CHAPTER TWO

Understanding Financial Statements

Dell Manages Profitability, Not Inventory[1] In 1994, Dell was a struggling second-tier PC maker. Like other PC makers, Dell ordered its components in advance and carried a large amount of component inventory. If its forecasts were wrong, Dell had major write-downs. Then Dell began to implement a new business model. Its operations had always featured a build-to-order process with direct sales to customers, but Dell took a series of ingenious steps to eliminate its inventories. The results were spectacular.

Over a four-year period, Dell's revenues grew from $2 billion to $16 billion, a 50 % annual growth rate. Earnings per share increased by 62 % per year. Dell's stock price increased by more than 17,000 % in a little over eight years. In 1998, Dell's return on invested capital was 217 %, and the company had $1.8 billion in cash. (The rapid growth

1983 Michael Dell starts business of preformatting IBM PC HDs on weekends

1985 **$6 million** sales, upgrading IBM compatibles for local businesses

1986 **$70 million** sales; focus on assembling own line of PCs

1990 **$500 million** sales with an extensive line of products

1996 Dell goes online; $1 million per day in online sales; **$5.3B** in annual sales

1997 Dell online sales at $3 million per day; 50% growth rate for third consecutive year, **$7.8B** in total annual sales.

2005 **$49.2B** in sales

[1] Jonathan Byrnes, "Dell Manages Profitability, Not Inventory," Harvard Business School, Working Knowledge, June 2, 2003.

continued, and the company's sales revenues finally reached $50 billion in 2005.)

Profitability management—coordinating a company's day-to-day activities through careful forethought and attentive oversight—was at the core of Dell's transformation in this critical period. Dell created a tightly aligned business model that enabled it to dispense with the need for its component inventories. Not only was capital not needed, but the change generated enormous amounts of cash that Dell used to fuel its growth. How did Dell do it?

Account selection. Dell purposely selected customers with relatively predictable purchasing patterns and low service costs. The company developed a core competence in targeting customers and kept a massive database for this purpose.

The remainder of Dell's business involved individual consumers. To obtain stable demand in this segment, Dell used higher-end products and those with the latest technology to target second-time buyers who had regular upgrade purchase patterns, required little technical support, and paid by credit card.

Demand management. Dell's core philosophy of actively managing demand in real time, or "selling what you have," rather than making what you want to sell, was a critical driver of Dell's successful profitability management. Without this critical element, Dell's business model simply would not have been effective.

Product life-cycle management. Because Dell's customers were largely high-end repeat buyers who rapidly adopted new technology, Dell's marketing could focus on managing product life-cycle transitions.

Supplier management. Although Dell's manufacturing system featured a combination of build-product-to-order and buy-component-to-plan processes, the company worked closely with its suppliers to introduce more flexibility into its system.

Forecasting. Dell's forecast accuracy was about 70 to 75%, due to its careful account selection. Demand management, in turn, closed the forecast gap. When in doubt, Dell managers overforecast on high-end products because it was easier to sell up and high-end products had a longer shelf life.

Liquidity management. Direct sales were explicitly targeted toward high-end customers who paid with a credit card. These sales had a 4-day cash conversion cycle, while Dell took 45 days to pay its vendors. This approach generated a huge amount of liquidity that helped finance Dell's rapid growth and limited its external financing needs. Dell's cash engine was a key underlying factor that enabled it to earn such extraordinarily high returns.

If you want to explore investing in Dell stock, what information would you go by? You would certainly prefer that Dell have a record of accomplishment of profitable operations, earning a profit (net income) year after year. The company would need a steady stream of cash coming in and a manageable level of debt. How would you determine whether the company met these criteria? Investors commonly use the financial statements contained in the annual report as a starting point in forming expectations about future levels of earnings and about the firm's riskiness.

Net worth is the amount by which a *company's* or individual's assets exceed the company's or individual's liabilities.

Before making any financial decision, it is good to understand an elementary aspect of your financial situation—one that you'll also need for retirement planning, estate planning, and, more generally, to get an answer to the question, "How am I doing?" It is called your **net worth**. If you decided to invest $10,000 in Dell stocks, how would that affect your net worth? You may need this information for your own financial planning, but it is routinely required whenever you have to borrow a large sum of money from a financial institution. For example, when you are buying a home, you need to apply for a mortgage. Invariably, the bank will ask you to submit your net-worth statement as a part of loan processing. Your net-worth statement is a snapshot of where you stand financially at a given point in time. The bank will determine how creditworthy you are by examining your net worth. In a similar way, a corporation prepares the same kind of information for its financial planning or to report its financial health to stockholders or investors. The reporting document is known as the financial statements. We will first review the basics of figuring out the personal net worth and then illustrate how any investment decision will affect this net-worth statement. Understanding the relationship between net worth and investing decisions will enhance one's overall understanding of how a company manages its assets in business operations.

CHAPTER LEARNING OBJECTIVES

After completing this chapter, you should understand the following concepts:

- The role of accounting in economic decisions.
- Four types of financial statements prepared for investors and regulators.
- How to read the balance sheet statement.
- How to use the income statement to manage a business.
- The sources and uses of cash in business operation.
- How to conduct the ratio analysis and what the numbers really mean.

2.1 Accounting: The Basis of Decision Making

We need financial information when we are making business decisions. Virtually all businesses and most individuals keep accounting records to aid in making decisions. As illustrated in Figure 2.1, accounting is the information system that measures business activities, processes the resulting information into reports, and communicates the results to decision makers. For this reason, we call accounting "the language of business." The better you understand this language, the better you can manage your financial well-being, and the better your financial decisions will be.

Personal financial planning, education expenses, loans, car payments, income taxes, and investments are all based on the information system we call accounting. The uses of accounting information are many and varied:

- **Individual people** use accounting information in their day-to-day affairs to manage bank accounts, to evaluate job prospects, to make investments, and to decide whether to rent an apartment or buy a house.
- **Business managers** use accounting information to set goals for their organizations, to evaluate progress toward those goals, and to take corrective actions if necessary. Decisions based on accounting information may include which building or equipment to purchase, how much merchandise to keep on hand as inventory, and how much cash to borrow.
- **Investors and creditors** provide the money a business needs to begin operations. To decide whether to help start a new venture, potential investors evaluate what income they can expect on their investment. Such an evaluation involves analyzing the financial statements of the business. Before making a loan, banks determine the borrower's ability to meet scheduled payments. This kind of evaluation includes a projection of future operations and revenue, based on accounting information.

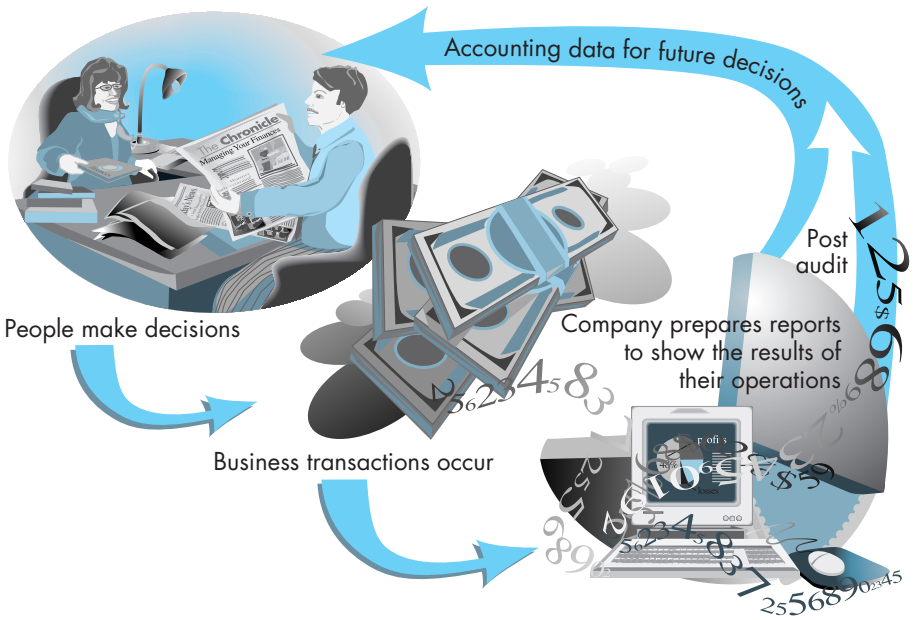

Figure 2.1 The accounting system, which illustrates the flow of information.

An essential product of an accounting information system is a series of financial statements that allows people to make informed decisions. For personal use, the net-worth statement is a snapshot of where you stand financially at a given point in time. You do that by adding your assets—such as cash, investments, and pension plans—in one column and your liabilities—or debts—in the other. Then subtract your liabilities from your assets to find your net worth. In other words, your net worth is what you would be left with if you sold everything and paid off all you owe. For business use, financial statements are the documents that report financial information about a business entity to decision makers. They tell us how a business is performing and where it stands financially. Our purpose is not to present the bookkeeping aspects of accounting, but to acquaint you with financial statements and to give you the basic information you need to make sound engineering economic decisions through the remainder of the book.

