3 Working with Financial Statements

On February 24, 2004, the price of a share of common stock in Linux software distributor Red Hat, Inc., closed at about $17. At that price, *The Wall Street Journal* reported Red Hat had a price-earnings (PE) ratio of 130. That is, investors were willing to pay $130 for every dollar in income earned by Red Hat. At the same time, investors were willing to pay only $38, $29, and $17 for each dollar earned by Cisco, Tootsie Roll, and Kraft Foods, respectively. At the other extreme were eBay and Yahoo!, both relative newcomers to the stock market. Each had negative earnings for the previous year, yet eBay was priced at about $67 per share and Yahoo! at about $44 per share. Since they had negative earnings, their PE ratios would have been negative, so they were not reported. At that time, the typical stock in the S&P 500 index of large company stocks was trading at a PE of about 23, or about 23 times earnings, as they say on Wall Street.

Price-to-earnings comparisons are examples of the use of financial ratios. As we will see in this chapter, there are a wide variety of financial ratios, all designed to summarize specific aspects of a firm's financial position. In addition to discussing how to analyze financial statements and compute financial ratios, we will have quite a bit to say about who uses this information and why.

In chapter 2, we discussed some of the essential concepts of financial statements and cash flows. Part 2, this chapter and the next, continues where our earlier discussion left off. Our goal here is to expand your understanding of the uses (and abuses) of financial statement information.

Financial statement information will crop up in various places in the remainder of our book. Part 2 is not essential for understanding this material, but it will help give you an overall perspective on the role of financial statement information in corporate finance.

A good working knowledge of financial statements is desirable simply because such statements, and numbers derived from those statements, are the primary means of communicating financial information both within the firm and outside the firm. In short, much of the language of corporate finance is rooted in the ideas we discuss in this chapter.

Furthermore, as we shall see, there are many different ways of using financial statement information and many different types of users. This diversity reflects the fact that financial statement information plays an important part in many types of decisions.

In the best of all worlds, the financial manager has full market value information about all of the firm's assets. This will rarely (if ever) happen. So the reason we rely on accounting figures for much of our financial information is that we are almost always unable to obtain all (or even part) of the market information that we want. The only meaningful yardstick for evaluating business decisions is whether or not they create economic value (see Chapter 1). However, in many important situations, it will not be possible to make this judgment directly because we can't see the market value effects of decisions.

We recognize that accounting numbers are often just pale reflections of economic reality, but they are frequently the best available information. For privately held corporations, not-for-profit businesses, and smaller firms, for example, very little direct market value information exists at all. The accountant's reporting function is crucial in these circumstances.

Clearly, one important goal of the accountant is to report financial information to the user in a form useful for decision making. Ironically, the information frequently does not come to the user in such a form. In other words, financial statements don't come with a user's guide. This chapter and the next are first steps in filling this gap.

CASH FLOW AND FINANCIAL STATEMENTS: A CLOSER LOOK 3.1

At the most fundamental level, firms do two different things: they generate cash and they spend it. Cash is generated by selling a product, an asset, or a security. Selling a security involves either borrowing or selling an equity interest (i.e., shares of stock) in the firm. Cash is spent in paying for materials and labor to produce a product and in purchasing assets. Payments to creditors and owners also require the spending of cash.

In Chapter 2, we saw that the cash activities of a firm could be summarized by a simple identity:

$$\text{Cash flow from assets} = \text{Cash flow to creditors} + \text{Cash flow to owners}$$

This cash flow identity summarizes the total cash result of all transactions a firm engages in during the year. In this section, we return to the subject of cash flows by taking a closer look at the cash events during the year that lead to these total figures.

Sources and Uses of Cash

Those activities that bring in cash are called **sources of cash**. Those activities that involve spending cash are called **uses** (or applications) **of cash**. What we need to do is to trace the changes in the firm's balance sheet to see how the firm obtained its cash and how the firm spent its cash during some time period.

sources of cash
A firm's activities that generate cash.

uses of cash
A firm's activities in which cash is spent. Also called applications of cash.

To get started, consider the balance sheets for the Prufrock Corporation in Table 3.1. Notice that we have calculated the change in each of the items on the balance sheets.

Looking over the balance sheets for Prufrock, we see that quite a few things changed during the year. For example, Prufrock increased its net fixed assets by $149 and its inventory by $29. (Note that, throughout, all figures are in millions of dollars.) Where did the money come from? To answer this and related questions, we need to first identify those changes that used up cash (uses) and those that brought cash in (sources).

A little common sense is useful here. A firm uses cash by either buying assets or making payments. So, loosely speaking, an increase in an asset account means the firm, on a net basis, bought some assets, a use of cash. If an asset account went down, then, on a net basis, the firm sold some assets. This would be a net source. Similarly, if a liability account goes down, then the firm has made a net payment, a use of cash.

Company financial information can be found many places on the Web, including www.financials.com, finance.yahoo.com, and moneycentral.msn.com.

Given this reasoning, there is a simple, albeit mechanical, definition you may find useful. An increase in a left-hand-side (asset) account or a decrease in a right-hand-side (liability or equity) account is a use of cash. Likewise, a decrease in an asset account or an increase in a liability (or equity) account is a source of cash.

TABLE 3.1 >>

PRUFROCK CORPORATION
2004 and 2005 Balance Sheets
($ in millions)

	2004	2005	Change
Assets			
Current assets			
Cash	$ 84	$ 98	+$ 14
Accounts receivable	165	188	+ 23
Inventory	393	422	+ 29
Total	$ 642	$ 708	+$ 66
Fixed assets			
Net plant and equipment	$2,731	$2,880	+$149
Total assets	$3,373	$3,588	+$215
Liabilities and Owners' Equity			
Current liabilities			
Accounts payable	$ 312	$ 344	+$ 32
Notes payable	231	196	− 35
Total	$ 543	$ 540	−$ 3
Long-term debt	$ 531	$ 457	−$ 74
Owners' equity			
Common stock and paid-in surplus	$ 500	$ 550	+$ 50
Retained earnings	1,799	2,041	+ 242
Total	$2,299	$2,591	+$292
Total liabilities and owners' equity	$3,373	$3,588	+$215

Looking again at Prufrock, we see that inventory rose by $29. This is a net use because Prufrock effectively paid out $29 to increase inventories. Accounts payable rose by $32. This is a source of cash because Prufrock effectively has borrowed an additional $32 payable by the end of the year. Notes payable, on the other hand, went down by $35, so Prufrock effectively paid off $35 worth of short-term debt—a use of cash.

Based on our discussion, we can summarize the sources and uses from the balance sheet as follows:

Sources of cash:	
Increase in accounts payable	$ 32
Increase in common stock	50
Increase in retained earnings	242
Total sources	$324
Uses of cash:	
Increase in accounts receivable	$ 23
Increase in inventory	29
Decrease in notes payable	35
Decrease in long-term debt	74
Net fixed asset acquisitions	149
Total uses	$310
Net addition to cash	$ 14

<< TABLE 3.2

PRUFROCK CORPORATION 2005 Income Statement ($ in millions)		
Sales		$2,311
Cost of goods sold		1,344
Depreciation		276
Earnings before interest and taxes		$ 691
Interest paid		141
Taxable income		$ 550
Taxes (34%)		187
Net income		$ 363
Dividends	$121	
Addition to retained earnings	242	

The net addition to cash is just the difference between sources and uses, and our $14 result here agrees with the $14 change shown on the balance sheet.

This simple statement tells us much of what happened during the year, but it doesn't tell the whole story. For example, the increase in retained earnings is net income (a source of funds) less dividends (a use of funds). It would be more enlightening to have these reported separately so we could see the breakdown. Also, we have only considered net fixed asset acquisitions. Total or gross spending would be more interesting to know.

To further trace the flow of cash through the firm during the year, we need an income statement. For Prufrock, the results for the year are shown in Table 3.2.

Notice here that the $242 addition to retained earnings we calculated from the balance sheet is just the difference between the net income of $363 and the dividends of $121.

The Statement of Cash Flows

statement of cash flows
A firm's financial statement that summarizes its sources and uses of cash over a specified period.

There is some flexibility in summarizing the sources and uses of cash in the form of a financial statement. However it is presented, the result is called the **statement of cash flows**. Historically, this statement was called the *statement of changes in financial position* and it was presented in terms of the changes in net working capital rather than cash flows. We will work with the newer cash format.

We present a particular format for this statement in Table 3.3. The basic idea is to group all the changes into three categories: operating activities, financing activities, and investment activities. The exact form differs in detail from one preparer to the next.

Don't be surprised if you come across different arrangements. The types of information presented will be very similar; the exact order can differ. The key thing to remember in this case is that we started out with $84 in cash and ended up with $98, for a net increase of $14. We're just trying to see what events led to this change.

Going back to Chapter 2, we note that there is a slight conceptual problem here. Interest paid should really go under financing activities, but unfortunately that's not the way the accounting is handled. The reason, you may recall, is that interest is deducted as an expense when net income is computed. Also, notice that the net purchase of fixed assets was $149. Because Prufrock wrote off $276 worth of assets (the depreciation), it must have actually spent a total of $149 + 276 = $425 on fixed assets.

Once we have this statement, it might seem appropriate to express the change in cash on a per-share basis, much as we did for net income. Ironically, despite the interest we might

TABLE 3.3 >>

PRUFROCK CORPORATION
2005 Statement of Cash Flows
($ in millions)

Cash, beginning of year	$ 84
Operating activity	
Net income	$363
Plus:	
Depreciation	276
Increase in accounts payable	32
Less:	
Increase in accounts receivable	− 23
Increase in inventory	− 29
Net cash from operating activity	$619
Investment activity	
Fixed asset acquisitions	−$425
Net cash from investment activity	−$425
Financing activity	
Decrease in notes payable	−$ 35
Decrease in long-term debt	− 74
Dividends paid	− 121
Increase in common stock	50
Net cash from financing activity	−$180
Net increase in cash	$ 14
Cash, end of year	$ 98

have in some measure of cash flow per share, standard accounting practice expressly prohibits reporting this information. The reason is that accountants feel that cash flow (or some component of cash flow) is not an alternative to accounting income, so only earnings per share are to be reported.

As shown in Table 3.4, it is sometimes useful to present the same information a bit differently. We will call this the "sources and uses of cash" statement. There is no such statement in financial accounting, but this arrangement resembles one used many years ago. As we will discuss, this form can come in handy, but we emphasize again that it is not the way this information is normally presented.

Now that we have the various cash pieces in place, we can get a good idea of what happened during the year. Prufrock's major cash outlays were fixed asset acquisitions and cash dividends. It paid for these activities primarily with cash generated from operations.

Prufrock also retired some long-term debt and increased current assets. Finally, current liabilities were not greatly changed, and a relatively small amount of new equity was sold. Altogether, this short sketch captures Prufrock's major sources and uses of cash for the year.

Concept Questions

3.1a What is a source of cash? Give three examples.

3.1b What is a use, or application, of cash? Give three examples.

<< TABLE 3.4

PRUFROCK CORPORATION 2005 Sources and Uses of Cash ($ in millions)	
Cash, beginning of year	$ 84
Sources of cash	
Operations:	
Net income	$363
Depreciation	276
	$639
Working capital:	
Increase in accounts payable	$ 32
Long-term financing:	
Increase in common stock	50
Total sources of cash	$721
Uses of cash	
Working capital:	
Increase in accounts receivable	$ 23
Increase in inventory	29
Decrease in notes payable	35
Long-term financing:	
Decrease in long-term debt	74
Fixed asset acquisitions	425
Dividends paid	121
Total uses of cash	$707
Net addition to cash	$ 14
Cash, end of year	$ 98

STANDARDIZED FINANCIAL STATEMENTS 3.2

The next thing we might want to do with Prufrock's financial statements is to compare them to those of other, similar, companies. We would immediately have a problem, however. It's almost impossible to directly compare the financial statements for two companies because of differences in size.

For example, Ford and GM are obviously serious rivals in the auto market, but GM is much larger (in terms of assets), so it is difficult to compare them directly. For that matter, it's difficult to even compare financial statements from different points in time for the same company if the company's size has changed. The size problem is compounded if we try to compare GM and, say, Toyota. If Toyota's financial statements are denominated in yen, then we have a size *and* a currency difference.

To start making comparisons, one obvious thing we might try to do is to somehow standardize the financial statements. One very common and useful way of doing this is to work with percentages instead of total dollars. In this section, we describe two different ways of standardizing financial statements along these lines.

Common-Size Statements

To get started, a useful way of standardizing financial statements is to express each item on the balance sheet as a percentage of assets and to express each item on the income

TABLE 3.5 >>

PRUFROCK CORPORATION
Common-Size Balance Sheets 2004 and 2005

	2004	2005	Change
Assets			
Current assets			
Cash	2.5%	2.7%	+ .2%
Accounts receivable	4.9	5.2	+ .3
Inventory	11.7	11.8	+ .1
Total	19.1	19.7	+ .6
Fixed assets			
Net plant and equipment	80.9	80.3	− .6
Total assets	100.0%	100.0%	0.0
Liabilities and Owners' Equity			
Current liabilities			
Accounts payable	9.2%	9.6%	+ .4%
Notes payable	6.8	5.5	−1.3
Total	16.0	15.1	− .9
Long-term debt	15.7	12.7	−3.0
Owners' equity			
Common stock and paid-in surplus	14.8	15.3	+ .5
Retained earnings	53.3	56.9	+3.6
Total	68.1	72.2	+4.1
Total liabilities and owners' equity	100.0%	100.0%	0.0

common-size statement
A standardized financial statement presenting all items in percentage terms. Balance sheet items are shown as a percentage of assets and income statement items as a percentage of sales.

statement as a percentage of sales. The resulting financial statements are called **common-size statements**. We consider these next.

