

## FINANCIAL PLANNING AND THE PRINCIPLES OF FINANCE

- ◆ *Example 1: Bottom-Up* Use both bottom-up and top-down processes to increase the chance of success for financial plans.
- ◆ *Example 2: Financial Review* Carefully evaluate and monitor the financial plan's impact on the firm and its stakeholders.
- ◆ *Example 3: Cash Flows* Forecast the firm's cash flows, and analyze the incremental cash flows for alternative decisions.
- ◆ *Example 4: NPV* Compare the NPVs of alternative financial plans.
- ◆ *Example 5: Win-Win* Look for situations that are not zero-sum games and thus may benefit both you and your supplier or customer, perhaps by reducing financial contracting costs and reducing transaction costs.
- ◆ *Example 6: Outsourcing* Consider subcontracting business activities to outside vendors if they can provide the services more cheaply and competently.
- ◆ *Example 7: Industry Practices* Use dominant industry practices as a good starting place for the planning process.

### 22.1 THE FINANCIAL PLANNING PROCESS

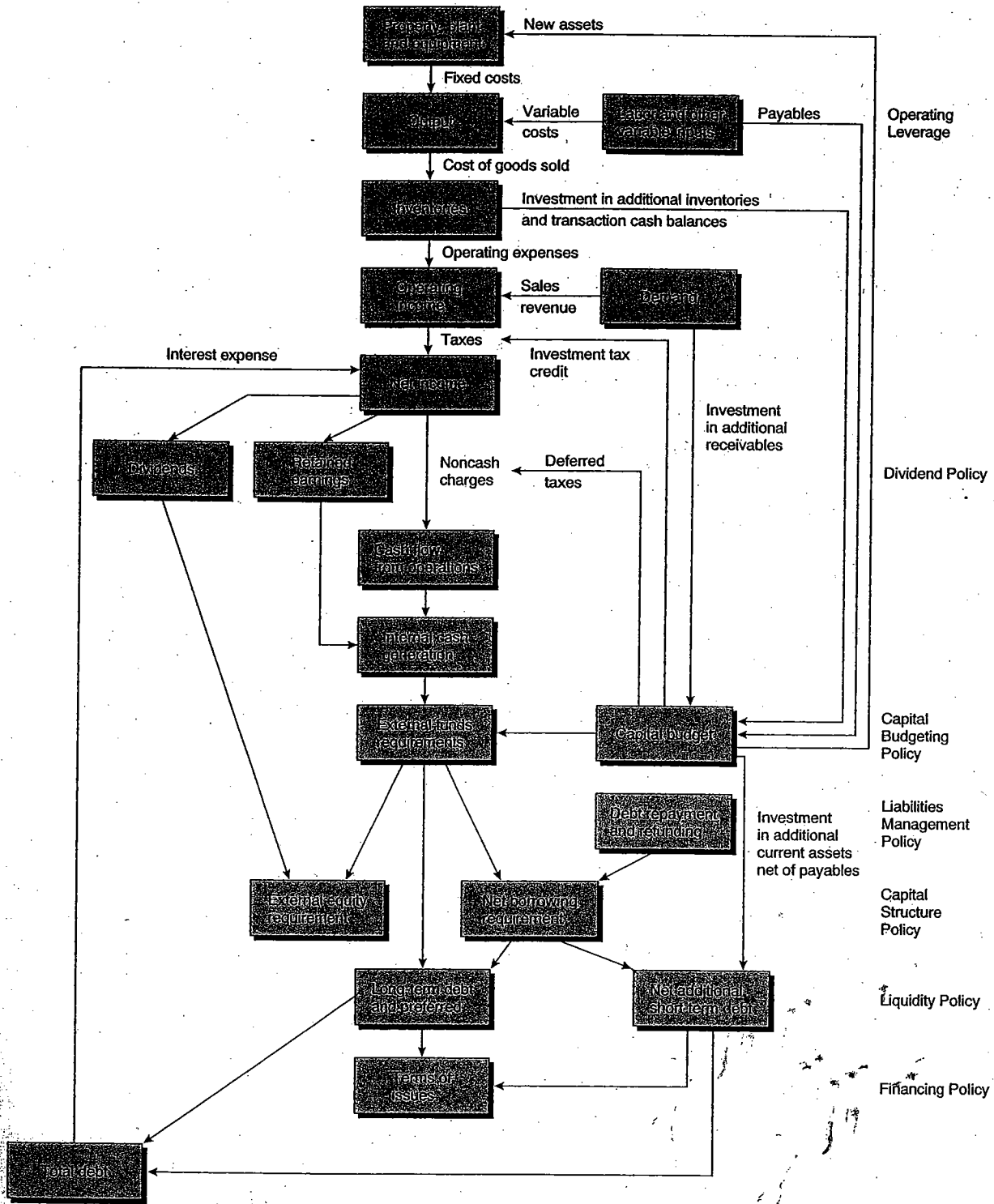
A firm is a dynamic system. Decisions and policies about liquidity, working capital, inventories, capital budgeting, capital structure, and dividends (among other things) interact continually. Figure 22-1 illustrates this interaction in a flow-of-funds framework.