2.2 Financial Status for Businesses

Just like figuring out your personal wealth, all businesses must prepare their financial status. Of the various reports corporations issue to their stockholders, the annual report is by far the most important, containing basic financial statements as well as management's opinion of the past year's operations and the firm's future prospects. What would managers and investors want to know about a company at the end of the fiscal year? Following are four basic questions that managers or investors are likely to ask:

- What is the company's financial position at the end of the fiscal period?
- How well did the company operate during the fiscal period?
- On what did the company decide to use its profits?
- How much cash did the company generate and spend during the fiscal period?

As illustrated in Figure 2.2, the answer to each of these questions is provided by one of the following financial statements: the balance sheet statement, the income statement, the statement of retained earnings, and the cash flow statement. The fiscal year (or operating

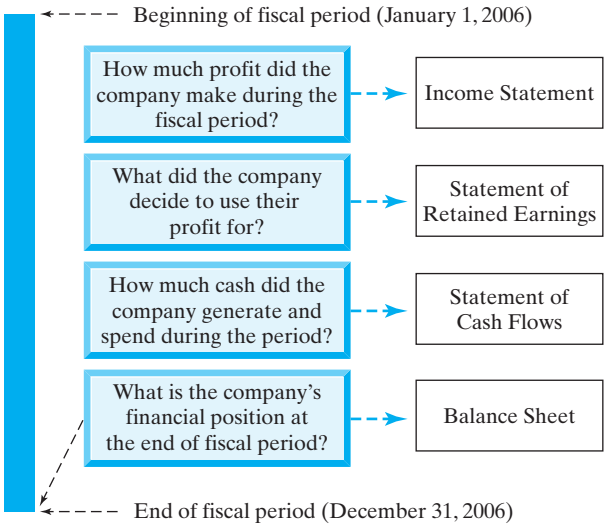

Figure 2.2 Information reported on the financial statements.

cycle) can be any 12-month term, but is usually January 1 through December 31 of a calendar year.

As mentioned in Section 1.1.2, one of the primary responsibilities of engineers in business is to plan for the acquisition of equipment (capital expenditure) that will enable the firm to design and produce products economically. This type of planning will require an estimation of the savings and costs associated with the acquisition of equipment and the degree of risk associated with execution of the project. Such an estimation will affect the business' **bottom line** (profitability), which will eventually affect the firm's stock price in the marketplace. Therefore, engineers should understand the various financial statements in order to communicate with upper management regarding the status of a project's profitability. The situation is summarized in Figure 2.3.

Bottom line is slang for net income or accounting profit.

For illustration purposes, we use data taken from Dell Corporation, manufacturer of a wide range of computer systems, including desktops, notebooks, and workstations, to discuss the basic financial statements. In 1984, Michael Dell began his computer business at the University of Texas in Austin, often hiding his IBM PC in his roommate's bathtub when his family came to visit. His dorm-room business officially became Dell Computer Corporation on May 3, 1984. Since 2001, Dell has become the number-one and fastest growing among all major computer system companies worldwide, with 55,200 employees around the globe. Dell's pioneering "direct model" is a simple concept involving selling personal computer systems directly to customers. It offers (1) in-person relationships with corporate and institutional customers; (2) telephone and Internet purchasing (the latter averaging $50 million a day in 2001); (3) built-to-order computer systems; (4) phone and online technical support; and (5) next-day on-site product service.

The company's revenue in 2005 totaled $49.205 billion. During fiscal 2005, Dell maintained its position as the world's number-one supplier of personal computer systems, with a performance that continued to outpace the industry. Over the same period, Dell's global market share of personal computer sales reached 17.8%. In the company's 2005 annual report, management painted an even more optimistic picture for the future,

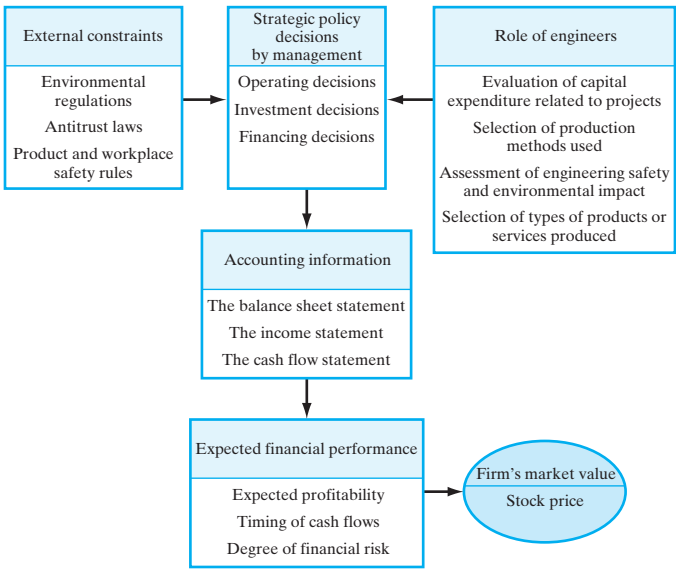

Figure 2.3 Summary of major factors affecting stock prices.

stating that Dell will continue to invest in information systems, research, development, and engineering activities to support its growth and to provide for new competitive products. Of course, there is no assurance that Dell's revenue will continue to grow at the annual rate of 50% in the future.

What can individual investors make of all this? Actually, we can make quite a bit. As you will see, investors use the information contained in an annual report to form expectations about future earnings and dividends. Therefore, the annual report is certainly of great interest to investors.

2.2.1 The Balance Sheet

What is the company's financial position at the end of the reporting period? We find the answer to this question in the company's **balance sheet statement**. A company's balance sheet, sometimes called its **statement of financial position**, reports three main categories of items: assets, liabilities, and stockholders' equity. Assets are arranged in order of liquidity. The most liquid assets appear at the top of the page, the least liquid assets at the bottom of the page. (See Figure 2.4.) Because cash is the most liquid of all assets, it is always listed first. Current assets are so critical that they are separately broken out and totaled. They are what will hold the business afloat for the next year.

Liabilities are arranged in order of payment, the most pressing at the top of the list, the least pressing at the bottom. Like current assets, current liabilities are so critical that they are separately broken out and totaled. They are what will be paid out during the next year.

A company's financial statements are based on the most fundamental tool of accounting: the accounting equation. The **accounting equation** shows the relationship among assets, liabilities, and owners' equity:

$$\text{Assets} = \text{Liabilities} + \text{Owners' Equity}$$

Every business transaction, no matter how simple or complex, can be expressed in terms of its effect on the accounting equation. Regardless of whether a business grows or contracts, the equality between the assets and the claims against the assets is always maintained. In other words, any change in the amount of total assets is necessarily accompanied by an equal change on the other side of the equation—that is, by an increase or decrease in either the liabilities or the owners' equity.

As shown in Table 2.1, the first half of Dell's year-end 2005 and 2004 balance sheets lists the firm's assets, while the remainder shows the liabilities and equity, or claims against those assets.

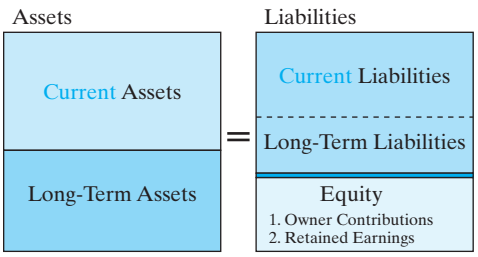

Figure 2.4 Using the four quadrants of the balance sheet.

TABLE 2.1 Consolidated Statements of Financial Position (in millions) for Dell, Inc.

	January 28, 2005	January 30, 2004
Assets		
Current assets:		
Cash and cash equivalents	$ 4,747	$ 4,317
Short-term investments	5,060	835
Accounts receivable, net	4,414	3,635
Inventories	459	327
Other	2,217	1,519
Total current assets	16,897	10,633
Property, plant, and equipment, net	1,691	1,517
Investments	4,319	6,770
Other noncurrent assets	308	391
Total assets	$ 23,215	$ 19,311
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 8,895	$ 7,316
Accrued and other	5,241	3,580
Total current liabilities	14,136	10,896
Long-term debt	505	505
Other noncurrent liabilities	2,089	1,630
Total liabilities	16,730	13,031
Commitments and contingent liabilities (Note 8)	—	—
Stockholders' equity:		
Preferred stock and capital in excess of $.01 par value; shares issued and outstanding: none	—	—
Common stock and capital in excess of $.01 par value; shares authorized: 7,000; shares issued: 2,769 and 2,721, respectively	8,195	6,823
Treasury stock, at cost; 284 and 165 shares, respectively	(10,758)	(6,539)
Retained earnings	9,174	6,131
Other comprehensive loss	(82)	(83)
Other	(44)	(52)
Total stockholders' equity	6,485	6,280
Total liabilities and stockholders' equity	$ 23,215	$ 19,311

Source: *Annual Report*, Dell Corporation, 2005.