Common-Size Balance Sheets One way, though not the only way, to construct a common-size balance sheet is to express each item as a percentage of total assets. Prufrock's 2004 and 2005 common-size balance sheets are shown in Table 3.5.

Notice that some of the totals don't check exactly because of rounding errors. Also notice that the total change has to be zero because the beginning and ending numbers must add up to 100 percent.

In this form, financial statements are relatively easy to read and compare. For example, just looking at the two balance sheets for Prufrock, we see that current assets were 19.7 percent of total assets in 2005, up from 19.1 percent in 2004. Current liabilities declined from 16.0 percent to 15.1 percent of total liabilities and equity over that same time. Similarly, total equity rose from 68.1 percent of total liabilities and equity to 72.2 percent.

Overall, Prufrock's liquidity, as measured by current assets compared to current liabilities, increased over the year. Simultaneously, Prufrock's indebtedness diminished as a percentage of total assets. We might be tempted to conclude that the balance sheet has grown "stronger." We will say more about this later.

Common-Size Income Statements A useful way of standardizing the income statement is to express each item as a percentage of total sales, as illustrated for Prufrock in Table 3.6.

<< TABLE 3.6

PRUFROCK CORPORATION
Common-Size Income Statement
2005

Sales		100.0%
Cost of goods sold		58.2
Depreciation		11.9
Earnings before interest and taxes		29.9
Interest paid		6.1
Taxable income		23.8
Taxes (34%)		8.1
Net income		15.7%
Dividends	5.2%	
Addition to retained earnings	10.5	

This income statement tells us what happens to each dollar in sales. For Prufrock, interest expense eats up $.061 out of every sales dollar and taxes take another $.081. When all is said and done, $.157 of each dollar flows through to the bottom line (net income), and that amount is split into $.105 retained in the business and $.052 paid out in dividends.

These percentages are very useful in comparisons. For example, a very relevant figure is the cost percentage. For Prufrock, $.582 of each $1 in sales goes to pay for goods sold. It would be interesting to compute the same percentage for Prufrock's main competitors to see how Prufrock stacks up in terms of cost control.

Common-Size Statements of Cash Flows Although we have not presented it here, it is also possible and useful to prepare a common-size statement of cash flows. Unfortunately, with the current statement of cash flows, there is no obvious denominator such as total assets or total sales. However, if the information is arranged in a way similar to that in Table 3.4, then each item can be expressed as a percentage of total sources (or total uses). The results can then be interpreted as the percentage of total sources of cash supplied or as the percentage of total uses of cash for a particular item.

Common–Base Year Financial Statements: Trend Analysis

Imagine we were given balance sheets for the last 10 years for some company and we were trying to investigate trends in the firm's pattern of operations. Does the firm use more or less debt? Has the firm grown more or less liquid? A useful way of standardizing financial statements in this case is to choose a base year and then express each item relative to the base amount. We will call the resulting statements **common–base year statements**.

common–base year statement
A standardized financial statement presenting all items relative to a certain base-year amount.

For example, from 2004 to 2005, Prufrock's inventory rose from $393 to $422. If we pick 2004 as our base year, then we would set inventory equal to 1.00 for that year. For the next year, we would calculate inventory relative to the base year as $422/393 = 1.07. In this case, we could say inventory grew by about 7 percent during the year. If we had multiple years, we would just divide the inventory figure for each one by $393. The resulting series is very easy to plot, and it is then very easy to compare two or more different companies. Table 3.7 summarizes these calculations for the asset side of the balance sheet.

TABLE 3.7 >>

PRUFROCK CORPORATION
Summary of Standardized Balance Sheets
(Asset side only)

	Assets ($ in millions)		Common-Size Assets		Common-Base Year Assets	Combined Common-Size and Base-Year Assets
	2004	2005	2004	2005	2005	2005
Current assets						
Cash	$ 84	$ 98	2.5%	2.7%	1.17	1.08
Accounts receivable	165	188	4.9	5.2	1.14	1.06
Inventory	393	422	11.7	11.8	1.07	1.01
Total current assets	$ 642	$ 708	19.1	19.7	1.10	1.03
Fixed assets						
Net plant and equipment	$2,731	$2,880	80.9	80.3	1.05	0.99
Total assets	$3,373	$3,588	100.0%	100.0%	1.06	1.00

NOTE: The common-size numbers are calculated by dividing each item by total assets for that year. For example, the 2004 common-size cash amount is $84/3,373 = 2.5%. The common-base year numbers are calculated by dividing each 2005 item by the base-year (2004) dollar amount. The common-base cash is thus $98/84 = 1.17, representing a 17 percent increase. The combined common-size and base-year figures are calculated by dividing each common-size amount by the base-year (2004) common-size amount. The cash figure is therefore 2.7%/2.5% = 1.08, representing an 8 percent increase in cash holdings as a percentage of total assets. Columns may not total precisely due to rounding.

Combined Common-Size and Base-Year Analysis

The trend analysis we have been discussing can be combined with the common-size analysis discussed earlier. The reason for doing this is that as total assets grow, most of the other accounts must grow as well. By first forming the common-size statements, we eliminate the effect of this overall growth.

For example, looking at Table 3.7, we see that Prufrock's accounts receivable were $165, or 4.9 percent of total assets, in 2004. In 2005, they had risen to $188, which was 5.2 percent of total assets. If we do our analysis in terms of dollars, then the 2005 figure would be $188/165 = 1.14, representing a 14 percent increase in receivables. However, if we work with the common-size statements, then the 2005 figure would be 5.2%/4.9% = 1.06. This tells us accounts receivable, as a percentage of total assets, grew by 6 percent. Roughly speaking, what we see is that of the 14 percent total increase, about 8 percent (14% − 6%) is attributable simply to growth in total assets.

Concept Questions

3.2a Why is it often necessary to standardize financial statements?

3.2b Name two types of standardized statements and describe how each is formed.

3.3 RATIO ANALYSIS

Another way of avoiding the problems involved in comparing companies of different sizes is to calculate and compare **financial ratios**. Such ratios are ways of comparing and investigating the relationships between different pieces of financial information. Using ratios

financial ratios
Relationships determined from a firm's financial information and used for comparison purposes.

eliminates the size problem because the size effectively divides out. We're then left with percentages, multiples, or time periods.

There is a problem in discussing financial ratios. Because a ratio is simply one number divided by another, and because there is a substantial quantity of accounting numbers out there, there is a huge number of possible ratios we could examine. Everybody has a favorite. We will restrict ourselves to a representative sampling.

In this section, we only want to introduce you to some commonly used financial ratios. These are not necessarily the ones we think are the best. In fact, some of them may strike you as illogical or not as useful as some alternatives. If they do, don't be concerned. As a financial analyst, you can always decide how to compute your own ratios.

What you do need to worry about is the fact that different people and different sources seldom compute these ratios in exactly the same way, and this leads to much confusion. The specific definitions we use here may or may not be the same as ones you have seen or will see elsewhere. If you are ever using ratios as a tool for analysis, you should be careful to document how you calculate each one, and, if you are comparing your numbers to numbers from another source, be sure you know how those numbers are computed.

We will defer much of our discussion of how ratios are used and some problems that come up with using them until later in the chapter. For now, for each of the ratios we discuss, we consider several questions that come to mind:

1. How is it computed?
2. What is it intended to measure, and why might we be interested?
3. What is the unit of measurement?
4. What might a high or low value be telling us? How might such values be misleading?
5. How could this measure be improved?

Financial ratios are traditionally grouped into the following categories:

1. Short-term solvency, or liquidity, ratios
2. Long-term solvency, or financial leverage, ratios
3. Asset management, or turnover, ratios
4. Profitability ratios
5. Market value ratios

We will consider each of these in turn. In calculating these numbers for Prufrock, we will use the ending balance sheet (2005) figures unless we explicitly say otherwise. Also notice that the various ratios are color keyed to indicate which numbers come from the income statement and which come from the balance sheet.

Short-Term Solvency, or Liquidity, Measures

As the name suggests, short-term solvency ratios as a group are intended to provide information about a firm's liquidity, and these ratios are sometimes called *liquidity measures*. The primary concern is the firm's ability to pay its bills over the short run without undue stress. Consequently, these ratios focus on current assets and current liabilities.

For obvious reasons, liquidity ratios are particularly interesting to short-term creditors. Because financial managers are constantly working with banks and other short-term lenders, an understanding of these ratios is essential.

One advantage of looking at current assets and liabilities is that their book values and market values are likely to be similar. Often (though not always), these assets and liabilities just don't live long enough for the two to get seriously out of step. On the other hand,

Go to www.investor.reuters.com and follow the "Ratio" link to examine comparative ratios for a huge number of companies.

like any type of near-cash, current assets and liabilities can and do change fairly rapidly, so today's amounts may not be a reliable guide to the future.

Current Ratio One of the best known and most widely used ratios is the *current ratio*. As you might guess, the current ratio is defined as:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} \tag{3.1}$$

For Prufrock, the 2005 current ratio is:

$$\text{Current ratio} = \frac{\$708}{\$540} = 1.31 \text{ times}$$

Because current assets and liabilities are, in principle, converted to cash over the following 12 months, the current ratio is a measure of short-term liquidity. The unit of measurement is either dollars or times. So, we could say Prufrock has $1.31 in current assets for every $1 in current liabilities, or we could say that Prufrock has its current liabilities covered 1.31 times over.

To a creditor, particularly a short-term creditor such as a supplier, the higher the current ratio, the better. To the firm, a high current ratio indicates liquidity, but it also may indicate an inefficient use of cash and other short-term assets. Absent some extraordinary circumstances, we would expect to see a current ratio of at least 1, because a current ratio of less than 1 would mean that net working capital (current assets less current liabilities) is negative. This would be unusual in a healthy firm, at least for most types of businesses.

The current ratio, like any ratio, is affected by various types of transactions. For example, suppose the firm borrows over the long term to raise money. The short-run effect would be an increase in cash from the issue proceeds and an increase in long-term debt. Current liabilities would not be affected, so the current ratio would rise.

Finally, note that an apparently low current ratio may not be a bad sign for a company with a large reserve of untapped borrowing power.

EXAMPLE 3.1 >> **Current Events**

Suppose a firm pays off some of its suppliers and short-term creditors. What happens to the current ratio? Suppose a firm buys some inventory. What happens in this case? What happens if a firm sells some merchandise?

The first case is a trick question. What happens is that the current ratio moves away from 1. If it is greater than 1 (the usual case), it will get bigger, but if it is less than 1, it will get smaller. To see this, suppose the firm has $4 in current assets and $2 in current liabilities for a current ratio of 2. If we use $1 in cash to reduce current liabilities, then the new current ratio is ($4 − 1)/($2 − 1) = 3. If we reverse the original situation to $2 in current assets and $4 in current liabilities, then the change will cause the current ratio to fall to 1/3 from 1/2.

The second case is not quite as tricky. Nothing happens to the current ratio because cash goes down while inventory goes up—total current assets are unaffected.

In the third case, the current ratio will usually rise because inventory is normally shown at cost and the sale will normally be at something greater than cost (the difference is the markup). The increase in either cash or receivables is therefore greater than the decrease in inventory. This increases current assets, and the current ratio rises.

The Quick (or Acid-Test) Ratio Inventory is often the least liquid current asset. It's also the one for which the book values are least reliable as measures of market value, because the quality of the inventory isn't considered. Some of the inventory may later turn out to be damaged, obsolete, or lost.

More to the point, relatively large inventories are often a sign of short-term trouble. The firm may have overestimated sales and overbought or overproduced as a result. In this case, the firm may have a substantial portion of its liquidity tied up in slow-moving inventory.

To further evaluate liquidity, the *quick*, or *acid-test, ratio* is computed just like the current ratio, except inventory is omitted:

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}} \qquad [3.2]$$

Notice that using cash to buy inventory does not affect the current ratio, but it reduces the quick ratio. Again, the idea is that inventory is relatively illiquid compared to cash.

For Prufrock, this ratio in 2005 was:

$$\text{Quick ratio} = \frac{\$708 - 422}{\$540} = .53 \text{ times}$$

The quick ratio here tells a somewhat different story than the current ratio, because inventory accounts for more than half of Prufrock's current assets. To exaggerate the point, if this inventory consisted of, say, unsold nuclear power plants, then this would be a cause for concern.

To give an example of current versus quick ratios, based on recent financial statements, Wal-Mart and Manpower Inc. had current ratios of .92 and 1.72, respectively. However, Manpower carries no inventory to speak of, whereas Wal-Mart's current assets are virtually all inventory. As a result, Wal-Mart's quick ratio was only .17, whereas Manpower's was 1.62, virtually the same as its current ratio.

Edward Lowe Peerspectives (peerspectives.org) provides educational information aimed at smaller, newer companies. Follow the "Acquiring and Managing Finances" link to read about financial statements.

Other Liquidity Ratios We briefly mention three other measures of liquidity. A very short-term creditor might be interested in the *cash ratio:*

$$\text{Cash ratio} = \frac{\text{Cash}}{\text{Current liabilities}} \qquad [3.3]$$

You can verify that for 2005 this works out to be .18 times for Prufrock.