The main net source of funds is the firm's operations. The firm uses its fixed assets, together with labor, raw materials, and other inputs, to produce products and services to sell. Sales revenue minus cost of goods sold and operating expenses (such as selling, general, and administrative expenses) equals the firm's operating income. An important question in connection with financial planning is how operating income responds to increases in output. The answer depends on the firm's operating leverage. Recall from Chapter 10 that the higher the fixed-cost component of total costs, the greater is operating leverage.

Net income is left after interest expense and taxes are paid. Net income can be paid out as dividends, or it can be retained and reinvested. The firm's dividend policy determines the split between dividends and retained earnings. Dividend policy interacts with the firm's capital budget. A higher payout ratio increases the amount of external financing needed to meet the capital budget. Both of these policies in turn interact with the firm's capital structure policy. The combination of the firm's financing needs, its dividend policy, and its capital structure policy determines the mix of debt and equity in any required new external financing.

The firm's financing needs are determined mainly by its capital budget and internal cash generation. The capital budget is in turn affected by projected sales. Increased sales will eventually require expenditures for planned expansions and new equipment. In addition, higher production rates cause machines to wear out faster, so the need for replacement investment also increases. Higher sales levels will also require additional investment in working capital.

The firm's planned investment in current assets (net of increases in payables), along with its liquidity policy, determines the net increase or decrease in short-term borrowing. The



**FIGURE 22-1**  
Interaction of financial decisions in a flow-of-funds framework.

rest of the firm's borrowing needs, the residual, should be on a long-term basis. The firm might issue some preferred stock in addition to (or in place of) long-term debt, depending on its tax position and capital structure objectives. The firm's tax position is essentially the amount of tax deductions and credits from depreciation, depletion allowance, and interest expense.

The total long-term borrowing requirement includes the residual just noted plus any required debt repayments and planned early refunding. Finally, the terms of the debt (and/or preferred stock) issues must be determined in light of the firm's financing policy. Any resulting debt issuance changes the firm's interest expense. This will affect net income—and the planning "circle" is complete.

The process illustrated in Figure 22-1 is a continuing one. Remember, the firm's total sources of funds must equal its total uses of funds in any finite planning period. For relatively short periods of time, this equality might require either unintended changes in cash balances or unplanned short-term borrowing. But the firm should strive to avoid these inefficiencies through good financial planning. All six of the basic financial policies must be determined simultaneously. This requires certain trade-offs. These trade-offs can be analyzed within a financial planning model.

### ***The Financial Plan***

Figure 22-1 provides a starting point for financial planning. **Financial planning** is a process of evaluating the impact of alternative investing and financing decisions. Decisions, such as the firm's capital budget or a debt restructuring, are then projected as part of a financial plan. Subsequently, outcomes are measured against the plan.

A financial plan has inputs, a model, and outputs. Examples of inputs include projections of sales, collections, costs, interest rates, and exchange rates. The firm's current position (cash balance, debt obligations, and so on) and alternative decisions are also inputs. The model is a set of mathematical relationships among the inputs and outputs.

The outputs of a financial plan are pro forma financial statements and a set of budgets. **Pro forma financial statements** are projected (forecasted) financial statements. A **budget** is a detailed schedule of a financial activity, such as an advertising budget, a sales budget, or a capital budget.

Firms use both short- and long-term financial planning models. Models are classified by their planning horizon. A model's **planning horizon** is the length of time it projects into the future. "Short-term" usually means a year or less. A five-year horizon is common for a long-term planning model, but some industries use a ten-year or longer horizon. For example, a forestry products firm might have a planning horizon of several decades.

Short-term models are detailed and very specific. Long-term models tend to be much less so.

A complete financial plan includes, at a minimum,

1. Clearly stated strategic, operating, and financial *objectives*.
2. The *assumptions* on which the plan is based.
3. Descriptions of the underlying *strategies*.
4. *Contingency plans* for emergencies.
5. *Budgets*, categorized and summarized in various ways, such as by time period, division, and type (for example, cash, advertising, and capital).
6. The *financing program*, categorized and summarized in various ways, such as by time period, sources of funds (for example, bonds, bank loans, and stock), and types of funds (for example, short-term versus long-term, and internal versus external).
7. A set of period-by-period *pro forma financial statements* for the entire planning horizon.