Assets

The dollar amount shown in the assets portion of the balance sheet represents how much the company owns at the time it issues the report. We list the asset items in the order of their "liquidity," or the length of time it takes to convert them to cash.

Current assets account represents the value of all assets that are reasonably expected to be converted into cash within one year.

- **Current assets** can be converted to cash or its equivalent in less than one year. Current assets generally include three major accounts:
  1. The first is *cash*. A firm typically has a cash account at a bank to provide for the funds needed to conduct day-to-day business. Although assets are always stated in terms of dollars, only cash represents actual money. Cash-equivalent items are also listed and include marketable securities and short-term investments.
  2. The second account is *accounts receivable*—money that is owed the firm, but that has not yet been received. For example, when Dell receives an order from a retail store, the company will send an invoice along with the shipment to the retailer. Then the unpaid bill immediately falls into the accounts receivable category. When the bill is paid, it will be deducted from the accounts receivable account and placed into the cash category. A typical firm will have a 30- to 45-day accounts receivable, depending on the frequency of its bills and the payment terms for customers.
  3. The third account is *inventories*, which show the dollar amount that Dell has invested in raw materials, work in process, and finished goods available for sale.
- **Fixed assets** are relatively permanent and take time to convert into cash. Fixed assets reflect the amount of money Dell paid for its plant and equipment when it acquired those assets. The most common fixed asset is the physical investment in the business, such as land, buildings,[2] factory machinery, office equipment, and automobiles. With the exception of land, most fixed assets have a limited useful life. For example, buildings and equipment are used up over a period of years. Each year, a portion of the usefulness of these assets expires, and a portion of their total cost should be recognized as a depreciation expense. The term *depreciation* denotes the accounting process for this gradual conversion of fixed assets into expenses. *Property, plant and equipment, net* thus represents the current book value of these assets after deducting depreciation expenses.
- Finally, **other assets** include investments made in other companies and intangible assets such as goodwill, copyrights, franchises, and so forth. Goodwill appears on the balance sheet only when an operating business is purchased in its entirety. Goodwill indicates any additional amount paid for the business above the fair market value of the business. (Here, the fair market value is defined as the price that a buyer is willing to pay when the business is offered for sale.)

Liabilities and Stockholders' Equity (Owners' Net Worth)

The claims against assets are of two types: liabilities and stockholders' equity. The liabilities of a company indicate where the company obtained the funds to acquire its assets and to operate the business. Liability is money the company owes. Stockholders' equity is that portion of the assets of a company which is provided by the investors (owners). Therefore, stockholders' equity is the liability of a company to its owners.

[2] Land and buildings are commonly called **real assets** to distinguish them from equipment and machinery.

- **Current liabilities** are those debts which must be paid in the near future (normally, within one year). The major current liabilities include accounts and notes payable within a year. Also included are accrued expenses (wages, salaries, interest, rent, taxes, etc., owed, but not yet due for payment), and advance payments and deposits from customers.
- **Other liabilities** include *long-term liabilities*, such as bonds, mortgages, and long-term notes, that are due and payable more than one year in the future.
- **Stockholders' equity** represents the amount that is available to the owners after all other debts have been paid. Generally, stockholders' equity consists of preferred and common stock, treasury stock, capital surplus, and retained earnings. Preferred stock is a hybrid between common stock and debt. In case the company goes bankrupt, it must pay its preferred stockholders after its debtors, but before its common stockholders. Preferred dividend is fixed, so preferred stockholders do not benefit if the company's earnings grow. In fact, many firms do not use preferred stock. The common stockholders' equity, or **net worth**, is a residual:

$$\text{Assets} - \text{Liabilities} - \text{Preferred stock} = \text{Common stockholders' equity}$$
$$\$11{,}471 - \$6{,}163 - \$0 = \$5{,}308.$$

- **Common stock** is the aggregate par value of the company's stock issued. Companies rarely issue stocks at a discount (i.e., at an amount below the stated par). Normally, corporations set the par value low enough so that, in practice, stock is usually sold at a premium.
- **Paid-in capital** (capital surplus) is the amount of money received from the sale of stock that is over and above the par value of the stock. Outstanding stock is the number of shares issued that actually are held by the public. If the corporation buys back part of its own issued stock, that stock is listed as *treasury stock* on the balance sheet.
- **Retained earnings** represent the cumulative net income of the firm since its inception, less the total dividends that have been paid to stockholders. In other words, retained earnings indicate the amount of assets that have been financed by plowing profits back into the business. Therefore, retained earnings belong to the stockholders.

Current liabilities are bills that are due to creditors and suppliers within a short period of time.

Treasury stock is not taken into consideration when calculating earnings per share or dividends.

Retained earnings refers to earnings not paid out as dividends but instead are reinvested in the core business or used to pay off debt.

2.2.2 The Income Statement

The second financial report is the **income statement**, which indicates whether the company is making or losing money during a stated *period*, usually a year. Most businesses prepare quarterly and monthly income statements as well. The company's accounting period refers to the period covered by an income statement.

Basic Income Statement Equation

Revenue
–
Expenses
Net Income (Loss)

For Dell, the accounting period begins on February 1 and ends on January 31 of the following year. Table 2.2 gives the 2005 and 2004 income statements for Dell.

TABLE 2.2 **Consolidated Statements of Income (in millions, except per share amounts) Dell, Inc.**

	Fiscal Year Ended		
	January 28, 2005	January 30, 2004	January 31, 2003
Net revenue	$ 49,205	$ 41,444	$ 35,404
Cost of revenue	40,190	33,892	29,055
Gross margin	9,015	7,552	6,349
Operating expenses:			
Selling, general, and administrative	4,298	3,544	3,050
Research, development, and engineering	463	464	455
Total operating expenses	4,761	4,008	3,505
Operating income	4,254	3,544	2,844
Investment and other income, net	191	180	183
Income before income taxes	4,445	3,724	3,027
Income tax provision	1,402	1,079	905
Net income	$ 3,043	$ 2,645	$ 2,122
Earnings per common share:			
Basic	$ 1.21	$ 1.03	$ 0.82
Diluted	$ 1.18	$ 1.01	$ 0.80
Weighted average shares outstanding:			
Basic	2,509	2,565	2,584
Diluted	2,568	2,619	2,644

Source: *Annual Report*, Dell Corporation, 2005.

Reporting Format

Typical items that are itemized in the income statement are as follows:

- **Revenue** is the income from goods sold and services rendered during a given accounting period.
- **Net revenue** represents gross sales, less any sales return and allowances.
- Shown on the next several lines are the expenses and costs of doing business, as deductions from revenue. The largest expense for a typical manufacturing firm is the expense it incurs in making a product (such as labor, materials, and overhead), called the **cost of revenue** (or cost of goods sold).
- Net revenue less the cost of revenue gives the **gross margin**.
- Next, we subtract any other operating expenses from the operating income. These other operating expenses are expenses associated with paying interest, leasing machinery or equipment, selling, and administration. This results in the operating income.
- Finally, we determine the **net income** (or net profit) by subtracting the income taxes from the taxable income. Net income is also commonly known as *accounting income*.

Gross margin represents the amount of money the company generated over the cost of producing its goods or services.

Earnings per Share

Another important piece of financial information provided in the income statement is the **earnings per share** (EPS).[3] In simple situations, we compute the EPS by dividing the available earnings to common stockholders by the number of shares of common stock outstanding. Stockholders and potential investors want to know what their share of profits is, not just the total dollar amount. The presentation of profits on a per share basis allows the stockholders to relate earnings to what they paid for a share of stock. Naturally, companies want to report a higher EPS to their investors as a means of summarizing how well they managed their businesses for the benefits of the owners. Interestingly, Dell earned $1.21 per share in 2005, up from $1.03 in 2004, but it paid no dividends.

EPS is generally considered to be the single most important variable in determining a share's price.

Retained Earnings

As a supplement to the income statement, many corporations also report their retained earnings during the accounting period. When a corporation makes some profits, it has to decide what to do with those profits. The corporation may decide to pay out some of the profits as dividends to its stockholders. Alternatively, it may retain the remaining profits in the business in order to finance expansion or support other business activities.

When the corporation declares dividends, preferred stock has priority over common stock. Preferred stock pays a stated dividend, much like the interest payment on bonds. The dividend is not a legal liability until the board of directors has declared it. However, many corporations view the dividend payments to preferred stockholders as a liability. Therefore, "available for common stockholders" reflects the net earnings of the corporation, less the preferred stock dividends. When preferred and common stock dividends are subtracted from net income, the remainder is retained earnings (profits) for the year. As mentioned previously, these retained earnings are reinvested into the business.

EXAMPLE 2.1 Understanding Dell's Balance Sheet and Income Statement

With revenue of $49,205 million for fiscal year 2005, Dell is the world's leading direct computer systems company. Tables 2.2 and 2.3 show how Dell generated its net income during the fiscal year.