Because net working capital, or NWC, is frequently viewed as the amount of short-term liquidity a firm has, we can consider the ratio of *NWC to total assets:*

$$\text{Net working capital to total assets} = \frac{\text{Net working capital}}{\text{Total assets}} \qquad [3.4]$$

A relatively low value might indicate relatively low levels of liquidity. Here, this ratio works out to be (\$708 − 540)/\$3,588 = 4.7%.

Finally, imagine that Prufrock was facing a strike and cash inflows began to dry up. How long could the business keep running? One answer is given by the *interval measure:*

$$\text{Interval measure} = \frac{\text{Current assets}}{\text{Average daily operating costs}} \qquad [3.5]$$

Total costs for the year, excluding depreciation and interest, were \$1,344. The average daily cost was \$1,344/365 = \$3.68 per day.[1] The interval measure is thus \$708/\$3.68 = 192 days. Based on this, Prufrock could hang on for six months or so.[2]

The interval measure (or something very similar) is also useful for newly founded or start-up companies that often have little in the way of revenues. For such companies, the interval measure indicates how long the company can operate until it needs another round of financing. The average daily operating cost for start-up companies is often called the burn rate, meaning the rate at which cash is burned in the race to become profitable.

Long-Term Solvency Measures

Long-term solvency ratios are intended to address the firm's long-run ability to meet its obligations, or, more generally, its financial leverage. These are sometimes called *financial leverage ratios* or just *leverage ratios.* We consider three commonly used measures and some variations.

Total Debt Ratio The *total debt ratio* takes into account all debts of all maturities to all creditors. It can be defined in several ways, the easiest of which is:

The online Women's Business Center has more information on financial statements, ratios, and small business topics (www.onlinewbc.gov).

$$\begin{aligned}\text{Total debt ratio} &= \frac{\text{Total assets} - \text{Total equity}}{\text{Total assets}} \\ &= \frac{\$3{,}588 - 2{,}591}{\$3{,}588} = .28 \text{ times}\end{aligned} \tag{3.6}$$

In this case, an analyst might say that Prufrock uses 28 percent debt.[3] Whether this is high or low or whether it even makes any difference depends on whether or not capital structure matters, a subject we discuss in Part 6.

Prufrock has \$.28 in debt for every \$1 in assets. Therefore, there is \$.72 in equity (\$1 − .28) for every \$.28 in debt. With this in mind, we can define two useful variations on the total debt ratio, the *debt-equity ratio* and the *equity multiplier:*

$$\begin{aligned}\text{Debt-equity ratio} &= \text{Total debt/Total equity} \\ &= \$.28/\$.72 = .39 \text{ times}\end{aligned} \tag{3.7}$$

$$\begin{aligned}\text{Equity multiplier} &= \text{Total assets/Total equity} \\ &= \$1/\$.72 = 1.39 \text{ times}\end{aligned} \tag{3.8}$$

The fact that the equity multiplier is 1 plus the debt-equity ratio is not a coincidence:

$$\begin{aligned}\text{Equity multiplier} &= \text{Total assets/Total equity} = \$1/\$.72 = 1.39 \\ &= (\text{Total equity} + \text{Total debt})/\text{Total equity} \\ &= 1 + \text{Debt-equity ratio} = 1.39 \text{ times}\end{aligned}$$

[1] For many of these ratios that involve average daily amounts, a 360-day year is often used in practice. This so-called banker's year has exactly four quarters of 90 days each and was computationally convenient in the days before pocket calculators. We'll use 365 days.

[2] Sometimes depreciation and/or interest is included in calculating average daily costs. Depreciation isn't a cash expense, so its inclusion doesn't make a lot of sense. Interest is a financing cost, so we excluded it by definition (we only looked at operating costs). We could, of course, define a different ratio that included interest expense.

[3] Total equity here includes preferred stock (discussed in Chapter 8 and elsewhere), if there is any. An equivalent numerator in this ratio would be Current liabilities + Long-term debt.

The thing to notice here is that given any one of these three ratios, you can immediately calculate the other two, so they all say exactly the same thing.

A Brief Digression: Total Capitalization versus Total Assets Frequently, financial analysts are more concerned with the firm's long-term debt than its short-term debt, because the short-term debt will constantly be changing. Also, a firm's accounts payable may be more of a reflection of trade practice than debt management policy. For these reasons, the *long-term debt ratio* is often calculated as:

$$\text{Long-term debt ratio} = \frac{\text{Long-term debt}}{\text{Long-term debt} + \text{Total equity}} = \frac{\$457}{\$457 + 2{,}591} = \frac{\$457}{\$3{,}048} = .15 \text{ times} \qquad [3.9]$$

The $3,048 in total long-term debt and equity is sometimes called the firm's *total capitalization,* and the financial manager will frequently focus on this quantity rather than on total assets.

To complicate matters, different people (and different books) mean different things by the term *debt ratio.* Some mean a ratio of total debt, and some mean a ratio of long-term debt only, and, unfortunately, a substantial number are simply vague about which one they mean.

This is a source of confusion, so we choose to give two separate names to the two measures. The same problem comes up in discussing the debt-equity ratio. Financial analysts frequently calculate this ratio using only long-term debt.

Ratios used to analyze technology firms can be found at www.chalfin.com under the "Publications" link.

Times Interest Earned Another common measure of long-term solvency is the *times interest earned* (TIE) *ratio.* Once again, there are several possible (and common) definitions, but we'll stick with the most traditional:

$$\text{Times interest earned ratio} = \frac{\text{EBIT}}{\text{Interest}} = \frac{\$691}{\$141} = 4.9 \text{ times} \qquad [3.10]$$

As the name suggests, this ratio measures how well a company has its interest obligations covered, and it is often called the interest coverage ratio. For Prufrock, the interest bill is covered 4.9 times over.

Cash Coverage A problem with the TIE ratio is that it is based on EBIT, which is not really a measure of cash available to pay interest. The reason is that depreciation, a noncash expense, has been deducted out. Because interest is most definitely a cash outflow (to creditors), one way to define the *cash coverage ratio* is:

$$\text{Cash coverage ratio} = \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest}} = \frac{\$691 + 276}{\$141} = \frac{\$967}{\$141} = 6.9 \text{ times} \qquad [3.11]$$

The numerator here, EBIT plus depreciation, is often abbreviated EBITD (earnings before interest, taxes, and depreciation—say "ebbit-dee"). It is a basic measure of the firm's ability to generate cash from operations, and it is frequently used as a measure of cash flow available to meet financial obligations.

A common variation on EBITD is earnings before interest, taxes, depreciation, and amortization (EBITDA, say "ebbit-dah"). Here amortization refers to a noncash deduction very similar conceptually to depreciation, except it applies to an intangible asset (such as a patent) rather than a tangible asset (such as machine). Note that the word *amortization* here does not refer to the repayment of debt, a subject we discuss in a later chapter.

Asset Management, or Turnover, Measures

We next turn our attention to the efficiency with which Prufrock uses its assets. The measures in this section are sometimes called *asset utilization ratios.* The specific ratios we discuss can all be interpreted as measures of turnover. What they are intended to describe is how efficiently or intensively a firm uses its assets to generate sales. We first look at two important current assets, inventory and receivables.

Inventory Turnover and Days' Sales in Inventory During the year, Prufrock had a cost of goods sold of $1,344. Inventory at the end of the year was $422. With these numbers, *inventory turnover* can be calculated as:

$$\begin{aligned}\text{Inventory turnover} &= \frac{\text{Cost of goods sold}}{\text{Inventory}} \\ &= \frac{\$1{,}344}{\$422} = 3.2 \text{ times}\end{aligned} \qquad \textbf{[3.12]}$$

In a sense, Prufrock sold off or turned over the entire inventory 3.2 times.[4] As long as we are not running out of stock and thereby forgoing sales, the higher this ratio is, the more efficiently we are managing inventory.

If we know that we turned our inventory over 3.2 times during the year, then we can immediately figure out how long it took us to turn it over on average. The result is the average *days' sales in inventory:*

$$\begin{aligned}\text{Days' sales in inventory} &= \frac{365 \text{ days}}{\text{Inventory turnover}} \\ &= \frac{365 \text{ days}}{3.2} = 114 \text{ days}\end{aligned} \qquad \textbf{[3.13]}$$

This tells us that, roughly speaking, inventory sits 114 days on average before it is sold. Alternatively, assuming we have used the most recent inventory and cost figures, it will take about 114 days to work off our current inventory.

For example, in December 2003, Ford had an 84-day supply of cars and trucks, more than the 60-day supply considered normal. This means that, at the then-current rate of sales, it would have taken Ford 84 days to deplete the available supply, or, equivalently, that Ford had 84 days of vehicle sales in inventory. Of course, for any manufacturer, this varies from vehicle to vehicle. Hot-sellers, such as BMW's MINI Cooper were in short supply, whereas the slow-selling (understandably!) Pontiac Aztek was in significant oversupply. This type of information is useful to auto manufacturers in planning future marketing and production decisions.

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[4]Notice that we used cost of goods sold in the top of this ratio. For some purposes, it might be more useful to use sales instead of costs. For example, if we wanted to know the amount of sales generated per dollar of inventory, then we could just replace the cost of goods sold with sales.

It might make more sense to use the average inventory in calculating turnover. Inventory turnover would then be $1,344/[($393 + 422)/2] = 3.3 times.[5] It really depends on the purpose of the calculation. If we are interested in how long it will take us to sell our current inventory, then using the ending figure (as we did initially) is probably better.

In many of the ratios we discuss in the following pages, average figures could just as well be used. Again, it really depends on whether we are worried about the past, in which case averages are appropriate, or the future, in which case ending figures might be better. Also, using ending figures is very common in reporting industry averages; so, for comparison purposes, ending figures should be used in such cases. In any event, using ending figures is definitely less work, so we'll continue to use them.

Receivables Turnover and Days' Sales in Receivables Our inventory measures give some indication of how fast we can sell product. We now look at how fast we collect on those sales. The *receivables turnover* is defined in the same way as inventory turnover:

$$\begin{aligned}\text{Receivables turnover} &= \frac{\text{Sales}}{\text{Accounts receivable}}\\ &= \frac{\$2{,}311}{\$188} = 12.3 \text{ times}\end{aligned} \qquad [3.14]$$

Loosely speaking, Prufrock collected its outstanding credit accounts and reloaned the money 12.3 times during the year.[6]

This ratio makes more sense if we convert it to days, so the *days' sales in receivables* is:

$$\begin{aligned}\text{Days' sales in receivables} &= \frac{365 \text{ days}}{\text{Receivables turnover}}\\ &= \frac{365}{12.3} = 30 \text{ days}\end{aligned} \qquad [3.15]$$

Therefore, on average, Prufrock collects on its credit sales in 30 days. For obvious reasons, this ratio is very frequently called the *average collection period* (ACP).

Also note that if we are using the most recent figures, we could also say that we have 30 days' worth of sales currently uncollected. We will learn more about this subject when we study credit policy in a later chapter.

EXAMPLE 3.2

Payables Turnover

Here is a variation on the receivables collection period. How long, on average, does it take for Prufrock Corporation to pay its bills? To answer, we need to calculate the accounts payable turnover rate using cost of goods sold. We will assume that Prufrock purchases everything on credit.

The cost of goods sold is $1,344, and accounts payable are $344. The turnover is therefore $1,344/$344 = 3.9 times. So payables turned over about every 365/3.9 = 94 days. On average, then, Prufrock takes 94 days to pay. As a potential creditor, we might take note of this fact.

[5] Notice that we calculated the average as (Beginning value + Ending value)/2.

[6] Here we have implicitly assumed that all sales are credit sales. If they were not, then we would simply use total credit sales in these calculations, not total sales.

Asset Turnover Ratios Moving away from specific accounts like inventory or receivables, we can consider several "big picture" ratios. For example, *NWC turnover* is:

$$\begin{aligned}\text{NWC turnover} &= \frac{\text{Sales}}{\text{NWC}} \\ &= \frac{\$2{,}311}{\$708 - 540} = 13.8 \text{ times}\end{aligned} \qquad [3.16]$$

This ratio measures how much "work" we get out of our working capital. Once again, assuming we aren't missing out on sales, a high value is preferred (why?).

Similarly, *fixed asset turnover* is:

PricewaterhouseCoopers has a useful utility for extracting EDGAR data. Try it at edgarscan.pwcglobal.com.

$$\begin{aligned}\text{Fixed asset turnover} &= \frac{\text{Sales}}{\text{Net fixed assets}} \\ &= \frac{\$2{,}311}{\$2{,}880} = .80 \text{ times}\end{aligned} \qquad [3.17]$$

With this ratio, it probably makes more sense to say that, for every dollar in fixed assets, Prufrock generated \$.80 in sales.

Our final asset management ratio, the *total asset turnover*, comes up quite a bit. We will see it later in this chapter and in the next chapter. As the name suggests, the total asset turnover is:

$$\begin{aligned}\text{Total asset turnover} &= \frac{\text{Sales}}{\text{Total assets}} \\ &= \frac{\$2{,}311}{\$3{,}588} = .64 \text{ times}\end{aligned} \qquad [3.18]$$

In other words, for every dollar in assets, Prufrock generated \$.64 in sales.