### **Planning Cycles**

Financial plans are updated on a regular basis, according to a planning cycle. Each update adds the latest information and renews the planning horizon—that is, it projects into the future by the length of the cycle. Short-term models might be updated monthly, weekly, or even daily. Long-term plans might be updated once, twice, or perhaps four times a year. Updates also vary in how thorough they are.

For example, a firm might update its short-term model by adding the latest data each week but might extend another month (renew the planning horizon) only once a month. In addition, the firm might review and make any changes in the model itself only once a year. Similar procedures are typical for long-term models.

### **Bottom-Up and Top-Down Planning**

Plans and ideas can be generated through either a bottom-up or a top-down process. A bottom-up planning process starts at the product or production level and proceeds upward through the plant and division levels to top management. At each level, ideas are added, modified, and/or deleted. Managers at successively higher levels, who are in a position to take a broader view, should be able to see things that are not visible to the lower levels. Higher management levels can also propose efficient combinations or eliminations that are unlikely to be suggested by the affected employees.

The top-down planning process starts with the firm's top management and its strategic plans and goals and proceeds downward through the organization's levels. Top management makes strategic decisions. These decisions often create, increase, shrink, or eliminate such things as the firm's products, divisions, and international marketing efforts. Managers describe how strategic decisions will be implemented. At each successively lower managerial level, the required actions become more specific.

Critics of the bottom-up process say it often fails to produce a coherent strategy for the firm as a whole and can cause the firm to appear chaotic and poorly managed. Critics of the top-down process say it tends to exaggerate the role of top managers and often results in bad investments and missed opportunities because top management may not be in touch with what is going on "in the field." But the bottom-up and top-down processes actually complement one another. Good planning requires both. Ideally, valuable new ideas are supported no matter where or how they originate.

### **Phases of the Financial Planning Process**

Financial planning has three phases: *formulating* the plan, *implementing* the plan, and *evaluating* performance. Involvement in the three phases depends on the manager's specific role. For example, salespersons may have special insights into marketing forecasts, and engineers may have special expertise in developing cost estimates. A financial plan should be formulated by using the kinds of bottom-up and top-down processes we just described.

In the implementation phase, budgets with specific objectives, resource allocations, and operating policies are used to clarify each manager's responsibilities for contributing to the firm's goals. During implementation, circumstances change and opportunities evolve. A firm should alter its plans to adapt to, and take advantage of, changing circumstances. Consequently, a good budgeting system should be *flexible*. A budget is simply part of a financial plan, and plans need to be adapted to new opportunities and circumstances.

In the evaluation phase, the firm compares its overall performance to the financial plan. Managers and their units are evaluated in terms of how well their performance compares to the objectives. In this process the conditions that actually prevailed, which can be very different from those expected and forecasted, are taken into account.

### *Benefits of Financial Planning*

Of course, the goal of the planning process is to help maximize the value of the firm. Toward this end, there are several benefits that a firm hopes to realize from the planning process:

1. *Standardizing assumptions.* The planning process can expose inconsistencies in decision-making methods. For example, when managers differ in their forecasts of future conditions, the more optimistic manager's plan will look better—even if there is no other difference between the plans. A similar problem occurs when managers use different required returns to evaluate the same project. Such differences bias the planning process in favor of one manager's proposals. Planning requires explicit assumptions that can themselves be evaluated and then must be agreed upon. Standardized assumptions then make it possible to compare the alternatives.
2. *Future orientation.* The planning process forces you to think about the future. Doing so generates new ideas and can eliminate bad ideas.
3. *Objectivity.* Because assumptions and models are made explicit, planning can expose decisions that are based on politics or emotions. Planning therefore increases the objective pursuit of organizational goals.
4. *Employee development.* The planning process includes input from many people. The ability to provide such input increases an employee's perceived stake in the firm. People who are empowered through the budgeting process may be better motivated to carry out the firm's plans. The planning process also educates participants about the firm. This fosters coordination and cooperation. It also helps prepare an employee for career advancement in the firm.
5. *Lender requirements.* Financial plans, sometimes very detailed, are necessary for borrowing—especially for the first time. Such plans indicate the use of the borrowed money and show the firm's expected future inflows and outflows, including the loan's interest and principal repayments.
6. *Better performance evaluation.* It is possible for a manager to make good decisions but to have bad performance because of an unexpected downturn in the economy. Similarly, bad decisions can have favorable outcomes as a result of just plain good luck. For example, when net income is higher than expected because interest rates and borrowing costs were lower than expected, the high performance is not due to superior managerial decision making. A financial plan provides a benchmark against which to identify reasons for the differences between outcomes and forecasts. Then the firm can avoid punishing good decisions because of bad outcomes or rewarding bad decisions because of good outcomes.
7. *Preparing for contingencies.* A good financial plan includes contingency plans for unlikely outcomes. The planning process can identify potential, if unlikely, conditions that would cause significant problems. This enables the firm to plan appropriate reactions should such an unlikely contingency occur. For example, the planning process might reveal a possible shortage of funds. The firm that has prearranged contingency financing will be able to continue to operate efficiently—regardless of its cash flow.

