4 Cash Flow and Financial Planning

Learning Goals

- **LG 1** Understand tax depreciation procedures and the effect of depreciation on the firm's cash flows.
- **LG 2** Discuss the firm's statement of cash flows, operating cash flow, and free cash flow.
- **LG 3** Understand the financial planning process, including long-term (strategic) financial plans and short-term (operating) financial plans.
- **LG 4** Discuss the cash-planning process and the preparation, evaluation, and use of the cash budget.
- **LG 5** Explain the simplified procedures used to prepare and evaluate the pro forma income statement and the pro forma balance sheet.
- **LG 6** Evaluate the simplified approaches to pro forma financial statement preparation and the common uses of pro forma statements.

Why This Chapter Matters to You

In your *professional* life

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 primary focus on 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 needed for strategic and operating plans, and what data are needed as inputs for preparing cash plans and profit plans.

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 provide key inputs into the firm's short-term financial plans, and the distinction between fixed and variable operating costs.

In your *personal* life

Individuals, like corporations, should focus on cash flow when planning and monitoring finances. You should establish short- and long-term financial goals (destinations) and develop personal financial plans (road maps) that will guide their achievement. Cash flows and financial plans are as important for individuals as for corporations.

European Aeronautic Defense and Space Co.

Making a Profit While Bleeding Cash

On May 14, 2013, the European Aeronautic Defense and Space Co. (EADS), parent company of the aircraft manufacturer Airbus, reported a 56 percent increase in its operating profits during the year's first quarter. The increase in earnings was higher than most analysts had expected, as was the increase in revenue that EADS reported. All that seemed like good news, but analysts who dug deeper into the firm's financial statements discovered that not all was well with the company. Specifically, during the first quarter EADS reported free cash flow of −3.2 billion euros. The negative free cash flow was primarily the result of a ramp-up in production of Airbus planes, which required the firm to accumulate a great deal of inventory.

The situation at EADS is not particularly uncommon. Even when a firm is reporting positive earnings, its cash flow picture may be quite different. When a firm is expanding, as EADS was in the first quarter of 2013, it may have to make additional investments in inventory, receivables, and fixed assets such as machinery. Cash outlays for those investments do not necessarily show up immediately in the profit calculation, but they do reduce free cash flow, a performance measure that financial analysts watch closely. Cash flow is the primary driver of a firm's value, and firms must have cash, not earnings, to pay their bills. After reading this chapter, you'll understand the differences between cash flow and profit.

LG 1 LG 2

4.1 Analyzing the Firm's Cash Flow

"Cash is king" is an old saying in finance. Cash flow, the lifeblood of the firm, is the primary ingredient in any financial valuation model. Whether an analyst wants to put a value on an investment that a firm is considering or the objective is to value the firm itself, estimating cash flow is central to the valuation process. This chapter explains where the cash flow numbers used in valuations come from.

DEPRECIATION

depreciation
A portion of the costs of fixed assets charged against annual revenues over time.

For tax and financial reporting purposes, businesses generally cannot deduct as an expense the full cost of an asset that will be in use for several years. Instead, each year firms are required to charge a portion of the costs of fixed assets against revenues. This allocation of historical cost over time is called **depreciation.** Depreciation deductions, like any other business expenses, reduce the income that a firm reports on its income statement and therefore reduce the taxes that the firm must pay. However, depreciation deductions are not associated with any cash outlay. That is, when a firm deducts depreciation expense, it is allocating a portion of an asset's original cost (that the firm has already paid for) as a charge against that year's income. The net effect is that *depreciation deductions increase a firm's cash flow because they reduce a firm's tax bill.*

For tax purposes, the depreciation of business assets is regulated by the Internal Revenue Code. Because the objectives of financial reporting sometimes differ from those of tax legislation, firms often use different depreciation methods for financial reporting than those required for tax purposes. Keeping two different sets of records for these two purposes is legal in the United States.

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. All depreciation methods require you to know an asset's depreciable value and its depreciable life.

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. Even if the asset is expected to have some salvage value at the end of its useful life, the firm can still take depreciation deductions equal to the asset's full initial cost.

Example 4.1 ▸

MyFinanceLab Solution Video

Baker Corporation acquired a new machine at a cost of $38,000, with installation costs of $2,000. When the machine is retired from service, Baker expects to sell it for scrap metal and receive $1,000. 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 is called its **depreciable life.** The shorter the depreciable life, the larger the annual depreciation deductions will be, and the larger will be the tax savings associated with those deductions, all other things being equal. Accordingly, firms generally would like to depreciate

TABLE 4.1 First Four Property Classes under MACRS

Property class (recovery period)	Definition
3 years	Research equipment and certain special tools
5 years	Computers, printers, 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

their assets as rapidly as possible. 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.** 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 as 3-, 5-, 7-, 10-, 15-, and 20-year property. The first four property classes—those routinely used by business—are defined in Table 4.1.

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

DEPRECIATION METHODS

For *financial reporting purposes,* companies can use a variety of depreciation methods (straight-line, double-declining balance, and sum-of-the-years'-digits). For *tax purposes,* assets in the first four MACRS property classes are depreciated by the double-declining balance method, using a half-year convention (meaning that a half-year's depreciation is taken in the year the asset is purchased) and switching to straight-line when advantageous. The *approximate percentages* (rounded to the nearest whole percent) written off each year for the first four property classes are shown in Table 4.2. 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; 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 4.2, 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 4.2 can be demonstrated by a simple example.

TABLE 4.2 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 depreciation using the half-year convention.

Example 4.2 ▸ 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 4.2, Baker calculates the depreciation in each year as follows:

Year	Cost (1)	Percentages (from Table 4.2) (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 used throughout this text.*

DEVELOPING THE STATEMENT OF CASH FLOWS

The *statement of cash flows,* introduced in Chapter 3, summarizes the firm's cash flow over a given period. Keep in mind that analysts typically lump cash and marketable securities together when assessing the firm's liquidity because both

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

cash flow from investment activities
Cash flows associated with purchase and sale of both fixed assets and equity investments in other firms.

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

cash and marketable securities represent a reservoir of liquidity. That reservoir is *increased by cash inflows* and *decreased by cash outflows*.

Also note that the firm's cash flows fall into three categories: (1) cash flow from operating activities, (2) cash flow from investment activities, and (3) cash flow from financing activities. **Cash flow from operating activities** include the cash inflows and outflows directly related to the sale and production of the firm's products and services. **Cash flow from investment activities** include the cash flows associated with the purchase and sale of both fixed assets and equity investments in other firms. Clearly, purchase transactions would result in cash outflows, whereas sales transactions would generate cash inflows. **Cash flow from financing activities** results from debt and equity financing transactions. Incurring either short-term or long-term debt would result in a corresponding cash inflow; repaying debt would result in an outflow. Similarly, the sale of the company's stock would result in a cash inflow; the repurchase of stock or payment of cash dividends would result in an outflow.

