CHAPTER 3

CASH FLOW AND FINANCIAL PLANNING

LEARNING GOALS

- **LG1** Understand the effect of depreciation on the firm's cash flows, the depreciable value of an asset, its depreciable life, and tax depreciation methods.
- **LG2** Discuss the firm's statement of cash flows, operating cash flow, and free cash flow.
- **LG3** Understand the financial planning process, including long-term (strategic) financial plans and short-term (operating) financial plans.
- **LG4** Discuss the cash-planning process and the preparation, evaluation, and use of the cash budget.
- **LG5** Explain the simplified procedures used to prepare and evaluate the pro forma income statement and the pro forma balance sheet.
- **LG6** Cite the weaknesses of the simplified approaches to pro forma financial statement preparation and the common uses of pro forma statements.

Across the Disciplines WHY THIS CHAPTER MATTERS TO YOU

Accounting: You need to understand how depreciation is used for both tax and financial reporting purposes; how to develop the statement of cash flows; the primacy of cash flows, rather than accruals, in financial decision making; and how pro forma financial statements are used within the firm.

Information systems: You need to understand the data that must be kept to record depreciation for tax and financial reporting; the information needs for strategic and operating plans; and what data are needed as inputs for cash-planning and profit-planning modules.

Management: You need to understand the difference between strategic and operating plans, and the role of each; the importance of focusing on the firm's cash flows; and how use of pro forma statements can head off trouble for the firm.

Marketing: You need to understand the central role that marketing plays in formulating the firm's long-term, strategic plans, and the importance of the sales forecast as the key input for both cash planning and profit planning.

Operations: You need to understand how depreciation affects the value of the firm's plant assets; how the results of operations are captured in the statement of cash flows; that operations are monitored primarily in the firm's short-term financial plans; and the distinction between fixed and variable operating costs.

Best Buy

Planning That "Best Buy"

It's tempting for companies to focus on short-term profitability, especially when Wall Street is watching earnings reports, looking for any signs of weakness that could send the stock plummeting. This was the dilemma facing the executive team at **Best Buy,** a specialty retailer of consumer electronics, home office equipment, entertainment software, and appliances. After four straight years of profits in this competitive retail business, revenues and quarterly earnings were falling as the economy started to downshift in fall 2000. On the planning boards was an expansion strategy that included acquiring the Musicland chain, using Best Buy stock to do so. As the stock price fell, some top managers urged founder and CEO Richard Schulze to retrench and focus on the chain's over 400 existing stores.

Instead of putting Best Buy's growth on hold, Schulze went forward as planned. He was convinced that this was the best long-term strategy for the company, which was financially sound. Careful planning had given Best Buy a $1 billion "war chest," so Schulze could buy Musicland with cash and the assumption of its debt. Best Buy also bought a Seattle chain, Magnolia Hi-Fi, for cash. Some company officers were concerned about buying Musicland when the company's stock price was down. "It doesn't change why we think this is a good deal," Schulze pointed out.

The acquisition was important to Best Buy's future plans. Musicland, which also owned the Sam Goody chain, had 1,300 stores. Most were smaller than the typical Best Buy "big-box" store. Their mall and small-town locations brought a different customer base to the company, providing a way to reach new types of customers and gain further leverage with suppliers.

Nor did the company neglect short-term planning. To boost productivity and reduce labor costs during the downturn, Best Buy cut sales staff during off-peak hours. It found ways to improve inventory management as well. With these plans in place, earnings were up in the fourth quarter of 2000, and the company reported record sales and a 20 percent increase in gross margin.

Despite the risks involved in taking this aggressive path, Schulze is more concerned with positioning Best Buy for the future. Opening new stores means higher expenses in the short term. But he is confident that he made the right decision in sticking with the company's long-term strategy to become the world's biggest consumer electronics chain. "Acquisitions and new strategies need to be developed even when the economy is a little soft," says Schulze. "You have to keep investing in yourself, and that's what we're doing."

This chapter focuses on the concept of cash flows and their use in the financial planning process.

LG1 LG2 3.1 Analyzing the Firm's Cash Flow

Cash flow, the lifeblood of the firm, is the primary focus of the financial manager both in managing day-to-day finances and in planning and making strategic decisions aimed at creation of shareholder value. An important factor affecting a firm's cash flow is depreciation (and any other noncash charges). From an accounting perspective, a firm's cash flows can be summarized in the statement of cash flows, which was described in Chapter 2. From a strict financial perspective, firms often focus on both *operating cash flow,* which is used in managerial decision making, and *free cash flow,* which is closely watched by participants in the capital market. We begin our analysis of cash flow by considering the key aspects of depreciation, which is closely related to the firm's cash flow.

Depreciation

depreciation
The systematic charging of a portion of the costs of fixed assets against annual revenues over time.

Business firms are permitted for tax and financial reporting purposes to charge a portion of the costs of fixed assets systematically against annual revenues. This allocation of historical cost over time is called **depreciation.** For tax purposes, the depreciation of business assets is regulated by the Internal Revenue Code. Because the objectives of financial reporting are sometimes different from those of tax legislation, firms often use different depreciation methods for financial reporting than those required for tax purposes. Tax laws are used to accomplish economic goals such as providing incentives for business investment in certain types of assets, whereas the objectives of financial reporting are of course quite different. Keeping two different sets of records for these two different purposes is legal.

modified accelerated cost recovery system (MACRS)
System used to determine the depreciation of assets for tax purposes.

Depreciation for tax purposes is determined by using the **modified accelerated cost recovery system (MACRS);** a variety of depreciation methods are available for financial reporting purposes. Before we discuss the methods of depreciating an asset, you must understand the depreciable value of an asset and the depreciable life of an asset.

Depreciable Value of an Asset

Under the basic MACRS procedures, the depreciable value of an asset (the amount to be depreciated) is its *full* cost, including outlays for installation.[1] No adjustment is required for expected salvage value.

EXAMPLE Baker Corporation acquired a new machine at a cost of $38,000, with installation costs of $2,000. Regardless of its expected salvage value, the depreciable value of the machine is $40,000: $38,000 cost + $2,000 installation cost.

Depreciable Life of an Asset

depreciable life
Time period over which an asset is depreciated.

The time period over which an asset is depreciated—its **depreciable life**—can significantly affect the pattern of cash flows. The shorter the depreciable life, the more quickly the cash flow created by the depreciation write-off will be received. Given the financial manager's preference for faster receipt of cash flows, a shorter

1. Land values are *not* depreciable. Therefore, to determine the depreciable value of real estate, the value of the land is subtracted from the cost of real estate. In other words, only buildings and other improvements are depreciable.

TABLE 3.1 First Four Property Classes Under MACRS

Property class (recovery period)	Definition
3 years	Research equipment and certain special tools.
5 years	Computers, typewriters, copiers, duplicating equipment, cars, light-duty trucks, qualified technological equipment, and similar assets.
7 years	Office furniture, fixtures, most manufacturing equipment, railroad track, and single-purpose agricultural and horticultural structures.
10 years	Equipment used in petroleum refining or in the manufacture of tobacco products and certain food products.

depreciable life is preferred to a longer one. However, the firm must abide by certain Internal Revenue Service (IRS) requirements for determining depreciable life. These MACRS standards, which apply to both new and used assets, require the taxpayer to use as an asset's depreciable life the appropriate MACRS **recovery period.**[2] There are six MACRS recovery periods—3, 5, 7, 10, 15, and 20 years—excluding real estate. It is customary to refer to the property classes, in accordance with their recovery periods, as 3-, 5-, 7-, 10-, 15-, and 20-year property. The first four property classes—those routinely used by business—are defined in Table 3.1.

recovery period
The appropriate depreciable life of a particular asset as determined by MACRS.

Depreciation Methods

For *financial reporting purposes,* a variety of depreciation methods (straight-line, double-declining balance, and sum-of-the-years'-digits[3]) can be used. For *tax purposes,* using MACRS recovery periods, assets in the first four property classes are depreciated by the double-declining balance (200 percent) method, using the half-year convention and switching to straight-line when advantageous. Although tables of depreciation percentages are not provided by law, the *approximate percentages* (rounded to the nearest whole percent) written off each year for the first four property classes are shown in Table 3.2. Rather than using the percentages in the table, the firm can either use straight-line depreciation over the asset's recovery period with the half-year convention or use the alternative depreciation system. For purposes of this text, we will use the MACRS depreciation percentages, because they generally provide for the fastest write-off and therefore the best cash flow effects for the profitable firm.

Because MACRS requires use of the half-year convention, assets are assumed to be acquired in the middle of the year, and therefore only one-half of the first year's depreciation is recovered in the first year. As a result, the final half-year of depreciation is recovered in the year immediately following the asset's stated recovery period. In Table 3.2, the depreciation percentages for an n-year class asset are given for $n + 1$ years. For example, a 5-year asset is depreciated over 6 recovery years. The application of the tax depreciation percentages given in Table 3.2 can be demonstrated by a simple example.

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2. An exception occurs in the case of assets depreciated under the *alternative depreciation system.* For convenience, in this text we ignore the depreciation of assets under this system.

3. For a review of these depreciation methods as well as other aspects of financial reporting, see any recently published financial accounting text.

TABLE 3.2 Rounded Depreciation Percentages by Recovery Year Using MACRS for First Four Property Classes

	Percentage by recovery year[a]			
Recovery year	3 years	5 years	7 years	10 years
1	33%	20%	14%	10%
2	45	32	25	18
3	15	19	18	14
4	7	12	12	12
5		12	9	9
6		5	9	8
7			9	7
8			4	6
9				6
10				6
11				4
Totals	100%	100%	100%	100%

[a]These percentages have been rounded to the nearest whole percent to simplify calculations while retaining realism. To calculate the *actual* depreciation for tax purposes, be sure to apply the actual unrounded percentages or directly apply double-declining balance (200%) depreciation using the half-year convention.

EXAMPLE Baker Corporation acquired, for an installed cost of $40,000, a machine having a recovery period of 5 years. Using the applicable percentages from Table 3.2, Baker calculates the depreciation in each year as follows:

Year	Cost (1)	Percentages (from Table 3.2) (2)	Depreciation [(1) × (2)] (3)
1	$40,000	20%	$ 8,000
2	40,000	32	12,800
3	40,000	19	7,600
4	40,000	12	4,800
5	40,000	12	4,800
6	40,000	5	2,000
Totals		100%	$40,000

Column 3 shows that the full cost of the asset is written off over 6 recovery years.

Because financial managers focus primarily on cash flows, *only tax depreciation methods will be utilized throughout this textbook.*

Developing the Statement of Cash Flows

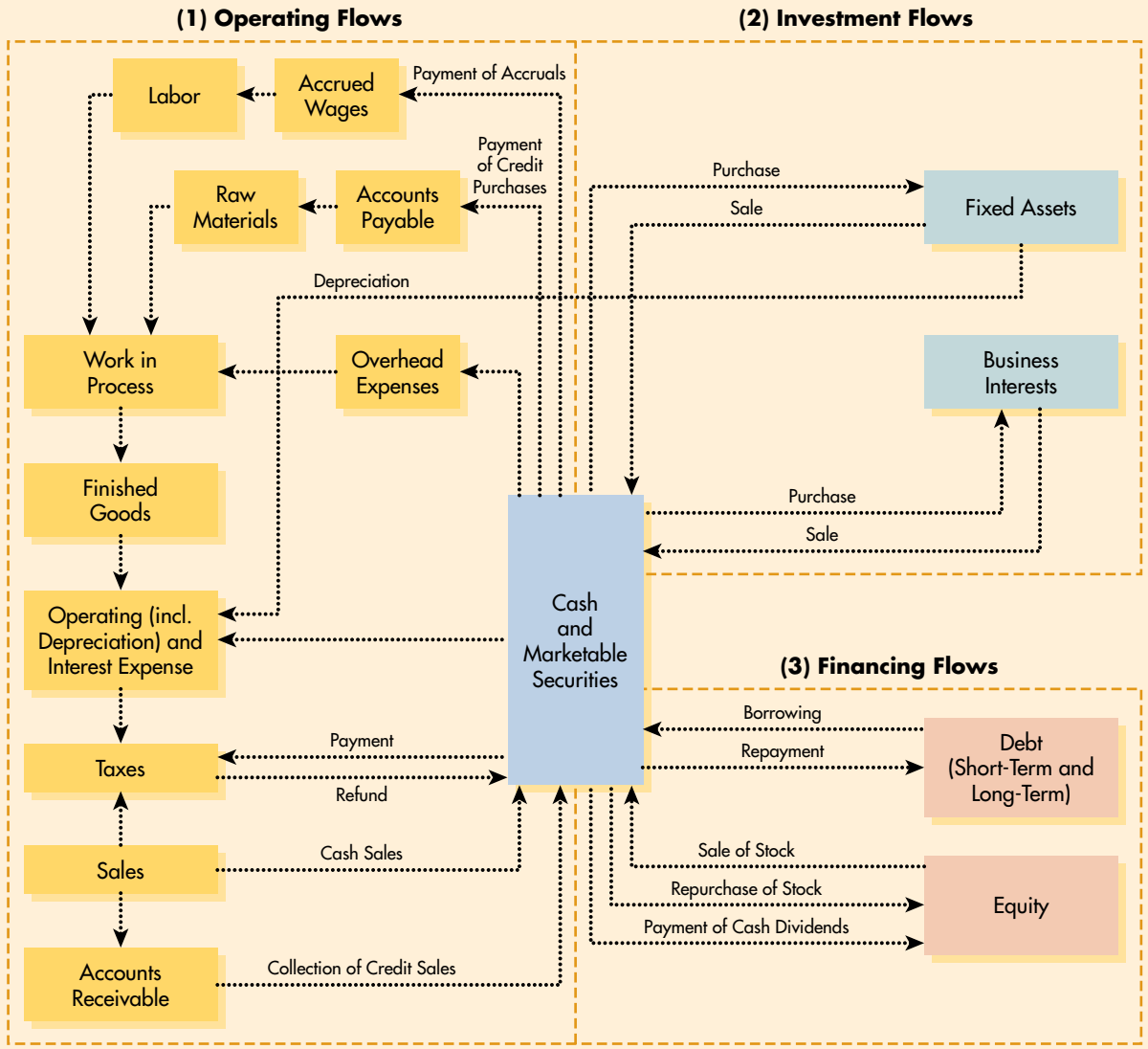
The *statement of cash flows,* introduced in Chapter 2, summarizes the firm's cash flow over a given period of time. Before discussing the statement and its interpretation, we will review the cash flow through the firm and the classification of inflows and outflows of cash.