To give an example of fixed and total asset turnover, based on recent financial statements, Delta Airlines had a total asset turnover of .54, as compared to .85 for IBM. However, the much higher investment in fixed assets in an airline is reflected in Delta's fixed asset turnover of .64, as compared to IBM's 1.50.

EXAMPLE 3.3 >> **More Turnover**

Suppose you find that a particular company generates \$.40 in sales for every dollar in total assets. How often does this company turn over its total assets?

The total asset turnover here is .40 times per year. It takes 1/.40 = 2.5 years to turn total assets over completely.

Profitability Measures

The three measures we discuss in this section are probably the best known and most widely used of all financial ratios. In one form or another, they are intended to measure how efficiently the firm uses its assets and how efficiently the firm manages its operations. The focus in this group is on the bottom line, net income.

Profit Margin Companies pay a great deal of attention to their *profit margin:*

$$\begin{aligned}\text{Profit margin} &= \frac{\text{Net income}}{\text{Sales}} \\ &= \frac{\$363}{\$2{,}311} = 15.7\%\end{aligned} \qquad [3.19]$$

This tells us that Prufrock, in an accounting sense, generates a little less than 16 cents in profit for every dollar in sales.

All other things being equal, a relatively high profit margin is obviously desirable. This situation corresponds to low expense ratios relative to sales. However, we hasten to add that other things are often not equal.

For example, lowering our sales price will usually increase unit volume, but will normally cause profit margins to shrink. Total profit (or, more important, operating cash flow) may go up or down; so the fact that margins are smaller isn't necessarily bad. After all, isn't it possible that, as the saying goes, "Our prices are so low that we lose money on everything we sell, but we make it up in volume"?[7]

Return on Assets *Return on assets* (ROA) is a measure of profit per dollar of assets. It can be defined several ways, but the most common is:

$$\begin{aligned}\text{Return on assets} &= \frac{\text{Net income}}{\text{Total assets}} \\ &= \frac{\$363}{\$3{,}588} = 10.12\%\end{aligned} \qquad [3.20]$$

Return on Equity *Return on equity* (ROE) is a measure of how the stockholders fared during the year. Because benefiting shareholders is our goal, ROE is, in an accounting sense, the true bottom-line measure of performance. ROE is usually measured as:

$$\begin{aligned}\text{Return on equity} &= \frac{\text{Net income}}{\text{Total equity}} \\ &= \frac{\$363}{\$2{,}591} = 14\%\end{aligned} \qquad [3.21]$$

For every dollar in equity, therefore, Prufrock generated 14 cents in profit, but, again, this is only correct in accounting terms.

Because ROA and ROE are such commonly cited numbers, we stress that it is important to remember they are accounting rates of return. For this reason, these measures should properly be called *return on book assets* and *return on book equity.* In fact, ROE is sometimes called *return on net worth.* Whatever it's called, it would be inappropriate to compare the result to, for example, an interest rate observed in the financial markets. We will have more to say about accounting rates of return in later chapters.

The fact that ROE exceeds ROA reflects Prufrock's use of financial leverage. We will examine the relationship between these two measures in more detail next.

[7] No, it's not.

EXAMPLE 3.4 >> **ROE and ROA**

Because ROE and ROA are usually intended to measure performance over a prior period, it makes a certain amount of sense to base them on average equity and average assets, respectively. For Prufrock, how would you calculate these?

We first need to calculate average assets and average equity:

$$\text{Average assets} = (\$3{,}373 + 3{,}588)/2 = \$3{,}481$$

$$\text{Average equity} = (\$2{,}299 + 2{,}591)/2 = \$2{,}445$$

With these averages, we can recalculate ROA and ROE as follows:

$$\text{ROA} = \frac{\$363}{\$3{,}481} = 10.43\%$$

$$\text{ROE} = \frac{\$363}{\$2{,}445} = 14.85\%$$

These are slightly higher than our previous calculations because assets grew during the year, with the result that the average is below the ending value.

Market Value Measures

Our final group of measures is based, in part, on information not necessarily contained in financial statements—the market price per share of the stock. Obviously, these measures can only be calculated directly for publicly traded companies.

We assume that Prufrock has 33 million shares outstanding and the stock sold for $88 per share at the end of the year. If we recall that Prufrock's net income was $363 million, then we can calculate that its earnings per share were:

$$\text{EPS} = \frac{\text{Net income}}{\text{Shares outstanding}} = \frac{\$363}{33} = \$11$$

Price-Earnings Ratio The first of our market value measures, the *price-earnings* (PE) *ratio* (or multiple), is defined as:

$$\begin{aligned}\text{PE ratio} &= \frac{\text{Price per share}}{\text{Earnings per share}} \\ &= \frac{\$88}{\$11} = 8 \text{ times}\end{aligned} \qquad [3.22]$$

In the vernacular, we would say that Prufrock shares sell for eight times earnings, or we might say that Prufrock shares have or "carry" a PE multiple of 8.

PE ratios vary substantially across companies, but, in 2004, a typical large company in the United States had a PE in the low 20s. This is on the high side by historical standards, but not dramatically so. A low point for PEs was about 5 in 1974. PEs also vary across countries. For example, Japanese PEs have historically been much higher than those of their U.S. counterparts.

Because the PE ratio measures how much investors are willing to pay per dollar of current earnings, higher PEs are often taken to mean the firm has significant prospects for future growth. Of course, if a firm had no or almost no earnings, its PE would probably be quite large; so, as always, care is needed in interpreting this ratio.

Market-to-Book Ratio A second commonly quoted market value measure is the *market-to-book ratio:*

$$\text{Market-to-book ratio} = \frac{\text{Market value per share}}{\text{Book value per share}} \qquad [3.23]$$

$$= \frac{\$88}{(\$2{,}591/33)} = \frac{\$88}{\$78.5} = 1.12 \text{ times}$$

Notice that book value per share is total equity (not just common stock) divided by the number of shares outstanding.

Because book value per share is an accounting number, it reflects historical costs. In a loose sense, the market-to-book ratio therefore compares the market value of the firm's investments to their cost. A value less than 1 could mean that the firm has not been successful overall in creating value for its stockholders.

Market-to-book ratios in recent years appear high relative to past values. For example, for the 30 blue-chip companies that make up the widely followed Dow-Jones Industrial Average, the historical norm is about 1.7; however, the market-to-book ratio for this group has recently been twice this size.

TABLE 3.8 >> **Common Financial Ratios**

I. Short-term solvency, or liquidity, ratios	II. Long-term solvency, or financial leverage, ratios
$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$	$\text{Total debt ratio} = \frac{\text{Total assets} - \text{Total equity}}{\text{Total assets}}$
$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$	Debt-equity ratio = Total debt/Total equity Equity multiplier = Total assets/Total equity
$\text{Cash ratio} = \frac{\text{Cash}}{\text{Current liabilities}}$	$\text{Long-term debt ratio} = \frac{\text{Long-term debt}}{\text{Long-term debt} + \text{Total equity}}$
$\text{Net working capital to total assets} = \frac{\text{Net working capital}}{\text{Total assets}}$	$\text{Times interest earned ratio} = \frac{\text{EBIT}}{\text{Interest}}$
$\text{Interval measure} = \frac{\text{Current assets}}{\text{Average daily operating costs}}$	$\text{Cash coverage ratio} = \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest}}$
III. Asset utilization, or turnover, ratios	**IV. Profitability ratios**
$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Inventory}}$	$\text{Profit margin} = \frac{\text{Net income}}{\text{Sales}}$
$\text{Days' sales in inventory} = \frac{\text{365 days}}{\text{Inventory turnover}}$	$\text{Return on assets (ROA)} = \frac{\text{Net income}}{\text{Total assets}}$
$\text{Receivables turnover} = \frac{\text{Sales}}{\text{Accounts receivable}}$	$\text{Return on equity (ROE)} = \frac{\text{Net income}}{\text{Total equity}}$
$\text{Days' sales in receivables} = \frac{\text{365 days}}{\text{Receivables turnover}}$	$\text{ROE} = \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$
$\text{NWC turnover} = \frac{\text{Sales}}{\text{NWC}}$	**V. Market value ratios**
$\text{Fixed asset turnover} = \frac{\text{Sales}}{\text{Net fixed assets}}$	$\text{Price-earnings ratio} = \frac{\text{Price per share}}{\text{Earnings per share}}$
$\text{Total asset turnover} = \frac{\text{Sales}}{\text{Total assets}}$	$\text{Market-to-book ratio} = \frac{\text{Market value per share}}{\text{Book value per share}}$

Conclusion

This completes our definitions of some common ratios. We could tell you about more of them, but these are enough for now. We'll leave it here and go on to discuss some ways of using these ratios instead of just how to calculate them. Table 3.8 summarizes the ratios we've discussed.

Concept Questions

3.3a What are the five groups of ratios? Give two or three examples of each kind.

3.3b Turnover ratios all have one of two figures as the numerator. What are these two figures? What do these ratios measure? How do you interpret the results?

3.3c Profitability ratios all have the same figure in the numerator. What is it? What do these ratios measure? How do you interpret the results?

3.3d Given the total debt ratio, what other two ratios can be computed? Explain how.

3.4 THE DU PONT IDENTITY

As we mentioned in discussing ROA and ROE, the difference between these two profitability measures is a reflection of the use of debt financing, or financial leverage. We illustrate the relationship between these measures in this section by investigating a famous way of decomposing ROE into its component parts.

A Closer Look at ROE

To begin, let's recall the definition of ROE:

$$\text{Return on equity} = \frac{\text{Net income}}{\text{Total equity}}$$

If we were so inclined, we could multiply this ratio by Assets/Assets without changing anything:

$$\begin{aligned}\text{Return on equity} &= \frac{\text{Net income}}{\text{Total equity}} = \frac{\text{Net income}}{\text{Total equity}} \times \frac{\text{Assets}}{\text{Assets}} \\ &= \frac{\text{Net income}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Total equity}}\end{aligned}$$

Notice that we have expressed the ROE as the product of two other ratios—ROA and the equity multiplier:

$$\text{ROE} = \text{ROA} \times \text{Equity multiplier} = \text{ROA} \times (1 + \text{Debt-equity ratio})$$

Looking back at Prufrock, for example, we see that the debt-equity ratio was .39 and ROA was 10.12 percent. Our work here implies that Prufrock's ROE, as we previously calculated, is:

$$\text{ROE} = 10.12\% \times 1.39 = 14\%$$

The difference between ROE and ROA can be substantial, particularly for certain businesses. For example, BankAmerica has an ROA of only 1.23 percent, which is actually fairly typical for a bank. However, banks tend to borrow a lot of money, and, as a result, have relatively large equity multipliers. For BankAmerica, ROE is about 16 percent, implying an equity multiplier of 13.

We can further decompose ROE by multiplying the top and bottom by total sales:

$$\text{ROE} = \frac{\text{Sales}}{\text{Sales}} \times \frac{\text{Net income}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Total equity}}$$

If we rearrange things a bit, ROE is:

$$\text{ROE} = \underbrace{\frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}}}_{\text{Return on assets}} \times \frac{\text{Assets}}{\text{Total equity}} \qquad [3.24]$$

$$= \text{Profit margin} \times \text{Total asset turnover} \times \text{Equity multiplier}$$

What we have now done is to partition ROA into its two component parts, profit margin and total asset turnover. The last expression of the preceding equation is called the **Du Pont identity**, after the Du Pont Corporation, which popularized its use.

Du Pont identity Popular expression breaking ROE into three parts: operating efficiency, asset use efficiency, and financial leverage.

We can check this relationship for Prufrock by noting that the profit margin was 15.7 percent and the total asset turnover was .64. ROE should thus be:

$$\begin{aligned} \text{ROE} &= \text{Profit margin} \times \text{Total asset turnover} \times \text{Equity multiplier} \\ &= 15.7\% \times .64 \times 1.39 \\ &= 14\% \end{aligned}$$

This 14 percent ROE is exactly what we had before.

The Du Pont identity tells us that ROE is affected by three things:

1. Operating efficiency (as measured by profit margin)
2. Asset use efficiency (as measured by total asset turnover)
3. Financial leverage (as measured by the equity multiplier)

Weakness in either operating or asset use efficiency (or both) will show up in a diminished return on assets, which will translate into a lower ROE.

Considering the Du Pont identity, it appears that the ROE could be leveraged up by increasing the amount of debt in the firm. However, notice that increasing debt also increases interest expense, which reduces profit margins, which acts to reduce ROE. So, ROE could go up or down, depending. More important, the use of debt financing has a number of other effects, and, as we discuss at some length in Part 6, the amount of leverage a firm uses is governed by its capital structure policy.

The decomposition of ROE we've discussed in this section is a convenient way of systematically approaching financial statement analysis. If ROE is unsatisfactory by some measure, then the Du Pont identity tells you where to start looking for the reasons.

General Motors provides a good example of how Du Pont analysis can be very useful and also illustrates why care must be taken in interpreting ROE values. In 1989, GM had an ROE of 12.1 percent. By 1993, its ROE had improved to 44.1 percent, a dramatic improvement. On closer inspection, however, we find that, over the same period, GM's profit margin had declined from 3.4 to 1.8 percent, and ROA had declined from 2.4 to 1.3 percent. The decline in ROA was moderated only slightly by an increase in total asset turnover from .71 to .73 over the period.