The Balance Sheet. Dell's $23,215 million of total assets shown in Table 2.1 were necessary to support its sales of $49,205 million.

- Dell obtained the bulk of the funds it used to buy assets
  1. By buying on credit from its suppliers (accounts payable).
  2. By borrowing from financial institutions (notes payable and long-term bonds).
  3. By issuing common stock to investors.
  4. By plowing earnings into the business, as reflected in the retained earnings account.

[3] In reporting EPS, the firm is required to distinguish between "basic EPS" and "diluted EPS." Basic EPS is the net income of the firm, divided by the number of shares of common stock outstanding. By contrast, the diluted EPS includes all common stock equivalents (convertible bonds, preferred stock, warrants, and rights), along with common stock. Therefore, diluted EPS will usually be less than basic EPS.

- The net increase in fixed assets was $174 million ($1,691 − $1,517; Table 2.1). However, this amount is after a deduction for the year's depreciation expenses. We should add depreciation expense back to show the increase in gross fixed assets. From the company's cash flow statement in Table 2.3, we see that the 2005 depreciation expense is $334 million; thus, the acquisition of fixed assets equals $508 million.
- Dell had a total long-term debt of $505 million (Table 2.1), consisting of several bonds issued in previous years. The interest Dell paid on these long-term debts was about $16 million.
- Dell had 2,509 million shares of common stock outstanding. Investors actually provided the company with a total capital of $8,195 million (Table 2.1). However, Dell has retained the current as well as previous earnings of $9,174 million since it was incorporated. Dell also held $10,758 million worth of treasury stock, which was financed through the current as well as previous retained earnings. The combined net stockholders' equity was $6,485 million, and these earnings belong to Dell's common stockholders (Table 2.1).
- On the average, stockholders have a total investment of $2.58 per share ($6,485 million/2,509 million shares) in the company. The $2.58 figure is known as the stock's *book value*. In the fall of 2005, the stock traded in the general range from $32 to $40 per share. Note that this market price is quite different from the stock's book value. Many factors affect the market price, the most important one being how investors expect the company to perform in the future. Certainly, the company's direct made-to-order business practices have had a major influence on the market value of its stock.

The Income Statement. Dell's net revenue was $49,205 million in 2005, compared with $41,444 million in 2004, a gain of 18.73% (Table 2.2). Profits from operations (operating income) rose 20.03% to $4,254 million, and net income was up 15.05% to $3,043 million.

- Dell issued no preferred stock, so there is no required cash dividend. Therefore, the entire net income of $3,043 million belongs to the common stockholders.
- Earnings per common share climbed at a faster pace than in 2004, to $1.21, an increase of 17.48% (Table 2.2). Dell could retain this income fully for reinvestment in the firm, or it could pay it out as dividends to the common stockholders. Instead of either of these alternatives, Dell repurchased and retired 56 million common stocks for $1,012 million. We can see that Dell had earnings available to common stockholders of $3,043 million. As shown in Table 2.1, the beginning balance of the retained earnings was $6,131 million. Therefore, the total retained earnings grew to $9,174 million.

2.2.3 The Cash Flow Statement

The income statement explained in the previous section indicates only whether the company was making or losing money during the reporting period. Therefore, the emphasis was on determining the net income (profits) of the firm for supporting its operating

activities. However, the income statement ignores two other important business activities for the period: financing and investing activities. Therefore, we need another financial statement—the cash flow statement, which details how the company generated the cash it received and how the company used that cash during the reporting period.

Sources and Uses of Cash

The difference between the sources (inflows) and uses (outflows) of cash represents the net cash flow during the reporting period. This is a very important piece of information, because investors determine the value of an asset (or, indeed, of a whole firm) by the cash flows it generates. Certainly, a firm's net income is important, but cash flows are even more important, particularly because the company needs cash to pay dividends and to purchase the assets required to continue its operations. As mentioned in the previous section, the goal of the firm should be to maximize the price of its stock. Since the value of any asset depends on the cash flows produced by the asset, managers want to maximize the cash flows available to investors over the long run. Therefore, we should make investment decisions on the basis of cash flows rather than profits. For such investment decisions, it is necessary to convert profits (as determined in the income statement) to cash flows. Table 2.3 is Dell's statement of cash flows, as it would appear in the company's annual report.

Reporting Format

In preparing the cash flow statement such as that in Table 2.3, many companies identify the sources and uses of cash according to the types of business activities. There are three types of activities:

- **Operating activities.** We start with the net change in operating cash flows from the income statement. Here, operating cash flows represent those cash flows related to production and the sales of goods or services. All noncash expenses are simply added back to net income (or after-tax profits). For example, an expense such as depreciation is only an accounting expense (a bookkeeping entry). Although we may charge depreciation against current income as an expense, it does not involve an actual cash outflow. The actual cash flow may have occurred when the asset was purchased. (Any adjustments in **working capital**[4] will also be listed here.)
- **Investing activities.** Once we determine the operating cash flows, we consider any cash flow transactions related to investment activities, which include purchasing new fixed assets (cash outflow), reselling old equipment (cash inflow), and buying and selling financial assets.
- **Financing activities.** Finally, we detail cash transactions related to financing any capital used in business. For example, the company could borrow or sell more stock, resulting in cash inflows. Paying off existing debt will result in cash outflows.

By summarizing cash inflows and outflows from three activities for a given accounting period, we obtain the net change in the cash flow position of the company.

[4] The difference between the increase in current assets and the spontaneous increase in current liabilities is the **net change in net working capital**. If this change is positive, then additional financing, over and above the cost of the fixed assets, is needed to fund the increase in current assets. This will further reduce the cash flow from the operating activities.

TABLE 2.3 Consolidated Statements of Cash Flows (in millions) Dell, Inc.

	Fiscal Year Ended		
	January 28, 2005	January 30, 2004	January 31, 2003
Cash flows from operating activities:			
Net income	$ 3,043	$ 2,645	$ 2,122
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	334	263	211
Tax benefits of employee stock plans	249	181	260
Effects of exchange rate changes on monetary assets and liabilities denominated in foreign currencies	(602)	(677)	(537)
Other	78	113	60
Changes in:			
Operating working capital	1,755	872	1,210
Noncurrent assets and liabilities	453	273	212
Net cash provided by operating activities	5,310	3,670	3,538
Cash flows from investing activities:			
Investments:			
Purchases	(12,261)	(12,099)	(8,736)
Maturities and sales	10,469	10,078	7,660
Capital expenditures	(525)	(329)	(305)
Purchase of assets held in master lease facilities	—	(636)	—
Cash assumed in consolidation of Dell Financial Services, L.P.	—	172	—
Net cash used in investing activities	(2,317)	(2,814)	(1,381)
Cash flows from financing activities:			
Repurchase of common stock	(4,219)	(2,000)	(2,290)
Issuance of common stock under employee plans and other	1,091	617	265
Net cash used in financing activities	(3,128)	(1,383)	(2,025)
Effect of exchange rate changes on cash and cash equivalents	565	612	459
Net increase in cash and cash equivalents	430	85	591
Cash and cash equivalents at beginning of period	4,317	4,232	3,641
Cash and cash equivalents at end of period	$ 4,747	$ 4,317	$ 4,232

Source: *Annual Report,* Dell Corporation, 2005.

EXAMPLE 2.2 Understanding Dell's Cash Flow Statement

As shown in Table 2.3, Dell's cash flow from operations amounted to $5,310 million. Note that this is significantly more than the $3,043 million earned during the reporting period. Where did the extra money come from?

- The main reason for the difference lies in the accrual-basis accounting principle used by the Dell Corporation. In **accrual-basis accounting**, an accountant recognizes the impact of a business event as it occurs. When the business performs a service, makes a sale, or incurs an expense, the accountant enters the transaction into the books, regardless of whether cash has or has not been received or paid. For example, an increase in accounts receivable of $4,414 million − $3,635 million = $779 million during 2005 represents the amount of total sales on credit (Table 2.1). Since the $779 million figure was included in the total sales in determining the net income, we need to subtract it to determine the company's true cash position. After adjustments, the net cash provided from operating activities is $5,310 million.
- As regards investment activities, there was an investment outflow of $525 million in new plant and equipment. Dell sold $10,469 million worth of stocks and bonds during the period, and reinvested $12,261 million in various financial securities. The net cash flow provided from these investing activities amounted to −$2,317 million, which means an outflow of money.
- Financing activities produced a net outflow of $4,219 million, including the repurchase of the company's own stocks. (Repurchasing its own stock is equivalent to investing the firm's idle cash from operation in the stock market. Dell could have bought another company's stock, such as IBM or Microsoft stock, with the money, but Dell liked its own stock better than any other stocks on the market.) Dell also raised $1,091 million by issuing shares of common stock. The net cash used in financing activities amounted to $3,128 million (outflow).
- Finally, there was the effect of exchange rate changes on cash for foreign sales. This amounted to a net increase of $565 million. Together, the three types of activities generated a total cash flow of $430 million. With the initial cash balance of $4,317 million, the ending cash balance thus increased to $4,747 million. This same amount denotes the change in Dell's cash position, as shown in the cash accounts in the balance sheet.