Hint Remember that in finance, cash is king. Income statement profits are good, but they don't pay the bills, nor do asset owners accept them in place of cash.

The Firm's Cash Flows

Figure 3.1 illustrates the firm's cash flows. Note that marketable securities are considered the same as cash because of their highly liquid nature. Both cash and marketable securities represent a reservoir of liquidity that is *increased by cash*

FIGURE 3.1 **Cash Flows**
The firm's cash flows



operating flows
Cash flows directly related to sale and production of the firm's products and services.

investment flows
Cash flows associated with purchase and sale of both fixed assets and business interests.

financing flows
Cash flows that result from debt and equity financing transactions; includes incurrence and repayment of debt, cash inflow from the sale of stock, and cash outflows to pay cash dividends or repurchase stock.

inflows and *decreased by cash outflows*. Also note that the firm's cash flows can be divided into (1) operating flows, (2) investment flows, and (3) financing flows. The **operating flows** are cash inflows and outflows directly related to sale and production of the firm's products and services. **Investment flows** are cash flows associated with purchase and sale of both fixed assets and business interests. Clearly, purchase transactions would result in cash outflows, whereas sales transactions would generate cash inflows. The **financing flows** result from debt and equity financing transactions. Incurring (or repaying) either short-term or long-term debt would result in a corresponding cash inflow (or outflow). Similarly, the sale of stock would result in a cash inflow; the payment of cash dividends or repurchase of stock would result in a financing outflow. In combination, the firm's operating, investment, and financing cash flows during a given period affect the firm's cash and marketable securities balances.

Classifying Inflows and Outflows of Cash

The statement of cash flows in effect summarizes the inflows and outflows of cash during a given period. Table 3.3 classifies the basic inflows (sources) and outflows (uses) of cash. For example, if a firm's accounts payable increased by $1,000 during the year, the change would be an *inflow of cash*. If the firm's inventory increased by $2,500, the change would be an *outflow of cash*.

A few additional points can be made with respect to the classification scheme in Table 3.3:

1. A *decrease* in an asset, such as the firm's cash balance, is an *inflow of cash,* because cash that has been tied up in the asset is released and can be used for some other purpose, such as repaying a loan. On the other hand, an *increase* in the firm's cash balance is an *outflow of cash,* because additional cash is being tied up in the firm's cash balance.
2. Depreciation (like amortization and depletion) is a **noncash charge**—an expense that is deducted on the income statement but does not involve the actual outlay of cash during the period. Because it shields the firm from taxes by lowering taxable income, the noncash charge is considered a cash inflow. From a strict accounting perspective, adding depreciation back to the firm's net profits after taxes gives cash flow from operations:

noncash charge
An expense deducted on the income statement but does not involve the actual outlay of cash during the period; includes depreciation, amortization, and depletion.

$$\text{Cash flow from operations} = \text{Net profits after taxes} + \text{Depreciation and other noncash charges} \quad (3.1)$$

TABLE 3.3 The Inflows and Outflows of Cash

Inflows (sources)	Outflows (uses)
Decrease in any asset	Increase in any asset
Increase in any liability	Decrease in any liability
Net profits after taxes	Net loss
Depreciation and other noncash charges	Dividends paid
Sale of stock	Repurchase or retirement of stock

Note that a firm can have a *net loss* (negative net profits after taxes) and still have positive cash flow from operations when depreciation (and other noncash charges) during the period are greater than the net loss. In the statement of cash flows, net profits after taxes (or net losses) and depreciation (and other noncash charges) are therefore treated as separate entries.

3. Because depreciation is treated as a separate cash inflow, only *gross* rather than *net* changes in fixed assets appear on the statement of cash flows. This treatment avoids the potential double counting of depreciation.
4. Direct entries of changes in retained earnings are not included on the statement of cash flows. Instead, entries for items that affect retained earnings appear as net profits or losses after taxes and dividends paid.

Preparing the Statement of Cash Flows

The statement of cash flows for a given period is developed using the income statement for the period, along with the beginning- and end-of-period balance sheets. The income statement for the year ended December 31, 2003, and the December 31 balance sheets for 2002 and 2003 for Baker Corporation are given in Tables 3.4 and 3.5, respectively. The statement of cash flows for the year

TABLE 3.4 Baker Corporation Income Statement ($000) for the Year Ended December 31, 2003

Sales revenue	$1,700
Less: Cost of goods sold	1,000
Gross profits	$ 700
Less: Operating expenses	
Selling expense	$ 70
General and administrative expense	120
Lease expense[a]	40
Depreciation expense	100
Total operating expense	330
Earnings before interest and taxes (EBIT)	$ 370
Less: Interest expense	70
Net profits before taxes	$ 300
Less: Taxes (rate = 40%)	120
Net profits after taxes	$ 180
Less: Preferred stock dividends	10
Earnings available for common stockholders	$ 170
Earnings per share (EPS)[b]	$1.70

[a]Lease expense is shown here as a separate item rather than included as interest expense as specified by the FASB for financial-reporting purposes. The approach used here is consistent with tax-reporting rather than financial-reporting procedures.

[b]Calculated by dividing the earnings available for common stockholders by the number of shares of common stock outstanding ($170,000 ÷ 100,000 shares = $1.70 per share).

TABLE 3.5 Baker Corporation Balance Sheets ($000)

	December 31	
Assets	**2003**	**2002**
Current assets		
Cash	$ 400	$ 300
Marketable securities	600	200
Accounts receivable	400	500
Inventories	600	900
Total current assets	$2,000	$1,900
Gross fixed assets (at cost)		
Land and buildings	$1,200	$1,050
Machinery and equipment	850	800
Furniture and fixtures	300	220
Vehicles	100	80
Other (includes certain leases)	50	50
Total gross fixed assets (at cost)	$2,500	$2,200
Less: Accumulated depreciation	1,300	1,200
Net fixed assets	$1,200	$1,000
Total assets	$3,200	$2,900
Liabilities and Stockholders' Equity		
Current liabilities		
Accounts payable	$ 700	$ 500
Notes payable	600	700
Accruals	100	200
Total current liabilities	$1,400	$1,400
Long-term debt	$ 600	$ 400
Total liabilities	$2,000	$1,800
Stockholders' equity		
Preferred stock	$ 100	$ 100
Common stock—$1.20 par, 100,000 shares outstanding in 2003 and 2002	120	120
Paid-in capital in excess of par on common stock	380	380
Retained earnings	600	500
Total stockholders' equity	$1,200	$1,100
Total liabilities and stockholders' equity	$3,200	$2,900

ended December 31, 2003, for Baker Corporation is presented in Table 3.6. Note that all cash inflows as well as net profits after taxes and depreciation are treated as positive values. All cash outflows, any losses, and dividends paid are treated as negative values. The items in each category—operating, investment, and financing—are totaled, and the three totals are added to get the "Net increase (decrease) in cash and marketable securities" for the period. As a

TABLE 3.6 Baker Corporation Statement of Cash Flows ($000) for the Year Ended December 31, 2003

Cash Flow from Operating Activities		
Net profits after taxes	$180	
Depreciation	100	
Decrease in accounts receivable	100	
Decrease in inventories	300	
Increase in accounts payable	200	
Decrease in accruals	(100)[a]	
Cash provided by operating activities		$780
Cash Flow from Investment Activities		
Increase in gross fixed assets	($300)	
Changes in business interests	0	
Cash provided by investment activities		(300)
Cash Flow from Financing Activities		
Decrease in notes payable	($100)	
Increase in long-term debts	200	
Changes in stockholders' equity[b]	0	
Dividends paid	(80)	
Cash provided by financing activities		20
Net increase in cash and marketable securities		$500

[a] As is customary, parentheses are used to denote a negative number, which in this case is a cash outflow.

[b] Retained earnings are excluded here, because their change is actually reflected in the combination of the "Net profits after taxes" and "Dividends paid" entries.

check, this value should reconcile with the actual change in cash and marketable securities for the year, which is obtained from the beginning- and end-of-period balance sheets.

Interpreting the Statement

The statement of cash flows allows the financial manager and other interested parties to analyze the firm's cash flow. The manager should pay special attention both to the major categories of cash flow and to the individual items of cash inflow and outflow, to assess whether any developments have occurred that are contrary to the company's financial policies. In addition, the statement can be used to evaluate progress toward projected goals or to isolate inefficiencies. For example, increases in accounts receivable or inventories resulting in major cash outflows may signal credit or inventory problems, respectively. The financial manager also can prepare a statement of cash flows developed from projected financial statements. This approach can be used to determine whether planned actions are desirable in view of the resulting cash flows.

An understanding of the basic financial principles presented throughout this text is absolutely essential to the effective interpretation of the statement of cash flows.

Operating Cash Flow

operating cash flow (OCF)
The cash flow a firm generates from its normal operations; calculated as EBIT − taxes + depreciation.

A firm's **operating cash flow (OCF)** is the cash flow it generates from its normal operations—producing and selling its output of goods or services. A variety of definitions of OCF can be found in the financial literature. Equation 3.1 introduced the simple accounting definition of cash flow from operations. Here we refine this definition to estimate cash flows more accurately. Unlike the earlier definition, this one excludes interest and taxes in order to focus on the true cash flow resulting from operations without regard to financing costs and taxes. Operating cash flow (OCF) is defined in Equation 3.2.

$$\text{OCF} = \text{EBIT} - \text{Taxes} + \text{Depreciation} \quad (3.2)$$

EXAMPLE

Substituting the values for Baker Corporation from its income statement (Table 3.4) into Equation 3.2, we get

$$\text{OCF} = \$370 - \$120 + \$100 = \$350$$

Baker Corporation during 2003 generated $350,000 of cash flow from producing and selling its output. Because Baker's operating cash flow is positive, we can conclude that the firm's operations are generating positive cash flows.

Comparing Equations 3.1 and 3.2 reveals that the key difference between the accounting and finance definitions of operating cash flow is that the finance definition excludes interest as an operating flow, whereas the accounting definition in effect includes it as an operating flow. In the unlikely case that a firm had no interest expense, the accounting (Equation 3.1) and finance (Equation 3.2) definitions of operating cash flow would be the same.

Free Cash Flow

free cash flow (FCF)
The amount of cash flow available to investors (creditors and owners) after the firm has met all operating needs and paid for investments in net fixed assets and net current assets.

The firm's **free cash flow (FCF)** represents the amount of cash flow available to investors—the providers of debt (creditors) and equity (owners)—after the firm has met all operating needs and paid for investments in net fixed assets and net current assets. It represents the summation of the net amount of cash flow available to creditors and owners during the period. Free cash flow can be defined by Equation 3.3.

$$\text{FCF} = \text{OCF} - \text{Net fixed asset investment (NFAI)} - \text{Net current asset investment (NCAI)} \quad (3.3)$$

The *net fixed asset investment* (*NFAI*) can be calculated as shown in Equation 3.4.

$$\text{NFAI} = \text{Change in net fixed assets} + \text{Depreciation} \quad (3.4)$$

EXAMPLE

Using the Baker Corporation's balance sheets in Table 3.5, we see that its change in net fixed assets between 2002 and 2003 was +$200 ($1,200 in 2003 − $1,000 in 2002). Substituting this value and the $100 of depreciation for 2003 into Equation 3.4, we get Baker's net fixed asset investment (NFAI) for 2003:

$$\text{NFAI} = \$200 + \$100 = \$300$$

Baker Corporation therefore invested a net $300,000 in fixed assets during 2003. This amount would, of course, represent a net cash outflow to acquire fixed assets during 2003.

Looking at Equation 3.4, we can see that if the depreciation during a year is less than the *decrease* during that year in net fixed assets, the NFAI would be negative. A negative NFAI represents a net cash *inflow* attributable to the fact that the firm sold more assets than it acquired during the year.

The *net current asset investment (NCAI)* represents the net investment made by the firm in its current (operating) assets. "Net" refers to the difference between current assets and spontaneous current liabilities, which typically include accounts payable and accruals. Because they are a negotiated source of short-term financing, notes payable are not included in the NCAI calculation. Instead, they serve as a creditor claim on the firm's free cash flow. Equation 3.5 shows the NCAI calculation.

$$\text{NCAI} = \text{Change in current assets} - \text{Change in spontaneous current liabilities (Accounts payable + Accruals)} \quad (3.5)$$

EXAMPLE Looking at the Baker Corporation's balance sheets for 2002 and 2003 in Table 3.5, we see that the change in current assets between 2002 and 2003 is +$100 ($2,000 in 2003 − $1,900 in 2002). The difference between Baker's accounts payable plus accruals of $800 in 2003 ($700 in accounts payable + $100 in accruals) and of $700 in 2002 ($500 in accounts payable + $200 in accruals) is +$100 ($800 in 2003 − $700 in 2002). Substituting into Equation 3.5 the change in current assets and the change in the sum of accounts payable plus accruals for Baker Corporation, we get its 2003 NCAI:

$$\text{NCAI} = \$100 - \$100 = \$0$$

This means that during 2003 Baker Corporation made no investment ($0) in its current assets net of spontaneous current liabilities.

Now we can substitute Baker Corporation's 2003 operating cash flow (OCF) of $350, its net fixed asset investment (NFAI) of $300, and its net current asset investment (NCAI) of $0 into Equation 3.3 to find its free cash flow (FCF):

$$\text{FCF} = \$350 - \$300 - \$0 = \$50$$

We can see that during 2003 Baker generated $50,000 of free cash flow, which it can use to pay its investors—creditors (payment of interest) and owners (payment of dividends). Thus, the firm generated adequate cash flow to cover all of its operating costs and investments and had free cash flow available to pay investors.