Given this information, how is it possible for GM's ROE to have climbed so sharply? From our understanding of the Du Pont identity, it must be the case that GM's equity multiplier increased substantially. In fact, what happened was that GM's book equity value was almost wiped out overnight in 1992 by changes in the accounting treatment of pension liabilities. If a company's equity value declines sharply, its equity multiplier rises. In GM's case, the multiplier went from 4.95 in 1989 to 33.62 in 1993. In sum, the dramatic "improvement" in GM's ROE was almost entirely due to an accounting change that affected the equity multiplier and doesn't really represent an improvement in financial performance at all.

An Expanded Du Pont Analysis

So far, we've seen how the Du Pont equation lets us break down ROE into its basic three components: profit margin, total asset turnover, and financial leverage. We now extend this analysis to take a closer look at how key parts of a firm's operations feed into ROE. To get going, we went to the *S&P Market Insight* Web page (www.mhhe.com/edumarketinsight) and pulled abbreviated financial statements for food products giant General Mills. What we found is summarized in Table 3.9.

Using the information in Table 3.9, Figure 3.1 shows how we can construct an expanded Du Pont analysis for General Mills and present that analysis in chart form. The advantage of the extended Du Pont chart is that it lets us examine several ratios at once, thereby getting a better overall picture of a company's performance and also allowing us to determine possible items to improve.

Looking at the left-hand side of our Du Pont chart in Figure 3.1, we see items related to profitability. As always, profit margin is calculated as net income divided by sales. But, as our chart emphasizes, net income depends on sales and a variety of costs, such as cost of goods sold (CoGS) and selling, general, and administrative expenses (SG&A expense). General Mills can increase its ROE by increasing sales and also by reducing one or more of these costs. In other words, if we want to improve profitability, our chart clearly shows us the areas on which we should focus.

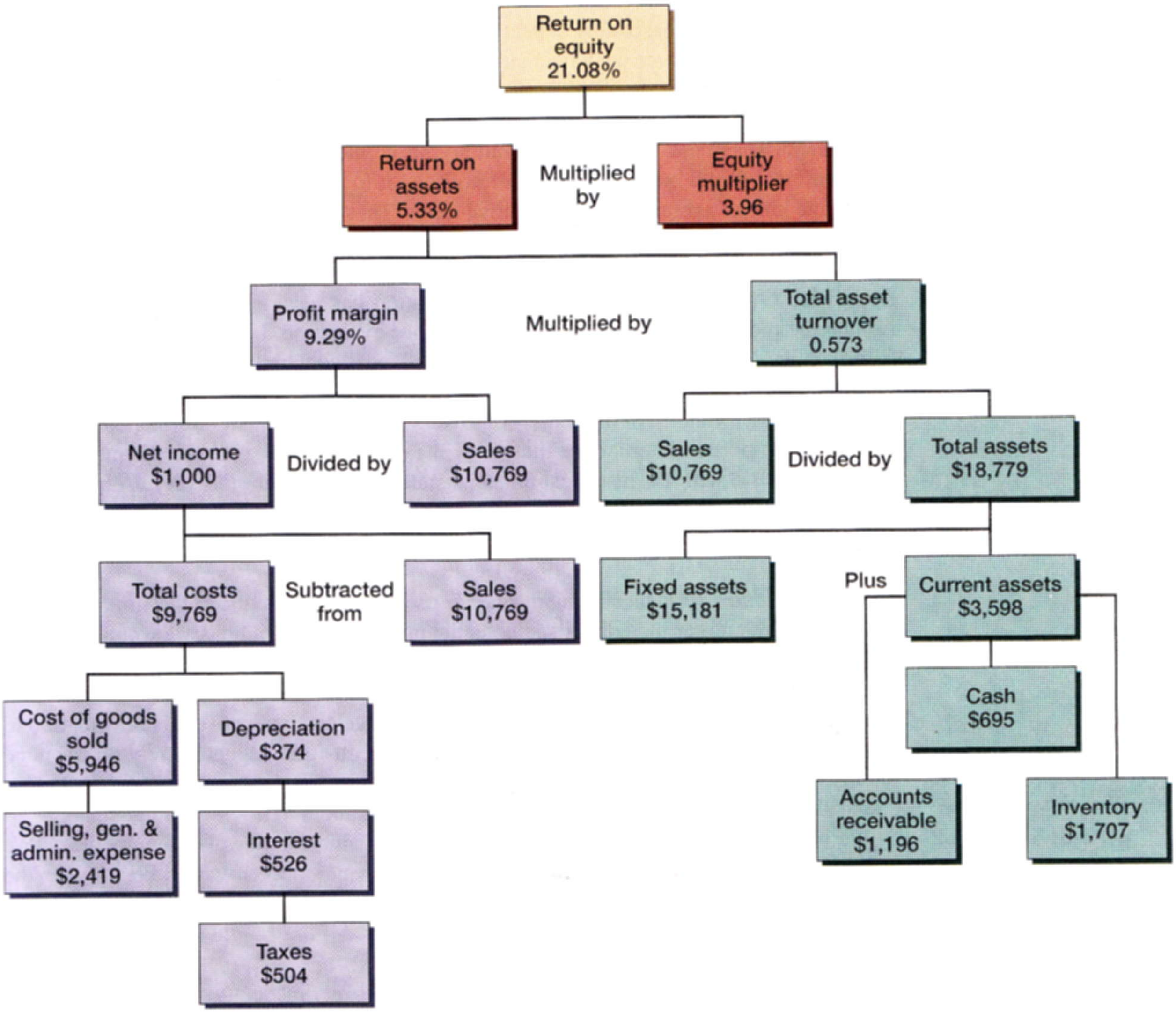
Turning to the right-hand side of Figure 3.1, we have an analysis of the key factors underlying total asset turnover. Thus, for example, we see that reducing inventory holdings through more efficient management reduces current assets, which reduces total assets, which then improves total asset turnover.

TABLE 3.9 >>

FINANCIAL STATEMENTS FOR GENERAL MILLS
12 months ending November 30, 2003
(All numbers are in millions)

Income Statement		**Balance Sheet**			
Sales	$10,769	Current assets		Current liabilities	
CoGS	5,946	Cash	$ 695	Accounts payable	$ 1,296
Gross profit	$ 4,823	Accounts receivable	1,196	Notes payable	1,202
SG&A expense	2,419	Inventory	1,707	Other	637
Depreciation	374	Total	$ 3,598	Total	$ 3,135
EBIT	$ 2,030				
Interest	526	Fixed assets	$15,181	Total long-term debt	$10,901
EBT	$ 1,504				
Taxes	504			Total equity	$ 4,743
Net income	$ 1,000	Total assets	$18,779	Total liabilities and equity	$18,779

FIGURE 3.1 >> Extended Du Pont Chart for General Mills



Concept Questions

3.4a Return on assets, or ROA, can be expressed as the product of two ratios. Which two?

3.4b Return on equity, or ROE, can be expressed as the product of three ratios. Which three?

USING FINANCIAL STATEMENT INFORMATION 3.5

Our last task in this chapter is to discuss in more detail some practical aspects of financial statement analysis. In particular, we will look at reasons for doing financial statement analysis, how to go about getting benchmark information, and some of the problems that come up in the process.

Why Evaluate Financial Statements?

As we have discussed, the primary reason for looking at accounting information is that we don't have, and can't reasonably expect to get, market value information. It is important to emphasize that, whenever we have market information, we will use it instead of accounting data. Also, if there is a conflict between accounting and market data, market data should be given precedence.

Financial statement analysis is essentially an application of "management by exception." In many cases, such analysis will boil down to comparing ratios for one business with some kind of average or representative ratios. Those ratios that seem to differ the most from the averages are tagged for further study.

Internal Uses Financial statement information has a variety of uses within a firm. Among the most important of these is performance evaluation. For example, managers are frequently evaluated and compensated on the basis of accounting measures of performance such as profit margin and return on equity. Also, firms with multiple divisions frequently compare the performance of those divisions using financial statement information.

Another important internal use that we will explore in the next chapter is planning for the future. As we will see, historical financial statement information is very useful for generating projections about the future and for checking the realism of assumptions made in those projections.

External Uses Financial statements are useful to parties outside the firm, including short-term and long-term creditors and potential investors. For example, we would find such information quite useful in deciding whether or not to grant credit to a new customer.

We would also use this information to evaluate suppliers, and suppliers would use our statements before deciding to extend credit to us. Large customers use this information to decide if we are likely to be around in the future. Credit-rating agencies rely on financial statements in assessing a firm's overall creditworthiness. The common theme here is that financial statements are a prime source of information about a firm's financial health.

We would also find such information useful in evaluating our main competitors. We might be thinking of launching a new product. A prime concern would be whether the competition would jump in shortly thereafter. In this case, we would be interested in learning about our competitors' financial strength to see if they could afford the necessary development.

Finally, we might be thinking of acquiring another firm. Financial statement information would be essential in identifying potential targets and deciding what to offer.

Choosing a Benchmark

Given that we want to evaluate a division or a firm based on its financial statements, a basic problem immediately comes up. How do we choose a benchmark, or a standard of comparison? We describe some ways of getting started in this section.

Time-Trend Analysis One standard we could use is history. Suppose we found that the current ratio for a particular firm is 2.4 based on the most recent financial statement information. Looking back over the last 10 years, we might find that this ratio had declined fairly steadily over that period.

Based on this, we might wonder if the liquidity position of the firm has deteriorated. It could be, of course, that the firm has made changes that allow it to more efficiently use its current assets, that the nature of the firm's business has changed, or that business practices have changed. If we investigate, we might find any of these possible explanations behind the decline. This is an example of what we mean by management by exception—a deteriorating time trend may not be bad, but it does merit investigation.

Peer Group Analysis The second means of establishing a benchmark is to identify firms similar in the sense that they compete in the same markets, have similar assets, and operate in similar ways. In other words, we need to identify a *peer group*. There are obvious problems with doing this since no two companies are identical. Ultimately, the choice of which companies to use as a basis for comparison is subjective.

One common way of identifying potential peers is based on **Standard Industrial Classification (SIC) codes**. These are four-digit codes established by the U.S. government for statistical reporting purposes. Firms with the same SIC code are frequently assumed to be similar.

Standard Industrial Classification (SIC) code
A U.S. government code used to classify a firm by its type of business operations.

The first digit in an SIC code establishes the general type of business. For example, firms engaged in finance, insurance, and real estate have SIC codes beginning with 6. Each additional digit narrows down the industry. So, companies with SIC codes beginning with 60 are mostly banks and banklike businesses, those with codes beginning with 602 are mostly commercial banks, and SIC code 6025 is assigned to national banks that are members of the Federal Reserve system. Table 3.10 is a list of selected two-digit codes (the first two digits of the four-digit SIC codes) and the industries they represent.

SIC codes are far from perfect. For example, suppose you were examining financial statements for Wal-Mart, the largest retailer in the United States. The relevant SIC code is 5310, Department Stores. In a quick scan of the nearest financial database, you would find about 20 large, publicly owned corporations with this same SIC code, but you might not be too comfortable with some of them. Target would seem to be a reasonable peer, but

<< TABLE 3.10

Selected Two-Digit SIC Codes

Agriculture, Forestry, and Fishing	**Wholesale Trade**
01 Agriculture production—crops	50 Wholesale trade—durable goods
08 Forestry	51 Wholesale trade—nondurable goods
09 Fishing, hunting, and trapping	
Mining	**Retail Trade**
10 Metal mining	54 Food stores
12 Bituminous coal and lignite mining	55 Automobile dealers and gas stations
13 Oil and gas extraction	58 Eating and drinking places
Construction	**Finance, Insurance, and Real Estate**
15 Building construction	60 Banking
16 Construction other than building	63 Insurance
17 Construction—special trade contractors	65 Real estate
Manufacturing	**Services**
28 Chemicals and allied products	78 Motion pictures
29 Petroleum refining and related industries	80 Health services
35 Machinery, except electrical	82 Educational services
37 Transportation equipment	
Transportation, Communication, Electric, Gas, and Sanitary Service	
40 Railroad transportation	
45 Transportation by air	
49 Electric, gas, and sanitary services	

Neiman-Marcus also carries the same industry code. Are Wal-Mart and Neiman-Marcus really comparable?

As this example illustrates, it is probably not appropriate to blindly use SIC code–based averages. Instead, analysts often identify a set of primary competitors and then compute a set of averages based on just this group. Also, we may be more concerned with a group of the top firms in an industry, not the average firm. Such a group is called an *aspirant group,* because we aspire to be like its members. In this case, a financial statement analysis reveals how far we have to go.

Learn more about NAICS at www.naics.com.

Beginning in 1997, a new industry classification system was initiated. Specifically, the North American Industry Classification System (NAICS, pronounced "nakes") is intended to replace the older SIC codes, and it will eventually. Currently, however, SIC codes are still widely used.

With these caveats about SIC codes in mind, we can now take a look at a specific industry. Suppose we are in the retail hardware business. Table 3.11 contains some condensed common-size financial statements for this industry from the Risk Management Association (RMA, formerly known as Robert Morris Associates), one of many sources of such information. Table 3.12 contains selected ratios from the same source.

There is a large amount of information here, most of which is self-explanatory. On the right in Table 3.11, we have current information reported for different groups based on sales. Within each sales group, common-size information is reported. For example, firms with sales in the $10 million to $25 million range have cash and equivalents equal to 5 percent of total assets. There are 31 companies in this group, out of 309 in all.

On the left, we have three years' worth of summary historical information for the entire group. For example, operating profit rose from 1.9 percent of sales to 2.5 percent over that time.