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 4.3 classifies the basic inflows (sources) and outflows (uses) of cash. For example, if a firm's accounts payable balance increased by $1,000 during the year, the change would be an *inflow of cash*. The change would be an *outflow of cash* if the firm's inventory increased by $2,500.

A few additional points can be made with respect to the classification scheme in Table 4.3:

1. A *decrease* in an asset, such as the firm's cash balance, is an *inflow of cash*. Why? It is 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.

   The classification of decreases and increases in a firm's cash balance is difficult for many to grasp. To clarify, imagine that you store all your cash in a bucket. Your cash balance is represented by the amount of cash in the bucket. When you need cash, you withdraw it from the bucket, which *decreases your cash balance and provides an inflow* of cash to you. Conversely, when you have excess cash, you deposit it in the bucket, which *increases your cash balance and represents an outflow* of cash from you. Focus on the movement of funds *in and out of your pocket*: Clearly, a decrease in cash (from the bucket) is an inflow (to your pocket); an increase in cash (in the bucket) is an outflow (from your pocket).

Matter of fact

Apple's Cash Flows

In its 2012 annual report, Apple reported more than $50 billion in cash from its operating activities. In the same year, Apple used $48.2 billion in cash to invest in marketable securities and other investments. By comparison, its financing cash flows were minor, resulting in a cash outflow of about $1.7 billion, mostly from stock issued to employees as part of Apple's compensation plans.

TABLE 4.3 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 after taxes
Depreciation and other noncash charges	Dividends paid
Sale of stock	Repurchase or retirement of stock

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

2. Depreciation (like amortization and depletion) is a **noncash charge,** an expense that is deducted on the income statement but does not involve an actual outlay of cash. Therefore, when measuring the amount of cash flow generated by a firm, we have to add depreciation back to net income; if we don't, we will understate the cash that the firm has truly generated. For this reason, depreciation appears as a source of cash in Table 4.3.
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. The change in net fixed assets is equal to the change in gross fixed assets minus the depreciation charge. Therefore, if we treated depreciation as a cash inflow as well as the reduction in net (rather than gross) fixed assets, we would be double counting 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 uses data from the income statement, along with the beginning- and end-of-period balance sheets. The income statement for the year ended December 31, 2015, and the December 31 balance sheets for 2014 and 2015 for Baker Corporation are given in Tables 4.4 and 4.5 (see facing page), respectively. The statement of cash flows for the year ended December 31, 2015, for Baker Corporation is presented in Table 4.6 (see page 170). Note that all cash inflows as well as net profits after taxes and depreciation are treated as positive

TABLE 4.4 Baker Corporation 2015 Income Statement ($000)

Sales revenue	$1,700
Less: Cost of goods sold	1,000
Gross profits	$ 700
Less: Operating expenses	
Selling, general, and administrative expense	$ 230
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)[a]	$1.70

[a]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 4.5 Baker Corporation Balance Sheets ($000)

	December 31	
Assets	**2015**	**2014**
Cash and marketable securities	$1,000	$ 500
Accounts receivable	400	500
Inventories	600	900
Total current assets	$2,000	$1,900
Land and buildings	$1,200	$1,050
Machinery and equipment, furniture and fixtures, vehicles, and other	1,300	1,150
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		
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
Preferred stock	$ 100	$ 100
Common stock: $1.20 par, 100,000 shares outstanding in 2015 and 2014	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

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 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. The

TABLE 4.6 Baker Corporation Statement of Cash Flows ($000) for the Year Ended December 31, 2015

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 equity investments in other firms	0
Cash provided by investment activities	($300)
Cash flow from financing activities	
Decrease in notes payable	($100)
Increase in long-term debt	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.

financial manager also can prepare a statement of cash flows developed from projected financial statements to determine whether planned actions are desirable in view of the resulting cash flows.

operating cash flow (OCF)
The cash flow a firm generates from its normal operations; calculated as *net operating profits after taxes (NOPAT)* plus depreciation.

net operating profits after taxes (NOPAT)
A firm's earnings before interest and after taxes, EBIT × (1 − *T*).

Operating Cash Flow 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. The definition introduced here excludes the impact of interest on cash flow. We exclude those effects because we want a measure that captures the cash flow generated by the firm's operations, not by how those operations are financed and taxed. The first step is to calculate **net operating profits after taxes (NOPAT)**, which represent the firm's earnings before interest and after taxes. Letting *T* equal the applicable corporate tax rate, NOPAT is calculated as

$$\text{NOPAT} = \text{EBIT} \times (1 - T) \tag{4.1}$$

To convert NOPAT to operating cash flow (OCF), we merely add back depreciation:

$$\text{OCF} = \text{NOPAT} + \text{Depreciation} \tag{4.2}$$

We can substitute the expression for NOPAT from Equation 4.1 into Equation 4.2 to get a single equation for OCF:

$$\text{OCF} = [\text{EBIT} \times (1 - T)] + \text{Depreciation} \tag{4.3}$$

Example 4.3 ▸

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Substituting the values for Baker Corporation from its income statement (Table 4.4) into Equation 4.3, we get

$$\text{OCF} = [\$370 \times (1.00 - 0.40)] + \$100 = \$222 + \$100 = \$322$$

During 2015, Baker Corporation generated $322,000 of cash flow from producing and selling its output. Therefore, we can conclude that Baker's operations are generating positive cash flows.

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 cash available to investors—the providers of debt (creditors) and equity (owners)—after the firm has met all operating needs and paid for net investments in fixed assets and current assets. Free cash flow can be defined as

$$\begin{aligned}\text{FCF} = \text{OCF} &- \text{Net fixed asset investment (NFAI)} \\ &- \text{Net current asset investment (NCAI)}\end{aligned} \tag{4.4}$$

The *net fixed asset investment (NFAI)* is the *net investment* that the firm makes in fixed assets and refers to purchases minus sales of fixed assets. You can calculate the NFAI using

$$\text{NFAI} = \text{Change in net fixed assets} + \text{Depreciation} \tag{4.5}$$

The NFAI is also equal to the change in gross fixed assets from one year to the next.

Example 4.4 ▸

Using the Baker Corporation's balance sheets in Table 4.5, we see that its change in net fixed assets between 2014 and 2015 was $200 ($1,200 in 2015 − $1,000 in 2014). Substituting this value and the $100 of depreciation for 2015 into Equation 4.5, we get Baker's net fixed asset investment (NFAI) for 2015:

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

Baker Corporation therefore invested a net $300,000 in fixed assets during 2015. This amount would, of course, represent a cash outflow to acquire fixed assets during 2015.

