decline dramatically if the customer goes elsewhere. On the other hand, if the relationship is firmly entrenched, this might actually stabilize sales.
2. *To what extent are the company's revenues tied to one key product?* Companies that focus on a single product may be more efficient, but this lack of diversification also increases risk. If revenues come from several different products, the overall bottom line will be less affected by an event that leads to a drop in the demand for one of the products.
3. *To what extent does the company rely on a single supplier?* Depending on a single supplier may lead to unanticipated shortages, which investors and potential creditors should consider.
4. *What percentage of the company's business is generated overseas?* Companies with a large percentage of overseas business are often able to realize higher growth and larger profit margins. However, firms with large overseas operations may be exposed to regional stability problems, and cash flows from their various operations also depend on the values of different currencies.
5. *Competition*. Increases in competition tend to lower prices and profit margins. In forecasting future performance, it is important to assess both the likely actions of the current competitors and the entry by new competitors.
6. *Future products*. Is it necessary for the company to invest heavily in research and development? If so, its future prospects will depend critically on the success of new products in the pipeline. For example, the market's assessment of Boeing's and Airbus's future profits depends on how their next generations of planes are shaping up. Likewise, investors in pharmaceutical companies are interested in knowing whether the company has a strong pipeline of potential blockbuster drugs, and that those products are doing well in the required tests.
7. *Legal and regulatory environment*. Changes in laws and regulations have important implications for many industries. For example, when forecasting the future of tobacco companies, it is crucial to factor in the effects of proposed regulations and pending or likely lawsuits. Likewise, when assessing banks, telecommunications firms, and electric utilities, analysts need to forecast both the extent to which these industries will be regulated in the future and the ability of individual firms to respond to changes in regulation.

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

Tying It All Together

The primary purpose of this chapter was to discuss techniques investors and managers use to analyze financial statements. The five main categories of ratios were discussed using data for Allied Foods, and we explained how trend analysis and benchmarking are used. It is important to realize ratio analysis is useful, but it must be done intelligently and with good judgment if it is to provide useful insights into firms' operations.

SELF-TEST QUESTIONS AND PROBLEMS (Solutions Appear in Appendix A)

ST-1 **Key terms** Define each of the following terms:

a. Liquidity ratios: current ratio; quick ratio
b. Asset management ratios: inventory turnover ratio; days sales outstanding (DSO); fixed assets turnover ratio; total assets turnover ratio
c. Financial leverage: debt ratio; times-interest-earned (TIE) ratio; EBITDA coverage ratio
d. Profitability ratios: profit margin on sales; basic earning power (BEP) ratio; return on total assets (ROA); return on common equity (ROE)
e. Market value ratios: price/earnings (P/E) ratio; price/cash flow ratio; market/book (M/B) ratio
f. Trend analysis; comparative ratio analysis; benchmarking
g. Basic and extended Du Pont equations; book value per share
h. "Window dressing"; seasonal effects on ratios

ST-2 **Debt ratio** Last year, K. Billingsworth & Co. had earnings per share of $4 and dividends per share of $2. Total retained earnings increased by $12 million during the year, while book value per share at year-end was $40. Billingsworth has no preferred stock, and no new common stock was issued during the year. If its year-end total debt was $120 million, what was the company's year-end debt/assets ratio?

ST-3 **Ratio analysis** The following data apply to A.L. Kaiser & Company (millions of dollars):

Cash and equivalents	$100.00
Fixed assets	$283.50
Sales	$1,000.00
Net income	$50.00
Current liabilities	$105.50
Current ratio	3.0×
DSO[a]	40.55 days
ROE	12%

[a] This calculation is based on a 365-day year.

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

a. Find Kaiser's (1) accounts receivable, (2) current assets, (3) total assets, (4) ROA, (5) common equity, (6) quick ratio, and (7) long-term debt.

b. In part a, you should have found Kaiser's accounts receivable (A/R) = $111.1 million. If Kaiser 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 common equity, how would this affect (1) the ROE, (2) the ROA, and (3) the total debt/total assets ratio?

QUESTIONS

4-1 Financial ratio analysis is conducted by four groups of analysts: short-term lenders, long-term lenders, stockholders, and managers. What is the primary emphasis of each group, and how would that affect the ratios they focus on?