Accrual-basis accounting measures the performance and position of a company by recognizing economic events regardless of when cash transactions occur.

2.3 Using Ratios to Make Business Decisions

As we have seen in Dell's financial statements, the purpose of accounting is to provide information for decision making. Accounting information tells what happened at a particular point in time. In that sense, financial statements are essentially historical documents. However, most users of financial statements are concerned about what will happen in the future. For example,

- Stockholders are concerned with future earnings and dividends.
- Creditors are concerned with the company's ability to repay its debts.
- Managers are concerned with the company's ability to finance future expansion.
- Engineers are concerned with planning actions that will influence the future course of business events.

Although financial statements are historical documents, they can still provide valuable information bearing on all of these concerns. An important part of financial analysis is the calculation and interpretation of various financial ratios. In this section, we consider some of the ratios that analysts typically use in attempting to predict the future course of events in business organizations. We may group these ratios into five categories (debt management, liquidity, asset management, profitability, and market trend) as outlined in Figure 2.5. In all financial ratio calculations, we will use the 2005 financial statements for Dell Computer Corporation, as summarized in Table 2.4.

2.3.1 Debt Management Analysis

All businesses need assets to operate. To acquire assets, the firm must raise capital. When the firm finances its long-term needs externally, it may obtain funds from the capital markets. Capital comes in two forms: **debt** and **equity**. Debt capital is capital borrowed from financial institutions. Equity capital is capital obtained from the owners of the company.

The basic methods of financing a company's debt are through bank loans and the sale of bonds. For example, suppose a firm needs $10,000 to purchase a computer. In this situation, the firm would borrow money from a bank and repay the loan, together with the interest specified, in a few years. This kind of financing is known as *short-term debt*

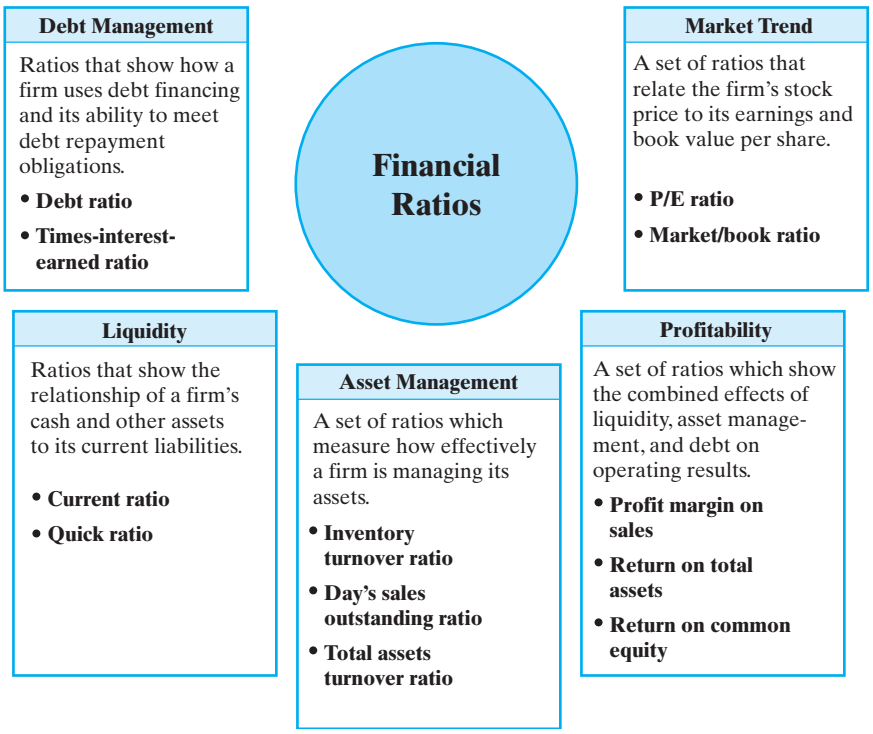

Figure 2.5 Types of ratios used in evaluating a firm's financial health.

TABLE 2.4 Summary of Dell's Key Financial Statements

Balance Sheet	January 28, 2005	January 30, 2004
Cash and cash equivalent	4,747	4,317
Accounts receivables, net	4,414	3,635
Inventories	459	327
Total current assets	16,897	10,633
Total assets	23,215	19,311
Total current liabilities	14,136	10,896
Long-term debt	505	505
Total liabilities	16,730	13,031
Common stock	8,195	6,823
Retained earnings	9,174	6,131
Total stockholders' equity	6,485	6,280
Income Statement		
Net revenue	49,205	41,444
Gross income (margin)	9,015	7,522
Operating income (margin)	4,254	3,544
Net income (margin)	3,043	2,645
Statements of Retained Earnings		
Beginning retained earnings	6,131	3,486
Net income	3,043	2,645
Ending retained earnings	9,174	6,131
Statement of Cash Flows		
Net cash from operating activities	5,310	3,670
Net cash used in investing activities	(2,317)	(2,814)
Net cash used in financing activities	(3,128)	(1,383)
Effect of exchange rate changes	565	612
Beginning cash position	4,317	4,232
Ending cash position	4,747	4,317

financing. Now suppose that the firm needs $100 million for a construction project. Normally, it would be very expensive (or require a substantial mortgage) to borrow the money directly from a bank. In this situation, the company would go public to borrow money on a long-term basis. When investors lend capital to a company and the company

consents to repay the loan at an agreed-upon interest rate, the investor is the creditor of the corporation. The document that records the nature of the arrangement between the issuing company and the investor is called a **bond**. Raising capital by issuing a bond is called *long-term debt financing*.

Similarly, there are different types of equity capital. For example, the equity of a proprietorship represents the money provided by the owner. For a corporation, equity capital comes in two forms: *preferred stock* and *common stock*. Investors provide capital to a corporation and the company agrees to endow the investor with fractional ownership in the corporation. Preferred stock pays a stated *dividend*, much like the interest payment on bonds. However, the dividend is not a legal liability until the company declares it. Preferred stockholders have preference over common stockholders as regards the receipt of dividends if the company has to liquidate its assets. We can examine the extent to which a company uses debt financing (or financial leverage) in the operation of its business if we

- Check the balance sheet to determine the extent to which borrowed funds have been used to finance assets, and
- Review the income statement to see the extent to which fixed charges (interests) are covered by operating profits.

Two essential indicators of a business's ability to pay its long-term liabilities are the *debt ratio* and the *times-interest-earned ratio*.

Debt Ratio

Debt ratio: A ratio that indicates what proportion of debt a *company* has relative to its assets.

The relationship between total liabilities and total assets, generally called the **debt ratio**, tells us the proportion of the company's assets that it has financed with debt:

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

$$= \frac{\$16{,}730}{\$23{,}215} = 72.07\%.$$

Total debt includes both current liabilities and long-term debt. If the debt ratio is unity, then the company has used debt to finance all of its assets. As of January 28, 2005, Dell's debt ratio was 72.07%; this means that its creditors have supplied close to 72% of the firm's total financing. Certainly, most creditors prefer low debt ratios, because the lower the ratio, the greater is the cushion against creditors' losses in case of liquidation. If a company seeking financing already has large liabilities, then additional debt payments may be too much for the business to handle. For such a highly leveraged company, creditors generally charge higher interest rates on new borrowing to help protect themselves.

Times-Interest-Earned Ratio

The most common measure of the ability of a company's operations to provide protection to the long-term creditor is the times-interest-earned ratio. We find this ratio by dividing earnings before interest and income taxes (EBIT) by the yearly interest charges that must be met. Dell issued $500 million worth of senior notes and long-term bonds

with a combined interest rate of 2.259%. This results in $11.29 million in interest expenses[5] in 2005:

$$\text{Times-interest-earned ratio} = \frac{\text{EBIT}}{\text{Interest expense}}$$

$$= \frac{\$4{,}445 + \$11.29}{\$11.29} = 394.72 \text{ times.}$$

The times-interest-earned ratio measures the extent to which operating income can decline before the firm is unable to meet its annual interest costs. Failure to meet this obligation can bring legal action by the firm's creditors, possibly resulting in the company's bankruptcy. Note that we use the earnings before interest and income taxes, rather than net income, in the numerator. Because Dell must pay interest with pretax dollars, Dell's ability to pay current interest is not affected by income taxes. Only those earnings remaining after all interest charges are subject to income taxes. For Dell, the times-interest-earned ratio for 2005 would be 395 times. This ratio is exceptionally high compared with the rest of the industry's 65.5 times during the same operating period.