Looking at Equation 4.5, we can see that if net fixed assets decline by an amount exceeding the depreciation for the period, the NFAI would be negative. A negative NFAI represents a net cash *inflow* attributable to the firm selling 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 the sum of accounts payable and accruals. Notes payable are not included in the NCAI calculation because they represent a negotiated creditor claim on the firm's free cash flow. The NCAI calculation is

$$\text{NCAI} = \text{Change in current assets} - \text{Change in (accounts payable} + \text{accruals)} \quad (4.6)$$

Example 4.5 ▸ Looking at the Baker Corporation's balance sheets for 2014 and 2015 in Table 4.5, we see that the change in current assets between 2014 and 2015 is $100 ($2,000 in 2015 − $1,900 in 2014). The difference between Baker's accounts payable plus accruals of $800 in 2015 ($700 in accounts payable + $100 in accruals) and of $700 in 2014 ($500 in accounts payable + $200 in accruals) is $100 ($800 in 2015 − $700 in 2014). Substituting into Equation 4.6 the change in current assets and the change in the sum of accounts payable plus accruals for Baker Corporation, we get its 2015 NCAI:

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

So, during 2015 Baker Corporation made no investment ($0) in its current assets net of accounts payable and accruals.

Now we can substitute Baker Corporation's 2015 operating cash flow (OCF) of $322, its net fixed asset investment (NFAI) of $300, and its net current asset investment (NCAI) of $0 into Equation 4.4 to find its free cash flow (FCF):

$$\text{FCF} = \$322 - \$300 - \$0 = \$22$$

We can see that during 2015 Baker generated $22,000 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 its operating costs and investments and had free cash flow available to pay investors. However, Baker's interest expense in 2015 was $70,000, so the firm is not generating enough FCF to provide a sufficient return to its investors.

Clearly, cash flow is the lifeblood of the firm. The *Focus on Practice* box discusses Cisco System's free cash flow. In the next section, we consider various aspects of financial planning for cash flow and profit.

→ REVIEW QUESTIONS

4–1 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.

4–2 Describe the overall cash flow through the firm in terms of cash flow from operating activities, cash flow from investment activities, and cash flow from financing activities.

focus on **PRACTICE**

Free Cash Flow at Cisco Systems

in practice On May 13, 2010, Cisco Systems issued what at first glance appeared to be a favorable earnings report, saying that it had achieved earnings per share of $0.42 for the most recent quarter, ahead of the expectations of Wall Street experts who had projected EPS of $0.39. Oddly, though, Cisco stock began to fall after the earnings announcement.

In subsequent analysis, one analyst observed that of the three cents by which Cisco beat the street's forecast, one cent could be attributed to the fact that the quarter was 14 weeks rather than the more typical 13 weeks. Another penny was attributable to unusual tax gains, and the third was classified with the somewhat vague label, "other income." Other analysts were even more skeptical. One noted that Cisco's free cash flow in the prior three quarters had been $6.24 billion, but $5.55 billion of that had been spent to buy shares to offset dilution from the stock options that Cisco granted its employees. The analyst complained, "Cisco is being run for the benefit of its employees and not its public shareholders."

▶ *Free cash flow is often considered a more reliable measure of a company's income than reported earnings. What are some possible ways that corporate accountants might be able to change their earnings to portray a more favorable earnings statement?*

Source: "Update Cisco Systems (CSCO)," May 13, 2010, **http://jubakpicks.com**; Eric Savitz, "Cisco Shares Off Despite Strong FYQ3; Focus on Q4 Guidance," May 13, 2010, **http://blogs.barrons.com**.

4–3 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.

4–4 Why is depreciation (as well as amortization and depletion) considered a *noncash charge*?

4–5 Describe the general format of the statement of cash flows. How are cash inflows differentiated from cash outflows on this statement?

4–6 Why do we exclude interest expense and taxes from operating cash flow?

4–7 From a strict financial perspective, define and differentiate between a firm's *operating cash flow (OCF)* and its *free cash flow (FCF)*.

LG 3

4.2 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 plans, 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
Plans that 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 effect 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. The *Focus on Ethics* box shows how one CEO dramatically reshaped his company's operating structure, although it later cost him his job.

SHORT-TERM (OPERATING) FINANCIAL PLANS

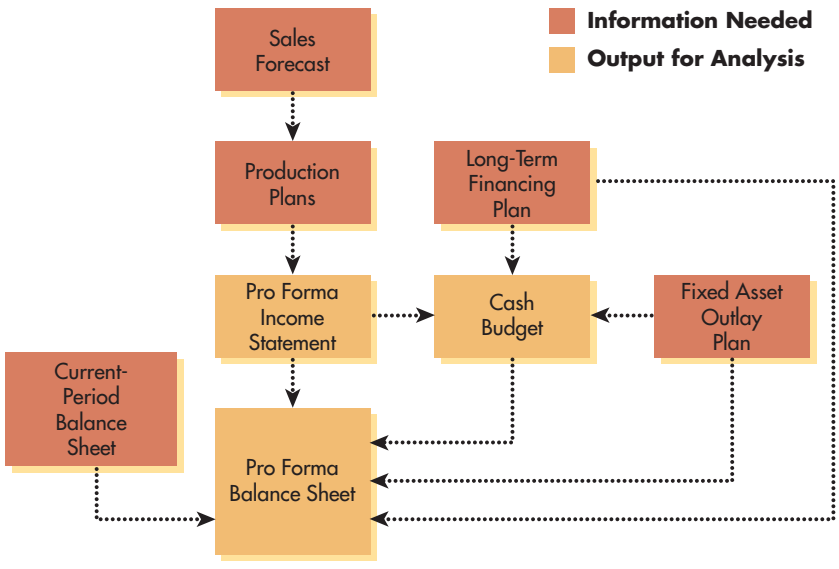
short-term (operating) financial plans
Specify short-term financial actions and the anticipated impact of those actions.

Short-term (operating) financial plans specify short-term financial actions and the anticipated effect 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 budget, and pro forma financial statements. The entire short-term financial planning process is outlined in Figure 4.1 below. Here we focus solely on cash and profit planning from the financial manager's perspective.

Short-term financial planning begins with the sales forecast. From it, companies develop production plans that take into account lead (preparation) times and include estimates of the required raw materials. Using the production plans, the

FIGURE 4.1

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



focus on **ETHICS**

How Much Is a CEO Worth?

in practice When Jack Welch retired as chairman and CEO of General Electric in 2000, Robert L. Nardelli was part of a lengthy and well-publicized succession planning saga; he eventually lost the job to Jeff Immelt. Nardelli was quickly hired by The Home Depot, one of several companies competing for his services, who offered generous incentives for him to come on board.