4-2 Why would the inventory turnover ratio be more important for someone analyzing a grocery store chain than an insurance company?

4-3 Over the past year, M. D. Ryngaert & Co. had an increase in its current ratio and a decline in its total assets turnover ratio. However, the company's sales, cash and equivalents, DSO, and its fixed assets turnover ratio remained constant. What balance sheet accounts must have changed to produce the indicated changes?

4-4 Profit margins and turnover ratios vary from one industry to another. What differences would you expect to find between the turnover ratios, profit margins, and Du Pont equations for a grocery chain and a steel company?

4-5 How does inflation distort ratio analysis comparisons, both for one company over time (trend analysis) and when different companies are being compared? Are only balance sheet items or both balance sheet and income statement items affected?

4-6 If a firm's ROE is low and management wants to improve it, explain how using more debt might help.

4-7 Give some examples that illustrate how (a) seasonal factors and (b) different growth rates might distort a comparative ratio analysis. How might these problems be alleviated?

4-8 Why is it sometimes misleading to compare a company's financial ratios with those of other firms that operate in the same industry?

4-9 Suppose you were comparing a discount merchandiser with a high-end merchandiser. Suppose further that both companies had identical ROEs. If you applied the extended Du Pont equation to both firms, would you expect the three components to be the same for each company? If not, explain what balance sheet and income statement items might lead to the component differences.

4-10 Indicate the effects of the transactions listed in the following table on total current assets, current ratio, and net income. Use (+) to indicate an increase, (−) to indicate a decrease, and (0) to indicate either no effect or an indeterminate effect. Be prepared to state any necessary assumptions, and assume an initial current ratio of more than 1.0. (Note: A good accounting background is necessary to answer some of these questions; if yours is not strong, just answer the questions you can handle.)

	Total Current Assets	Current Ratio	Effect on Net Income
a. Cash is acquired through issuance of additional common stock.	____	____	____
b. Merchandise is sold for cash.	____	____	____
c. Federal income tax due for the previous year is paid.	____	____	____
d. A fixed asset is sold for less than book value.	____	____	____
e. A fixed asset is sold for more than book value.	____	____	____
f. Merchandise is sold on credit.	____	____	____
g. Payment is made to trade creditors for previous purchases.	____	____	____
h. A cash dividend is declared and paid.	____	____	____

		Total Current Assets	Current Ratio	Effect on Net Income
i.	Cash is obtained through short-term bank loans.	____	____	____
j.	Short-term notes receivable are sold at a discount.	____	____	____
k.	Marketable securities are sold below cost.	____	____	____
l.	Advances are made to employees.	____	____	____
m.	Current operating expenses are paid.	____	____	____
n.	Short-term promissory notes are issued to trade creditors in exchange for past due accounts payable.	____	____	____
o.	Ten-year notes are issued to pay off accounts payable.	____	____	____
p.	A fully depreciated asset is retired.	____	____	____
q.	Accounts receivable are collected.	____	____	____
r.	Equipment is purchased with short-term notes.	____	____	____
s.	Merchandise is purchased on credit.	____	____	____
t.	The estimated taxes payable are increased.	____	____	____

PROBLEMS

Easy Problems 1–6

4-1 **Days sales outstanding** Baker Brothers has a DSO of 40 days, and its annual sales are $7,300,000. What is its accounts receivable balance? Assume it uses a 365-day year.

4-2 **Debt ratio** Bartley Barstools has an equity multiplier of 2.4, and its assets are financed with some combination of long-term debt and common equity. What is its debt ratio?

4-3 **Du Pont analysis** Doublewide Dealers has an ROA of 10 percent, a 2 percent profit margin, and an ROE of 15 percent. What is its total assets turnover? What is its equity multiplier?

4-4 **Market/book ratio** Jaster Jets 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, and its stock price is $32 per share. What is Jaster's market/book ratio?

4-5 **Price/earnings ratio** A company has an EPS of $2.00, a cash flow per share of $3.00, and a price/cash flow ratio of 8.0×. What is its P/E ratio?

4-6 **Du Pont and ROE** A firm has a profit margin of 2 percent and an equity multiplier of 2.0. Its sales are $100 million and it has total assets of $50 million. What is its ROE?