2.3.2 Liquidity Analysis

If you were one of the many suppliers to Dell, your primary concern would be whether Dell will be able to pay off its debts as they come due over the next year or so. Short-term creditors want to be repaid on time. Therefore, they focus on Dell's cash flows and on its working capital, as these are the company's primary sources of cash in the near future. The excess of current assets over current liabilities is known as **working capital**, a figure that indicates the extent to which current assets can be converted to cash to meet current obligations. Therefore, we view a firm's net working capital as a measure of its *liquidity* position. In general, the larger the working capital, the better able the business is to pay its debt.

Current Ratio

We calculate the **current ratio** by dividing current assets by current liabilities:

The **current ratio** measures a company's ability to pay its short-term obligations.

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

$$= \frac{\$16{,}897}{\$14{,}136} = 1.1953 \text{ times.}$$

If a company is getting into financial difficulty, it begins paying its bills (accounts payable) more slowly, borrowing from its bank, and so on. If current liabilities are rising faster than current assets, the current ratio will fall, and that could spell trouble. What is an acceptable current ratio? The answer depends on the nature of the industry. The general rule of thumb calls for a current ratio of 2 to 1. This rule, of course, is subject to many exceptions, depending heavily on the composition of the assets involved.

[5] Unless the interest expenses are itemized in the income statement, you will find them in the firm's annual report.

Quick (Acid-Test) Ratio

The quick ratio tells us whether a company could pay all of its current liabilities if they came due immediately. We calculate the quick ratio by deducting inventories from current assets and then dividing the remainder by current liabilities:

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}}$$

$$= \frac{\$16{,}897 - \$459}{\$14{,}136} = 1.1628 \text{ times.}$$

The quick ratio measures how well a company can meet its obligations without having to liquidate or depend too heavily on its inventory. Inventories are typically the least liquid of a firm's current assets; hence, they are the assets on which losses are most likely to occur in case of liquidation. Although Dell's current ratio may appear to be below the average for its industry, 1.4, its liquidity position is relatively strong, as it has carried very little inventory in its current assets (only $459 million out of $16,897 million of current assets, or 2.7%). We often compare against industry average figures and should note at this point that an industry average is not an absolute number that all firms should strive to maintain. In fact, some very well managed firms will be above the average, while other good firms will be below it. However, if we find that a firm's ratios are quite different from the average for its industry, we should examine the reason for the difference.

2.3.3 Asset Management Analysis

The ability to sell inventory and collect accounts receivables is fundamental to business success. Therefore, the third group of ratios measures how effectively the firm is managing its assets. We will review three ratios related to a firm's asset management: (1) the inventory turnover ratio, (2) the day's sales outstanding ratio, and (3) the total asset turnover ratio. The purpose of these ratios is to answer this question: Does the total amount of each type of asset, as reported on the balance sheet, seem reasonable in view of current and projected sales levels? The acquisition of any asset requires the use of funds. On the one hand, if a firm has too many assets, its cost of capital will be too high; hence, its profits will be depressed. On the other hand, if assets are too low, the firm is likely lose profitable sales.

Inventory Turnover

Inventory turnover: A ratio that shows how many times the inventory of a firm is sold and replaced over a specific period.

The inventory turnover ratio measures how many times the company sold and replaced its inventory over a specific period—for example, during the year. We compute the ratio by dividing sales by the average level of inventories on hand. We compute the average inventory figure by taking the average of the beginning and ending inventory figures. Since Dell has a beginning inventory figure of $327 million and an ending inventory figure of $459 million, its average inventory for the year would be $393 million, or ($327 + $459)/2. Then we compute Dell's inventory turnover for 2005 as follows:

$$\text{Inventory turnover ratio} = \frac{\text{Sales}}{\text{Average inventory balance}}$$

$$= \frac{\$49{,}205}{\$393} = 125.20 \text{ times.}$$

As a rough approximation, Dell was able to sell and restock its inventory 125.20 times per year. Dell's turnover of 125.20 times is much faster than its competitor HPQ (Hewlett Packard), 9.5 times. This suggests that HPQ is holding excessive stocks of inventory; excess stocks are, of course, unproductive, and they represent an investment with a low or zero rate of return.

Day's Sales Outstanding (Accounts Receivable Turnover)

The day's sales outstanding (DSO) is a rough measure of how many times a company's accounts receivable have been turned into cash during the year. We determine this ratio, also called the **average collection period**, by dividing accounts receivable by average sales per day. In other words, the DSO indicates the average length of time the firm must wait after making a sale before receiving cash. For Dell,

Average collection period is often used to help determine if a company is trying to disguise weak sales.

$$\begin{aligned}\text{DSO} &= \frac{\text{Receivables}}{\text{Average sales per day}} = \frac{\text{Receivables}}{\text{Annual sales}/365} \\ &= \frac{\$4{,}414}{\$49{,}205/365} = \frac{\$4{,}414}{\$134.81} \\ &= 32.74 \text{ days.}\end{aligned}$$

Thus, on average, it takes Dell 32.74 days to collect on a credit sale. During the same period, HPQ's average collection period was 43–52 days. Whether the average of 32.74 days taken to collect an account is good or bad depends on the credit terms Dell is offering its customers. If the credit terms are 30 days, we can say that Dell's customers, on the average, are not paying their bills on time. In order to improve their working-capital position, most customers tend to withhold payment for as long as the credit terms will allow and may even go over a few days. The long collection period may signal either that customers are in financial trouble or that the company manages its credit poorly.

Total Assets Turnover

Asset turnover is a measure of how well assets are being used to produce revenue.

The total assets turnover ratio measures how effectively the firm uses its total assets in generating its revenues. It is the ratio of sales to all the firm's assets:

$$\begin{aligned}\text{Total assets turnover ratio} &= \frac{\text{Sales}}{\text{Total assets}} \\ &= \frac{\$49{,}205}{\$23{,}215} = 2.12 \text{ times.}\end{aligned}$$

Dell's ratio of 2.12 times, compared with HPQ's 1.1, is almost 93% faster, indicating that Dell is using its total assets about 93% more intensively than HPQ is. In fact, Dell's total investment in plant and equipment is about one-fourth of HPQ's. If we view Dell's ratio as the industry average, we can say that HPQ has too much investment in inventory, plant, and equipment compared to the size of sale.

2.3.4 Profitability Analysis

One of the most important goals for any business is to earn a profit. The ratios examined thus far provide useful clues about the effectiveness of a firm's operations, but the profitability

ratios show the combined effects of liquidity, asset management, and debt on operating results. Therefore, ratios that measure profitability play a large role in decision making.

Profit Margin on Sales

The **profit margin** measures how much out of every dollar of sales a company actually keeps in *earnings*.

We calculate the profit margin on sales by dividing net income by sales. This ratio indicates the profit per dollar of sales:

$$\text{Profit margin on sales} = \frac{\text{Net income available to common stockholders}}{\text{Sales}}$$

$$= \frac{\$3{,}043}{\$49{,}205} = 6.18\%.$$

Thus, Dell's profit margin is equivalent to 6.18 cents for each sales dollar generated. Dell's profit margin is greater than HPQ's profit margin of 3.6%, indicating that, although HPQ's sales are about 76% more than Dell's revenue during the same operating period, HPQ's operation is less efficient than Dell's. HPQ's low profit margin is also a result of its heavy use of debt and its carrying a very high volume of inventory. Recall that net income is income after taxes. Therefore, if two firms have identical operations in the sense that their sales, operating costs, and earnings before income tax are the same, but if one company uses more debt than the other, it will have higher interest charges. Those interest charges will pull net income down, and since sales are constant, the result will be a relatively low profit margin.

Return on Total Assets

The return on total assets—or simply, return on assets (ROA)—measures a company's success in using its assets to earn a profit. The ratio of net income to total assets measures the return on total assets after interest and taxes:

$$\text{Return on total assets} = \frac{\text{Net income} + \text{interest expense}(1 - \text{tax rate})}{\text{Average total assets}}$$

$$= \frac{\$3{,}043 + \$11.29(1 - 0.315)}{(\$23{,}215 + \$19{,}311)/2} = 14.35\%.$$

Adding interest expenses back to net income results in an adjusted earnings figure that shows what earnings would have been if the assets had been acquired solely by selling shares of stock. (Note that Dell's effective tax rate was 31.5% in 2005.) With this adjustment, we may be able to compare the return on total assets for companies with differing amounts of debt. Again, Dell's 14.35% return on assets is well above the 4.1% for HPQ. This high return results from (1) the company's high basic earning power and (2) its low use of debt, both of which cause its net income to be relatively high.

The **return on equity** reveals how much profit a company generates with the money its shareholders have invested in it.