In the next section, we will discuss cash budgeting, which usually has a short-term planning horizon and focuses on the cash flows of the firm.

#### Self-Check Questions

1. What is financial planning? What benefits can a firm derive from it? Why is sound financial planning critical to a firm's success?
2. What are pro forma financial statements? How are they created?
3. What is a budget? How is it related to the firm's financial plan?
4. What is a financial plan? What should a complete financial plan include?
5. Describe the three phases of the financial planning process.

## 22.2 CASH BUDGETING

A cash budget projects and summarizes the cash inflows and outflows expected during the planning horizon. The cash budget also shows the monthly cash balances and any short-term borrowing used to cover cash shortfalls. Monthly cash budgets typically have a six- to twelve-month planning horizon. A positive net cash flow for a month can increase cash, reduce outstanding loans, or be used elsewhere in the business. Similarly, negative net cash flows can reduce cash or be offset with additional borrowing.

For the most part, cash budgets are used in short-term plans, so they include substantial detail. However, the amount of detail also depends on the size of the firm and on the present stage of projects in the planning horizon. Projections farther out in the planning horizon are less detailed. Small firms are less complex, and their cash budgets are less detailed. Because of the complexity of larger firms, more detail is required to take into account all of the factors that affect their cash flows.

Most cash budgets are based on sales forecasts, because so many cash flows are tied to sales. Inflows from sales depend on the amount of sales and also on the proportion that are cash versus credit sales. The time delays involved in collecting on credit sales depend on credit terms and payment patterns.

Several cash outflows also depend on sales. The cost of goods sold reflects raw materials purchases, wages, and production costs for inventories based on anticipated sales. Selling costs, including commissions, are often directly linked to sales.

Other cash expenditures do not fluctuate with current sales. These include capital expenditures; rent, lease, and debt payments; and some types of salaries and tax payments. Such fixed cash outflows are also included in the cash budget. Our next example shows how to create a cash budget.

The cash managers of Monet Paint are preparing a cash budget for the 6 months from April through September. Their cash management model is based on the following assumptions:

1. Recent and forecasted sales are

February (actual)	\$400,000
March (actual)	500,000
April (forecast)	600,000
May	700,000
June	800,000
July	800,000
August	700,000
September	600,000
October	500,000

- Twenty percent of sales are collected in the month of sale, 50% are collected in the month following the sale, and 30% are collected in the second month following the sale.
- Purchases are 60% of sales, and purchases are paid for 1 month prior to sale.
- Wages and salaries are 12% of sales and are paid in the same month as the sale.
- Rent of \$10,000 is paid each month. Additional cash operating expenses of \$30,000 per month will be incurred for April through July. These will decrease to \$25,000 for August and September.
- Tax payments of \$20,000 and \$30,000 are expected in April and July, respectively. A capital expenditure of \$150,000 will occur in June, and the firm has a mortgage payment of \$60,000 due in May.

*Cash  
Budgeting  
at the  
Monet  
Paint  
Company*

**EXAMPLE**

The cash balance at the end of March is \$150,000. Managers want to maintain a minimum balance of \$100,000 at all times. The firm will borrow what it needs to achieve the minimum balance. Any cash above the minimum will be used to pay off any loan balance until it is eliminated.

The cash budget in Table 22-1 is based on these assumptions. The top part of the table presents the cash receipts, which reflect the sales predicted in assumption 1 and the collection pattern in assumption 2. The cash disbursements for each month reflect the checks that must be written to satisfy assumptions 3 through 6. April's beginning cash balance is the end-of-March cash balance in assumption 7. Monthly net cash flows are total receipts minus total disbursements for the month.

The lower portion of Table 22-1 projects the beginning and ending cash balances for each month, amounts borrowed or repaid on short-term loans, and the cumulative short-term loan balance. It is important to follow the logic in this section of the cash budget.