Intermediate Problems 7–19

4-7 **Du Pont and net income** Ebersoll Mining has $6 million in sales; its ROE is 12 percent; and its total assets turnover is 3.2×. The company is 50 percent equity financed. What is its net income?

4-8 **Basic earning power** Duval Manufacturing recently reported the following information:

Net income	$600,000
ROA	8%
Interest expense	$225,000

Its tax rate is 35 percent. What is its basic earning power (BEP)?

4-9 **M/B and share price** You are given the following information: Stockholders' equity = $3.75 billion; price/earnings ratio = 3.5; common shares outstanding = 50 million; and market/book ratio = 1.9. Calculate the price of a share of the company's common stock.

4-10 **Ratio calculations** Assume you are given the following relationships for the Brauer Corp.:

Sales/total assets	1.5×
Return on assets (ROA)	3%
Return on equity (ROE)	5%

Calculate Brauer's profit margin and debt ratio.

4-11 **EBITDA coverage ratio** Willis Publishing has $30 billion in total assets. Its basic earning power (BEP) ratio is 20 percent, and its times-interest-earned ratio is 8.0. Willis' depreciation and amortization expense totals $3.2 billion. It has $2 billion in lease payments, and

$1 billion must go toward principal payments on outstanding loans and long-term debt. What is Willis's EBITDA coverage ratio?

4-12 **Ratio calculations** Graser Trucking has $12 billion in assets, and its tax rate is 40 percent. Its basic earning power (BEP) ratio is 15 percent, and its return on assets (ROA) is 5 percent. What is its times-interest-earned (TIE) ratio?

4-13 **Times-interest-earned ratio** The H.R. Pickett Corp. has $500,000 of debt outstanding, and it pays an annual interest rate of 10 percent. Its annual sales are $2 million, its average tax rate is 30 percent, and its net profit margin on sales is 5 percent. What is its TIE ratio?

4-14 **Return on equity** Midwest Packaging's ROE last year was only 3 percent, but its management has developed a new operating plan that calls for a total debt ratio of 60 percent, which will result in annual interest charges of $300,000. Management projects an EBIT of $1,000,000 on sales of $10,000,000, and it expects to have a total assets turnover ratio of 2.0. Under these conditions, the tax rate will be 34 percent. If the changes are made, what will be its return on equity?

4-15 **Return on equity and quick ratio** Lloyd Inc. has sales of $200,000, a net income of $15,000, and the following balance sheet:

Cash	$ 10,000	Accounts payable	$ 30,000
Receivables	50,000	Other current liabilities	20,000
Inventories	150,000	Long-term debt	50,000
Net fixed assets	90,000	Common equity	200,000
Total assets	$300,000	Total liabilities and equity	$300,000

The new owner thinks that inventories are excessive and can be lowered to the point where the current ratio is equal to the industry average, 2.5×, without affecting either sales or net income. If inventories are sold off and not replaced thus reducing the current ratio to 2.5×, if the funds generated are used to reduce common equity (stock can be repurchased at book value), and if no other changes occur, by how much will the ROE change? What will be the firm's new quick ratio?

4-16 **Return on equity** Central City Construction (CCC) needs $1 million of assets to get started, and it expects to have a basic earning power ratio of 20 percent. CCC will own no securities, so all of its income will be operating income. If it chooses to, CCC can finance up to 50 percent of its assets with debt, which will have an 8 percent interest rate. Assuming a 40 percent tax rate on all taxable income, what is the *difference* between its expected ROE if CCC finances with 50 percent debt versus its expected ROE if it finances entirely with common stock?

4-17 **Conceptual: Return on equity** Which of the following statements is most correct? (Hint: Work Problem 4-16 before answering 4-17, and consider the solution setup for 4-16, as you think about 4-17.)

a. If a firm's expected basic earning power (BEP) is constant for all of its assets and exceeds the interest rate on its debt, then adding assets and financing them with debt will raise the firm's expected return on common equity (ROE).
b. The higher its tax rate, the lower a firm's BEP ratio will be, other things held constant.
c. The higher the interest rate on its debt, the lower a firm's BEP ratio will be, other things held constant.
d. The higher its debt ratio, the lower a firm's BEP ratio will be, other things held constant.
e. Statement a is false, but statements b, c, and d are all true.