Using the "Six Sigma" management strategy from GE, Nardelli dramatically overhauled The Home Depot and replaced its freewheeling entrepreneurial culture. He changed the decentralized management structure by eliminating and consolidating division executives. He also installed processes and streamlined operations, most notably implementing a computerized automated inventory system and centralizing supply orders at the Atlanta headquarters. Nardelli was credited with doubling the sales of the chain and improving its competitive position. Revenue increased from $45.7 billion in 2000 to $81.5 billion in 2005, while profit rose from $2.6 billion to $5.8 billion.

However, the company's stagnating share price, Nardelli's results-driven management style, which turned off both employees and customers, and his compensation package eventually earned the ire of investors. Despite having received the solid support of The Home Depot's board of directors, Nardelli abruptly resigned on January 3, 2007. He was not destined for poverty, as his severance package had been negotiated years earlier when he joined The Home Depot. The total severance package amounted to $210 million, including $55.3 million of life insurance coverage; reimbursement of $1.3 million of Nardelli's personal taxes related to the life insurance; $50,000 to cover his legal fees; $33.8 million in cash due July 3, 2007; an additional $18 million over 4 years for abiding by the terms of the deal; and the balance of the package from accelerated vesting of stock options. In addition, Nardelli and his family would receive health care benefits from the company for the next 3 years.

The mammoth payoff for Nardelli's departure caused uproar among many shareholder activists because The Home Depot's stock fell 8 percent during his 6-year tenure. Clearly, the mantra of shareholder activists today is, "Ask not what you can do for your company, ask what your company can do for shareholders." The spotlight will no longer be only on what a CEO does, but also on how much the CEO is paid.

▶ *Do you think shareholder activists would have been as upset with Nardelli's severance package had The Home Depot's stock performed much better under his leadership?*

firm can estimate direct labor requirements, factory overhead outlays, and operating expenses. Once these estimates have been made, the firm can prepare a pro forma income statement and cash budget. With these basic inputs, the firm can finally develop a pro forma balance sheet.

Personal Finance Example 4.6 ▶ The first step in personal financial planning requires you to define your goals. Whereas in a corporation the goal is to maximize owner wealth (that is, share price), individuals typically have a number of major goals.

Generally, personal goals can be short-term (1 year), intermediate-term (2 to 5 years), or long-term (6 or more years). The short- and intermediate-term goals support the long-term goals. Clearly, types of long-term personal goals depend on the individual's or family's age, and goals will continue to change with one's life situation.

You should set your personal financial goals carefully and realistically. Each goal should be clearly defined and have a priority, time frame, and cost estimate. For example, a college senior's intermediate-term goal in 2015 might include earning a master's degree at a cost of $40,000 by 2017, and his or her long-term goal might be to buy a condominium at a cost of $125,000 by 2019.

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

4–8 What is the *financial planning process?* Contrast *long-term (strategic) financial plans* and *short-term (operating) financial plans.*

4–9 Which three statements result as part of the short-term (operating) financial planning process?

LG 4 4.3 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 being paid 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 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. 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.

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

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.

Internal forecasts are based on a 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.

TABLE 4.7 The General Format of the Cash Budget

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

PREPARING THE CASH BUDGET

The general format of the cash budget is presented in Table 4.7. The following dicussion along with Tables 4.8 and 4.9 illustrates each of its components individually. Table 4.10 presents the completed cash budget for Coulson Industries.

Total Cash Receipts

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

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

Example 4.7 ▸

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. 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 4.8. It contains the following:

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.

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.

TABLE 4.8 A Schedule of Projected Cash Receipts for Coulson Industries ($000)

Sales forecast	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	$20	$90	$210	$320	$340

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 4.8.

Total cash disbursements

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

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

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

Example 4.8 ▸ 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.

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

Wages and salaries Fixed salaries for the year are $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.

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 4.9. Some items in the table are explained in greater detail as follows:

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

TABLE 4.9 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	$7	$63	$213	$418	$305

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.

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.

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.

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

Look back at the general-format cash budget in Table 4.7 on page 177. 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 4.9 ▸

Table 4.10 presents Coulson Industries' cash budget. The company wishes to maintain, as a reserve for unexpected needs, a minimum cash balance of $25,000. 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

TABLE 4.10 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 4.8.

[b]From Table 4.9.

[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.

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.

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. 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.

Personal Finance Example 4.10 ▶ Because individuals receive only a finite amount of income (cash inflow) during a given period, they need to prepare budgets to make sure they can cover their expenses (cash outflows) during the period. The *personal budget* is a short-term financial planning report that helps individuals or families achieve short-term financial goals. Personal budgets typically cover a 1-year period, broken into months.

A condensed version of a personal budget for the first quarter (3 months) is shown below.

	Jan.	Feb.	Mar.
Income			
Take-home pay	$4,775	$4,775	$4,775
Investment income			90
(1) Total income	$4,775	$4,775	$4,865
Expenses			
(2) Total expenses	$4,026	$5,291	$7,396
Cash surplus or deficit [(1)−(2)]	$ 749	($ 516)	($2,531)
Cumulative cash surplus or deficit	$ 749	$ 233	($2,298)

The personal budget shows a cash surplus of $749 in January followed by monthly deficits in February and March of $516 and $2,531, resulting in a cumulative deficit of $2,298 through March. Clearly, to cover the deficit, some action—such as increasing income, reducing expenses, drawing down savings, or borrowing—will be necessary to bring the budget into balance. Borrowing by using credit can offset a deficit in the short term but can lead to financial trouble if done repeatedly.

COPING WITH UNCERTAINTY IN THE CASH BUDGET

Aside from careful estimation of cash budget inputs, there are two ways of coping with uncertainty in the cash budget. 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 scenarios, also should give the financial manager a sense of the riskiness of the various alternatives. This *scenario analysis,* or "what if" approach, is often used to analyze cash flows under a variety of circumstances. Clearly, the use of electronic spreadsheets simplifies the process of performing scenario analysis.

Example 4.11 ▸ Table 4.11 presents the summary of Coulson Industries' cash budget prepared for each month 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 $107,000. By considering the extreme values in the pessimistic and optimistic outcomes, Coulson

TABLE 4.11 A Scenario Analysis of Coulson Industries' Cash Budget ($000)

	October			November			December		
	Pessi-mistic	Most likely	Opti-mistic	Pessi-mistic	Most likely	Opti-mistic	Pessi-mistic	Most likely	Opti-mistic
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

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 12). 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.