The monthly net cash flow plus the beginning balance for the month gives an available balance. The available balance is compared to the desired minimum \$100,000 balance. If the available balance is too low, the firm borrows enough to bring the balance up to \$100,000. Any amount above the minimum can be used to repay any outstanding short-term loans. The ending cash balance is the available balance plus the month's borrowing and minus the month's loan repayments. Finally, the cumulative loan balance is the previous month's loan balance plus any additional borrowing and minus any loan repayments this month. Note that Monet projects negative net cash flows for April, May, and June, which will require the firm to borrow each month and build up its loan balance. Beginning in July, the projected positive net cash flows will enable Monet to pay off its outstanding loan balance and to accumulate a substantial ending cash balance by the end of September. ■

TABLE 22-1  
Cash Budget for the Monet Paint Company

CASH BUDGET, APRIL-SEPTEMBER							
	April \$600,000	May \$700,000	June \$800,000	July \$800,000	August \$700,000	September \$600,000	
<b>Cash Receipts</b>							
Collections (current) 20%	\$120,000	\$140,000	\$160,000	\$160,000	\$140,000	\$120,000	
collections (month) 50%	250,000	300,000	350,000	400,000	400,000	350,000	
coll. (month previous) 30%	120,000	150,000	180,000	210,000	240,000	240,000	
Total cash receipts	490,000	590,000	690,000	770,000	780,000	710,000	
<b>Cash Disbursements</b>							
Payments	420,000	480,000	480,000	420,000	360,000	300,000	
Wages and salaries	72,000	84,000	96,000	96,000	84,000	72,000	
Rent	10,000	10,000	10,000	10,000	10,000	10,000	
Cash operating expenses	30,000	30,000	30,000	30,000	25,000	25,000	
Capital expenditures	20,000			30,000			
Dividend payments		60,000					
Total cash disbursements	550,000	664,000	766,000	586,000	479,000	407,000	
<b>Monthly Cash Balance</b>							
Net cash flow	-60,000	-74,000	-76,000	184,000	301,000	303,000	
Beginning cash balance	150,000	100,000	100,000	100,000	122,000	423,000	
Available balance	90,000	26,000	24,000	284,000	423,000	726,000	
Monthly borrowing	10,000	74,000	76,000				
Monthly repayments				162,000			
Ending cash balance	\$100,000	\$100,000	\$100,000	\$122,000	\$423,000	\$726,000	
Cumulative loan balance	\$12,000	\$86,000	\$162,000	\$0	0	0	

The purpose of a cash budget is to ensure a firm's smooth financial operation over the planning horizon. The cash budget identifies the amounts and timing of any surplus or needed funds and is the basis for planning the firm's uses and sources of funds. For example, there is often a benefit to maturity matching short-term investments to particular cash needs that are identified in the cash budgeting process. Once these needs have been quantified, the firm can select from among the short-term investment alternatives discussed in Section 19.3.

Monet's cash budget is a monthly budget. It could be further divided into weekly or daily flows. There are cash flow patterns within the month, which can be incorporated into the daily or weekly budgets. For example, wage and salary cash flows will occur on predictable days. Similarly, payments for rent, loans, and even trade credit are often known in advance. These more detailed daily and weekly cash budgets enable a firm to monitor its short-term finances very closely.

#### Self-Check Questions

1. What is a cash budget? What is the typical planning horizon for a cash budget?
2. What is the purpose of a cash budget?
3. How is a cash budget constructed?



## 22.3 PRO FORMA FINANCIAL STATEMENTS

Firms continually make decisions. For example, they choose the schedules, amounts, processes, innovations, and pricing connected with such things as their products, marketing, production, labor, and inventories. Before making such decisions—and to help them make the best ones—they want to know the effects of alternative choices. Although it is not possible to predict the future perfectly, the effects of many decisions can be predicted with reasonable accuracy.

Pro forma financial statements show the effects of the firm's decisions on its future financial statements. Firms use pro forma financial statements throughout the planning process to assess the effects of alternative decisions on various items of interest, such as sales and net income. In addition to helping in the decision-making process, pro forma statements also help the firm create contingent plans for responding to unexpected situations.

A complete financial plan includes a set of pro forma financial statements, which show the firm's planned financial position at regular points over the planning horizon. These statements are based on the actual decisions made as a result of the planning process, and on the agreed upon sales and other forecasts. Our next example illustrates the use of pro forma financial statements.

Bluestem Crafts operates several stores in medium-size towns in the Southwest. It has decided to expand into the Southeast. Pro forma financial statements for next year are shown in Table 22-2, along with the latest income statement and current balance sheet.

Bluestem forecasts increased sales and profits next year for existing stores. However, new stores are not expected to break even in their first year because of startup and extra promotional costs.