Further analysis of free cash flow is beyond the scope of this initial introduction to cash flow. Clearly, cash flow is the lifeblood of the firm. We next consider various aspects of financial planning for cash flow and profit.

Review Questions

3–1 Briefly describe the first four modified accelerated cost recovery system (MACRS) property classes and recovery periods. Explain how the depreciation percentages are determined by using the MACRS recovery periods.

3–2 Describe the overall cash flow through the firm in terms of operating flows, investments flows, and financing flows.

3–3 Explain why a decrease in cash is classified as a *cash inflow (source)* and why an increase in cash is classified as a *cash outflow (use)* in preparing the statement of cash flows.

3–4 Why is depreciation (as well as amortization and depletion) considered a *noncash charge?* How do accountants estimate *cash flow from operations?*

3–5 Describe the general format of the statement of cash flows. How are cash inflows differentiated from cash outflows on this statement?

3–6 From a strict financial perspective, define and differentiate between a firm's *operating cash flow (OCF)* and its *free cash flow (FCF)*.

LG3 3.2 The Financial Planning Process

Financial planning is an important aspect of the firm's operations because it provides road maps for guiding, coordinating, and controlling the firm's actions to achieve its objectives. Two key aspects of the financial planning process are *cash planning* and *profit planning*. Cash planning involves preparation of the firm's cash budget. Profit planning involves preparation of pro forma statements. Both the cash budget and the pro forma statements are useful for internal financial planning; they also are routinely required by existing and prospective lenders.

financial planning process
Planning that begins with long-term, or *strategic,* financial plans that in turn guide the formulation of short-term, or *operating,* plans and budgets.

The **financial planning process** begins with long-term, or *strategic,* financial plans. These in turn guide the formulation of short-term, or *operating,* plans and budgets. Generally, the short-term plans and budgets implement the firm's long-term strategic objectives. Although the remainder of this chapter places primary emphasis on short-term financial plans and budgets, a few preliminary comments on long-term financial plans are in order.

Long-Term (Strategic) Financial Plans

long-term (strategic) financial plans
Lay out a company's planned financial actions and the anticipated impact of those actions over periods ranging from 2 to 10 years.

Long-term (strategic) financial plans lay out a company's planned financial actions and the anticipated impact of those actions over periods ranging from 2 to 10 years. Five-year strategic plans, which are revised as significant new information becomes available, are common. Generally, firms that are subject to high degrees of operating uncertainty, relatively short production cycles, or both, tend to use shorter planning horizons.

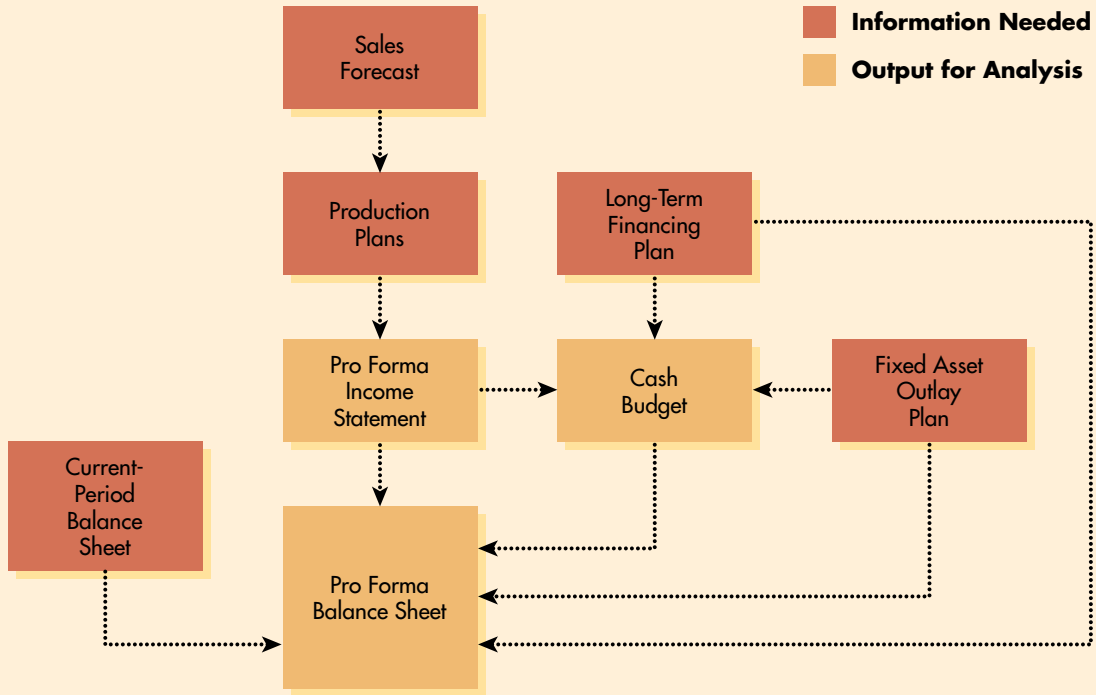
Long-term financial plans are part of an integrated strategy that, along with production and marketing plans, guides the firm toward strategic goals. Those long-term plans consider proposed outlays for fixed assets, research and development activities, marketing and product development actions, capital structure, and major sources of financing. Also included would be termination of existing projects, product lines, or lines of business; repayment or retirement of outstanding debts; and any planned acquisitions. Such plans tend to be supported by a series of annual budgets and profit plans.

Short-Term (Operating) Financial Plans

short-term (operating) financial plans
Specify short-term financial actions and the anticipated impact of those actions.

Short-term (operating) financial plans specify short-term financial actions and the anticipated impact of those actions. These plans most often cover a 1- to 2-year period. Key inputs include the sales forecast and various forms of operating and financial data. Key outputs include a number of operating budgets, the cash bud-

FIGURE 3.2 **Short-Term Financial Planning**
The short-term (operating) financial planning process



get, and pro forma financial statements. The entire short-term financial planning process is outlined in Figure 3.2.

Hint Electronic spreadsheets such as Excel and Lotus 1–2–3 are widely used to streamline the process of preparing and evaluating these short-term financial planning statements.

Short-term financial planning begins with the sales forecast. From it, production plans are developed that take into account lead (preparation) times and include estimates of the required raw materials. Using the production plans, the firm can estimate direct labor requirements, factory overhead outlays, and operating expenses. Once these estimates have been made, the firm's pro forma income statement and cash budget can be prepared. With the basic inputs (pro forma income statement, cash budget, fixed asset outlay plan, long-term financing plan, and current-period balance sheet), the pro forma balance sheet can finally be developed.

Throughout the remainder of this chapter, we will concentrate on the key outputs of the short-term financial planning process: the cash budget, the pro forma income statement, and the pro forma balance sheet.

Review Questions

3–7 What is the *financial planning process?* Contrast *long-term (strategic) financial plans* and *short-term (operating) financial plans.*

3–8 Which three statements result as part of the short-term (operating) financial planning process?

3.3 Cash Planning: Cash Budgets

cash budget (cash forecast)
A statement of the firm's planned inflows and outflows of cash that is used to estimate its short-term cash requirements.

The **cash budget,** or **cash forecast,** is a statement of the firm's planned inflows and outflows of cash. It is used by the firm to estimate its short-term cash requirements, with particular attention to planning for surplus cash and for cash shortages.

Typically, the cash budget is designed to cover a 1-year period, divided into smaller time intervals. The number and type of intervals depend on the nature of the business. The more seasonal and uncertain a firm's cash flows, the greater the number of intervals. Because many firms are confronted with a seasonal cash flow pattern, the cash budget is quite often presented on a monthly basis. Firms with stable patterns of cash flow may use quarterly or annual time intervals.

The Sales Forecast

sales forecast
The prediction of the firm's sales over a given period, based on external and/or internal data; used as the key input to the short-term financial planning process.

The key input to the short-term financial planning process is the firm's **sales forecast.** This prediction of the firm's sales over a given period is ordinarily prepared by the marketing department. On the basis of the sales forecast, the financial manager estimates the monthly cash flows that will result from projected sales receipts and from outlays related to production, inventory, and sales. The manager also determines the level of fixed assets required and the amount of financing, if any, needed to support the forecast level of sales and production. In practice, obtaining good data is the most difficult aspect of forecasting.[4] The sales forecast may be based on an analysis of external data, internal data, or a combination of the two.

external forecast
A sales forecast based on the relationships observed between the firm's sales and certain key external economic indicators.

An **external forecast** is based on the relationships observed between the firm's sales and certain key external economic indicators such as the gross domestic product (GDP), new housing starts, consumer confidence, and disposable personal income. Forecasts containing these indicators are readily available. Because the firm's sales are often closely related to some aspect of overall national economic activity, a forecast of economic activity should provide insight into future sales.

internal forecast
A sales forecast based on a buildup, or consensus, of sales forecasts through the firm's own sales channels.

Internal forecasts are based on a buildup, or consensus, of sales forecasts through the firm's own sales channels. Typically, the firm's salespeople in the field are asked to estimate how many units of each type of product they expect to sell in the coming year. These forecasts are collected and totaled by the sales manager, who may adjust the figures using knowledge of specific markets or of the salesperson's forecasting ability. Finally, adjustments may be made for additional internal factors, such as production capabilities.

Firms generally use a combination of external and internal forecast data to make the final sales forecast. The internal data provide insight into sales expectations, and the external data provide a means of adjusting these expectations to take into account general economic factors. The nature of the firm's product also often affects the mix and types of forecasting methods used.

Hint The firm needs to spend a great deal of time and effort to make the sales forecast as precise as possible. An "after-the-fact" analysis of the prior year's forecast can help the firm determine which approach or combination of approaches will give it the most accurate forecasts.

4. Calculation of the various forecasting techniques, such as regression, moving averages, and exponential smoothing, is not included in this text. For a description of the technical side of forecasting, refer to a basic statistics, econometrics, or management science text.

TABLE 3.7 The General Format of the Cash Budget

	Jan.	Feb.	. . .	Nov.	Dec.
Cash receipts	$XXX	$XXG		$XXM	$XXT
Less: Cash disbursements	XXA	XXH	. . .	XXN	XXU
Net cash flow	$XXB	$XXI		$XXO	$XXV
Add: Beginning cash	XXC	XXD	XXJ	XXP	XXQ
Ending cash	$XXD	$XXJ		$XXQ	$XXW
Less: Minimum cash balance	XXE	XXK	. . .	XXR	XXY
Required total financing		$XXL		$XXS	
Excess cash balance	$XXF				$XXZ

Preparing the Cash Budget

The general format of the cash budget is presented in Table 3.7. We will discuss each of its components individually.

Cash Receipts

cash receipts
All of a firm's inflows of cash in a given financial period.

Cash receipts include all of a firm's inflows of cash in a given financial period. The most common components of cash receipts are cash sales, collections of accounts receivable, and other cash receipts.

EXAMPLE

Coulson Industries, a defense contractor, is developing a cash budget for October, November, and December. Coulson's sales in August and September were $100,000 and $200,000, respectively. Sales of $400,000, $300,000, and $200,000 have been forecast for October, November, and December, respectively. Historically, 20% of the firm's sales have been for cash, 50% have generated accounts receivable collected after 1 month, and the remaining 30% have generated accounts receivable collected after 2 months. Bad-debt expenses (uncollectible accounts) have been negligible.[5] In December, the firm will receive a $30,000 dividend from stock in a subsidiary. The schedule of expected cash receipts for the company is presented in Table 3.8. It contains the following items:

Forecast sales This initial entry is *merely informational*. It is provided as an aid in calculating other sales-related items.

Cash sales The cash sales shown for each month represent 20% of the total sales forecast for that month.

Collections of A/R These entries represent the collection of accounts receivable (A/R) resulting from sales in earlier months.

5. Normally, it would be expected that the collection percentages would total slightly less than 100%, because some of the accounts receivable would be uncollectible. In this example, the sum of the collection percentages is 100% (20% + 50% + 30%), which reflects the fact that all sales are assumed to be collected.

TABLE 3.8 A Schedule of Projected Cash Receipts for Coulson Industries ($000)

Forecast sales	Aug. $100	Sept. $200	Oct. $400	Nov. $300	Dec. $200
Cash sales (0.20)	$20	$40	$ 80	$ 60	$ 40
Collections of A/R:					
Lagged 1 month (0.50)		50	100	200	150
Lagged 2 months (0.30)			30	60	120
Other cash receipts			___	___	30
Total cash receipts			$210	$320	$340

Lagged 1 month These figures represent sales made in the preceding month that generated accounts receivable collected in the current month. Because 50% of the current month's sales are collected 1 month later, the collections of A/R with a 1-month lag shown for September represent 50% of the sales in August, collections for October represent 50% of September sales, and so on.

Lagged 2 months These figures represent sales made 2 months earlier that generated accounts receivable collected in the current month. Because 30% of sales are collected 2 months later, the collections with a 2-month lag shown for October represent 30% of the sales in August, and so on.

Other cash receipts These are cash receipts expected from sources other than sales. Interest received, dividends received, proceeds from the sale of equipment, stock and bond sale proceeds, and lease receipts may show up here. For Coulson Industries, the only other cash receipt is the $30,000 dividend due in December.

Total cash receipts This figure represents the total of all the cash receipts listed for each month. For Coulson Industries, we are concerned only with October, November, and December, as shown in Table 3.8.

Cash Disbursements

cash disbursements
All outlays of cash by the firm during a given financial period.

Cash disbursements include all outlays of cash by the firm during a given financial period. The most common cash disbursements are

Cash purchases	Fixed-asset outlays
Payments of accounts payable	Interest payments
Rent (and lease) payments	Cash dividend payments
Wages and salaries	Principal payments (loans)
Tax payments	Repurchases or retirements of stock

It is important to recognize that *depreciation and other noncash charges are NOT included in the cash budget,* because they merely represent a scheduled write-off of an earlier cash outflow. The impact of depreciation, as we noted earlier, is reflected in the reduced cash outflow for tax payments.