The synchronization of cash flows in the cash budget at month-end does not ensure that the firm will be able to meet its 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 amount of attention required.

→ REVIEW QUESTIONS

4–10 What is the purpose of the *cash budget?* What role does the sales forecast play in its preparation?

4–11 Briefly describe the basic format of the cash budget.

4–12 How can the two "bottom lines" of the cash budget be used to determine the firm's short-term borrowing and investment requirements?

4–13 What is the cause of uncertainty in the cash budget, and what two techniques can be used to cope with this uncertainty?

LG 5 4.4 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 income statements and balance sheets. The basic steps in the short-term financial planning process were shown in the flow diagram of Figure 4.1. The approaches for estimating the pro forma statements are all 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.

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 2015 operations is given in Table 4.12. 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 2015 is given in Table 4.13.

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 (2016), based on both external and internal data, is presented in Table 4.14. 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

4–14 What is the purpose of *pro forma statements?* What inputs are required for preparing them using the simplified approaches?

TABLE 4.12 Vectra Manufacturing's Income Statement for the Year Ended December 31, 2015

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 4.13 Vectra Manufacturing's Balance Sheet, December 31, 2015

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	Total liabilities	$37,000
		Common stock	30,000
		Retained earnings	23,000
		Total liabilities and stockholders' equity	$90,000

TABLE 4.14 2016 Sales Forecast for Vectra Manufacturing

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

LG 5 4.5 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 2015 income statement (Table 4.12), we find that these percentages are

$$\frac{\text{Cost of goods sold}}{\text{Sales}} = \frac{\$80{,}000}{\$100{,}000} = 0.800 = 80.0\%$$

$$\frac{\text{Operating expenses}}{\text{Sales}} = \frac{\$10{,}000}{\$100{,}000} = 0.100 = 10.0\%$$

$$\frac{\text{Interest expense}}{\text{Sales}} = \frac{\$1{,}000}{\$100{,}000} = 0.010 = 1.0\%$$

Applying these percentages to the firm's forecast sales of $135,000 (developed in Table 4.14), we get the 2016 pro forma income statement shown in Table 4.15. 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 4.12).

CONSIDERING TYPES OF COSTS AND EXPENSES

The technique that is used to prepare the pro forma income statement in Table 4.15 assumes that all the firm's costs and expenses are *variable*. That is, for a given percentage increase in sales, the same percentage increase in cost of goods sold, operating expenses, and interest expense would result. For example, as Vectra's sales increased by 35 percent, we assumed that its costs of goods sold also increased by 35 percent. On the basis of this assumption, the firm's net profits before taxes also increased by 35 percent.

TABLE 4.15 A Pro Forma Income Statement, Using the Percent-of-Sales Method, for Vectra Manufacturing for the Year Ended December 31, 2016

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

Because this approach assumes that all costs are variable, it may understate the increase in profits that will occur when sales increase if some of the firm's costs are fixed. Similarly, if sales decline, the percentage-of-sales method may overstate profits if some costs are fixed and do not fall when revenues decline. Therefore, a pro forma income statement constructed using the percentage-of-sales method generally tends to *understate profits when sales are increasing* and *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. The potential returns as well as risks resulting from use of fixed (operating and financial) costs to create "leverage" are discussed in Chapter 13. The key point to recognize is that fixed costs make a firm's profits more variable than its revenues. That is, when both profits and sales are rising, profits tend to increase at a faster rate, but when profits and sales are in decline, the percentage drop in profits is often greater than the rate of decline in sales.

Example 4.12 ▸ Vectra Manufacturing's 2015 actual and 2016 pro forma income statements, broken into fixed and variable cost and expense components, follow:

Vectra Manufacturing Income Statements

	2015 Actual	2016 pro forma
Sales revenue	$100,000	$135,000
Less: Cost of goods 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

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 4.15), we find that projected net profits before taxes would continue to equal 9 percent of sales (in 2015, $9,000 net profits before taxes ÷ $100,000 sales). Therefore, the 2016 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

4–15 How is the *percent-of-sales method* used to prepare pro forma income statements?

4–16 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?

LG 5 4.6 Preparing the Pro Forma Balance Sheet

judgmental approach
A simplified approach for preparing the pro forma balance sheet under which the firm estimates the values of certain balance sheet accounts and uses its external financing as a balancing, or "plug," figure.

A number of simplified approaches are available for preparing the pro forma balance sheet. One involves estimating all balance sheet accounts as a strict percentage of sales. A better and more popular approach is the **judgmental approach,** under which the firm estimates the values of certain balance sheet accounts and uses its external financing as a balancing, or "plug," figure. The judgmental approach represents an improved version of the 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.

To apply the judgmental approach to prepare Vectra Manufacturing's 2016 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 will remain unchanged from their current level of $4,000.
3. Accounts receivable on average represent about 45 days of sales (about 1/8 of a year). Because Vectra's annual sales are projected to be $135,000, accounts receivable should average $16,875 (1/8 × $135,000).
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 yields net fixed assets of $63,000.
6. Purchases will represent approximately 30 percent of annual sales, which in this case is approximately $40,500 (0.30 × $135,000). The firm estimates that it can take 73 days on average to satisfy its accounts payable. Thus accounts payable should equal one-fifth (73 days ÷ 365 days) of the firm's purchases, or $8,100 (1/5 × $40,500).
7. Taxes payable will 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 4.15).
8. Notes payable will 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 will 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, 2015, in Table 4.13) to $29,327. The increase of $6,327 represents the amount of retained earnings calculated in the year-end 2016 pro forma income statement in Table 4.15.

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. It can be either a positive or a negative value.

A 2016 pro forma balance sheet for Vectra Manufacturing based on these assumptions is presented in Table 4.16. A **"plug" figure**—called the **external financing required**—of $8,293 is needed to bring the statement into balance. This means that the firm will have to obtain about $8,300 of additional external financing to support the increased sales level of $135,000 for 2016.

A *positive* value for "external financing required," like that shown in Table 4.16, means that, based on its plans, the firm will not generate enough internal financing to support its forecast growth in assets. To support the forecast level of operation, the firm must raise funds externally by 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, based on its plans, the firm will generate more financing internally than it needs to support its forecast growth in assets. 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,

TABLE 4.16 A Pro Forma Balance Sheet, Using the Judgmental Approach, for Vectra Manufacturing (December 31, 2016)

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	Total liabilities	$ 38,255
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.

the judgmental approach is frequently used specifically to estimate the firm's financing requirements.

→ REVIEW QUESTIONS

4–17 Describe the *judgmental approach* for simplified preparation of the pro forma balance sheet.

4–18 What is the significance of the "plug" figure, *external financing required?* Differentiate between strategies associated with positive values and with negative values for external financing required.