4-18 **TIE ratio** AEI Incorporated has $5 billion in assets, and its tax rate is 40 percent. Its basic earning power (BEP) ratio is 10 percent, and its return on assets (ROA) is 5 percent. What is AEI's times-interest-earned (TIE) ratio?

4-19 **Current ratio** The Petry 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 its short-term debt (notes payable) increase without pushing its current ratio below 2.0?

Challenging Problems 20–24

4-20 **DSO and accounts receivable** Harrelson Inc. currently has $750,000 in accounts receivable, and its days sales outstanding (DSO) is 55 days. It wants to reduce its DSO to 35 days by pressuring more of its customers to pay their bills on time. If this policy is adopted the company's average sales will fall by 15 percent. What will be the level of accounts receivable following the change? Assume a 365-day year.

4-21 **P/E and stock price** Fontaine Inc. recently reported net income of $2 million. It has 500,000 shares of common stock, which currently trades at $40 a share. Fontaine continues to expand and anticipates that 1 year from now its net income will be $3.25 million. Over the next year it also anticipates issuing an additional 150,000 shares of stock, so that 1 year from now it will have 650,000 shares of common stock. Assuming its price/earnings ratio remains at its current level, what will be its stock price 1 year from now?

4-22 **Balance sheet analysis** Complete the balance sheet and sales information that follows using the following financial data:

Debt ratio: 50%
Current ratio: 1.8×
Total assets turnover: 1.5×
Days sales outstanding: 36.5 days[a]
Gross profit margin on sales: (Sales − Cost of goods sold)/Sales = 25%
Inventory turnover ratio: 5×

[a] 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	_____

4-23 **Ratio analysis** Data for Barry Computer Co. and its industry averages follow.

a. Calculate the indicated ratios for Barry.
b. Construct the extended Du Pont equation for both Barry and the industry.
c. Outline Barry's strengths and weaknesses as revealed by your analysis.
d. Suppose Barry had doubled its sales as well as its inventories, accounts receivable, and common equity during 2005. 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.)

Barry Computer Company: Balance Sheet as of December 31, 2005 (In Thousands)

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
		Long-term debt	256,500
Net fixed assets	292,500	Common equity	361,000
Total assets	$947,500	Total liabilities and equity	$947,500

Barry Computer Company: Income Statement for Year Ended December 31, 2005 (In Thousands)

Sales		$1,607,500
Cost of goods sold		
Materials	$717,000	
Labor	453,000	
Heat, light, and power	68,000	
Indirect labor	113,000	
Depreciation	41,500	1,392,500
Gross profit		$ 215,000
Selling expenses		115,000
General and administrative expenses		30,000
Earnings before interest and taxes (EBIT)		$ 70,000
Interest expense		24,500
Earnings before taxes (EBT)		$ 45,500
Federal and state income taxes (40 percent)		18,200
Net income		$ 27,300

Ratio	Barry	Industry Average
Current	_____	2.0×
Quick	_____	1.3×
Days sales outstanding[a]	_____	35 days
Inventory turnover	_____	6.7×
Total assets turnover	_____	3.0×
Net profit margin	_____	1.2%
ROA	_____	3.6%
ROE	_____	9.0%
Total debt/total assets	_____	60.0%

[a] Calculation is based on a 365-day year.

4-24 **Du Pont analysis** A firm has been experiencing low profitability in recent years. Perform an analysis of the firm's financial position using the extended Du Pont equation. The firm has no lease payments, but has a $2 million sinking fund payment on its debt. The most recent industry average ratios and the firm's financial statements are as follows:

Industry Average Ratios

Current ratio	2×	Fixed assets turnover	6×
Debt/total assets	30%	Total assets turnover	3×
Times interest earned	7×	Profit margin on sales	3%
EBITDA coverage	9×	Return on total assets	9%
Inventory turnover	10×	Return on common equity	12.9%
Days sales outstanding[a]	24 days		

[a] Calculation is based on a 365-day year.