Table 3.12 contains some selected ratios, again reported by sales groups on the right and time period on the left. To see how we might use this information, suppose our firm has a current ratio of 2. Based on these ratios, is this value unusual?

Looking at the current ratio for the overall group for the most recent year (third column from the left in Table 3.12), we see that three numbers are reported. The one in the middle, 2.2, is the median, meaning that half of the 309 firms had current ratios that were lower and half had bigger current ratios. The other two numbers are the upper and lower quartiles. So, 25 percent of the firms had a current ratio larger than 3.7 and 25 percent had a current ratio smaller than 1.5. Our value of 2 falls comfortably within these bounds, so it doesn't appear too unusual. This comparison illustrates how knowledge of the range of ratios is important in addition to knowledge of the average. Notice how stable the current ratio has been for the last three years.

EXAMPLE 3.5 >> More Ratios

Take a look at the most recent numbers reported for Sales/Receivables and EBIT/Interest in Table 3.12. What are the overall median values? What are these ratios?

If you look back at our discussion, you will see that these are the receivables turnover and the times interest earned, or TIE, ratios. The median value for receivables turnover for the entire group is 26.5 times. So, the days in receivables would be 365/26.5 = 14, which is the bold-faced number reported. The median for the TIE is 2.8 times. The number in parentheses indicates that the calculation is meaningful for, and therefore based on, only 269 of the 309 companies. In this case, the reason is that only 269 companies paid any significant amount of interest.

TABLE 3.11 >> **Selected Financial Statement Information**

Retail—Hardware Stores SIC# 5072, 5251 (NAICS 444130)

Comparative Historical Data				**Current Data Sorted by Sales**					
			Type of Statement						
9	11	17	Unqualified	1	1	2	1	4	8
38	42	54	Reviewed		8	10	16	14	6
88	85	110	Compiled	19	48	18	17	5	3
44	34	52	Tax Returns	10	30	5	1	5	1
67	57	76	Other	14	25	13	11	3	10
				58 (4/1-9/30/02)		**251 (10/1/02-3/31/03)**			
4/1/00-3/31/01 ALL	**4/1/01-3/31/02 ALL**	**4/1/02-3/31/03 ALL**		**0-1 MM**	**1-3 MM**	**3-5 MM**	**5-10 MM**	**10-25 MM**	**25MM & OVER**
246	229	309	**NUMBER OF STATEMENTS**	44	112	48	46	31	28
			ASSETS						
5.9%	6.1%	6.0%	Cash & Equivalents	5.3%	7.1%	7.4%	5.0%	5.0%	3.5%
12.2	13.3	13.8	Trade Receivables (net)	7.4	11.6	15.3	19.9	20.4	13.5
52.0	48.9	50.5	Inventory	62.4	50.1	47.8	47.3	44.5	50.4
1.3	1.3	1.8	All Other Current	1.8	1.7	1.7	2.1	.7	2.7
71.4	69.6	72.2	Total Current	76.8	70.4	72.2	74.2	70.5	70.1
17.3	17.8	17.0	Fixed Assets (net)	14.7	17.4	16.4	16.0	18.3	20.2
1.9	3.1	1.7	Intangibles (net)	1.1	1.6	1.5	2.0	.5	3.5
9.4	9.5	9.2	All Other Non-Current	7.3	10.5	9.9	7.8	10.7	6.2
100.0	100.0	100.0	Total	100.0	100.0	100.0	100.0	100.0	100.0
			LIABILITIES						
8.7	8.0	11.3	Notes Payable-Short Term	11.1	10.1	8.0	13.3	11.1	18.5
3.7	3.8	3.5	Cur. Mat.-L/T/D	2.9	3.6	3.5	5.2	2.6	2.0
15.7	15.6	15.5	Trade Payables	13.2	14.6	15.8	19.4	15.4	15.3
.2	.2	.2	Income Taxes Payable	.0	.5	.1	.2	.3	.1
7.1	8.1	7.0	All Other Current	7.8	7.3	5.8	6.0	7.1	8.2
35.3	35.6	37.4	Total Current	35.0	36.0	33.3	44.1	36.5	44.1
19.1	20.6	19.0	Long Term Debt	29.0	20.6	17.9	13.6	13.7	13.9
.1	.1	.1	Deferred Taxes	.1	.0	.0	.1	.3	.2
4.8	6.3	5.0	All Other Non-Current	8.9	4.8	5.4	1.3	3.5	6.4
40.6	37.4	38.5	Net Worth	27.0	38.6	43.3	40.9	46.0	35.5
100.0	100.0	100.0	Total Liabilities & Net Worth	100.0	100.0	100.0	100.0	100.0	100.0
			INCOME DATA						
100.0	100.0	100.0	Net Sales	100.0	100.0	100.0	100.0	100.0	100.0
35.0	35.3	35.7	Gross Profit	39.8	37.3	36.4	32.9	29.9	32.3
33.1	33.1	33.1	Operating Expenses	38.3	34.7	33.6	30.1	27.9	29.0
1.9	2.2	2.5	Operating Profit	1.5	2.7	2.8	2.8	2.0	3.4
.1	.4	.2	All Other Expenses (net)	.6	.2	.1	.2	−.3	.7
1.8	1.8	2.3	Profit Before Taxes	.9	2.5	2.7	2.6	2.3	2.7

MM = $ million.

Interpretation of Statement Studies Figures: RMA cautions that the studies be regarded only as a general guideline and not as an absolute industry norm. This is due to limited samples within categories, the categorization of companies by their primary Standard Industrial Classification (SIC) number only, and different methods of operations by companies within the same industry. For these reasons, RMA recommends that the figures be used only as general guidelines in addition to other methods of financial analysis.

TABLE 3.12 >> **Selected Ratios**

Retail—Hardware Stores SIC# 5072, 5251 (NAICS 444130)

Comparative Historical Data				**Current Data Sorted by Sales**					
			Type of Statement						
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88	85	110	Compiled	19	48	18	17	5	3
44	34	52	Tax Returns	10	30	5	1	5	1
67	57	76	Other	14	25	13	11	3	10
4/1/00-	**4/1/01-**	**4/1/02-**		**58 (4/1-9/30/02)**			**251 (10/1/02-3/31/03)**		
3/31/01	**3/31/02**	**3/31/03**		**0-1**	**1-3**	**3-5**	**5-10**	**10-25**	**25MM**
ALL	**ALL**	**ALL**	**NUMBER OF**	**MM**	**MM**	**MM**	**MM**	**MM**	**& OVER**
246	229	309	**STATEMENTS**	44	112	48	46	31	28
			RATIOS						
3.8%	3.7%	3.7%		6.6%	4.0%	3.4%	2.6%	2.8%	2.4%
2.1	2.2	2.2	Current	2.5	2.5	2.6	1.8	1.7	1.8
1.5	1.4	1.5		1.4	1.5	1.5	1.8	1.5	1.3
1.0	1.0	1.1		.9	1.1	1.2	1.0	1.1	.7
.5	.5	(308) .5	Quick	.4	.5	(47) .6	.5	.7	.5
.3	.2	.2		.2	.2	.3	.2	.4	.2
8 43.2	**7** 49.8	**7** 49.8	Sales/	**4** 91.2	**8** 48.6	**6** 65.0	**11** 33.2	**11** 34.6	**5** 68.4
14 26.7	**15** 24.5	**14** 26.5	Receivables	**11** 32.1	**12** 29.3	**15** 25.0	**20** 18.4	**26** 14.0	**15** 24.5
25 14.6	**27** 13.4	**29** 12.4		**20** 18.4	**25** 14.6	**34** 10.8	**43** 8.4	**39** 9.4	**38** 9.7
88 4.2	**81** 4.5	**85** 4.3	Cost of Sales/	**137** 2.7	**93** 3.9	**78** 4.7	**70** 5.2	**57** 6.4	**81** 4.5
120 3.0	**121** 3.0	**120** 3.0	Inventory	**179** 2.0	**121** 3.0	**114** 3.2	**108** 3.4	**83** 4.4	**104** 3.5
178 2.0	**163** 2.2	**171** 2.1		**262** 1.4	**172** 2.1	**167** 2.2	**161** 2.3	**120** 3.0	**149** 2.5
17 21.3	**18** 20.0	**17** 21.3	Cost of Sales/	**0** UND	**17** 22.0	**17** 22.0	**22** 16.3	**15** 23.8	**18** 19.8
29 12.8	**29** 12.7	**30** 12.3	Payables	**25** 14.3	**30** 12.3	**29** 12.7	**34** 10.6	**22** 16.4	**30** 12.1
48 7.7	**46** 7.9	**50** 7.4		**68** 5.4	**43** 8.5	**53** 6.9	**59** 6.2	**41** 8.8	**44** 8.3
4.2	4.4	4.2	Sales/	2.6	4.1	4.4	5.4	5.7	5.7
6.4	6.7	7.0	Working Capital	4.0	6.5	6.8	9.1	7.0	10.2
11.8	12.9	12.3		10.5	11.2	10.2	14.9	12.4	16.4
5.0	4.8	8.1		7.7	7.8	8.4	15.1	9.5	8.3
(225) 2.1	(213) 2.1	(269) 2.8	EBIT/Interest	(36) 2.4	(93) 2.5	(43) 4.0	(43) 3.2	(27) 4.1	(27) 3.2
.7	1.1	1.1		−.7	1.2	1.4	1.0	1.6	1.1
3.8	4.5	5.5	Net Profit + Depr.,		5.2	12.4	2.6	6.1	13.4
(58) 1.7	(53) 2.0	(73) 2.4	Dep., Amort./Cur.		(21) 1.9	(10) 2.0	(15) .6	(14) 2.8	(11) 5.3
.7	1.1	.5	Mat. L/T/D		.7	.1	.0	1.3	.5
.1	.2	.2		.0	.2	.1	.1	.1	.3
.4	.4	.4	Fixed/Worth	.4	.4	.4	.3	.3	.6
1.1	1.1	1.0		8.1	1.1	.9	.7	.8	1.2
.7	.6	.7		.8	.6	.7	.6	.6	1.2
1.6	1.7	1.5	Debt/Worth	2.8	1.6	1.4	1.7	1.0	2.2
3.8	4.8	3.7		NM	4.2	2.9	2.9	1.9	3.6
27.7	27.6	29.2	% Profit Before	46.5	25.3	28.4	31.0	17.6	40.4
(224) 9.9	(203) 10.4	(277) 11.9	Taxes/Tangible	(33) 12.3	(98) 11.5	(45) 15.0	(45) 10.9	(30) 9.6	(26) 23.7
.1	1.6	2.2	Net Worth	.4	.9	3.3	1.8	.3	2.5
9.4	9.1	11.5	% Profit	10.6	10.5	12.4	12.7	9.2	11.3
3.6	3.2	4.7	Before Taxes/	4.9	4.6	4.7	5.4	5.2	4.9
−1.2	.2	.2	Total Assets	−6.0	.2	1.5	.5	.2	.4
49.2	40.5	41.1	Sales/Net	97.7	42.1	42.7	40.3	55.4	29.1
21.0	20.4	19.6	Fixed Assets	21.2	23.1	18.6	20.1	17.6	14.3
9.4	8.7	9.2		7.1	9.4	9.6	12.2	7.6	9.1
3.1	3.0	3.1	Sales/	2.8	3.0	3.2	3.2	3.0	3.3
2.3	2.4	2.4	Total Assets	2.0	2.5	2.4	2.5	2.4	2.3
1.8	1.8	1.8		1.1	1.9	1.8	1.7	2.2	1.9
.7	.7	.7	% Depr., Dep.,	.8	.7	.7	.7	.8	.8
(222) 1.1	(200) 1.2	(266) 1.2	Amort./Sales	(31) 1.2	(102) 1.5	(41) 1.2	(40) 1.0	(29) 1.1	(23) 1.2
2.0	2.2	2.0		2.4	2.5	1.6	1.3	1.8	1.7
2.9	2.0	2.3	% Officers',	3.7	2.7	2.0	2.1	1.3	
(132) 4.6	(136) 4.0	(168) 4.0	Directors', Owners'	(21) 5.3	(75) 4.5	(32) 3.8	(22) 3.0	(14) 2.0	
7.0	6.1	7.0	Comp/Sales	11.6	7.1	6.7	6.2	3.3	
2771100M	**2517327M**	**3762671M**	Net Sales ($)	**27586M**	**204026M**	**188955M**	**328481M**	**469173M**	**2544450M**
990644M	**1153657M**	**1607310M**	Total Assets ($)	**18552M**	**93100M**	**86254M**	**158179M**	**191739M**	**1059486M**

M = $ thousand; MM = $ million.

There are many sources of ratio information in addition to the one we examine here. Our nearby *Work the Web* box shows how to get this information for just about any company, along with some very useful benchmarking information. Be sure to look it over and then benchmark your favorite company.

Problems with Financial Statement Analysis

We close out our chapter on financial statements by discussing some additional problems that can arise in using financial statements. In one way or another, the basic problem with financial statement analysis is that there is no underlying theory to help us identify which quantities to look at and to guide us in establishing benchmarks.

As we discuss in other chapters, there are many cases in which financial theory and economic logic provide guidance in making judgments about value and risk. Very little such help exists with financial statements. This is why we can't say which ratios matter the most and what a high or low value might be.