LG 6 4.7 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. It is nonetheless 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. The widespread use of spreadsheets certainly helps to streamline the financial planning process.

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

4–19 What are the two basic weaknesses of the simplified approaches to preparing pro forma statements?

4–20 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 the firm's cash flow. The goal is to ensure the firm's solvency 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.

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. Clearly, the financial manager must deliberately and carefully plan and manage the firm's cash flows to achieve the firm's goal of maximizing share price.

REVIEW OF LEARNING GOALS

LG 1 **Understand tax depreciation procedures and the effect of depreciation on the firm's cash flows.** Depreciation is an important factor affecting a firm's cash flow. An asset's depreciable value and depreciable life are determined by using the MACRS standards in the federal tax code. MACRS groups assets (excluding real estate) into six property classes based on length of recovery period.

LG 2 **Discuss the firm's statement of cash flows, operating cash flow, and free cash flow.** The statement of cash flows is divided into cash flow from operating, investment, and financing activities. 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 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 flow is defined to exclude interest. Of greater importance is a firm's free cash flow, which is the amount of cash flow available to creditors and owners.

LG 3 **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; short-term plans most often cover a 1- to 2-year period.

LG 4 **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 firm can determine required total financing or the excess cash balance. To cope with uncertainty in the cash budget, scenario analysis or simulation can be used. A firm must also consider its pattern of daily cash receipts and cash disbursements.

LG 5 **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 applying 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 the firm's external financing is used as a balancing, or "plug," figure. A positive value for "external financing required" means that the firm will not generate enough internal financing to support its forecast growth in assets and will have to raise funds externally or reduce dividends. A negative value for "external financing required" indicates that the firm will generate more financing internally than it needs to support its forecast growth in assets and funds will be available for use in repaying debt, repurchasing stock, or increasing dividends.

LG 6 **Evaluate the simplified approaches to pro forma financial statement preparation and the common uses of pro forma statements.** Simplified approaches for preparing pro forma statements assume that the firm's past financial condition is an accurate indicator of the future. 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 to achieve short-term financial goals.

Opener-in-Review

The chapter opener described a company that reported increases in revenues and profits, but even so, the company's free cash flow was negative. Explain why a profitable, expanding business may have negative free cash flow.

Self-Test Problems (Solutions in Appendix)

LG 1 LG 2 **ST4–1** **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 $15,000. 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 4.2 on page 166.

b. Calculate the firm's operating cash flows for each of the 6 years, using Equation 4.3. Assume that the firm is subject to a 40% tax rate on all the profit that it earns.

c. Suppose that 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**.

LG 4 LG 5 **ST4–2 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

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 cash budgets 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.

LG 5 **ST4–3** **Pro forma income statement** Euro Designs, Inc., expects sales during 2016 to rise from the 2015 level of $3.5 million to $3.9 million. Because of a scheduled large loan payment, the interest expense in 2016 is expected to drop to $325,000. The firm plans to increase its cash dividend payments during 2016 to $320,000. The company's year-end 2015 income statement follows.

Euro Designs, Inc., Income Statement for the Year Ended December 31, 2015

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 2016 pro forma income statement for Euro Designs, Inc.

b. Explain why the statement may underestimate the company's actual 2016 pro forma income.

Warm-Up Exercises

All problems are available in MyFinanceLab.

LG 1 **E4–1** The installed cost of a new computerized controller was $65,000. Calculate the depreciation schedule by year assuming a recovery period of 5 years and using the appropriate MACRS depreciation percentages given in Table 4.2 on page 166.

LG 2 **E4–2** After studying the balance sheet of Save Money Incorporation, you have noticed the following: an increase of $800 in inventory, an increase of $330 in accounts payable, a decrease of $890 in short-term debt, and an increase of $950 in accounts receivable. What is the net cash effect of these changes?

LG 2 **E4–3** Determine the *operating cash flow (OCF)* for Kleczka, Inc., based on the following data. (All values are in thousands of dollars.) During the year the firm had sales of $2,500, cost of goods sold totaled $1,800, operating expenses totaled $300, and depreciation expenses were $200. The firm is in the 35% tax bracket.

LG 2 **E4–4** During the year, Xero, Inc., experienced an increase in net fixed assets of $300,000 and had depreciation of $200,000. It also experienced an increase in current assets of $150,000 and an increase in accounts payable and accruals of $75,000. If operating cash flow (OCF) for the year was $700,000, calculate the firm's *free cash flow (FCF)* for the year.

LG 5 **E4–5** Rimier Corp. forecasts sales of $650,000 for 2016. Assume that the firm has fixed costs of $250,000 and variable costs amounting to 35% of sales. Operating expenses are estimated to include fixed costs of $28,000 and a variable portion equal to 7.5% of sales. Interest expenses for the coming year are estimated to be $20,000. Estimate Rimier's net profits before taxes for 2016.

Problems

All problems are available in MyFinanceLab.

LG 1 **P4–1** **Depreciation** On March 20, 2015, 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 4.2 on page 166, prepare a depreciation schedule for each of these assets.

LG 1 **P4–2** **Depreciation** Early this year, Rubber Incorporated purchased a new machine for $12,000 to shape rubber. It is estimated that the new machine will have a recovery period of 3 years with an expected salvage value of $2,500. Use the MACRS depreciation percentages presented in Table 4.2 to develop a depreciation schedule for the new machine.

LG 1 LG 2 **P4–3** **MACRS depreciation expense and accounting cash flow** Pavlovich Instruments, Inc., a maker of precision telescopes, expects to report pretax 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 4.2 on page 166.)

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

LG 1 LG 2 **P4–4** **Depreciation and accounting cash flow** The following data are available for a firm's current year's operations. The firm has only one asset, which has a 3-year recovery period. The cost of the asset one year ago was $165,000. The depreciation rate is 45%.

Accruals	$ 12,500
Current assets	135,000
Interest expense	13,550
Sales revenue	420,000
Inventory	82,300
Total costs before depreciation, interest, and taxes	295,000
Tax rate on ordinary income	40%

a. Calculate the firm's operating cash flow for the current year (see Equation 4.2).
b. Why is it important to add back noncash items such as depreciation when calculating cash flows?

LG 2 **P4–5 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	+150	Cash dividends	+540
Accounts payable	+1,100	Accounts receivable	−460
Notes payable	−530	Inventory	−160
Fixed assets	+550	Repurchase of stock	+475
Sale of stock	+950	Long-term debt	−1,890
Depreciation	+110	Net profit	+380

LG 2 **P4–6 Finding operating and free cash flows** Consider the following summary of Summer Breeze Corporation's financial statements.