In Practice

FOCUS ON PRACTICE Cash Forecasts Needed, "Rain or Shine"

Given the importance of cash to sound financial management, it is surprising how many companies ignore the cash-forecasting process. Three reasons come up most often: Cash forecasts are always wrong, they're hard to do, and managers don't see the benefits of these forecasts unless the company is already in a cash crunch. In addition, each company has its own methodology for cash forecasting. If the firm's cash inflows and outflows don't form a pattern that managers can graph, it's tough to develop successful forecasts.

Yet the reasons to forecast cash are equally compelling: Cash forecasts provide for reliable liquidity, enable a company to minimize borrowing costs or maximize investment income, and help financial executives manage currency exposures more accurately. In times of tight credit, lenders expect borrowers to monitor cash carefully and will favor a company that prepares good cash forecasts. When cash needs and the forecasted cash position don't match, financial managers can plan for borrowed funds to close the gap.

New York City–based men's apparel manufacturer **Salant Corp.** closely integrates its financial plans and forecasts. "Our biggest challenge is to keep the cash forecast and the projected profit and loss in sync with the balance sheet and vice versa," says William R. Bennett, vice president and treasurer. "We learned that the hard way and developed our own spreadsheet-based model." Although complicated to build, the model is easy for managers to use.

Salant is a capital-intensive operation, so its liquidity is linked to its assets. Bennett uses the forecast of inventory and receivables as the forecast for borrowing capacity required to meet its operating needs.

Like Salant, many companies are using technology to demystify cash forecasts. Software can apply statistical techniques, graph historical data, or build models based on each customer's payment patterns. It can also tap corporate databases for the firm's purchases and associated payment information and order shipments to customers and the associated payment terms. These data increase forecast accuracy.

Sources: Adapted from Richard H. Gamble, "Cash Forecast: Cloudy But Clearing," *Business Finance* (May 2001), downloaded from *www.businessfinancemag.com;* "Profile: Salant Corp.," *Yahoo! Finance, www.biz.yahoo.com,* downloaded November 19, 2001.

EXAMPLE Coulson Industries has gathered the following data needed for the preparation of a cash disbursements schedule for October, November, and December.

Purchases The firm's purchases represent 70% of sales. Of this amount, 10% is paid in cash, 70% is paid in the month immediately following the month of purchase, and the remaining 20% is paid 2 months following the month of purchase.[6]

Rent payments Rent of $5,000 will be paid each month.

Wages and salaries Fixed salary cost for the year is $96,000, or $8,000 per month. In addition, wages are estimated as 10% of monthly sales.

Tax payments Taxes of $25,000 must be paid in December.

Fixed-asset outlays New machinery costing $130,000 will be purchased and paid for in November.

Interest payments An interest payment of $10,000 is due in December.

6. Unlike the collection percentages for sales, the total of the payment percentages should equal 100%, because it is expected that the firm will pay off all of its accounts payable.

Cash dividend payments Cash dividends of $20,000 will be paid in October.

Principal payments (loans) A $20,000 principal payment is due in December.

Repurchases or retirements of stock No repurchase or retirement of stock is expected between October and December.

The firm's cash disbursements schedule, using the preceding data, is shown in Table 3.9. Some items in the table are explained in greater detail below.

Purchases This entry is *merely informational*. The figures represent 70% of the forecast sales for each month. They have been included to facilitate calculation of the cash purchases and related payments.

Cash purchases The cash purchases for each month represent 10% of the month's purchases.

Payments of A/P These entries represent the payment of accounts payable (A/P) resulting from purchases in earlier months.

Lagged 1 month These figures represent purchases made in the preceding month that are paid for in the current month. Because 70% of the firm's purchases are paid for 1 month later, the payments with a 1-month lag shown for September represent 70% of the August purchases, payments for October represent 70% of September purchases, and so on.

Lagged 2 months These figures represent purchases made 2 months earlier that are paid for in the current month. Because 20% of the firm's purchases are paid for 2 months later, the payments with a 2-month lag for October represent 20% of the August purchases, and so on.

TABLE 3.9 A Schedule of Projected Cash Disbursements for Coulson Industries ($000)

Purchases (0.70 × sales)	Aug. $70	Sept. $140	Oct. $280	Nov. $210	Dec. $140
Cash purchases (0.10)	$7	$14	$ 28	$ 21	$ 14
Payments of A/P:					
Lagged 1 month (0.70)		49	98	196	147
Lagged 2 months (0.20)			14	28	56
Rent payments			5	5	5
Wages and salaries			48	38	28
Tax payments					25
Fixed-asset outlays				130	
Interest payments					10
Cash dividend payments			20		
Principal payments					20
Total cash disbursements			$213	$418	$305

Wages and salaries These amounts were obtained by adding $8,000 to 10% of the *sales* in each month. The $8,000 represents the salary component; the rest represents wages.

The remaining items on the cash disbursements schedule are self-explanatory.

net cash flow
The mathematical difference between the firm's cash receipts and its cash disbursements in each period.

ending cash
The sum of the firm's beginning cash and its net cash flow for the period.

required total financing
Amount of funds needed by the firm if the ending cash for the period is less than the desired minimum cash balance; typically represented by notes payable.

Net Cash Flow, Ending Cash, Financing, and Excess Cash

Look back at the general-format cash budget in Table 3.7. We have inputs for the first two entries, and we now continue calculating the firm's cash needs. The firm's **net cash flow** is found by subtracting the cash disbursements from cash receipts in each period. Then we add beginning cash to the firm's net cash flow to determine the **ending cash** for each period. Finally, we subtract the desired minimum cash balance from ending cash to find the **required total financing** or the **excess cash balance.** If the ending cash is less than the minimum cash balance, *financing* is required. Such financing is typically viewed as short-term and is therefore represented by notes payable. If the ending cash is greater than the minimum cash balance, *excess cash* exists. Any excess cash is assumed to be invested in a liquid, short-term, interest-paying vehicle—that is, in marketable securities.

EXAMPLE

Table 3.10 presents Coulson Industries' cash budget, based on the data already developed. At the end of September, Coulson's cash balance was $50,000, and its notes payable and marketable securities equaled $0.[7] The company wishes to maintain, as a reserve for unexpected needs, a minimum cash balance of $25,000.

excess cash balance
The (excess) amount available for investment by the firm if the period's ending cash is greater than the desired minimum cash balance; assumed to be invested in marketable securities.

TABLE 3.10 A Cash Budget for Coulson Industries ($000)

	Oct.	Nov.	Dec.
Total cash receipts[a]	$210	$320	$340
Less: Total cash disbursements[b]	213	418	305
Net cash flow	($ 3)	($ 98)	$ 35
Add: Beginning cash	50	47	(51)
Ending cash	$ 47	($ 51)	($ 16)
Less: Minimum cash balance	25	25	25
Required total financing (notes payable)[c]	—	$ 76	$ 41
Excess cash balance (marketable securities)[d]	$ 22	—	—

[a]From Table 3.8.
[b]From Table 3.9.
[c]Values are placed in this line when the ending cash is less than the desired minimum cash balance. These amounts are typically financed short-term and therefore are represented by notes payable.
[d]Values are placed in this line when the ending cash is greater than the desired minimum cash balance. These amounts are typically assumed to be invested short-term and therefore are represented by marketable securities.

7. If Coulson either had outstanding notes payable or held marketable securities at the end of September, its "beginning cash" value would be misleading. It could be either overstated or understated, depending on whether the firm had notes payable or marketable securities on its books at that time. For simplicity, the cash budget discussions and problems presented in this chapter assume that the firm's notes payable and marketable securities equal $0 at the beginning of the period of concern.

For Coulson Industries to maintain its required $25,000 ending cash balance, it will need total borrowing of $76,000 in November and $41,000 in December. In October the firm will have an excess cash balance of $22,000, which can be held in an interest-earning marketable security. The required total financing figures in the cash budget refer to *how much will be owed at the end of the month;* they do *not* represent the monthly changes in borrowing.

The monthly changes in borrowing and in excess cash can be found by further analyzing the cash budget. In October the $50,000 beginning cash, which becomes $47,000 after the $3,000 net cash outflow, results in a $22,000 excess cash balance once the $25,000 minimum cash is deducted. In November the $76,000 of required total financing resulted from the $98,000 net cash outflow less the $22,000 of excess cash from October. The $41,000 of required total financing in December resulted from reducing November's $76,000 of required total financing by the $35,000 of net cash inflow during December. Summarizing, the financial activities for each month would be as follows:

October:	Invest the $22,000 excess cash balance in marketable securities.
November:	Liquidate the $22,000 of marketable securities and borrow $76,000 (notes payable).
December:	Repay $35,000 of notes payable to leave $41,000 of outstanding required total financing.

Hint Not only is the cash budget a great tool to let management know when it has cash shortages or excesses, but it may be a document required by potential creditors. It communicates to them what the money is going to be used for, and how and when their loan will be repaid.

Evaluating the Cash Budget

The cash budget indicates whether a cash shortage or surplus is expected in each of the months covered by the forecast. Each month's figure is based on the internally imposed requirement of a minimum cash balance and *represents the total balance at the end of the month*.

At the end of each of the 3 months, Coulson expects the following balances in cash, marketable securities, and notes payable:

	End-of-month balance ($000)		
Account	Oct.	Nov.	Dec.
Cash	$25	$25	$25
Marketable securities	22	0	0
Notes payable	0	76	41

Note that the firm is assumed first to liquidate its marketable securities to meet deficits and then to borrow with notes payable if additional financing is needed. As a result, it will not have marketable securities and notes payable on its books at the same time.

Hint Because of the uncertainty of the ending cash values, the financial manager will usually seek to borrow more than the maximum financing indicated in the cash budget.

Because it may be necessary to borrow up to $76,000 for the 3-month period, the financial manager should be certain that some arrangement is made to ensure the availability of these funds.

Coping with Uncertainty in the Cash Budget

Aside from careful estimation of cash budget inputs, there are two ways of coping with the uncertainty of the cash budget.[8] One is to prepare several cash budgets—based on pessimistic, most likely, and optimistic forecasts. From this range of cash flows, the financial manager can determine the amount of financing necessary to cover the most adverse situation. The use of several cash budgets, based on differing assumptions, also should give the financial manager a sense of the riskiness of various alternatives. This *sensitivity analysis*, or "what if" approach, is often used to analyze cash flows under a variety of circumstances. Computers and electronic spreadsheets simplify the process of performing sensitivity analysis.

EXAMPLE Table 3.11 presents the summary of Coulson Industries' cash budget prepared for each month of concern using pessimistic, most likely, and optimistic estimates of total cash receipts and disbursements. The most likely estimate is based on the expected outcomes presented earlier.

During October, Coulson will, at worst, need a maximum of $15,000 of financing and, at best, will have a $62,000 excess cash balance. During November, its financing requirement will be between $0 and $185,000, or it could experience an excess cash balance of $5,000. The December projections show maximum borrowing of $190,000 with a possible excess cash balance of

TABLE 3.11 A Sensitivity Analysis of Coulson Industries' Cash Budget ($000)

	October			November			December		
	Pessimistic	Most likely	Optimistic	Pessimistic	Most likely	Optimistic	Pessimistic	Most likely	Optimistic
Total cash receipts	$160	$210	$285	$210	$320	$ 410	$275	$340	$422
Less: Total cash disbursements	200	213	248	380	418	467	280	305	320
Net cash flow	($ 40)	($ 3)	$ 37	($170)	($ 98)	($ 57)	($ 5)	$ 35	$102
Add: Beginning cash	50	50	50	10	47	87	(160)	(51)	30
Ending cash	$ 10	$ 47	$ 87	($160)	($ 51)	$ 30	($165)	($ 16)	$132
Less: Minimum cash balance	25	25	25	25	25	25	25	25	25
Required total financing	$ 15	—	—	$185	$ 76	—	$190	$ 41	—
Excess cash balance	—	$ 22	$ 62	—	—	$ 5	—	—	$107

8. The term *uncertainty* is used here to refer to the variability of the cash flow outcomes that may actually occur.

$107,000. By considering the extreme values in the pessimistic and optimistic outcomes, Coulson Industries should be better able to plan its cash requirements. For the 3-month period, the peak borrowing requirement under the worst circumstances would be $190,000, which happens to be considerably greater than the most likely estimate of $76,000 for this period.

A second and much more sophisticated way of coping with uncertainty in the cash budget is *simulation* (discussed in Chapter 10). By simulating the occurrence of sales and other uncertain events, the firm can develop a probability distribution of its ending cash flows for each month. The financial decision maker can then use the probability distribution to determine the amount of financing needed to protect the firm adequately against a cash shortage.

Cash Flow Within the Month

Because the cash budget shows cash flows only on a total monthly basis, the information provided by the cash budget is not necessarily adequate for ensuring solvency. A firm must look more closely at its pattern of daily cash receipts and cash disbursements to ensure that adequate cash is available for paying bills as they come due. For an example related to this topic, see the book's Web site at www.aw.com/gitman.

The synchronization of cash flows in the cash budget at month-end does not ensure that the firm will be able to meet daily cash requirements. Because a firm's cash flows are generally quite variable when viewed on a daily basis, effective cash planning requires a look *beyond* the cash budget. The financial manager must therefore plan and monitor cash flow more frequently than on a monthly basis. The greater the variability of cash flows from day to day, the greater the attention required.

Review Questions

3–9 What is the purpose of the *cash budget?* What role does the sales forecast play in its preparation?

3–10 Briefly describe the basic format of the cash budget.

3–11 How can the two "bottom lines" of the cash budget be used to determine the firm's short-term borrowing and investment requirements?

3–12 What is the cause of uncertainty in the cash budget, and what two techniques can be used to cope with this uncertainty?