Cost of goods sold and the selling, general, and administrative expenses are expected to rise somewhat faster than sales. The result will be a small increase in earnings before interest

*Pro Forma  
Financial  
Statements  
for  
Bluestem  
Crafts  
Stores*

**EXAMPLE**



	INCOME STATEMENT		
	Current	Projected	Change
Sales	\$74,000,000	\$95,000,000	\$21,000,000
Less cost of goods sold	45,500,000	59,000,000	13,500,000
Less depreciation	500,000	600,000	100,000
Gross profit	28,000,000	35,400,000	7,400,000
Less selling & administrative expenses	21,000,000	28,000,000	7,000,000
Earnings before interest and taxes	7,000,000	7,400,000	400,000
Less interest	500,000	500,000	—
Earnings before taxes	6,500,000	6,900,000	400,000
Less taxes	3,000,000	3,200,000	200,000
Net income	3,500,000	3,700,000	200,000
Less cash dividends	—	—	—
Addition to retained earnings	<u>\$ 3,500,000</u>	<u>\$ 3,700,000</u>	<u>\$ 200,000</u>
	BALANCE SHEET		
ASSETS			
Cash and marketable securities	\$ 3,000,000	\$ 3,000,000	—
Accounts receivable	4,600,000	6,000,000	\$ 1,400,000
Inventory	9,500,000	12,400,000	2,900,000
Total current assets	17,100,000	21,400,000	4,300,000
Net plant and equipment	6,500,000	8,000,000	1,500,000
Total assets	<u>\$23,600,000</u>	<u>\$29,400,000</u>	<u>\$ 5,800,000</u>
LIABILITIES AND EQUITY			
Accounts payable	\$ 3,400,000	\$ 4,000,000	\$ 600,000
Bank loans	1,700,000	3,200,000	1,500,000
Other short-term debt	3,000,000	3,000,000	—
Total current liabilities	8,100,000	10,200,000	2,100,000
Long-term debt	3,500,000	3,500,000	—
Stockholders' equity	12,000,000	15,700,000	3,700,000
Total liabilities and equity	<u>\$23,600,000</u>	<u>\$29,400,000</u>	<u>\$ 5,800,000</u>

and taxes) and a correspondingly modest increase in net income. Because of a recent decline in interest rates, Bluestem expects interest expense to be unchanged, even though total debt will increase. Bluestem is not planning any cash dividends during the next year.

Bluestem's balance sheet shows a \$5.8 million increase in assets as receivables, inventories, and fixed assets all increase. This increase in assets is financed with \$3.7 million from retained earnings, a \$600,000 increase in accounts payable, and a \$1.5 million increase in bank loans.

Income statements beyond next year are expected to show increased profitability as the new stores get over their "shakedown period" and become profitable. Of course, Bluestem may continue to expand, and future growth decisions will depend on the success of this year's new stores. ■

In addition to pro forma financial statements, firms create many specialized budgets that show in greater detail each unit's resources and responsibilities. Table 22-3 lists statements and budgets that are often created in the planning process. For example, a sales budget provides sales forecasts in units and total revenues, shown in various ways such as by product, division, geographical region, and store. The production budget shows the planned quantities of various items to be produced. Planned production equals forecasted sales plus the desired ending inventory minus the beginning inventory. The purchasing budget specifies the quantities

**FINANCIAL STATEMENTS**

Income statement

Projected revenues, expenses, net income, and additions to retained earnings

Balance sheet

Projected assets, liabilities, and equity

Statement of cash flows

Projected cash flows for operations, investing, and financing

**SPECIALIZED BUDGETS**

Cash budget

Cash inflows, cash outflows, and cash balances

Sales budget

Planned sales in units and in dollar volume. Various sales budgets may be produced for different divisions, product lines, regions, and even individual stores and individuals

Production budget

Scheduled production (quantities and costs)

Purchasing budget

Planned purchases of the raw materials the firm uses in production, goods for resale, and supplies used in operating the firm

Advertising budget

Planned advertising campaigns and their cost

Capital budget

Purchase of long-term assets

R&amp;D budget

Research-and-development plans for the period

Personnel training and recruiting budget

Planned expenses for training employees and recruiting new employees

Administrative budgets

Administrative expenses for each plant, store, department, or managerial unit in the organization

**TABLE 22-3**  
**Statements and budgets produced in the financial planning process.**

and costs of the necessary production input items. Of course, these and other budgets must be carefully coordinated.

Which budgets and statements managers are concerned with depends on their role in the firm. For example, top management and the board of directors often focus on the combined pro forma financial statements for the entire firm. These officials coordinate the firm's investing, financing, production, and liquidity; they must understand the entire firm's operations.

Middle managers need other kinds of information to do their specific jobs. Specialized budgets are provided for each managerial responsibility. For example, personnel managers are given training budgets for training current personnel and recruiting budgets for recruiting new employees. The recruiting budget has funds for advertising job opportunities, visiting college campuses, and hosting job candidates on visits to the firm.