Summer Breeze Corporation Balance Sheets

	December 31	
Assets	**2015**	**2014**
Cash	$ 2,000	$ 1,500
Marketable securities	2,400	1,800
Accounts receivable	2,200	2,000
Inventories	3,000	2,900
Total current assets	$ 9,600	$ 8,200
Gross fixed assets	$30,900	$29,500
Less: Accumulated depreciation	16,300	14,700
Net fixed assets	$14,600	$14,800
Total assets	$24,200	$23,000
Liabilities and stockholders' equity		
Accounts payable	$ 1,700	$ 1,600
Notes payable	3,400	2,800
Accruals	100	200
Total current liabilities	$ 5,200	$ 4,600
Long-term debt	5,000	5,000
Total liabilities	$10,200	$ 9,600
Common stock	$10,000	$10,000
Retained earnings	4,000	3,400
Total stockholders' equity	$14,000	$13,400
Total liabilities and stockholders' equity	$24,200	$23,000

Summer Breeze Corporation Income Statement Data (2015)	
Depreciation expense	$1,800
Earnings before interest and taxes (EBIT)	2,900
Interest expense	397
Net profits after taxes	1,600
Tax rate	40%

a. Using Equation 4.1, calculate the firm's *net operating profit after tax* (NOPAT) for the year ended December 31, 2015.
b. Using Equation 4.3, calculate the firm's *operating cash flow* (OCF) for the year ended December 31, 2015.
c. How much cash is available to be distributed to the investors after the firm has met all operating needs and all investment needs?
d. Distinguish between the two cash flows calculated in parts **b** and **c**.

LG 4

P4–7 Cash receipts A firm reported actual sales of $65,000 in the month of June and $70,000 in July. The sales forecasts indicate that sales are expected to be $85,000, $92,000, and $95,750 for the months of August, September, and October, respectively. Sales are 60% cash and 40% credit, and credit sales are collected evenly over the following 2 months. No other cash receipts were received. What are the firm's expected cash receipts for the months of August, September, and October?

LG 4

P4–8 Cash disbursements schedule The Coffee Specialist Corporation approached you to compile a cash disbursement schedule for the months of March, April, and May. Use the following information and Table 4.9 as a guide to prepare this schedule.

Sales: January = $520,000; February = $540,000; March = $550,000; April = $600,000; May = $660,000; June = $670,000

Purchases: Purchases are calculated as 70% of the following month's sales, 50% of purchases are made in cash, 30% of purchases are settled one month after purchase, and the remaining 20% of purchases are settled two months after purchase.

Rent: The firm pays rent of $9,500 per month.

Wages and salaries: The fixed wage and salary costs are $7,500 per month plus a variable cost of 6.5% of the current month's sales.

Taxes: The tax bill to be paid in May amounts to $57,500.

Fixed asset outlays: New equipment will be acquired during March at a cost of $85,000.

Interest payments: An amount of $32,000 for interest is due in March.

Cash dividends: Dividends of $15,000 will be paid in April.

LG 4

P4–9 Cash budget: Basic Farmers Delight Corporation reported sales of $350,000 in June, $380,000 in July, and $390,000 in August. The forecasts for September, October, and November are $385,000, $418,000, and $429,000, respectively. The initial cash balance on September 1 is $150,000, and a minimum of $8,000 should be kept. Use the given information to compile a cash budget for the months of September, October, and November.

(1) Farmers Delight predicts that 5% of its sales will never be collected, 30% of its sales will be cash sales, and the remaining 65% will be collected in the following month.

(2) Farmers Delight receives other monthly income of $3,000.
(3) The actual or expected purchases are $150,000, $120,000, and $115,000 for the months of September to November, respectively, and 50% are paid in cash while the remainder is paid in the following month. The purchases for August were $120,000.
(4) Monthly rent is $3,500 chargeable only in October and November.
(5) Wages and salaries are 12% of the previous month's sales.
(6) Cash dividends of $4,600 are declared and will be paid in September.
(7) Long-term loan repayment of principal and interest of $4,700 is due in October.
(8) Additional equipment costing $8,500 is ordered and scheduled to be paid for in cash in November.
(9) Taxes of $8,250 are due in November.

Personal Finance Problem

LG 4 **P4–10** **Preparation of cash budget** Sam and Suzy Sizeman need to prepare a cash budget for the last quarter of 2016 to make sure they can cover their expenditures during the period. Sam and Suzy have been preparing budgets for the past several years and have been able to establish specific percentages for most of their cash outflows. These percentages are based on their take-home pay (that is, monthly utilities normally run 5% of monthly take-home pay). The information in the following table can be used to create their fourth-quarter budget for 2016.

Income	
Monthly take-home pay	$4,900
Expenses	
Housing	30%
Utilities	5%
Food	10%
Transportation	7%
Medical/dental	.5%
Clothing for October and November	3%
Clothing for December	$440
Property taxes (November only)	11.5%
Appliances	1%
Personal care	2%
Entertainment for October and November	6%
Entertainment for December	$1,500
Savings	7.5%
Other	5%
Excess cash	4.5%

a. Prepare a quarterly cash budget for Sam and Suzy covering the months October through December 2016.
b. Are there individual months that incur a deficit?
c. What is the cumulative cash surplus or deficit by the end of December 2016?

LG 4 **P4–11** **Cash budget: Advanced** The actual sales and purchases for Xenocore, Inc., for September and October 2015, along with its forecast sales and purchases for the period November 2015 through April 2016, follow.

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.

Year	Month	Sales	Purchases
2015	September	$210,000	$120,000
2015	October	250,000	150,000
2015	November	170,000	140,000
2015	December	160,000	100,000
2016	January	140,000	80,000
2016	February	180,000	110,000
2016	March	200,000	100,000
2016	April	250,000	90,000

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.

LG 4 **P4–12** **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.

	Statement		
Transaction	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			

LG 4 **P4–13** **Cash budget: Scenario analysis** Markham Enterprises needs to plan its cash requirements and short-term investment opportunities for the months of June, July, and August. The following data are available. The beginning balance is −$28,000 for June and the minimum required cash balance is $30,000. All amounts are shown in thousands of dollars.

	June			July			August		
	Pessimistic	Most likely	Optimistic	Pessimistic	Most likely	Optimistic	Pessimistic	Most likely	Optimistic
Total cash receipts	$250	$370	$430	$245	$305	$395	$265	$335	$412
Total cash disbursements	260	310	405	255	285	375	280	300	396

a. Prepare a scenario analysis of Markham Enterprises.
b. Identify the finance need/surplus for each month under the different scenarios. If needed, where could the funds be obtained? What should be done with a surplus of cash?

LG 4 **P4–14** **Multiple cash budgets: Scenario 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.