LG5 3.4 Profit Planning: Pro Forma Statements

pro forma statements
Projected, or forecast, income statements and balance sheets.

Whereas cash planning focuses on forecasting cash flows, *profit planning* relies on accrual concepts to project the firm's profit and overall financial position. Shareholders, creditors, and the firm's management pay close attention to the **pro forma statements,** which are projected, or forecast, income statements and bal-

ance sheets. The basic steps in the short-term financial planning process were shown in the flow diagram of Figure 3.2. Various approaches for estimating the pro forma statements are based on the belief that the financial relationships reflected in the firm's past financial statements will not change in the coming period. The commonly used simplified approaches are presented in subsequent discussions.

Hint A key point in understanding pro forma statements is that they reflect the goals and objectives of the firm for the planning period. In order for these goals and objectives to be achieved, operational plans will have to be developed. Financial plans can be realized only if the correct actions are implemented.

Two inputs are required for preparing pro forma statements: (1) financial statements for the preceding year and (2) the sales forecast for the coming year. A variety of assumptions must also be made. The company that we will use to illustrate the simplified approaches to pro forma preparation is Vectra Manufacturing, which manufactures and sells one product. It has two basic product models—X and Y—which are produced by the same process but require different amounts of raw material and labor.

Preceding Year's Financial Statements

The income statement for the firm's 2003 operations is given in Table 3.12. It indicates that Vectra had sales of $100,000, total cost of goods sold of $80,000, net profits before taxes of $9,000, and net profits after taxes of $7,650. The firm paid $4,000 in cash dividends, leaving $3,650 to be transferred to retained earnings. The firm's balance sheet for 2003 is given in Table 3.13.

TABLE 3.12 Vectra Manufacturing's Income Statement for the Year Ended December 31, 2003

Sales revenue		
Model X (1,000 units at $20/unit)	$20,000	
Model Y (2,000 units at $40/unit)	80,000	
Total sales		$100,000
Less: Cost of goods sold		
Labor	$28,500	
Material A	8,000	
Material B	5,500	
Overhead	38,000	
Total cost of goods sold		80,000
Gross profits		$ 20,000
Less: Operating expenses		10,000
Operating profits		$ 10,000
Less: Interest expense		1,000
Net profits before taxes		$ 9,000
Less: Taxes (0.15 × $9,000)		1,350
Net profits after taxes		$ 7,650
Less: Common stock dividends		4,000
To retained earnings		$ 3,650

TABLE 3.13 Vectra Manufacturing's Balance Sheet, December 31, 2003

Assets		Liabilities and Stockholders' Equity	
Cash	$ 6,000	Accounts payable	$ 7,000
Marketable securities	4,000	Taxes payable	300
Accounts receivable	13,000	Notes payable	8,300
Inventories	16,000	Other current liabilities	3,400
Total current assets	$39,000	Total current liabilities	$19,000
Net fixed assets	$51,000	Long-term debt	$18,000
Total assets	$90,000	Stockholders' equity	
		Common stock	$30,000
		Retained earnings	$23,000
		Total liabilities and stockholders' equity	$90,000

Sales Forecast

Just as for the cash budget, the key input for pro forma statements is the sales forecast. Vectra Manufacturing's sales forecast for the coming year, based on both external and internal data, is presented in Table 3.14. The unit sale prices of the products reflect an increase from $20 to $25 for model X and from $40 to $50 for model Y. These increases are necessary to cover anticipated increases in costs.

Review Question

3–13 What is the purpose of *pro forma statements?* What inputs are required for preparing them using the simplified approaches?

TABLE 3.14 2004 Sales Forecast for Vectra Manufacturing

Unit sales	
Model X	1,500
Model Y	1,950
Dollar sales	
Model X ($25/unit)	$ 37,500
Model Y ($50/unit)	97,500
Total	$135,000

LG5 3.5 Preparing the Pro Forma Income Statement

percent-of-sales method
A simple method for developing the pro forma income statement; it forecasts sales and then expresses the various income statement items as percentages of projected sales.

A simple method for developing a pro forma income statement is the **percent-of-sales method.** It forecasts sales and then expresses the various income statement items as percentages of projected sales. The percentages used are likely to be the percentages of sales for those items in the previous year. By using dollar values taken from Vectra's 2003 income statement (Table 3.12), we find that these percentages are

$$\frac{\text{Cost of goods sold}}{\text{Sales}} = \frac{\$80{,}000}{\$100{,}000} = 80.0\%$$

$$\frac{\text{Operating expenses}}{\text{Sales}} = \frac{\$10{,}000}{\$100{,}000} = 10.0\%$$

$$\frac{\text{Interest expense}}{\text{Sales}} = \frac{\$1{,}000}{\$100{,}000} = 1.0\%$$

Applying these percentages to the firm's forecast sales of $135,000 (developed in Table 3.14), we get the 2004 pro forma income statement shown in Table 3.15. We have assumed that Vectra will pay $4,000 in common stock dividends, so the expected contribution to retained earnings is $6,327. This represents a considerable increase over $3,650 in the preceding year (see Table 3.12).

Considering Types of Costs and Expenses

The technique that is used to prepare the pro forma income statement in Table 3.15 assumes that all the firm's costs and expenses are *variable*. That is, we assumed that for a given percentage increase in sales, the same percentage increase

TABLE 3.15 A Pro Forma Income Statement, Using the Percent-of-Sales Method, for Vectra Manufacturing for the Year Ended December 31, 2004

Sales revenue	$135,000
Less: Cost of goods sold (0.80)	108,000
Gross profits	$ 27,000
Less: Operating expenses (0.10)	13,500
Operating profits	$ 13,500
Less: Interest expense (0.01)	1,350
Net profits before taxes	$ 12,150
Less: Taxes (0.15 × $12,150)	1,823
Net profits after taxes	$ 10,327
Less: Common stock dividends	4,000
To retained earnings	$ 6,327

in cost of goods sold, operating expenses, and interest expense would result. For example, as Vectra's sales increased by 35 percent (from $100,000 in 2003 to $135,000 projected for 2004), we assumed that its costs of goods sold also increased by 35 percent (from $80,000 in 2003 to $108,000 in 2004). On the basis of this assumption, the firm's net profits before taxes also increased by 35 percent (from $9,000 in 2003 to $12,150 projected for 2004).

This approach implies that the firm will not receive the benefits that result from fixed costs when sales are increasing.[9] Clearly, though, if the firm has fixed costs, these costs do not change when sales increase; the result is increased profits. But by remaining unchanged when sales decline, these costs tend to lower profits. Therefore, the use of past cost and expense ratios generally *tends to understate profits when sales are increasing.* (Likewise, it *tends to overstate profits when sales are decreasing.*) The best way to adjust for the presence of fixed costs when preparing a pro forma income statement is to break the firm's historical costs and expenses into *fixed* and *variable* components.[10]

EXAMPLE Vectra Manufacturing's 2003 actual and 2004 pro forma income statements, broken into fixed and variable cost and expense components, follow:

Vectra Manufacturing
Income Statements

	2003 Actual	2004 Pro forma
Sales revenue	$100,000	$135,000
Less: Cost of good sold		
Fixed cost	40,000	40,000
Variable cost (0.40 × sales)	40,000	54,000
Gross profits	$ 20,000	$ 41,000
Less: Operating expenses		
Fixed expense	5,000	5,000
Variable expense (0.05 × sales)	5,000	6,750
Operating profits	$ 10,000	$ 29,250
Less: Interest expense (all fixed)	1,000	1,000
Net profits before taxes	$ 9,000	$ 28,250
Less: Taxes (0.15 × net profits before taxes)	1,350	4,238
Net profits after taxes	$ 7,650	$ 24,012

9. The potential returns as well as risks resulting from use of fixed (operating and financial) costs to create "leverage" are discussed in Chapter 12. The key point to recognize here is that when the firm's revenue is *increasing*, fixed costs can magnify returns.

10. The application of *regression analysis*—a statistically based technique for measuring the relationship between variables—to past cost data as they relate to past sales could be used to develop equations that recognize the fixed and variable nature of each cost. Such equations could be employed when preparing the pro forma income statement from the sales forecast. The use of the regression approach in pro forma income statement preparation is widespread, and many computer software packages for use in pro forma preparation rely on this technique. Expanded discussions of the application of this technique can be found in most second-level managerial finance texts.

In Practice

FOCUS ON ETHICS Critical Ethical Lapse at Critical Path

Critical Path provides a fascinating study in how managers can seem to be maximizing shareholder wealth by making financial projections that primarily benefit the managers themselves. This Silicon Valley dot-com publicized wildly optimistic sales projections for its leading-edge corporate e-mail services at a time when its CEO was privately trying to sell the company at a price well above the current stock price. As the fiscal year-end neared and no buyer took the bait, sales personnel and accountants were pressured into doing whatever was necessary to try to approach the projected numbers. *Business Week* quoted a former sales manager: "The line between right and wrong wasn't just blurred—it was wiped out."

Could Critical Path stockholders have benefited if an acquisition had been completed before the actual results were reported? Possibly—although ensuing lawsuits and an SEC investigation into accounting irregularities leave that open to doubt. But there is no doubt that the new acquirer's stockholders would have been shortchanged. So much for maximizing shareholder wealth within ethical constraints!

This isn't just a case of wishful thinking. Managers who anticipated personal profits after taking a public company private through a "leveraged buyout" have occasionally *underestimated* sales and profits so that they would pay a lower price to existing shareholders. The phenomenal trust that stockholders put in financial managers can be easily abused through either misuse of funds or manipulation of the better information that managers possess.

Don't laws and the SEC offer enough protection against publicizing unrealistic financial forecasts? The Private Securities Litigation Reform Act of 1995 requires that companies disclose risks and uncertainties that may cause public "forward-looking statements" not to materialize. Accordingly, **Fifth Third Bankcorp** was careful to note six reasons why the anticipated benefits from its acquisition of **Old Kent Financial** might not come to pass, including changes in bank competition, interest rates, and the general economy. Furthermore, to keep companies from selectively disclosing key developments to Wall Street securities analysts but not to the general public, the SEC adopted Regulation FD (for Fair Disclosure) in 2000. Unfortunately, though, companies do not have to release revisions of forecasts, and this loophole leaves room for the ethical lapses seen at Critical Path.

Breaking Vectra's costs and expenses into fixed and variable components provides a more accurate projection of its pro forma profit. By assuming that *all* costs are variable (as shown in Table 3.15), we find that projected net profits before taxes would continue to equal 9 percent of sales (in 2003, $9,000 net profits before taxes ÷ $100,000 sales). Therefore, the 2004 net profits before taxes would have been $12,150 (0.09 × $135,000 projected sales) instead of the $28,250 obtained by using the firm's fixed-cost–variable-cost breakdown.

Clearly, when using a simplified approach to prepare a pro forma income statement, we should break down costs and expenses into fixed and variable components.

Review Questions

3–14 How is the *percent-of-sales method* used to prepare pro forma income statements?

3–15 Why does the presence of fixed costs cause the percent-of-sales method of pro forma income statement preparation to fail? What is a better method?

LG5 3.6 Preparing the Pro Forma Balance Sheet

judgmental approach
A simplified approach for preparing the pro forma balance sheet under which the values of certain balance sheet accounts are estimated and the firm's external financing is used as a balancing, or "plug," figure.

A number of simplified approaches are available for preparing the pro forma balance sheet. Probably the best and most popular is the **judgmental approach,**[11] under which the values of certain balance sheet accounts are estimated and the firm's external financing is used as a balancing, or "plug," figure. To apply the judgmental approach to prepare Vectra Manufacturing's 2004 pro forma balance sheet, a number of assumptions must be made about levels of various balance sheet accounts:

1. A minimum cash balance of $6,000 is desired.
2. Marketable securities are assumed to remain unchanged from their current level of $4,000.
3. Accounts receivable on average represent 45 days of sales. Because Vectra's annual sales are projected to be $135,000, accounts receivable should average $16,875 (1/8 × $135,000). (Forty-five days expressed fractionally is one-eighth of a year: 45/360 = 1/8.)
4. The ending inventory should remain at a level of about $16,000, of which 25 percent (approximately $4,000) should be raw materials and the remaining 75 percent (approximately $12,000) should consist of finished goods.
5. A new machine costing $20,000 will be purchased. Total depreciation for the year is $8,000. Adding the $20,000 acquisition to the existing net fixed assets of $51,000 and subtracting the depreciation of $8,000 yield net fixed assets of $63,000.
6. Purchases are expected to represent approximately 30% of annual sales, which in this case is approximately $40,500 (0.30 × $135,000). The firm estimates that it can take 72 days on average to satisfy its accounts payable. Thus accounts payable should equal one-fifth (72 days ÷ 360 days) of the firm's purchases, or $8,100 (1/5 × $40,500).
7. Taxes payable are expected to equal one-fourth of the current year's tax liability, which equals $455 (one-fourth of the tax liability of $1,823 shown in the pro forma income statement in Table 3.15).
8. Notes payable are assumed to remain unchanged from their current level of $8,300.
9. No change in other current liabilities is expected. They remain at the level of the previous year: $3,400.
10. The firm's long-term debt and its common stock are expected to remain unchanged at $18,000 and $30,000, respectively; no issues, retirements, or repurchases of bonds or stocks are planned.
11. Retained earnings will increase from the beginning level of $23,000 (from the balance sheet dated December 31, 2003, in Table 3.13) to $29,327. The increase of $6,327 represents the amount of retained earnings calculated in the year-end 2004 pro forma income statement in Table 3.15.

external financing required ("plug" figure)
Under the judgmental approach for developing a pro forma balance sheet, the amount of external financing needed to bring the statement into balance.

A 2004 pro forma balance sheet for Vectra Manufacturing based on these assumptions is presented in Table 3.16. A **"plug" figure**—called the **external fi-**

11. The judgmental approach represents an improved version of the often discussed *percent-of-sales approach* to pro forma balance sheet preparation. Because the judgmental approach requires only slightly more information and should yield better estimates than the somewhat naive percent-of-sales approach, it is presented here.