Balance Sheet as of December 31, 2005 (Millions of Dollars)

Cash and equivalents	$ 78	Accounts payable	$ 45
Net receivables	66	Notes payable	45
Inventories	159	Other current liabilities	21
Total current assets	$303	Total current liabilities	$111
		Long-term debt	24
		Total liabilities	$135
Gross fixed assets	225		
Less depreciation	78	Common stock	114
Net fixed assets	$147	Retained earnings	201
		Total stockholders' equity	$315
Total assets	$450	Total liabilities and equity	$450

Income Statement for Year Ended December 31, 2005 (Millions of Dollars)

Net sales	$795.0
Cost of goods sold	660.0
Gross profit	$135.0
Selling expenses	73.5
EBITDA	$ 61.5
Depreciation expense	12.0
Earnings before interest and taxes (EBIT)	$ 49.5
Interest expense	4.5
Earnings before taxes (EBT)	$ 45.0
Taxes (40%)	18.0
Net income	$ 27.0

a. Calculate those ratios that you think would be useful in this analysis.
b. Construct an extended Du Pont equation, and compare the company's ratios to the industry average ratios.
c. Do the balance sheet accounts or the income statement figures seem to be primarily responsible for the low profits?
d. Which specific accounts seem to be most out of line relative to other firms in the industry?
e. If the firm had a pronounced seasonal sales pattern, or if it grew rapidly during the year, how might that affect the validity of your ratio analysis? How might you correct for such potential problems?

COMPREHENSIVE/SPREADSHEET PROBLEM

4-25 **Ratio analysis** The Corrigan Corporation's 2004 and 2005 financial statements follow, along with some industry average ratios.

a. Assess Corrigan's liquidity position, and determine how it compares with peers and how the liquidity position has changed over time.
b. Assess Corrigan's asset management position, and determine how it compares with peers and how its asset management efficiency has changed over time.
c. Assess Corrigan's debt management position, and determine how it compares with peers and how its debt management has changed over time.
d. Assess Corrigan's profitability ratios, and determine how they compare with peers and how the profitability position has changed over time.
e. Assess Corrigan's market value ratios, and determine how their valuation compares with peers and how it has changed over time.
f. Calculate Corrigan's ROE, as well as the industry average ROE, using the extended Du Pont equation. From this analysis, how does Corrigan's financial position compare with the industry average numbers?
g. What do you think would happen to its 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.

Corrigan Corporation: Balance Sheets as of December 31

	2005	2004
Cash	$ 72,000	$ 65,000
Accounts receivable	439,000	328,000
Inventories	894,000	813,000
Total current assets	$1,405,000	$1,206,000
Land and building	238,000	271,000
Machinery	132,000	133,000
Other fixed assets	61,000	57,000
Total assets	$1,836,000	$1,667,000
Accounts and notes payable	$ 432,000	$ 409,500
Accrued liabilities	170,000	162,000
Total current liabilities	$ 602,000	$ 571,500
Long-term debt	404,290	258,898
Common stock	575,000	575,000
Retained earnings	254,710	261,602
Total liabilities and equity	$1,836,000	$1,667,000

Corrigan Corporation: Income Statements for Years Ending December 31

	2005	2004
Sales	$4,240,000	$3,635,000
Cost of goods sold	3,680,000	2,980,000
Gross operating profit	$ 560,000	$ 655,000
General administrative and selling expenses	236,320	213,550
Depreciation	159,000	154,500
Miscellaneous	134,000	127,000
Earnings before taxes (EBT)	$ 30,680	$ 159,950
Taxes (40%)	12,272	63,980
Net income	$ 18,408	$ 95,970

Per-Share Data

	2005	2004
EPS	$0.80	$4.17
Cash dividends	$1.10	$0.95
Market price (average)	$12.34	$23.57
P/E ratio	15.4×	5.65×
Number of shares outstanding	23,000	23,000

Industry Financial Ratios[a]

Current ratio	2.7×
Inventory turnover[b]	7.0×
Days sales outstanding[c]	32 days
Fixed assets turnover[b]	13.0×
Total assets turnover[b]	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×

[a] Industry average ratios have been constant for the past 4 years.
[b] Based on year-end balance sheet figures.
[c] Calculation is based on a 365-day year.