LG 5 **P4–15** **Pro forma income statement** Bells Manufacturing estimates that the sales for the 2016 financial year will be $2.25 million. No new borrowing was obtained and, therefore, the interest expense remained unchanged at $24,500. Bells Manufacturing is planning on paying cash dividends of $85,000 during 2016. Refer to the financial data in the table while answering the following:
a. Compile the pro forma income statement for the year ended December 31, 2016, using the percentage-of-sales method.
b. Compile the pro forma income statement for the year ended December 31, 2016, using the fixed and variable cost data.
c. As the financial manager, which of the two pro forma statements would you regard as more accurate? Explain.

Bells Manufacturing Income Statement for the Year Ended December 31, 2015	
Sales revenue	$1,800,000
Less: Cost of goods sold	1,100,000
Gross profits	$ 700,000
Less: Operating expenses	450,000
Operating profits	$ 250,000
Less: Interest expense	24,500
Net profits before taxes	$ 225,500
Less: Taxes (rate = 40%)	90,200
Net profits after taxes	$ 135,300
Less: Cash dividends	85,000
To retained earnings	$ 50,300

Bell Manufacturing Breakdown of Costs and Expenses into Fixed and Variable Components for the Year Ended December 31, 2015	
Cost of goods sold	
Fixed cost	$ 750,000
Variable cost	350,000
Total costs	$1,100,000
Operating expenses	
Fixed expenses	$ 155,000
Variable expenses	295,000
Total expenses	$ 450,000

LG 5 **P4–16** **Pro forma income statement: Scenario analysis** Allen Products, Inc., wants to do a *scenario 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, 2015	
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, 2015, 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 the 2015 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 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**?

LG 5 **P4–17** **Pro forma balance sheet: Basic** Leonard Industries wishes to prepare a pro forma balance sheet for December 31, 2016. The firm expects 2016 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 2016. 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 2016.
(9) The December 31, 2015, balance sheet follows.

Leonard Industries Balance Sheet December 31, 2015

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	Total liabilities	$ 835,000
Total assets	$ 1,255,000	Common stock	200,000
		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, 2016, for Leonard Industries.
b. How much, if any, additional financing will Leonard Industries require in 2016? Discuss.
c. Could Leonard Industries adjust its planned 2016 dividend to avoid the situation described in part **b**? Explain how.

LG 5 **P4–18** **Pro forma balance sheet** Randy & Wiskers Enterprises reported sales of $15.5 million for the 2015 financial year. In order to identify the financial needs for the 2016 financial year, you were requested to compile a pro forma balance sheet. The balance sheet as of December 31, 2015 (shown on the next page) and other additional information are as follows.

Additional information

(1) The balance sheet items vary directly with sales: Accounts receivable (15%), Inventory (15%), Accounts payable (10%), and net profit margin (2%).
(2) All other balance sheet items remain unchanged.

(3) Minimum cash balance of $520,000 is desired.
(4) New equipment costing $20,000 will be purchased during 2016, and the net fixed assets will increase to $5,815,000.
(5) Accruals will increase to $660,000.
(6) Long-term debt is not expected to be repaid in full, and no common stock will be repurchased.
(7) The dividend payout will remain unchanged at 50% of net profits.
(8) Sales are expected to decrease to $15,000,000.

Randy & Wiskers Enterprises Balance Sheet December 31, 2015 ($000)

Assets		Liabilities and stockholders' equity	
Cash	$ 500	Accounts payable	$1,870
Marketable securities	350	Accruals	600
Accounts receivable	1,500	Other current liabilities	150
Inventories	2,300	Total current liabilities	$2,620
Total current assets	$ 4,650	Long-term debt	2,000
Net fixed assets	5,800	Total liabilities	4,620
Total assets	$10,450	Common equity	5,830
		Total liabilities and stockholders' equity	$10,450

Based on the information provided, answer the following:
a. Prepare a pro forma balance sheet as at December 31, 2016.
b. Identify and describe the needs as indicated by the pro forma balance sheet in part **a.**

LG 5 **P4–19** **Integrative: Pro forma statements** Red Queen Restaurants wishes to prepare financial plans. Use the financial statements and the other information provided below to prepare the financial plans.

The following financial data are also available:
(1) The firm has estimated that its sales for 2016 will be $900,000.
(2) The firm expects to pay $35,000 in cash dividends in 2016.
(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 2016.
(6) A new machine costing $42,000 will be purchased in 2016. Total depreciation for 2016 will be $17,000.
(7) Accounts payable will change directly in response to changes in sales in 2016.
(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, 2016, using the *percent-of-sales method.*
b. Prepare a pro forma balance sheet dated December 31, 2016, using the *judgmental approach.*
c. Analyze these statements, and discuss the resulting *external financing required.*

Red Queen Restaurants Income Statement for the Year Ended December 31, 2015	
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, 2015

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	Total liabilities	$325,000
Total assets	$650,000	Common stock	150,000
		Retained earnings	175,000
		Total liabilities and stockholders' equity	$650,000

LG 5 **P4–20 Integrative: Pro forma statements** Provincial Imports, Inc., has assembled past (2015) financial statements (income statement and balance sheet below) and financial projections for use in preparing financial plans for the coming year (2016).

Provincial Imports, Inc., Income Statement for the Year Ended December 31, 2015	
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

Information related to financial projections for the year 2016 is as follows:

Provincial Imports, Inc.,
Balance Sheet December 31, 2015

Assets		Liabilities and stockholders' equity	
Cash	$ 200,000	Accounts payable	$ 700,000
Marketable securities	225,000	Taxes payable	95,000
Accounts receivable	625,000	Notes payable	200,000
Inventories	500,000	Other current liabilities	5,000
Total current assets	$1,550,000	Total current liabilities	$1,000,000
Net fixed assets	1,400,000	Long-term debt	500,000
Total assets	$2,950,000	Total liabilities	$1,500,000
		Common stock	75,000
		Retained earnings	1,375,000
		Total liabilities and equity	$2,950,000

(1) Projected sales are $6,000,000.
(2) Cost of goods sold in 2015 includes $1,000,000 in fixed costs.
(3) Operating expense in 2015 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.
(10) The tax rate will remain at 40%.

a. Prepare a pro forma income statement for the year ended December 31, 2016, using the *fixed cost data* given to improve the accuracy of the *percent-of-sales method*.
b. Prepare a pro forma balance sheet as of December 31, 2016, 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*.

LG 3 **P4–21** **ETHICS PROBLEM** The SEC is trying to get companies to notify the investment community more quickly when a "material change" will affect their forthcoming financial results. In what sense might a financial manager be seen as "more ethical" if he or she follows this directive and issues a press release indicating that sales will not be as high as previously anticipated?