Pro forma financial statements omit many details in order to provide a "big picture" of the firm. This big picture is important and is especially useful to the board of directors, CEO, CFO, and other top managers. But the many specialized budgets provide important detailed guidance to other employees. For example, a salesperson probably does not need to know the firm's leverage policy, liquidity objective, dividend policy, and the like. The salesperson, however, does need to know about the availability and prices of new and existing products and must be familiar with the resources available to help in selling them. Each of the firm's units and managers should have the budgets and parts of the financial plan that are relevant to their responsibilities.

***Percent of Sales Forecasting Method***

Although pro forma statements and budgets are very useful, they can be complex and time-consuming to produce. Consequently, managers often use a shortcut method to create them: the percent of sales forecasting method. This method is a crude but easy way to estimate the funds required to finance growth.

Sales growth requires additional investments in receivables, inventories, and fixed assets, so the firm must have financing to grow. Some short-term financing comes sponta-

neously from the additional sales, because accounts payable and accruals such as wages and taxes payable naturally increase with an increase in sales. Other financing can come from retained earnings. Any remaining necessary financing must come from other sources, such as additional borrowing.

The percent of sales forecasting formula is based on the following equation:

$$\begin{array}{r} \text{Additional} \\ \text{financing} \\ \text{needed} \end{array} = \begin{array}{r} \text{Required} \\ \text{increase} \\ \text{in assets} \end{array} - \begin{array}{r} \text{Increase} \\ \text{in liabilities} \end{array} - \begin{array}{r} \text{Increase in} \\ \text{retained} \\ \text{earnings} \end{array} \quad (22.1)$$

$$AFN = (A/S)gS_0 - (L/S)gS_0 - [M(1 + g)S_0 - D]$$

where AFN = additional financing needed  
 A/S = the increase in assets required per dollar increase in sales  
 L/S = the increase in liabilities provided per dollar increase in sales  
 S<sub>0</sub> = sales for the current year  
 g = growth in sales  
 M = net profit margin on sales  
 D = cash dividends planned for common stock

### EXAMPLE

#### Forecasting Company Needs of Cohen Energy Management Systems

Cohen Energy Management Systems is a small firm with excellent growth opportunities. Cohen's sales last year were \$2 million. They are expected to grow 25% in the coming year to \$2.5 million. Cohen believes that it has access to \$250,000 of external capital and wants to know whether this is sufficient to finance its planned growth.

Cohen requires additional assets (receivables, inventories, and fixed assets) equal to 60% of the increase in sales. Short-term liabilities (accounts payable and other accruals) will increase by 10% of the sales increase. The net profit margin is 8%, and Cohen plans to pay a \$50,000 cash dividend next year.

Using Equation (22.1) reveals that the additional financing required is

$$\begin{aligned} AFN &= (A/S)gS_0 - (L/S)gS_0 - [M(1 + g)S_0 - D] \\ &= (0.60)500,000 - (0.10)500,000 - [(0.08)2,500,000 - 50,000] \\ &= 300,000 - 50,000 - 150,000 = \$100,000 \end{aligned}$$

From this, we can see that Cohen requires an additional \$300,000 of assets to support its sales growth. Spontaneous financing from short-term liabilities that increase with sales provides \$50,000 of the needed funds. After payment of the \$50,000 dividend from the expected net income of \$200,000, this year's retained earnings will provide \$150,000 of funds. This leaves a need for only \$100,000 more to finance the expected sales growth. Cohen will be fine, then, because it has access to up to \$250,000 of additional financing. ■

### Cash Flow Break-Even Point

Knowing the firm's cash flow break-even point is helpful in interpreting the pro forma financial statements. In Chapter 12, we introduced the *break-even* concept with respect to accounting earnings. We noted that a firm faced with operating a project at its break-even point for a prolonged period would probably be better off exercising its abandonment option. However, even though the accounting-earnings break-even point is not a desirable target for performance, the break-even concept, applied to cash flow, can provide a pivotal point in connection with the planning process.

Over the planning horizon, the **cash flow break-even point** is the point below which the firm will need either to obtain additional financing or to liquidate some of its assets to meet its fixed costs (for example, salaries and administrative costs, interest and principal payments, and planned cash dividends). The existence of the cash flow break-even point is pivotal in that it “forces” the firm to address contingency plans for possible, but perhaps unlikely, bad outcomes.

Note that we are not suggesting that forecasting outcomes above this break-even point is all that is necessary to continue in business. Still, a temporary downturn in economic conditions may force a firm below the cash flow break-even point. Costly financial distress and eventually bankruptcy might result, even if the firm’s portfolio of projects has a positive NPV.