Return on Common Equity

Another popular measure of profitability is rate of return on common equity. This ratio shows the relationship between net income and common stockholders' investment in the company—that is, how much income is earned for every $1 invested by the common stockholders. To compute the return on common equity, we first subtract preferred dividends from net income, yielding the net income available to common stockholders. We

then divide this net income available to common stockholders by the average common stockholders' equity during the year. We compute average common equity by using the beginning and ending balances. At the beginning of fiscal-year 2005, Dell's common equity balance was \$6,280 million; at the end of fiscal-year 2005, the balance was \$6,485 million. The average balance is then simply \$6,382.50 million, and we have

$$\begin{aligned}\text{Return on common equity} &= \frac{\text{Net income available to common stockholders}}{\text{Average common equity}} \\ &= \frac{\$3{,}043}{(\$6{,}485 + \$6{,}280)/2} \\ &= \frac{\$3{,}043}{\$6{,}382.50} = 47.68\%.\end{aligned}$$

The rate of return on common equity for Dell was 47.68% during 2005. Over the same period, HPQ's return on common equity amounted to 8.2%, a poor performance relative to the computer industry (12.6% in 2005) in general.

To learn more about what management can do to increase the return on common equity, or ROE, we may rewrite the ROE in terms of the following three components:

$$\begin{aligned}\text{ROE} &= \frac{\text{Net income}}{\text{Stockholders' equity}} \\ &= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Stockholders' equity}}.\end{aligned}$$

The three principal components can be described as the profit margin, asset turnover, and financial leverage, respectively, so that

$$\begin{aligned}\text{ROE} &= (\text{Profit margin}) \times (\text{Asset turnover}) \times (\text{Financial leverage}) \\ &= (6.18\%) \times (2.12) \times \left(\frac{23{,}215}{6{,}382.5}\right) \\ &= 47.68\%.\end{aligned}$$

Financial leverage: The degree to which an *investor* or business is utilizing borrowed money.

This expression tells us that management has only three key ratios for controlling a company's ROE: (1) the earnings from sales (the profit margin); (2) the revenue generated from each dollar of assets employed (asset turnover); and (3) the amount of equity used to finance the assets in the operation of the business (financial leverage).

2.3.5 Market Value Analysis

When you purchase a company's stock, what are your primary factors in valuing the stock? In general, investors purchase stock to earn a return on their investment. This return consists of two parts: (1) gains (or losses) from selling the stock at a price that differs from the investors' purchase price and (2) dividends—the periodic distributions of profits to stockholders. The market value ratios, such as the price-to-earnings ratio and the market-to-book ratio, relate the firm's stock price to its earnings and book value per share, respectively. These ratios give management an indication of what investors think of the

company's past performance and future prospects. If the firm's asset and debt management is sound and its profit is rising, then its market value ratios will be high, and its stock price will probably be as high as can be expected.

Price-to-Earnings Ratio

The price-to-earnings (P/E) ratio shows how much investors are willing to pay per dollar of reported profits. Dell's stock sold for $41.50 in early February of 2005, so with an EPS of $1.21, its P/E ratio was 34.29:

The ***P/E* ratio** shows how much investors are willing to pay per dollar of earnings.

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

$$= \frac{\$41.5}{\$1.21} = 34.29.$$

That is, the stock was selling for about 34.29 times its current earnings per share. In general, P/E ratios are higher for firms with high growth prospects, other things held constant, but they are lower for firms with lower expected earnings. Dell's expected annual increase in operating earnings is 30% over the next 3 to 5 years. Since Dell's ratio is greater than 25%, the average for other computer industry firms, this suggests that investors value Dell's stock more highly than most as having excellent growth prospects. However, all stocks with high P/E ratios carry high risk whenever the expected growths fail to materialize. Any slight earnings disappointment tends to punish the market price significantly.

Book Value per Share

Another ratio frequently used in assessing the well-being of the common stockholders is the book value per share, which measures the amount that would be distributed to holders of each share of common stock if all assets were sold at their balance-sheet carrying amounts and if all creditors were paid off. We compute the book value per share for Dell's common stock as follows:

$$\text{Book value per share} = \frac{\text{Total stockholders' equity} - \text{preferred stock}}{\text{Shares outstanding}}$$

$$= \frac{\$6{,}485 - \$0}{2{,}509} = \$2.58.$$

If we compare this book value with the current market price of $41.50, then we may say that the stock appears to be overpriced. Once again, though, market prices reflect expectations about future earnings and dividends, whereas book value largely reflects the results of events that occurred in the past. Therefore, the market value of a stock tends to exceed its book value. Table 2.5 summarizes the financial ratios for Dell Computer Corporation in comparison to its direct competitor Hewlett Packard (HPQ) and the industry average.

2.3.6 Limitations of Financial Ratios in Business Decisions

Business decisions are made in a world of uncertainty. As useful as ratios are, they have limitations. We can draw an analogy between their use in decision making and a physician's use of a thermometer. A reading of 102°F indicates that something is wrong with the

TABLE 2.5 **Comparisons of Dell Computer Corporation's Key Financial Ratios with Those of Hewlett Packard (HPQ) and the Industry Average (2005)**

Category	Financial Ratios	Dell	HPQ	Industry
Debt Management	Debt ratio	72.07%	9%	29%
	Time-interest earned	394.72	18.37	65.5
Liquidity	Current ratio	1.1953	1.4	1.4
	Quick ratio	1.16	0.90	1.0
	Inventory turnover	125.20	9.5	11.1
Asset Management	Day's sales outstanding	32.74	52.43	34
	Total asset turnover	2.12	1.1	1.0
	Profit margin	6.18%	3.6%	5.0%
Profitability	Return on total asset	14.35%	4.1%	4.9%
	Return on common equity	47.68%	8.2%	12.6%
	P/E ratio	34.29	27.5	25.3
Market Trend	Book value-to-share ratio	2.58	13.05	9.26

patient, but the temperature alone does not indicate what the problem is or how to cure it. In other words, ratio analysis is useful, but analysts should be aware of ever-changing market conditions and make adjustments as necessary. It is also difficult to generalize about whether a particular ratio is "good" or "bad." For example, a high current ratio may indicate a strong liquidity position, which is good, but holding too much cash in a bank account (which will increase the current ratio) may not be the best utilization of funds. Ratio analysis based on any one year may not represent the true business condition. It is important to analyze trends in various financial ratios, as well as their absolute levels, for trends give clues as to whether the financial situation is likely to improve or deteriorate. To do a **trend analysis**, one simply plots a ratio over time. As a typical engineering student, your judgment in interpreting a set of financial ratios is understandably weak at this point, but it will improve as you encounter many facets of business decisions in the real world. Again, accounting is a language of business, and as you speak it more often, it can provide useful insights into a firm's operations.

Trend analysis is based on the idea that what has happened in the past gives traders an idea of what will happen in the future.

SUMMARY

The primary purposes of this chapter were (1) to describe the basic financial statements, (2) to present some background information on cash flows and corporate profitability, and (3) to discuss techniques used by investors and managers to analyze financial statements. Following are some concepts we covered:

- Before making any major financial decisions, it is important to understand their impact on your net worth. Your net-worth statement is a snapshot of where you stand financially at a given point in time.

- The three basic financial statements contained in the annual report are the balance sheet, the income statement, and the statement of cash flows. Investors use the information provided in these statements to form expectations about future levels of earnings and dividends and about the firm's risk-taking behavior.
- A firm's balance sheet shows a snapshot of a firm's financial position at a particular point in time through three categories: (1) assets the firm owns, (2) liabilities the firm owes, and (3) owners' equity, or assets less liabilities.
- A firm's income statement reports the results of operations over a period of time and shows earnings per share as its "bottom line." The main items are (1) revenues and gains, (2) expenses and losses, and (3) net income or net loss (revenue less expenses).
- A firm's statement of cash flows reports the impact of operating, investing, and financing activities on cash flows over an accounting period.
- The purpose of calculating a set of financial ratios is twofold: (1) to examine the relative strengths and weaknesses of a company compared with those of other companies in the same industry and (2) to learn whether the company's position has been improving or deteriorating over time.
- Liquidity ratios show the relationship of a firm's current assets to its current liabilities and thus its ability to meet maturing debts. Two commonly used liquidity ratios are the current ratio and the quick (acid-test) ratio.
- Asset management ratios measure how effectively a firm is managing its assets. Some of the major ratios are inventory turnover, fixed assets turnover, and total assets turnover.
- Debt management ratios reveal (1) the extent to which a firm is financed with debt and (2) the firm's likelihood of defaulting on its debt obligations. In this category are the debt ratio and the times-interest-earned ratio.
- Profitability ratios show the combined effects of liquidity, asset management, and debt management policies on operating results. Profitability ratios include the profit margin on sales, the return on total assets, and the return on common equity.
- Market value ratios relate the firm's stock price to its earnings and book value per share, and they give management an indication of what investors think of the company's past performance and future prospects. Market value ratios include the price-to-earnings ratio and the book value per share.
- Trend analysis, in which one plots a ratio over time, is important, because it reveals whether the firm's ratios are improving or deteriorating over time.