Integrated Case

D'Leon Inc., Part II

4-26 **Financial statement analysis** Part I of this case, presented in Chapter 3, discussed the situation that D'Leon Inc., a regional snack-foods producer, was in after an expansion program. D'Leon had increased plant capacity and undertaken a major marketing campaign in an attempt to "go national." Thus far, sales have not been up to the forecasted level, costs have been higher than were projected, and a large loss occurred in 2005 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, D'Leon's chairman, who had the task of getting the company back into a sound financial position. D'Leon's 2004 and 2005 balance sheets and income statements, together with projections for 2006, are given in Tables IC4-1 and IC4-2. In addition, Table IC4-3 gives the company's 2004 and 2005 financial ratios, together with industry average data. The 2006 projected financial statement data represent Jamison's and Campo's best guess for 2006 results, assuming that some new financing is arranged to get the company "over the hump."

Jamison examined monthly data for 2005 (not given in the case), and she detected an improving pattern during the year. Monthly sales were rising, costs were falling, and large losses in the early months had turned to a small profit by December. Thus, the annual data look somewhat worse than final monthly data. Also, it appears to be taking longer for the advertising program to get the message across, for the new sales offices to generate sales, and for the new manufacturing facilities to operate efficiently. In other words, the lags between spending money and deriving benefits were longer than D'Leon's managers had anticipated. For these reasons, Jamison and Campo see hope for the company—provided it can survive in the short run.

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.

a. Why are ratios useful? What are the five major categories of ratios?
b. Calculate D'Leon's 2006 current and quick ratios based on the projected balance sheet and income statement data. What can you say about the company's liquidity positions in 2004, 2005, and as projected for 2006? 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 these liquidity ratios?
c. Calculate the 2006 inventory turnover, days sales outstanding (DSO), fixed assets turnover, and total assets turnover. How does D'Leon's utilization of assets stack up against other firms in its industry?
d. Calculate the 2006 debt, times-interest-earned, and EBITDA coverage ratios. How does D'Leon compare with the industry with respect to financial leverage? What can you conclude from these ratios?
e. Calculate the 2006 profit margin, basic earning power (BEP), return on assets (ROA), and return on equity (ROE). What can you say about these ratios?
f. Calculate the 2006 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. Use the extended Du Pont equation to provide a summary and overview of D'Leon's financial condition as projected for 2006. What are the firm's major strengths and weaknesses?
h. Use the following simplified 2006 balance sheet to show, in general terms, how an improvement in the DSO would tend to affect the stock price. For example, if the company could improve its collection procedures and thereby lower its DSO from 45.6 days to the 32-day industry average without affecting sales, how would that change "ripple through" the financial statements (shown in thousands below) and influence the stock price?

Accounts receivable	$ 878	Debt	$1,545
Other current assets	1,802		
Net fixed assets	817	Equity	1,952
Total assets	$3,497	Liabilities plus equity	$3,497

i. Does it appear that inventories could be adjusted, and, if so, how should that adjustment affect D'Leon's profitability and stock price?
j. In 2005, the company paid its suppliers much later than the due dates, and it was not maintaining financial ratios at levels called for in its bank loan agreements. Therefore, suppliers could cut the company off, and its bank could refuse to renew the loan when it comes due in 90 days. On the basis of data provided, would you, as a credit manager, continue to sell to D'Leon on credit? (You could demand cash on delivery—that is, sell on terms of COD—but that might cause D'Leon to stop buying from your company.) Similarly, if you were the bank loan officer, would you recommend renewing the loan or demand its repayment? Would your actions be influenced if, in early 2006, D'Leon showed you its 2006 projections plus proof that it was going to raise more than $1.2 million of new equity?
k. In hindsight, what should D'Leon have done back in 2004?
l. What are some potential problems and limitations of financial ratio analysis?
m. What are some qualitative factors analysts should consider when evaluating a company's likely future financial performance?