TABLE 3.16 A Pro Forma Balance Sheet, Using the Judgmental Approach, for Vectra Manufacturing (December 31, 2004)

Assets			Liabilities and Stockholders' Equity	
Cash		$ 6,000	Accounts payable	$ 8,100
Marketable securities		4,000	Taxes payable	455
Accounts receivable		16,875	Notes payable	8,300
Inventories			Other current liabilities	3,400
Raw materials	$ 4,000		Total current liabilities	$ 20,255
Finished goods	12,000		Long-term debt	$ 18,000
Total inventory		16,000	Stockholders' equity	
Total current assets		$ 42,875	Common stock	$ 30,000
Net fixed assets		$ 63,000	Retained earnings	$ 29,327
Total assets		$105,875	Total	$ 97,582
			External financing required[a]	$ 8,293
			Total liabilities and stockholders' equity	$105,875

[a]The amount of external financing needed to force the firm's balance sheet to balance. Because of the nature of the judgmental approach, the balance sheet is not expected to balance without some type of adjustment.

nancing required—of $8,293 is needed to bring the statement into balance. This means that the firm will have to obtain about $8,293 of additional external financing to support the increased sales level of $135,000 for 2004.

A *positive* value for "external financing required," like that shown in Table 3.16, means that to support the forecast level of operation, the firm must raise funds externally using debt and/or equity financing or by reducing dividends. Once the form of financing is determined, the pro forma balance sheet is modified to replace "external financing required" with the planned increases in the debt and/or equity accounts.

A *negative* value for "external financing required" indicates that the firm's forecast financing is in excess of its needs. In this case, funds are available for use in repaying debt, repurchasing stock, or increasing dividends. Once the specific actions are determined, "external financing required" is replaced in the pro forma balance sheet with the planned reductions in the debt and/or equity accounts. Obviously, besides being used to prepare the pro forma balance sheet, the judgmental approach is also frequently used specifically to estimate the firm's financing requirements.

Review Questions

3–16 Describe the *judgmental approach* for simplified preparation of the pro forma balance sheet.

3–17 What is the significance of the "plug" figure, *external financing required?* Differentiate between strategies associated with positive and with negative values for external financing required.

3.7 Evaluation of Pro Forma Statements

It is difficult to forecast the many variables involved in preparing pro forma statements. As a result, investors, lenders, and managers frequently use the techniques presented in this chapter to make rough estimates of pro forma financial statements. However, it is important to recognize the basic weaknesses of these simplified approaches. The weaknesses lie in two assumptions: (1) that the firm's past financial condition is an accurate indicator of its future, and (2) that certain variables (such as cash, accounts receivable, and inventories) can be forced to take on certain "desired" values. These assumptions cannot be justified solely on the basis of their ability to simplify the calculations involved. However, despite their weaknesses, the simplified approaches to pro forma statement preparation are likely to remain popular because of their relative simplicity. Eventually, the use of computers to streamline financial planning will become the norm.

However pro forma statements are prepared, analysts must understand how to use them to make financial decisions. Both financial managers and lenders can use pro forma statements to analyze the firm's inflows and outflows of cash, as well as its liquidity, activity, debt, profitability, and market value. Various ratios can be calculated from the pro forma income statement and balance sheet to evaluate performance. Cash inflows and outflows can be evaluated by preparing a pro forma statement of cash flows. After analyzing the pro forma statements, the financial manager can take steps to adjust planned operations to achieve short-term financial goals. For example, if projected profits on the pro forma income statement are too low, a variety of pricing and/or cost-cutting actions might be initiated. If the projected level of accounts receivable on the pro forma balance sheet is too high, changes in credit or collection policy may be called for. Pro forma statements are therefore of great importance in solidifying the firm's financial plans for the coming year.

Review Questions

3–18 What are the two key weaknesses of the simplified approaches to preparing pro forma statements?

3–19 What is the financial manager's objective in evaluating pro forma statements?

SUMMARY

FOCUS ON VALUE

Cash flow, the lifeblood of the firm, is a key determinant of the value of the firm. The financial manager must plan and manage—create, allocate, conserve, and monitor—the firm's cash flow. The goal is to ensure the firm's solvency by meeting financial obligations in a

timely manner and to generate positive cash flow for the firm's owners. Both the magnitude and the risk of the cash flows generated on behalf of the owners determine the firm's value.

In order to carry out the responsibility **to create value for owners,** the financial manager uses tools such as cash budgets and pro forma financial statements as part of the process of generating positive cash flow. Good financial plans should result in large free cash flows that fully satisfy creditor claims and produce positive cash flows on behalf of owners. Clearly, the financial manager must use deliberate and careful planning and management of the firm's cash flows in order to achieve the firm's goal of maximizing share price.

REVIEW OF LEARNING GOALS

LG1 **Understand the effect of depreciation on the firm's cash flows, the depreciable value of an asset, its depreciable life, and tax depreciation methods.** Depreciation is an important factor affecting a firm's cash flow. The depreciable value of an asset and its depreciable life are determined by using the modified accelerated cost recovery system (MACRS) standards in the federal tax code. MACRS groups assets (excluding real estate) into six property classes based on length of recovery period—3, 5, 7, 10, 15, and 20 years—and can be applied over the appropriate period by using a schedule of yearly depreciation percentages for each period.

LG2 **Discuss the firm's statement of cash flows, operating cash flow, and free cash flow.** The statement of cash flows is divided into operating, investment, and financing flows. It reconciles changes in the firm's cash flows with changes in cash and marketable securities for the period. Interpreting the statement of cash flows requires an understanding of basic financial principles and involves both the major categories of cash flow and the individual items of cash inflow and outflow. From a strict financial point of view, a firm's operating cash flows, the cash flow it generates from normal operations, is defined to exclude interest and taxes; the simpler accounting view does not make these exclusions. Of greater importance is a firm's free cash flow, which is the amount of cash flow available to investors—the providers of debt (creditors) and equity (owners).

LG3 **Understand the financial planning process, including long-term (strategic) financial plans and short-term (operating) financial plans.** The two key aspects of the financial planning process are cash planning and profit planning. Cash planning involves the cash budget or cash forecast. Profit planning relies on the pro forma income statement and balance sheet. Long-term (strategic) financial plans act as a guide for preparing short-term (operating) financial plans. Long-term plans tend to cover periods ranging from 2 to 10 years and are updated periodically. Short-term plans most often cover a 1- to 2-year period.

LG4 **Discuss the cash-planning process and the preparation, evaluation, and use of the cash budget.** The cash planning process uses the cash budget, based on a sales forecast, to estimate short-term cash surpluses and shortages. The cash budget is typically prepared for a 1-year period divided into months. It nets cash receipts and disbursements for each period to calculate net cash flow. Ending cash is estimated by adding beginning cash to the net cash flow. By subtracting the desired minimum cash balance from the ending cash, the financial manager can determine required total financing (typically borrowing with notes payable) or the excess cash balance (typically investing in marketable securities). To cope with uncertainty in the cash budget, sensitivity analysis or simulation can be used. A firm must also consider its pattern of daily cash receipts and cash disbursements.

LG5 **Explain the simplified procedures used to prepare and evaluate the pro forma income statement and the pro forma balance sheet.** A pro forma income statement can be developed by calculating past percentage relationships between certain cost and expense items and the firm's sales and then ap-

plying these percentages to forecasts. Because this approach implies that all costs and expenses are variable, it tends to understate profits when sales are increasing and to overstate profits when sales are decreasing. This problem can be avoided by breaking down costs and expenses into fixed and variable components. In this case, the fixed components remain unchanged from the most recent year, and the variable costs and expenses are forecast on a percent-of-sales basis.

Under the judgmental approach, the values of certain balance sheet accounts are estimated and others are calculated, frequently on the basis of their relationship to sales. The firm's external financing is used as a balancing, or "plug," figure. A positive value for "external financing required" means that the firm must raise funds externally or reduce dividends; a negative value indicates that funds are available for use in repaying debt, repurchasing stock, or increasing dividends.

LG6 **Cite the weaknesses of the simplified approaches to pro forma financial statement preparation and the common uses of pro forma statements.** Simplified approaches for preparing pro forma statements, although popular, can be criticized for assuming that the firm's past financial condition is an accurate indicator of the future and that certain variables can be forced to take on certain "desired" values. Pro forma statements are commonly used to forecast and analyze the firm's level of profitability and overall financial performance so that adjustments can be made to planned operations in order to achieve short-term financial goals.

SELF-TEST PROBLEMS (Solutions in Appendix B)

LG1 LG2 **ST 3–1 Depreciation and cash flow** A firm expects to have earnings before interest and taxes (EBIT) of $160,000 in each of the next 6 years. It pays annual interest of $1,500. The firm is considering the purchase of an asset that costs $140,000, requires $10,000 in installation cost, and has a recovery period of 5 years. It will be the firm's only asset, and the asset's depreciation is already reflected in its EBIT estimates.

a. Calculate the annual depreciation for the asset purchase using the MACRS depreciation percentages in Table 3.2 on page 100.

b Calculate the annual operating cash flows for each of the 6 years, using both the accounting and the finance definitions of *operating cash flow*. Assume that the firm is subject to a 40% ordinary tax rate.

c. Say the firm's net fixed assets, current assets, accounts payable, and accruals had the following values at the start and end of the final year (year 6). Calculate the firm's free cash flow (FCF) for that year.

Account	Year 6 Start	Year 6 End
Net fixed assets	$ 7,500	$ 0
Current assets	90,000	110,000
Accounts payable	40,000	45,000
Accruals	8,000	7,000

d. Compare and discuss the significance of each value calculated in parts **b** and **c.**

LG4 LG5 **ST 3–2 Cash budget and pro forma balance sheet inputs** Jane McDonald, a financial analyst for Carroll Company, has prepared the following sales and cash disbursement estimates for the period February–June of the current year.

Month	Sales	Cash disbursements
February	$500	$400
March	600	300
April	400	600
May	200	500
June	200	200

Ms. McDonald notes that historically, 30% of sales have been for cash. Of *credit sales,* 70% are collected 1 month after the sale, and the remaining 30% are collected 2 months after the sale. The firm wishes to maintain a minimum ending balance in its cash account of $25. Balances above this amount would be invested in short-term government securities (marketable securities), whereas any deficits would be financed through short-term bank borrowing (notes payable). The beginning cash balance at April 1 is $115.

a. Prepare a cash budget for April, May, and June.

b. How much financing, if any, at a maximum would Carroll Company require to meet its obligations during this 3-month period?

c. A pro forma balance sheet dated at the end of June is to be prepared from the information presented. Give the size of each of the following: cash, notes payable, marketable securities, and accounts receivable.

LG5 **ST 3–3 Pro forma income statement** Euro Designs, Inc., expects sales during 2004 to rise from the 2003 level of $3.5 million to $3.9 million. Because of a scheduled large loan payment, the interest expense in 2004 is expected to drop to $325,000. The firm plans to increase its cash dividend payments during 2004 to $320,000. The company's year-end 2003 income statement follows.

Euro Designs, Inc.
Income Statement
for the Year Ended December 31, 2003

Sales revenue	$3,500,000
Less: Cost of goods sold	1,925,000
Gross profits	$1,575,000
Less: Operating expenses	420,000
Operating profits	$1,155,000
Less: Interest expense	400,000
Net profits before taxes	$ 755,000
Less: Taxes (rate = 40%)	302,000
Net profits after taxes	$ 453,000
Less: Cash dividends	250,000
To retained earnings	$ 203,000

a. Use the *percent-of-sales method* to prepare a 2004 pro forma income statement for Euro Designs, Inc.

b. Explain why the statement may underestimate the company's actual 2004 pro forma income.

PROBLEMS

LG1 **3–1 Depreciation** On March 20, 2003, Norton Systems acquired two new assets. Asset A was research equipment costing $17,000 and having a 3-year recovery period. Asset B was duplicating equipment having an installed cost of $45,000 and a 5-year recovery period. Using the MACRS depreciation percentages in Table 3.2 on page 100, prepare a depreciation schedule for each of these assets.

LG2 **3–2 Accounting cash flow** A firm had earnings after taxes of $50,000 in 2003. Depreciation charges were $28,000, and a $2,000 charge for amortization of a bond discount was incurred. What was the firm's accounting *cash flow from operations* (see Equation 3.1) during 2003?

LG1 LG2 **3–3 MACRS depreciation expense and accounting cash flow** Pavlovich Instruments, Inc., a maker of precision telescopes, expects to report pre-tax income of $430,000 this year. The company's financial manager is considering the timing of a purchase of new computerized lens grinders. The grinders will have an installed cost of $80,000 and a cost recovery period of 5 years. They will be depreciated using the MACRS schedule.

a. If the firm purchases the grinders before year end, what depreciation expense will it be able to claim this year? (Use Table 3.2 on page 100.)

b. If the firm reduces its reported income by the amount of the depreciation expense calculated in part **a,** what tax savings will result?

c. Assuming that Pavlovich does purchase the grinders this year and that they are its only depreciable asset, use the accounting definition given in Equation 3.1 to find the firm's *cash flow from operations* for the year.

LG1 LG2 **3–4 Depreciation and accounting cash flow** A firm in the third year of depreciating its only asset, which originally cost $180,000 and has a 5-year MACRS recovery period, has gathered the following data relative to the current year's operations.

Accruals	$ 15,000
Current assets	120,000
Interest expense	15,000
Sales revenue	400,000
Inventory	70,000
Total costs before depreciation, interest, and taxes	290,000
Tax rate on ordinary income	40%

a. Use the *relevant data* to determine the accounting *cash flow from operations* (see Equation 3.1) for the current year.

b. Explain the impact that depreciation, as well as any other noncash charges, has on a firm's cash flows.

LG2 **3–5 Classifying inflows and outflows of cash** Classify each of the following items as an inflow (I) or an outflow (O) of cash, or as neither (N).