PROBLEMS

Financial Statements

2.1 Consider the balance-sheet entries for War Eagle Corporation in Table P2.1.

(a) Compute the firm's
Current assets: $_____
Current liabilities: $_____
Working capital: $_____
Shareholders' equity: $_____

TABLE P2.1

Balance Sheet Statement as of December 31, 2000		
Assets:		
Cash		$ 150,000
Marketable securities		200,000
Accounts receivables		150,000
Inventories		50,000
Prepaid taxes and insurance		30,000
Manufacturing plant at cost	$ 600,000	
Less accumulated depreciation	100,000	
Net fixed assets		500,000
Goodwill		20,000
Liabilities and shareholders' equity:		
Notes payable		50,000
Accounts payable		100,000
Income taxes payable		80,000
Long-term mortgage bonds		400,000
Preferred stock, 6%, $100 par value (1,000 shares)		100,000
Common stock, $15 par value (10,000 shares)		150,000
Capital surplus		150,000
Retained earnings		70,000

(b) If the firm had a net income of $500,000 after taxes, what is the earnings per share?

(c) When the firm issued its common stock, what was the market price of the stock per share?

2.2 A chemical processing firm is planning on adding a duplicate polyethylene plant at another location. The financial information for the first project year is shown in Table P2.2.

(a) Compute the working-capital requirement during the project period.

(b) What is the taxable income during the project period?

(c) What is the net income during the project period?

(d) Compute the net cash flow from the project during the first year.

TABLE P2.2 Financial Information for First Project Year

Sales		$1,500,000
Manufacturing costs		
Direct materials	$ 150,000	
Direct labor	200,000	
Overhead	100,000	
Depreciation	200,000	
Operating expenses		150,000
Equipment purchase		400,000
Borrowing to finance equipment		200,000
Increase in inventories		100,000
Decrease in accounts receivable		20,000
Increase in wages payable		30,000
Decrease in notes payable		40,000
Income taxes		272,000
Interest payment on financing		20,000

Financial Ratio Analysis

2.3 Table P2.3 shows financial statements for Nano Networks, Inc. The closing stock price for Nano Network was $56.67 (split adjusted) on December 31, 2005. On the basis of the financial data presented, compute the various financial ratios and make an informed analysis of Nano's financial health.

TABLE P2.3 Balance Sheet for Nano Networks, Inc.

	Dec. 2005 U.S. $ (000) (Year)	Dec. 2004 U.S. $ (000) (Year)
Balance Sheet Summary		
Cash	158,043	20,098
Securities	285,116	0
Receivables	24,582	8,056
Allowances	632	0
Inventory	0	0
Current assets	377,833	28,834
Property and equipment, net	20,588	10,569

(*Continued*)

	Dec. 2005 U.S. $ (000) (Year)	Dec. 2004 U.S. $ (000) (Year)
Depreciation	8,172	2,867
Total assets	513,378	36,671
Current liabilities	55,663	14,402
Bonds	0	0
Preferred mandatory	0	0
Preferred stock	0	0
Common stock	2	1
Other stockholders' equity	457,713	17,064
Total liabilities and equity	513,378	36,671
Income Statement Summary		
Total revenues	102,606	3,807
Cost of sales	45,272	4,416
Other expenses	71,954	31,661
Loss provision	0	0
Interest income	8,011	1,301
Income pretax	−6,609	−69
Income tax	2,425	2
Income continuing	−9,034	−30,971
Net income	**−9,034**	**−30,971**
EPS primary	**−$0.1**	**−$0.80**
EPS diluted	−$0.10	−$0.80
	−$0.05	−$0.40
	(split adjusted)	(split adjusted)

(a) Debt ratio
(b) Times-interest-earned ratio
(c) Current ratio
(d) Quick (acid-test) ratio
(e) Inventory turnover ratio
(f) Day's sales outstanding
(g) Total assets turnover
(h) Profit margin on sales
(i) Return on total assets

(j) Return on common equity
(k) Price-to-earnings ratio
(l) Book value per share

2.4 The balance sheet that follows summarizes the financial conditions for Flex, Inc., an electronic outsourcing contractor, for fiscal-year 2005. Unlike Nano Network Corporation in Problem 2.3, Flex has reported a profit for several years running. Compute the various financial ratios and interpret the firm's financial health during fiscal-year 2005.

	Aug. 2005 U.S. $ (000) (12 mos.)	Aug. 2004 U.S. $ (000) (Year)
Balance Sheet Summary		
Cash	1,325,637	225,228
Securities	362,769	83,576
Receivables	1,123,901	674,193
Allowances	5,580	−3,999
Inventory	1,080,083	788,519
Current assets	3,994,084	1,887,558
Property and equipment, net	1,186,885	859,831
Depreciation	533,311	−411,792
Total assets	4,834,696	2,410,568
Current liabilities	1,113,186	840,834
Bonds	922,653	385,519
Preferred mandatory	0	0
Preferred stock	0	0
Common stock	271	117
Other stockholders' equity	2,792,820	1,181,209
Total liabilities and equity	4,834,696	2,410,568
Income Statement Summary		
Total revenues	8,391,409	5,288,294
Cost of sales	7,614,589	4,749,988
Other expenses	335,808	237,063
Loss provision	2,143	2,254
Interest expense	36,479	24,759

(*Continued*)

	Aug. 2005 U.S. $ (000) (12 mos.)	Aug. 2004 U.S. $ (000) (Year)
Income pretax	432,342	298,983
Income tax	138,407	100,159
Income continuing	293,935	198,159
Discontinued	0	0
Extraordinary	0	0
Changes	0	0
Net income	**293,935**	**198,159**
EPS primary	**$1.19**	**$1.72**
EPS diluted	$1.13	$1.65

(a) Debt ratio
(b) Times-interest-earned ratio
(c) Current ratio
(d) Quick (acid-test) ratio
(e) Inventory turnover ratio
(f) Day's sales outstanding
(g) Total assets turnover
(h) Profit margin on sales
(i) Return on total assets
(j) Return on common equity
(k) Price-to-earnings ratio
(l) Book value per share

2.5 J. C. Olson & Co. had earnings per share of $8 in year 2006, and it paid a $4 dividend. Book value per share at year's end was $80. During the same period, the total retained earnings increased by $24 million. Olson has no preferred stock, and no new common stock was issued during the year. If Olson's year-end debt (which equals its total liabilities) was $240 million, what was the company's year-end debt-to-asset ratio?

2.6 If Company A uses more debt than Company B and both companies have identical operations in terms of sales, operating costs, etc., which of the following statements is *true*?

(a) Company B will definitely have a higher current ratio.
(b) Company B has a higher profit margin on sales than Company A.
(c) Both companies have identical profit margins on sales.
(d) Company B's return on total assets would be higher.

2.7 You are looking to buy stock in a high-growth company. Which of the following ratios best indicates the company's growth potential?

(a) Debt ratio

(b) Price-to-earnings ratio

(c) Profit margin

(d) Total asset turnover

2.8 Which of the following statements is *incorrect*?

(a) The quickest way to determine whether the firm has too much debt is to calculate the debt-to-equity ratio.

(b) The best rule of thumb for determining the firm's liquidity is to calculate the current ratio.

(c) From an investor's point of view, the rate of return on common equity is a good indicator of whether or a firm is generating an acceptable return to the investor.

(d) The operating margin is determined by expressing net income as a percentage of total sales.

2.9 Consider the following financial data for Northgate Corporation:

- Cash and marketable securities, $100
- Total fixed assets, $280
- Annual sales, $1,200
- Net income, $358
- Inventory, $180
- Current liabilities, $134
- Current ratio, 3.2
- Average correction period, 45 days
- Average common equity, $500

On the basis of these financial data, determine the firm's *return on (common) equity*.

(a) 141.60%

(b) 71.6%

(c) 76.0%

(d) 30%

Short Case Studies

ST2.1 Consider the two companies Cisco Systems and Lucent Technologies, which compete with each other in the network equipment sector. Lucent enjoys strong relationships among Baby Bells in the telephone equipment area and Cisco has a dominant role in the network router and switching equipment area. Get these companies' annual reports from their websites, and answer the following questions (*Note*: To download their annual reports, visit http://www.cisco.com and http://www.lucent.com) and look for "Investors' Relations":

(a) On the basis of the most recent financial statements, comment on each company's financial performance in the following areas:

- Asset management
- Liquidity

- Debt management
- Profitability
- Market trend

(b) Check the current stock prices for both companies. The stock ticker symbol is CSCO for Cisco and LU for Lucent. Based on your analysis in Problem 2.6(a), which company would you bet your money on and why? (Lucent and Alcatel were engaged in discussions about a potential merger of equals in late March of 2006.)

ST2.2 Compare XM Satellite Radio, Inc., and Sirius Satellite Radio, Inc., using a thorough financial ratios analysis.

(a) For each company, compute all the ratios listed in Figure 2.5 (i.e., debt management, liquidity, asset management, market trend, and profitability) for the year 2005.

(b) Compare and contrast the two companies, using the ratios you calculated from part (a).

(c) Carefully read and summarize the "risk management" or "hedging" practices described in the financial statements of each company.

(d) If you were a mutual-fund manager and could invest in only one of these companies, which one would you select and why? Be sure to justify your answer by using your results from parts (a), (b), and (c).