One particularly severe problem is that many firms are conglomerates, owning more-or-less unrelated lines of business. The consolidated financial statements for such firms don't really fit any neat industry category. Going back to department stores, for example, Sears

WORK THE WEB

As we discussed in this chapter, ratios are an important tool for examining a company's performance. Gathering the necessary financial statements to calculate ratios can be tedious and time consuming. Fortunately, many sites on the Web provide this information for free. One of the best is www.investor.reuters.com. We went there, entered a ticker symbol ("TXN" for Texas Instruments), and selected the "Ratios" and "Financial Condition" links. Here is an abbreviated look at the results:

Texas Instruments Incorporated (NYSE)

LAST 30.65 | CHANGE ▼ -0.60 (-1.92%) 4:01 PM ET | Risk Alert for TXN.N: Low | sponsored by Scottrade $7 TRADES

SECTOR: Technology | INDUSTRY: Semiconductors

Financial Strength	Company	Industry	Sector	S&P 500
Quick Ratio (MRQ)	2.63	3.40	2.56	1.30
Current Ratio (MRQ)	3.50	4.14	3.02	1.81
LT Debt to Equity (MRQ)	0.03	0.13	0.23	0.72
Total Debt to Equity (MRQ)	0.07	0.15	0.28	0.89
Interest Coverage (TTM)	24.21	6.78	9.17	13.49

Most of the information is self-explanatory. Interest Coverage ratio is the same as the Times Interest Earned ratio discussed in the text. The abbreviation MRQ refers to results from the most recent quarterly financial statements, and TTM refers to results covering the previous ("trailing") 12 months. This site also provides a comparison to the industry, business sector, and S&P 500 average for the ratios. Other ratios available on the site have five-year averages calculated. Have a look!

Visit us at www.mhhe.com/rwj

has had an SIC code of 6710 (Holding Offices) because of its diverse financial and retailing operations. More generally, the kind of peer group analysis we have been describing is going to work best when the firms are strictly in the same line of business, the industry is competitive, and there is only one way of operating.

Another problem that is becoming increasingly common is that major competitors and natural peer group members in an industry may be scattered around the globe. The automobile industry is an obvious example. The problem here is that financial statements from outside the United States do not necessarily conform at all to GAAP. The existence of different standards and procedures makes it very difficult to compare financial statements across national borders.

Even companies that are clearly in the same line of business may not be comparable. For example, electric utilities engaged primarily in power generation are all classified in the same group (SIC 4911). This group is often thought to be relatively homogeneous. However, most utilities operate as regulated monopolies, so they don't compete very much with each other, at least not historically. Many have stockholders, and many are organized as cooperatives with no stockholders. There are several different ways of generating power, ranging from hydroelectric to nuclear, so the operating activities of these utilities can differ quite a bit. Finally, profitability is strongly affected by regulatory environment, so utilities in different locations can be very similar but show very different profits.

Several other general problems frequently crop up. First, different firms use different accounting procedures—for inventory, for example. This makes it difficult to compare statements. Second, different firms end their fiscal years at different times. For firms in seasonal businesses (such as a retailer with a large Christmas season), this can lead to difficulties in comparing balance sheets because of fluctuations in accounts during the year. Finally, for any particular firm, unusual or transient events, such as a one-time profit from an asset sale, may affect financial performance. In comparing firms, such events can give misleading signals.

Concept Questions

3.5a What are some uses for financial statement analysis?

3.5b What are SIC codes and how might they be useful?

3.5c Why do we say that financial statement analysis is management by exception?

3.5d What are some of the problems that can come up with financial statement analysis?

3.6 SUMMARY AND CONCLUSIONS

This chapter has discussed aspects of financial statement analysis:

1. Sources and uses of cash. We discussed how to identify the ways in which businesses obtain and use cash, and we described how to trace the flow of cash through the business over the course of the year. We briefly looked at the statement of cash flows.
2. Standardized financial statements. We explained that differences in size make it difficult to compare financial statements, and we discussed how to form common-size and common–base period statements to make comparisons easier.

3. Ratio analysis. Evaluating ratios of accounting numbers is another way of comparing financial statement information. We therefore defined and discussed a number of the most commonly reported and used financial ratios. We also discussed the famous Du Pont identity as a way of analyzing financial performance.
4. Using financial statements. We described how to establish benchmarks for comparison purposes and discussed some of the types of information that are available. We then examined some of the potential problems that can arise.

After you have studied this chapter, we hope that you will have some perspective on the uses and abuses of financial statements. You should also find that your vocabulary of business and financial terms has grown substantially.

Chapter Review and Self-Test Problems

3.1 Sources and Uses of Cash Consider the following balance sheets for the Philippe Corporation. Calculate the changes in the various accounts and, where applicable, identify the change as a source or use of cash. What were the major sources and uses of cash? Did the company become more or less liquid during the year? What happened to cash during the year?

PHILIPPE CORPORATION
2004 and 2005 Balance Sheets
($ in millions)

	2004	2005
Assets		
Current assets		
Cash	$ 210	$ 215
Accounts receivable	355	310
Inventory	507	328
Total	$1,072	$ 853
Fixed assets		
Net plant and equipment	$6,085	$6,527
Total assets	$7,157	$7,380
Liabilities and Owners' Equity		
Current liabilities		
Accounts payable	$ 207	$ 298
Notes payable	1,715	1,427
Total	$1,922	$1,725
Long-term debt	$1,987	$2,308
Owners' equity		
Common stock and paid-in surplus	$1,000	$1,000
Retained earnings	2,248	2,347
Total	$3,248	$3,347
Total liabilities and owners' equity	$7,157	$7,380

3.2 Common-Size Statements Below is the most recent income statement for Philippe. Prepare a common-size income statement based on this information. How do you interpret the standardized net income? What percentage of sales goes to cost of goods sold?

PHILIPPE CORPORATION 2005 Income Statement ($ in millions)		
Sales		$4,053
Cost of goods sold		2,780
Depreciation		550
Earnings before interest and taxes		$ 723
Interest paid		502
Taxable income		$ 221
Taxes (34%)		75
Net income		$ 146
Dividends	$47	
Addition to retained earnings	99	

3.3 Financial Ratios Based on the balance sheets and income statement in the previous two problems, calculate the following ratios for 2005:

Current ratio	________
Quick ratio	________
Cash ratio	________
Inventory turnover	________
Receivables turnover	________
Days' sales in inventory	________
Days' sales in receivables	________
Total debt ratio	________
Long-term debt ratio	________
Times interest earned ratio	________
Cash coverage ratio	________

3.4 ROE and the Du Pont Identity Calculate the 2005 ROE for the Philippe Corporation and then break down your answer into its component parts using the Du Pont identity.

Answers to Chapter Review and Self-Test Problems

3.1 We've filled in the answers in the following table. Remember, increases in assets and decreases in liabilities indicate that we spent some cash. Decreases in assets and increases in liabilities are ways of getting cash.

Philippe used its cash primarily to purchase fixed assets and to pay off short-term debt. The major sources of cash to do this were additional long-term borrowing, reductions in current assets, and additions to retained earnings.

PHILIPPE CORPORATION 2004 and 2005 Balance Sheets ($ in millions)				
	2004	**2005**	**Change**	**Source or Use of Cash**
Assets				
Current assets				
Cash	$ 210	$ 215	+$ 5	
Accounts receivable	355	310	− 45	Source
Inventory	507	328	− 179	Source
Total	$1,072	$ 853	−$219	
Fixed assets				
Net plant and equipment	$6,085	$6,527	+$442	Use
Total assets	$7,157	$7,380	+$223	
Liabilities and Owners' Equity				
Current liabilities				
Accounts payable	$ 207	$ 298	+$ 91	Source
Notes payable	1,715	1,427	− 288	Use
Total	$1,922	$1,725	−$197	
Long-term debt	$1,987	$2,308	+$321	Source
Owners' equity				
Common stock and paid-in surplus	$1,000	$1,000	+$ 0	—
Retained earnings	2,248	2,347	+ 99	Source
Total	$3,248	$3,347	+$ 99	
Total liabilities and owners' equity	$7,157	$7,380	+$223	

The current ratio went from $1,072/1,922 = .56 to $853/1,725 = .49, so the firm's liquidity appears to have declined somewhat. Overall, however, the amount of cash on hand increased by $5.

3.2 We've calculated the common-size income statement below. Remember that we simply divide each item by total sales.

PHILIPPE CORPORATION 2004 Common-Size Income Statement		
Sales		100.0%
Cost of goods sold		68.6
Depreciation		13.6
Earnings before interest and taxes		17.8
Interest paid		12.3
Taxable income		5.5
Taxes (34%)		1.9
Net income		3.6%
Dividends	1.2%	
Addition to retained earnings	2.4%	

Net income is 3.6 percent of sales. Because this is the percentage of each sales dollar that makes its way to the bottom line, the standardized net income is the firm's profit margin. Cost of goods sold is 68.6 percent of sales.

3.3 We've calculated the following ratios based on the ending figures. If you don't remember a definition, refer back to Table 3.8.

Current ratio	\$853/\$1,725	= .49 times
Quick ratio	\$525/\$1,725	= .30 times
Cash ratio	\$215/\$1,725	= .12 times
Inventory turnover	\$2,780/\$328	= 8.48 times
Receivables turnover	\$4,053/\$310	= 13.07 times
Days' sales in inventory	365/8.48	= 43.06 days
Days' sales in receivables	365/13.07	= 27.92 days
Total debt ratio	\$4,033/\$7,380	= 54.6%
Long-term debt ratio	\$2,308/\$5,655	= 40.8%
Times interest earned ratio	\$723/\$502	= 1.44 times
Cash coverage ratio	\$1,273/\$502	= 2.54 times

3.4 The return on equity is the ratio of net income to total equity. For Philippe, this is \$146/\$3,347 = 4.4%, which is not outstanding.

Given the Du Pont identity, ROE can be written as:

$$\begin{aligned} \text{ROE} &= \text{Profit margin} \times \text{Total asset turnover} \times \text{Equity multiplier} \\ &= \$146/\$4{,}053 \times \$4{,}053/\$7{,}380 \times \$7{,}380/\$3{,}347 \\ &= 3.6\% \times .549 \times 2.20 \\ &= 4.4\% \end{aligned}$$

Notice that return on assets, ROA, is 3.6% × .549 = 1.98%.

Concepts Review and Critical Thinking Questions

1. **Current Ratio** What effect would the following actions have on a firm's current ratio? Assume that net working capital is positive.
   a. Inventory is purchased.
   b. A supplier is paid.
   c. A short-term bank loan is repaid.
   d. A long-term debt is paid off early.
   e. A customer pays off a credit account.
   f. Inventory is sold at cost.
   g. Inventory is sold for a profit.
2. **Current Ratio and Quick Ratio** In recent years, Dixie Co. has greatly increased its current ratio. At the same time, the quick ratio has fallen. What has happened? Has the liquidity of the company improved?
3. **Current Ratio** Explain what it means for a firm to have a current ratio equal to .50. Would the firm be better off if the current ratio were 1.50? What if it were 15.0? Explain your answers.
4. **Financial Ratios** Fully explain the kind of information the following financial ratios provide about a firm:
   a. Quick ratio
   b. Cash ratio

- **c.** Total asset turnover
- **d.** Equity multiplier
- **e.** Long-term debt ratio
- **f.** Times interest earned ratio
- **g.** Profit margin
- **h.** Return on assets
- **i.** Return on equity
- **j.** Price-earnings ratio

5. **Standardized Financial Statements** What types of information do common-size financial statements reveal about the firm? What is the best use for these common-size statements? What purpose do common–base year statements have? When would you use them?
6. **Peer Group Analysis** Explain what peer group analysis means. As a financial manager, how could you use the results of peer group analysis to evaluate the performance of your firm? How is a peer group different from an aspirant group?
7. **Du Pont Identity** Why is the Du Pont identity a valuable tool for analyzing the performance of a firm? Discuss the types of information it reveals as compared to ROE considered by itself.
8. **Industry-Specific Ratios** Specialized ratios are sometimes used in specific industries. For example, the so-called book-to-bill ratio is closely watched for semiconductor manufacturers. A ratio of .93 indicates that for every $100 worth of chips shipped over some period, only $93 worth of new orders was received. In October 2003, the semiconductor equipment industry's book-to-bill ratio reached 1.01, compared to .96 during the month of September. The ratio had last been above 1.0 fourteen months previously during August 2002 when it was at 1.02. The book-to-bill ratio reached a low of .78 during October 2002. The three-month average of world-wide bookings in October 2003 was $871.1 million, an increase of 12 percent over September, while the three-month average billings were $873.4 million, an 8 percent increase from September. What is this ratio intended to measure? Why do you think it is so closely followed?
9. **Industry-Specific Ratios** So-called "same-store sales" are a very important measure for companies as diverse as McDonald's and Sears. As the name suggests, examining same-store sales means comparing revenues from the same stores or restaurants at two different points in time. Why might companies focus on same-store sales rather than total sales?
10. **Industry-Specific Ratios** There are many ways of using standardized financial information beyond those discussed in this chapter. The usual goal is to put firms on an equal footing for comparison purposes. For example, for auto manufacturers, it is common to express sales, costs, and profits on a per-car basis. For each of the following industries, give an example of an actual company and discuss one or more potentially useful means of standardizing financial information:
    - **a.** Public utilities
    - **b.** Large retailers
    - **c.** Airlines
    - **d.** On-line services
    - **e.** Hospitals
    - **f.** College textbook publishers