Item	Change ($)	Item	Change ($)
Cash	+100	Accounts receivable	−700
Accounts payable	−1,000	Net profits	+600
Notes payable	+500	Depreciation	+100
Long-term debt	−2,000	Repurchase of stock	+600
Inventory	+200	Cash dividends	+800
Fixed assets	+400	Sale of stock	+1,000

LG2 **3–6 Finding operating and free cash flows** Consider the balance sheets and selected data from the income statement of Keith Corporation that follow.

a. Calculate the firm's accounting *cash flow from operations* for the year ended December 31, 2003, using Equation 3.1.

b. Calculate the firm's *operating cash flow* (*OCF*) for the year ended December 31, 2003, using Equation 3.2.

c. Calculate the firm's *free cash flow* (*FCF*) for the year ended December 31, 2003, using Equation 3.3.

d. Interpret, compare, and contrast your cash flow estimates in parts **a, b,** and **c.**

Keith Corporation
Balance Sheets

	December 31	
Assets	**2003**	**2002**
Cash	$ 1,500	$ 1,000
Marketable securities	1,800	1,200
Accounts receivable	2,000	1,800
Inventories	2,900	2,800
Total current assets	$ 8,200	$ 6,800
Gross fixed assets	$29,500	$28,100
Less: Accumulated depreciation	14,700	13,100
Net fixed assets	$14,800	$15,000
Total assets	$23,000	$21,800
Liabilities and Stockholders' Equity		
Accounts payable	$ 1,600	$ 1,500
Notes payable	2,800	2,200
Accruals	200	300
Total current liabilities	$ 4,600	$ 4,000
Long-term debt	$ 5,000	$ 5,000
Common stock	$10,000	$10,000
Retained earnings	3,400	2,800
Total stockholders' equity	$13,400	$12,800
Total liabilities and stockholders' equity	$23,000	$21,800

Income Statement Data (2003)	
Depreciation expense	$11,600
Earnings before interest and taxes (EBIT)	2,700
Taxes	933
Net profits after taxes	1,400

LG4 **3–7 Cash receipts** A firm has actual sales of $65,000 in April and $60,000 in May. It expects sales of $70,000 in June and $100,000 in July and in August. Assuming that sales are the only source of cash inflows and that half of them are for cash and the remainder are collected evenly over the following 2 months, what are the firm's expected cash receipts for June, July, and August?

LG4 **3–8 Cash disbursements schedule** Maris Brothers, Inc., needs a cash disbursement schedule for the months of April, May, and June. Use the format of Table 3.9 and the following information in its preparation.

Sales: February = $500,000; March = $500,000; April = $560,000; May = $610,000; June = $650,000; July = $650,000

Purchases: Purchases are calculated as 60% of the next month's sales, 10% of purchases are made in cash, 50% of purchases are paid for 1 month after purchase, and the remaining 40% of purchases are paid for 2 months after purchase.

Rent: The firm pays rent of $8,000 per month.

Wages and salaries: Base wage and salary costs are fixed at $6,000 per month plus a variable cost of 7% of the current month's sales.

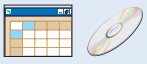
Taxes: A tax payment of $54,500 is due in June.

Fixed asset outlays: New equipment costing $75,000 will be bought and paid for in April.

Interest payments: An interest payment of $30,000 is due in June.

Cash dividends: Dividends of $12,500 will be paid in April.

Principal repayments and retirements: No principal repayments or retirements are due during these months.


LG4 **3–9 Cash budget—Basic** Grenoble Enterprises had sales of $50,000 in March and $60,000 in April. Forecast sales for May, June, and July are $70,000, $80,000, and $100,000, respectively. The firm has a cash balance of $5,000 on May 1 and wishes to maintain a minimum cash balance of $5,000. Given the following data, prepare and interpret a cash budget for the months of May, June, and July.

(1) The firm makes 20% of sales for cash, 60% are collected in the next month, and the remaining 20% are collected in the second month following sale.
(2) The firm receives other income of $2,000 per month.
(3) The firm's actual or expected purchases, all made for cash, are $50,000, $70,000, and $80,000 for the months of May through July, respectively.
(4) Rent is $3,000 per month.
(5) Wages and salaries are 10% of the previous month's sales.
(6) Cash dividends of $3,000 will be paid in June.
(7) Payment of principal and interest of $4,000 is due in June.
(8) A cash purchase of equipment costing $6,000 is scheduled in July.
(9) Taxes of $6,000 are due in June.

LG4 **3–10 Cash budget—Advanced** The actual sales and purchases for Xenocore, Inc., for September and October 2003, along with its forecast sales and purchases for the period November 2003 through April 2004, follow.

Year	Month	Sales	Purchases
2003	September	$210,000	$120,000
2003	October	250,000	150,000
2003	November	170,000	140,000
2003	December	160,000	100,000
2004	January	140,000	80,000
2004	February	180,000	110,000
2004	March	200,000	100,000
2004	April	250,000	90,000

The firm makes 20% of all sales for cash and collects on 40% of its sales in each of the 2 months following the sale. Other cash inflows are expected to be $12,000 in September and April, $15,000 in January and March, and $27,000 in February. The firm pays cash for 10% of its purchases. It pays for 50% of its purchases in the following month and for 40% of its purchases 2 months later.

Wages and salaries amount to 20% of the preceding month's sales. Rent of $20,000 per month must be paid. Interest payments of $10,000 are due in January and April. A principal payment of $30,000 is also due in April. The firm expects to pay cash dividends of $20,000 in January and April. Taxes of $80,000 are due in April. The firm also intends to make a $25,000 cash purchase of fixed assets in December.

a. Assuming that the firm has a cash balance of $22,000 at the beginning of November, determine the end-of-month cash balances for each month, November through April.

b. Assuming that the firm wishes to maintain a $15,000 minimum cash balance, determine the required total financing or excess cash balance for each month, November through April.

c. If the firm were requesting a line of credit to cover needed financing for the period November to April, how large would this line have to be? Explain your answer.

LG4 **3–11 Cash flow concepts** The following represent financial transactions that Johnsfield & Co. will be undertaking in the next planning period. For each transaction, check the statement or statements that will be affected immediately.

Transaction	Statement		
	Cash budget	Pro forma income statement	Pro forma balance sheet
Cash sale			
Credit sale			
Accounts receivable are collected			
Asset with 5-year life is purchased			
Depreciation is taken			
Amortization of goodwill is taken			
Sale of common stock			
Retirement of outstanding bonds			
Fire insurance premium is paid for the next 3 years			

LG4 **3–12 Cash budget—Sensitivity analysis** Trotter Enterprises, Inc., has gathered the following data in order to plan for its cash requirements and short-term investment opportunities for October, November, and December. All amounts are shown in thousands of dollars.

	October			November			December		
	Pessimistic	Most likely	Optimistic	Pessimistic	Most likely	Optimistic	Pessimistic	Most likely	Optimistic
Total cash receipts	$260	$342	$462	$200	$287	$366	$191	$294	$353
Total cash disbursements	285	326	421	203	261	313	287	332	315

a. Prepare a sensitivity analysis of Trotter's cash budget using −$20,000 as the beginning cash balance for October and a minimum required cash balance of $18,000.

b. Use the analysis prepared in part **a** to predict Trotter's financing needs and investment opportunities over the months of October, November, and December. Discuss how knowledge of the timing and amounts involved can aid the planning process.

LG4 **3–13 Multiple cash budgets—Sensitivity analysis** Brownstein, Inc., expects sales of $100,000 during each of the next 3 months. It will make monthly purchases of $60,000 during this time. Wages and salaries are $10,000 per month plus 5% of sales. Brownstein expects to make a tax payment of $20,000 in the next month and a $15,000 purchase of fixed assets in the second month and to receive $8,000 in cash from the sale of an asset in the third month. All sales and purchases are for cash. Beginning cash and the minimum cash balance are assumed to be zero.

a. Construct a cash budget for the next 3 months.

b. Brownstein is unsure of the sales levels, but all other figures are certain. If the most pessimistic sales figure is $80,000 per month and the most optimistic is $120,000 per month, what are the monthly minimum and maximum ending cash balances that the firm can expect for each of the 1-month periods?

c. Briefly discuss how the financial manager can use the data in parts **a** and **b** to plan for financing needs.

LG5 **3–14 Pro forma income statement** The marketing department of Metroline Manufacturing estimates that its sales in 2004 will be $1.5 million. Interest expense is expected to remain unchanged at $35,000, and the firm plans to pay $70,000 in cash dividends during 2004. Metroline Manufacturing's income statement for the year ended December 31, 2003, is given below, along with a breakdown of the firm's cost of goods sold and operating expenses into their fixed and variable components.

Metroline Manufacturing
Income Statement
for the Year Ended December 31, 2003

Sales revenue	$1,400,000
Less: Cost of goods sold	910,000
Gross profits	$ 490,000
Less: Operating expenses	120,000
Operating profits	$ 370,000
Less: Interest expense	35,000
Net profits before taxes	$ 335,000
Less: Taxes (rate = 40%)	134,000
Net profits after taxes	$ 201,000
Less: Cash dividends	66,000
To retained earnings	$ 135,000

Metroline Manufacturing
Breakdown of
Costs and Expenses
into Fixed and Variable
Components for the
Year Ended December 31, 2003

Cost of goods sold	
Fixed cost	$210,000
Variable cost	700,000
Total cost	$910,000
Operating expenses	
Fixed expenses	$ 36,000
Variable expenses	84,000
Total expenses	$120,000

a. Use the *percent-of-sales method* to prepare a pro forma income statement for the year ended December 31, 2004.
b. Use *fixed and variable cost data* to develop a pro forma income statement for the year ended December 31, 2004.
c. Compare and contrast the statements developed in parts **a** and **b.** Which statement probably provides the better estimate of 2004 income? Explain why.

LG5

3–15 Pro forma income statement—Sensitivity analysis Allen Products, Inc., wants to do a sensitivity analysis for the coming year. The pessimistic prediction for sales is $900,000; the most likely amount of sales is $1,125,000; and the optimistic prediction is $1,280,000. Allen's income statement for the most recent year follows.

Allen Products, Inc.
Income Statement for the
Year Ended December 31, 2003

Sales revenue	$937,500
Less: Cost of goods sold	421,875
Gross profits	$515,625
Less: Operating expenses	234,375
Operating profits	$281,250
Less: Interest expense	30,000
Net profits before taxes	$251,250
Less: Taxes (rate = 25%)	62,813
Net profits after taxes	$188,437

a. Use the *percent-of-sales method,* the income statement for December 31, 2003, and the sales revenue estimates to develop pessimistic, most likely, and optimistic pro forma income statements for the coming year.

b. Explain how the percent-of-sales method could result in an overstatement of profits for the pessimistic case and an understatement of profits for the most likely and optimistic cases.

c. Restate the pro forma income statements prepared in part **a** to incorporate the following assumptions about costs:

$250,000 of the cost of goods sold is fixed; the rest is variable.
$180,000 of the operating expenses is fixed; the rest is variable.
All of the interest expense is fixed.

d. Compare your findings in part **c** to your findings in part **a.** Do your observations confirm your explanation in part **b?**

LG5

3–16 Pro forma balance sheet—Basic Leonard Industries wishes to prepare a pro forma balance sheet for December 31, 2004. The firm expects 2004 sales to total $3,000,000. The following information has been gathered.

(1) A minimum cash balance of $50,000 is desired.
(2) Marketable securities are expected to remain unchanged.
(3) Accounts receivable represent 10% of sales.
(4) Inventories represent 12% of sales.
(5) A new machine costing $90,000 will be acquired during 2004. Total depreciation for the year will be $32,000.
(6) Accounts payable represent 14% of sales.
(7) Accruals, other current liabilities, long-term debt, and common stock are expected to remain unchanged.
(8) The firm's net profit margin is 4%, and it expects to pay out $70,000 in cash dividends during 2004.
(9) The December 31, 2003, balance sheet follows.

Leonard Industries
Balance Sheet
December 31, 2003

Assets		Liabilities and Stockholders' Equity	
Cash	$ 45,000	Accounts payable	$ 395,000
Marketable securities	15,000	Accruals	60,000
Accounts receivable	255,000	Other current liabilities	30,000
Inventories	340,000	Total current liabilities	$ 485,000
Total current assets	$ 655,000	Long-term debt	$ 350,000
Net fixed assets	$ 600,000	Common stock	$ 200,000
Total assets	$1,255,000	Retained earnings	$ 220,000
		Total liabilities and stockholders' equity	$1,255,000

a. Use the *judgmental approach* to prepare a pro forma balance sheet dated December 31, 2004, for Leonard Industries.

b. How much, if any, additional financing will Leonard Industries require in 2004? Discuss.

c. Could Leonard Industries adjust its planned 2004 dividend to avoid the situation described in part **b?** Explain how.

LG5 **3–17 Pro forma balance sheet** Peabody & Peabody has 2003 sales of $10 million. It wishes to analyze expected performance and financing needs for 2005—2 years ahead. Given the following information, respond to parts **a** and **b.**

(1) The percents of sales for items that vary directly with sales are as follows:
Accounts receivable, 12%
Inventory, 18%
Accounts payable, 14%
Net profit margin, 3%
(2) Marketable securities and other current liabilities are expected to remain unchanged.
(3) A minimum cash balance of $480,000 is desired.
(4) A new machine costing $650,000 will be acquired in 2004, and equipment costing $850,000 will be purchased in 2005. Total depreciation in 2004 is forecast as $290,000, and in 2005 $390,000 of depreciation will be taken.
(5) Accruals are expected to rise to $500,000 by the end of 2005.
(6) No sale or retirement of long-term debt is expected.
(7) No sale or repurchase of common stock is expected.
(8) The dividend payout of 50% of net profits is expected to continue.
(9) Sales are expected to be $11 million in 2004 and $12 million in 2005.
(10) The December 31, 2003, balance sheet follows.