TABLE IC4-1 *Balance Sheets*

	2006E	2005	2004
Assets			
Cash	$ 85,632	$ 7,282	$ 57,600
Accounts receivable	878,000	632,160	351,200
Inventories	1,716,480	1,287,360	715,200
Total current assets	$2,680,112	$1,926,802	$1,124,000
Gross fixed assets	1,197,160	1,202,950	491,000
Less accumulated depreciation	380,120	263,160	146,200
Net fixed assets	$ 817,040	$ 939,790	$ 344,800
Total assets	$3,497,152	$2,866,592	$1,468,800
Liabilities and Equity			
Accounts payable	$ 436,800	$ 524,160	$ 145,600
Notes payable	300,000	636,808	200,000
Accruals	408,000	489,600	136,000
Total current liabilities	$1,144,800	$1,650,568	$ 481,600
Long-term debt	400,000	723,432	323,432
Common stock	1,721,176	460,000	460,000
Retained earnings	231,176	32,592	203,768
Total equity	$1,952,352	$ 492,592	$ 663,768
Total liabilities and equity	$3,497,152	$2,866,592	$1,468,800

Note: "E" indicates estimated. The 2006 data are forecasts.

TABLE IC4-2 *Income Statements*

	2006E	2005	2004
Sales	$7,035,600	$6,034,000	$3,432,000
Cost of goods sold	5,875,992	5,528,000	2,864,000
Other expenses	550,000	519,988	358,672
Total operating costs excluding depreciation	$6,425,992	$6,047,988	$3,222,672
EBITDA	$ 609,608	($ 13,988)	$ 209,328
Depreciation	116,960	116,960	18,900
EBIT	$ 492,648	($ 130,948)	$ 190,428
Interest expense	70,008	136,012	43,828
EBT	$ 422,640	($ 266,960)	$ 146,600
Taxes (40%)	169,056	(106,784)[a]	58,640
Net income	$ 253,584	($ 160,176)	$ 87,960
EPS	$1.014	($1.602)	$0.880
DPS	$0.220	$0.110	$0.220
Book value per share	$7.809	$4.926	$6.638
Stock price	$12.17	$2.25	$8.50
Shares outstanding	250,000	100,000	100,000
Tax rate	40.00%	40.00%	40.00%
Lease payments	40,000	40,000	40,000
Sinking fund payments	0	0	0

Note: "E" indicates estimated. The 2006 data are forecasts.
[a] The firm had sufficient taxable income in 2003 and 2004 to obtain its full tax refund in 2005.

TABLE IC4-3 *Ratio Analysis*

	2006E	2005	2004	Industry Average
Current		1.2×	2.3×	2.7×
Quick		0.4×	0.8×	1.0×
Inventory turnover		4.7×	4.8×	6.1×
Days sales outstanding (DSO)[a]		38.2	37.4	32.0
Fixed assets turnover		6.4×	10.0×	7.0×
Total assets turnover		2.1×	2.3×	2.6×
Debt ratio		82.8%	54.8%	50.0%
TIE		−1.0×	4.3×	6.2×
EBITDA coverage		0.1×	3.0×	8.0×
Profit margin		−2.7%	2.6%	3.5%
Basic earning power		−4.6%	13.0%	19.1%
ROA		−5.6%	6.0%	9.1%
ROE		−32.5%	13.3%	18.2%
Price/earnings		−1.4×	9.7×	14.2×
Price/cash flow		−5.2×	8.0×	11.0×
Market/book		0.5×	1.3×	2.4×
Book value per share		$4.93	$6.64	n.a.

Note: "E" indicates estimated. The 2006 data are forecasts.
[a] Calculation is based on a 365-day year.

Please go to the ThomsonNOW Web site to access the Cyberproblems.

THOMSON ONE Business School Edition

Access the Thomson ONE problems though the ThomsonNOW Web site. Use the Thomson ONE—Business School Edition online database to work this chapter's questions.

Conducting a Financial Ratio Analysis on Ford Motor Company

In Chapter 3, we took a look at Starbucks' financial statements. Now we use Thomson One to analyze Ford Motor Company.

Enter Ford's ticker symbol (F) and select "GO." If we select the tab at the top labeled "Financials," we 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 3 years. This information enables you to evaluate Ford's performance over time for each of the ratio categories that we mention in the text (liquidity, asset management, debt management, profitability, and market-based ratios).

The text mentions that financial statement analysis has two major components: a trend analysis, where we evaluate changes in the key ratios over time, and a peer analysis, where we compare financial ratios with firms that are in the same industry and/or line of business. We have already used Thomson One to conduct a trend analysis—next we use this tool to conduct a peer analysis. If we click on the "Peers" tab (on the first line of tabs) near the top of the screen, some summary financial information for Ford and a few of its peers will be presented. 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.

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?