Questions and Problems

BASIC
(Questions 1–17)

1. **Calculating Liquidity Ratios** Bermuda Shorts Design, has net working capital of BMD 2,450, current liabilities of BMD 9,230, and inventory of BMD 3,540. What is the current ratio? What is the quick ratio?
2. **Calculating Profitability Ratios** Timber Line, Inc. has sales of $29 million, total assets of $37 million, and total debt of $13 million. If the profit margin is 9 percent, what is net income? What is ROA? What is ROE?
3. **Calculating the Average Collection Period** Pyramid Holdings has a current accounts receivable balance of 421,865 Egyptian pounds. Credit sales for the year just ended were EGP 2,873,150. What is the receivables turnover? The days' sales in receivables? How long did it take on average for credit customers to pay off their accounts during the past year?
4. **Calculating Inventory Turnover** The Sosa Cork Corporation has ending inventory of 420,000 pesos, and cost of goods sold for the year just ended was 4,225,000 pesos. What is the inventory turnover? The days' sales in inventory? How long on average did a unit of inventory sit on the shelf before it was sold?
5. **Calculating Leverage Ratios** Kid Pet Rocks, Inc., has a total debt ratio of .44. What is its debt-equity ratio? What is its equity multiplier?
6. **Calculating Market Value Ratios** Athens Antiques had additions to retained earnings for the year just ended of €310,000. The firm paid out €160,000 in cash dividends, and it has ending total equity of €6.5 million. If Athens currently has 180,000 shares of common stock outstanding, what are earnings per share? Dividends per share? Book value per share? If the stock currently sells for €78 per share, what is the market-to-book ratio? The price-earnings ratio?
7. **Du Pont Identity** If Roten Rooters, Inc., has an equity multiplier of 1.75, total asset turnover of 1.30, and a profit margin of 8.5 percent, what is its ROE?
8. **Du Pont Identity** Forester Fire Prevention Corp. has a profit margin of 9.20 percent, total asset turnover of 1.63, and ROE of 18.67 percent. What is this firm's debt-equity ratio?
9. **Sources and Uses of Cash** Based only on the following information, given in thousands of Kronur, for Iceland Greenery did cash go up or down? By how much? Classify each event as a source or use of cash.

Increase in inventory	ISK 57,000
Increase in accounts payable	31,350
Decrease in notes payable	75,050
Increase in accounts receivable	90,250

10. **Calculating Average Payables Period** For 2005, BDJ, Inc., had a cost of goods sold of $13,168. At the end of the year, the accounts payable balance was $2,965. How long on average did it take the company to pay off its suppliers during the year? What might a large value for this ratio imply?
11. **Cash Flow and Capital Spending** For the year just ended, Dolvin Frozen Marmalade shows an increase in its net fixed assets account of Au$580. The company took Au$165 in depreciation expense for the year. How much did Dolvin spend on new fixed assets? Is this a source or use of cash?

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12. **Equity Multiplier and Return on Equity** Thomsen Fried Chicken Company has a debt-equity ratio of 1.40. Return on assets is 8.7 percent, and total equity is $520,000. What is the equity multiplier? Return on equity? Net income?

Blair Radio PLC reports the following balance sheet information for 2004 and 2005. Use this information to work Problems 13 through 17.

BLAIR RADIO PLC
2004 and 2005 Balance Sheets

Assets			Liabilities and Owners' Equity		
	2004	2005		2004	2005
Current assets			Current liabilities		
Cash	£ 10,168	£ 10,683	Accounts payable	£ 73,185	£ 59,309
Accounts receivable	27,145	28,613	Notes payable	39,125	48,168
Inventory	59,324	64,853	Total	£112,310	£107,477
Total	£ 96,637	£104,149	Long-term debt	£ 50,000	£ 62,000
Fixed assets			Owners' equity		
Net plant and equipment	£304,165	£347,168	Common stock and paid-in surplus	£ 80,000	£ 80,000
			Retained earnings	158,492	201,840
			Total	£238,492	£281,840
Total assets	£400,802	£451,317	Total liabilities and owners' equity	£400,802	£451,317

13. **Preparing Standardized Financial Statements** Prepare the 2004 and 2005 common-size balance sheets for Blair Radio.
14. **Preparing Standardized Financial Statements** Prepare the 2005 common–base year balance sheet for Blair Radio.
15. **Preparing Standardized Financial Statements** Prepare the 2005 combined common-size, common–base year balance sheet for Blair Radio.
16. **Sources and Uses of Cash** For each account on this company's balance sheet, show the change in the account during 2005 and note whether this change was a source or use of cash. Do your numbers add up and make sense? Explain your answer for total assets as compared to your answer for total liabilities and owners' equity.
17. **Calculating Financial Ratios** Based on the balance sheets given for Blair Radio, calculate the following financial ratios for each year:
    a. Current ratio
    b. Quick ratio
    c. Cash ratio
    d. NWC to total assets ratio
    e. Debt-equity ratio and equity multiplier
    f. Total debt ratio and long-term debt ratio

INTERMEDIATE
(Questions 18–30)

18. **Using the Du Pont Identity** Kamikaze Beverage, has sales of ¥320,000, total assets of ¥105,400, and a debt-equity ratio of 1.00. If its return on equity is 16 percent, what is its net income?
19. **Days' Sales in Receivables** A company has net income of $173,000, a profit margin of 8.6 percent, and an accounts receivable balance of $143,200. Assuming 75 percent of sales are on credit, what is the company's days' sales in receivables?
20. **Ratios and Fixed Assets** The Le Bleu Company has a long-term debt ratio of 0.70 and a current ratio of 1.20. Current liabilities are 850 euros, sales are 4,310 euros,

profit margin is 9.5 percent, and ROE is 21.5 percent. What is the amount of the firm's net fixed assets?

21. **Profit Margin** In response to complaints about high prices, an Indonesian grocery chain runs the following advertising campaign: "If you pay your child $1 to go buy $50 worth of groceries, then your child makes twice as much on the trip as we do." You've collected the following information from the grocery chain's financial statements:

(millions of rupiah)	
Sales	IDR 770.0
Net income	7.7
Total assets	196.0
Total debt	130.0

Evaluate the grocery chain's claim. What is the basis for the statement? Is this claim misleading? Why or why not?

22. **Return on Equity** Firm A and Firm B have debt/total asset ratios of 60% and 40% and returns on total assets of 20% and 30%, respectively. Which firm has a greater return on equity?

23. **Calculating the Cash Coverage Ratio** Hercules Hammers' net income for the most recent year was 9,200 euros. The tax rate was 34 percent. The firm paid 3,250 euros in total interest expense and deducted 2,125 euros in depreciation expense. What was Hercules' cash coverage ratio for the year?

24. **Cost of Goods Sold** Guthrie Corp. has current liabilities of $340,000, a quick ratio of 1.8, inventory turnover of 4.2, and a current ratio of 3.3. What is the cost of goods sold for the company?

25. **Ratios and Foreign Companies** Prince Albert Canning PLC had a net loss of £13,156 on sales of £147,318 (both in thousands of pounds). What was the company's profit margin? In dollars, sales were $267,661. What was the net loss in dollars?

Some recent financial statements for Ellis Ern Golf, a South African based firm, follow. Use this information, given in millions of rand, to work Problems 26 through 30.

ELLIS ERN GOLF
2004 and 2005 Balance Sheets

Assets	2004	2005	Liabilities and Owners' Equity	2004	2005
Current assets			Current liabilities		
Cash	ZAR 815	ZAR 906	Accounts payable	ZAR 983	ZAR 1,292
Accounts receivable	2,405	2,510	Notes Payable	720	840
Inventory	4,608	4,906	Other	105	188
Total	ZAR 7,828	ZAR 8,322	Total	ZAR 1,808	ZAR 2,320
Fixed assets			Long-Term debt	ZAR 4,817	ZAR 4,960
Net plant and equipment	ZAR 15,164	ZAR 19,167	Owners' equity		
			Common stock and paid-in surplus	ZAR 10,000	ZAR 10,000
			Retained earnings	6,367	10,209
			Total	ZAR 16,367	ZAR 20,209
Total assets	ZAR 22,992	ZAR 27,489	Total	ZAR 22,992	ZAR 27,489

ELLIS ERN GOLF 2005 Income Statement		
Sales		ZAR 33,500
Cost of goods sold		18,970
Depreciation		1,980
Earnings before interest and taxes		ZAR 12,550
Interest paid		486
Taxable income		ZAR 12,064
Taxes (35%)		4,222
Net income		ZAR 7,842
Dividends	ZAR 4,000	
Addition to retained earnings	3,842	

26. Calculating Financial Ratios Find the following financial ratios for Smolira Golf Corp. (use year-end figures rather than average values where appropriate):

Short-term solvency ratios

a. Current ratio ____________

b. Quick ratio ____________

c. Cash ratio ____________

Asset utilization ratios

d. Total asset turnover ____________

e. Inventory turnover ____________

f. Receivables turnover ____________

Long-term solvency ratios

g. Total debt ratio ____________

h. Debt-equity ratio ____________

i. Equity multiplier ____________

j. Times interest earned ratio ____________

k. Cash coverage ratio ____________

Profitability ratios

l. Profit margin ____________

m. Return on assets ____________

n. Return on equity ____________

27. Du Pont Identity Construct the Du Pont identity for Ellis Ern Golf.

28. Calculating the Interval Measure For how many days could Ellis. continue to operate if its cash inflows were suddenly suspended?

29. Statement of Cash Flows Prepare the 2005 statement of cash flows for Ellis Ern Golf.

30. Market Value Ratios Ellis has 2,500 shares of common stock outstanding, and the market price for a share of stock at the end of 2005 was ZAR 67. What is the price-earnings ratio? What are the dividends per share? What is the market-to-book ratio at the end of 2005?

S&P Problems

www.mhhe.com/edumarketinsight

STANDARD &POOR'S

1. **Equity Multiplier** Use the balance sheets for Amazon.com (AMZN), Bethlehem Steel (BS), American Electric Power (AEP), and Pfizer (PFE) to calculate the equity multiplier for each company over the most recent two years. Comment on any similarities or differences between the companies and explain how these might affect the equity multiplier.
2. **Inventory Turnover** Use the financial statements for Dell Computer Corporation (DELL) and Boeing Company (BA) to calculate the inventory turnover for each company over the past three years. Is there a difference in inventory turnover between the two companies? Is there a reason the inventory turnover is lower for Boeing? What does this tell you about comparing ratios across industries?
3. **SIC Codes** Find the SIC codes for Papa Johns' International (PZZA) and Darden Restaurants (DRI) on each company's home page. What is the SIC code for each of these companies? What does the business description say for each company? Are these companies comparable? What does this tell you about comparing ratios for companies based on SIC codes?
4. **Calculating the Du Pont Identity** Find the annual income statements and balance sheets for Dow Chemical (DOW) and Gateway (GTW). Calculate the Du Pont identity for each company for the most recent three years. Comment on the changes in each component of the Du Pont identity for each company over this period and compare the components between the two companies. Are the results what you expected? Why or why not?
5. **Ratio Analysis** Look under "Valuation" and download the "Profitability" spreadsheet for Southwest Airlines (LUV) and Continental Airlines (CAL). Find the ROA (Net ROA), ROE (Net ROE), PE ratio (P/E-High and P/E-low), and the market-to-book ratio (Price/Book-high and Price/Book-low) for each company. Since stock prices change daily, PE and market-to-book ratios are often reported as the highest and lowest values over the year, as is done in this instance. Look at these ratios for both companies over the past five years. Do you notice any trends in these ratios? Which company appears to be operating at a more efficient level based on these four ratios? If you were going to invest in an airline, which one (if either) of these companies would you choose based on this information? Why?

What's On the Web?

3.1 **Du Pont Identity** You can find financial statements for Walt Disney Company on the "Investor" link at Disney's home page, disney.go.com. For the three most recent years, calculate the Du Pont identity for Disney. How has ROE changed over this period? How have changes in each component of the Du Pont identity affected ROE over this period?

3.2 **Ratio Analysis** You want to examine the financial ratios for Dell Computer Corporation. Go to www.investors.reuters.com and type in the ticker symbol for the company (DELL). Next, go to the comparison link. You should find financial ratios for Dell and the industry, sector, and S&P 500 averages for each ratio.

- **a.** What do TTM and MRQ mean?
- **b.** How do Dell's recent profitability ratios compare to their values over the past five years? To the industry averages? To the sector averages? To the S&P 500

averages? Which is the better comparison group for Dell: the industry, sector, or S&P 500 averages? Why?

c. In what areas does Dell seem to outperform its competitors based on the financial ratios? Where does Dell seem to lag behind its competitors?

d. Dell's inventory turnover ratio is much larger than that for all comparison groups. Why do you think this is?

3.3. **Sources and Uses of Cash** Find the two most recent balance sheets for 3M at the "Investor Relations" link on the web site www.mmm.com. For each account in the balance sheet, show the change during the most recent year and note whether this was a source or use of cash. Do your numbers add up and make sense? Explain your answer for total assets as compared to your answer for total liabilities and owners' equity.

3.4. **Asset Utilization Ratios** Find the most recent financial statements for Wal-Mart at www.walmart.com and Boeing at www.boeing.com. Calculate the asset utilization ratio for these two companies. What does this ratio measure? Is the ratio similar for both companies? Why or why not?