Peabody & Peabody
Balance Sheet
December 31, 2003
($000)

Assets		Liabilities and Stockholders' Equity	
Cash	$ 400	Accounts payable	$1,400
Marketable securities	200	Accruals	400
Accounts receivable	1,200	Other current liabilities	80
Inventories	1,800	Total current liabilities	$1,880
Total current assets	$3,600	Long-term debt	$2,000
Net fixed assets	$4,000	Common equity	$3,720
Total assets	$7,600	Total liabilities and stockholders' equity	$7,600

a. Prepare a pro forma balance sheet dated December 31, 2005.
b. Discuss the financing changes suggested by the statement prepared in part **a.**

LG5 **3–18 Integrative—Pro forma statements** Red Queen Restaurants wishes to prepare financial plans. Use the financial statements and the other information provided in what follows to prepare the financial plans.

Red Queen Restaurants
Income Statement for the
Year Ended December 31, 2003

Sales revenue	$800,000
Less: Cost of goods sold	600,000
Gross profits	$200,000
Less: Operating expenses	100,000
Net profits before taxes	$100,000
Less: Taxes (rate = 40%)	40,000
Net profits after taxes	$ 60,000
Less: Cash dividends	20,000
To retained earnings	$ 40,000

Red Queen Restaurants
Balance Sheet
December 31, 2003

Assets		Liabilities and Stockholders' Equity	
Cash	$ 32,000	Accounts payable	$100,000
Marketable securities	18,000	Taxes payable	20,000
Accounts receivable	150,000	Other current liabilities	5,000
Inventories	100,000	Total current liabilities	$125,000
Total current assets	$300,000	Long-term debt	$200,000
Net fixed assets	$350,000	Common stock	$150,000
Total assets	$650,000	Retained earnings	$175,000
		Total liabilities and stockholders' equity	$650,000

The following financial data are also available:

(1) The firm has estimated that its sales for 2004 will be $900,000.
(2) The firm expects to pay $35,000 in cash dividends in 2004.
(3) The firm wishes to maintain a minimum cash balance of $30,000.
(4) Accounts receivable represent approximately 18% of annual sales.
(5) The firm's ending inventory will change directly with changes in sales in 2004.
(6) A new machine costing $42,000 will be purchased in 2004. Total depreciation for 2004 will be $17,000.
(7) Accounts payable will change directly in response to changes in sales in 2004.
(8) Taxes payable will equal one-fourth of the tax liability on the pro forma income statement.
(9) Marketable securities, other current liabilities, long-term debt, and common stock will remain unchanged.

a. Prepare a pro forma income statement for the year ended December 31, 2004, using the *percent-of-sales method*.
b. Prepare a pro forma balance sheet dated December 31, 2004, using the *judgmental approach*.

c. Analyze these statements, and discuss the resulting *external financing required*.

LG5 **3–19 Integrative—Pro forma statements** Provincial Imports, Inc., has assembled statements and information to prepare financial plans for the coming year.

Provincial Imports, Inc.
Income Statement for the
Year Ended December 31, 2003

Sales revenue	$5,000,000
Less: Cost of goods sold	2,750,000
Gross profits	$2,250,000
Less: Operating expenses	850,000
Operating profits	$1,400,000
Less: Interest expense	200,000
Net profits before taxes	$1,200,000
Less: Taxes (rate = 40%)	480,000
Net profits after taxes	$ 720,000
Less: Cash dividends	288,000
To retained earnings	$ 432,000

Provincial Imports, Inc.
Balance Sheet
December 31, 2003

Assets		Liabilities and Stockholders' Equity	
Cash	$ 200,000	Accounts payable	$ 700,000
Marketable securities	275,000	Taxes payable	95,000
Accounts receivable	625,000	Notes payable	200,000
Inventories	500,000	Other current liabilities	5,000
Total current assets	$1,600,000	Total current liabilities	$1,000,000
Net fixed assets	$1,400,000	Long-term debt	$ 500,000
Total assets	$3,000,000	Common stock	$ 75,000
		Retained earnings	$1,375,000
		Total liabilities and equity	$3,000,000

Information related to financial projections for the year 2004:

(1) Projected sales are $6,000,000.
(2) Cost of goods sold includes $1,000,000 in fixed costs.
(3) Operating expense includes $250,000 in fixed costs.
(4) Interest expense will remain unchanged.
(5) The firm will pay cash dividends amounting to 40% of net profits after taxes.
(6) Cash and inventories will double.
(7) Marketable securities, notes payable, long-term debt, and common stock will remain unchanged.

(8) Accounts receivable, accounts payable, and other current liabilities will change in direct response to the change in sales.
(9) A new computer system costing $356,000 will be purchased during the year. Total depreciation expense for the year will be $110,000.

a. Prepare a pro forma income statement for the year ended December 31, 2004, using the information given and the *percent-of-sales method*.
b. Prepare a pro forma balance sheet as of December 31, 2004, using the information given and the *judgmental approach*. Include a reconciliation of the retained earnings account.
c. Analyze these statements, and discuss the resulting *external financing required*.

CHAPTER 3 CASE Preparing Martin Manufacturing's 2004 Pro Forma Financial Statements

To improve its competitive position, Martin Manufacturing is planning to implement a major equipment modernization program. Included will be replacement and modernization of key manufacturing equipment at a cost of $400,000 in 2004. The planned program is expected to lower the variable cost per unit of finished product. Terri Spiro, an experienced budget analyst, has been charged with preparing a forecast of the firm's 2004 financial position, assuming replacement and modernization of manufacturing equipment. She plans to use the 2003 financial statements presented on pages 92 and 93, along with the key projected financial data summarized in the following table.

Martin Manufacturing Company
Key Projected Financial Data (2004)

Data item	Value
Sales revenue	$6,500,000
Minimum cash balance	$25,000
Inventory turnover (times)	7.0
Average collection period	50 days
Fixed-asset purchases	$400,000
Dividend payments	$20,000
Depreciation expense	$185,000
Interest expense	$97,000
Accounts payable increase	20%
Accruals and long-term debt	Unchanged
Notes payable, preferred and common stock	Unchanged

Required

a. Use the historical and projected financial data provided to prepare a pro forma income statement for the year ended December 31, 2004. (*Hint:* Use

the *percent-of-sales method* to estimate all values *except* depreciation expense and interest expense, which have been estimated by management and included in the table.)

b. Use the projected financial data along with relevant data from the pro forma income statement prepared in part **a** to prepare the pro forma balance sheet at December 31, 2004. (*Hint:* Use the *judgmental approach*.)

c. Will Martin Manufacturing Company need to obtain *external financing* to fund the proposed equipment modernization program? Explain.

WEB EXERCISE

Go to the **Best Depreciation Calculator** at the Fixed Asset Info. site, *www.fixedassetinfo.com/defaultCalc.asp*. Use this calculator to determine the straight-line, declining balance (using 200%), and MACRS depreciation schedules for the following items, using half-year averaging (the half-year convention).

Item	Date placed in service	Cost
Office furnishings	2/15/2002	$22,500
Laboratory equipment	5/27/2001	$14,375
Fleet vehicles	9/5/2000	$45,863

Make a chart comparing the depreciation amounts that these three methods yield for the years 2002 to 2007. Discuss the implications of these differences.

Remember to check the book's Web site at

www.aw.com/gitman

for additional resources, including additional Web exercises.

INTEGRATIVE CASE 1

Track Software, Inc.

Seven years ago, after 15 years in public accounting, Stanley Booker, CPA, resigned his position as Manager of Cost Systems for Davis, Cohen, and O'Brien Public Accountants and started Track Software, Inc. In the 2 years preceding his departure from Davis, Cohen, and O'Brien, Stanley had spent nights and weekends developing a sophisticated cost-accounting software program that became Track's initial product offering. As the firm grew, Stanley planned to develop and expand the software product offerings—all of which would be related to streamlining the accounting processes of medium- to large-sized manufacturers.

Although Track experienced losses during its first 2 years of operation—1997 and 1998—its profit has increased steadily from 1999 to the present (2003). The firm's profit history, including dividend payments and contributions to retained earnings, is summarized in Table 1.

Stanley started the firm with a $100,000 investment—his savings of $50,000 as equity and a $50,000 long-term loan from the bank. He had hoped to maintain his initial 100 percent ownership in the corporation,

Table 1

Track Software, Inc.
Profit, Dividends, and Retained Earnings, 1997–2003

Year	Net profits after taxes (1)	Dividends paid (2)	Contribution to retained earnings [(1) – (2)] (3)
1997	($50,000)	$ 0	($50,000)
1998	(20,000)	0	(20,000)
1999	15,000	0	15,000
2000	35,000	0	35,000
2001	40,000	1,000	39,000
2002	43,000	3,000	40,000
2003	48,000	5,000	43,000

but after experiencing a $50,000 loss during the first year of operation (1997), he sold 60 percent of the stock to a group of investors to obtain needed funds. Since then, no other stock transactions have taken place. Although he owns only 40 percent of the firm, Stanley actively manages all aspects of its activities; the other stockholders are not active in management of the firm. The firm's stock closed at $4.50 per share in 2002 and at $5.28 per share in 2003.

Stanley has just prepared the firm's 2003 income statement, balance sheet, and statement of retained earnings, shown in Tables 2, 3, and 4 (on pages 143–145), along with the 2002 balance sheet. In addition, he has compiled the 2002 ratio values and industry average ratio values for 2003, which are applicable to both 2002 and 2003 and are summarized in Table 5 (on page 145). He is quite pleased to have achieved record earnings of $48,000 in 2003, but he is concerned about the firm's cash flows. Specifically, he is finding it more and more difficult to pay the firm's bills in a timely manner and generate cash flows to investors—both creditors and owners. To gain insight into these cash flow problems, Stanley is planning to determine the firm's 2003 operating cash flow (OCF) and free cash flow (FCF).

Table 2

Track Software, Inc.
Income Statement ($000)
for the Year Ended December 31, 2003

Sales revenue		$1,550
Less: Cost of goods sold		1,030
Gross profits		$ 520
Less: Operating expenses		
Selling expense	$150	
General and administrative expense	270	
Depreciation expense	11	
Total operating expense		431
Operating profits (EBIT)		$ 89
Less: Interest expense		29
Net profits before taxes		$ 60
Less: Taxes (20%)		12
Net profits after taxes		$ 48

Table 3

Track Software, Inc.
Balance Sheets ($000)

	December 31	
Assets	**2003**	**2002**
Current assets		
Cash	$ 12	$ 31
Marketable securities	66	82
Accounts receivable	152	104
Inventories	191	145
Total current assets	$421	$362
Gross fixed assets	$195	$180
Less: Accumulated depreciation	63	52
Net fixed assets	$132	$128
Total assets	$553	$490
Liabilities and Stockholders' Equity		
Current liabilities		
Accounts payable	$136	$126
Notes payable	200	190
Accruals	27	25
Total current liabilities	$363	$341
Long-term debt	$ 38	$ 40
Total liabilities	$401	$381
Stockholders' equity		
Common stock (50,000 shares outstanding at $0.40 par value)	$ 20	$ 20
Paid-in capital in excess of par	30	30
Retained earnings	102	59
Total stockholders' equity	$152	$109
Total liabilities and stockholders' equity	$553	$490

Table 4

Track Software, Inc.
Statement of Retained Earnings ($000)
for the Year Ended December 31, 2003

Retained earnings balance (January 1, 2003)	$ 59
Plus: Net profits after taxes (for 2003)	48
Less: Cash dividends on common stock (paid during 2003)	(5)
Retained earnings balance (December 31, 2003)	$102

Table 5

Ratio	Actual 2002	Industry average 2003
Current ratio	1.06	1.82
Quick ratio	0.63	1.10
Inventory turnover	10.40	12.45
Average collection period	29.6 days	20.2 days
Total asset turnover	2.66	3.92
Debt ratio	0.78	0.55
Times interest earned ratio	3.0	5.6
Gross profit margin	32.1%	42.3%
Operating profit margin	5.5%	12.4%
Net profit margin	3.0%	4.0%
Return on total assets (ROA)	8.0%	15.6%
Return on common equity (ROE)	36.4%	34.7%
Price/earnings (P/E) ratio	5.2	7.1
Market/book (M/B) ratio	2.1	2.2

Stanley is further frustrated by the firm's inability to afford to hire a software developer to complete development of a cost estimation package that is believed to have "blockbuster" sales potential. Stanley began development of this package 2 years ago, but the firm's growing complexity has forced him to devote more of his time to administrative duties, thereby halting the development of this product. Stanley's reluctance to fill this position stems from his concern that the added $80,000 per year in salary and benefits for the position would certainly lower the firm's earnings per share (EPS) over the next couple of years. Although the project's success is in no way guaranteed, Stanley believes that if the money were spent to hire the software developer, the firm's sales and earnings would significantly rise once the 2- to 3-year development, production, and marketing process was completed.

With all of these concerns in mind, Stanley set out to review the various data to develop strategies that would help to ensure a bright future for Track Software. Stanley believed that as part of this process, a thorough ratio analysis of the firm's 2003 results would provide important additional insights.

Required

a. (1) Upon what financial goal does Stanley seem to be focusing? Is it the correct goal? Why or why not?
(2) Could a potential agency problem exist in this firm? Explain.

b. Calculate the firm's earnings per share (EPS) for each year, recognizing that the number of shares of common stock outstanding has remained *unchanged* since the firm's inception. Comment on the EPS performance in view of your response in part **a.**

c. Use the financial data presented to determine Track's operating cash flow (OCF) and free cash flow (FCF) in 2003. Evaluate your findings in light of Track's current cash flow difficulties.

d. Analyze the firm's financial condition in 2003 as it relates to (1) liquidity, (2) activity, (3) debt, (4) profitability, and (5) market, using the financial statements provided in Tables 2 and 3 and the ratio data included in Table 5. Be sure to *evaluate* the firm on both a cross-sectional and a time-series basis.

e. What recommendation would you make to Stanley regarding hiring a new software developer? Relate your recommendation here to your responses in part **a.**