The probability of falling below cash flow break-even during a planning horizon provides a measure of the firm’s total risk. This probability depends both on the variability of sales and on how close the firm is to its cash flow break-even point when adversity begins to set in.

It is important to keep the possible effects of financial leverage and operating leverage in mind when preparing the financial plan for a firm. Both are sources of risk. Thus, to control the risk that it will be unable to meet, for example, its contractual debt payment obligations, a firm can, to whatever extent possible, (1) change its financial leverage, (2) change its operating leverage and, consequently, its break-even point, or (3) change some combination of the two. To the extent that a firm cannot control its operating leverage, the firm should use the planning process to control risk by creating contingency plans for dealing with bad outcomes.

### *Alternatives When Funds Are Inadequate*

Many rapidly growing firms find themselves short of cash even though they are profitable. In such cases, the firm has the following alternatives:

1. *Reduce the growth rate.* The firm can choose to reduce its funds requirement to a manageable level by not fully meeting the demand for its product. One thing that might reduce demand is to raise the selling price. If implemented successfully, this approach has the added benefit of increasing the firm’s income, which provides additional funds that can be reinvested to finance growth. (See our discussion of the price-setting option in Section 13.1.)
2. *Sell assets.* If there are any assets that are not required to run the firm, it can sell those assets and reinvest the proceeds. Such an alternative would need to be analyzed as a capital budgeting project under capital rationing. (See Chapters 10, 11, 12, and especially 13.)
3. *Obtain new external financing.* Among other things, a firm can issue new securities, arrange loans, lease or rent assets, or use venture capital financing. Because these choices can affect capital structure, they must be made in conjunction with the firm’s capital structure policy. (See Chapters 15 and 16.)
4. *Reduce or stop paying dividends.* Cash dividends use funds that could otherwise be reinvested. However, there are many factors to consider before making this decision. (See our discussion of dividend policy in Chapters 17 and 18.)

Managers must weigh the benefits and costs of each alternative carefully before deciding on a course of action. Most important, the problem will not cure itself. Consider this simple rule: An unprofitable firm that does not have substantial unused production capacity cannot grow itself into profitability.<sup>1</sup>

Growth does not usually increase the firm’s return on its existing assets. Growth in the

<sup>1</sup>A firm with substantial unused capacity might become profitable if it can grow. If it can expand sales, for example through better marketing, and earn a positive contribution margin on the increased sales, its *rate of return ratios* will improve. (See Chapter 2.)

form of a simple expansion of existing operations would normally have a lower *rate* of return than the rate of return on existing assets. Growth is attractive—in spite of this lower return—only when the growth has a positive NPV, that is, when the expected return exceeds the required return.<sup>2</sup> Growth can lead to disaster when it has a negative NPV. An unprofitable firm should consider the abandonment option if it is unable to move itself into profitability without growth.

It is also important to remember that rapid expansion is risky. Expansion often means sales in new markets or even sales of new products—both of which are likely to be riskier than the firm's current operations. Consequently, firms often limit their growth through capital rationing to control the firm's risk. (See our discussion of the potential benefits of capital rationing in Chapter 13.)

### Internal Growth

How fast should the firm grow? The answer depends on several factors, including the amount of investment required for a given growth level, the firm's profit margin, its attitude toward risk, and its willingness and ability to obtain new external financing.

Equation (22.1) shows the additional financing needed for growth. Some short-term funds are generated naturally by payables and accruals, and other funds come from new retained earnings. The **internal growth rate** is the maximum rate of growth using *only* these funds.

We can find the internal growth rate from Equation (22.1) by assuming no additional funds are needed. Setting  $AFN = 0$ , we have

$$AFN = (A/S)gS_0 - (L/S)gS_0 - [MS_0(1 + g) - D] = 0$$

and solving for the growth rate, we get

$$g = \frac{MS_0 - D}{S_0[(A/S) - (L/S) - M]}$$

We can make a further simplifying assumption about cash dividends, the same one we used for the dividend growth model in Chapter 5. Let's assume the firm pays a cash dividend each year that is a fixed proportion,  $d$ , of its net income. Next year's net income is simply the profit margin times next year's sales, so the dividend next year will be

$$D = dMS_0(1 + g)$$

Substituting this expression for  $D$ , we find that the internal growth rate is

$$g = \frac{M(1 - d)}{(A/S) - (L/S) - M(1 - d)} \quad (22.2)$$

The internal growth rate (the maximum growth possible without using any external funds) is then directly related to the profit margin,  $M$ , and inversely related to the dividend payout ratio,  $d$ . A higher profit margin allows more growth, and a higher payout ratio restricts growth. The additional financing needed (AFN) for an additional dollar of sales is the denominator of Equation (22.2). It is the assets required,  $A/S$ , minus the natural increase in short-term liabilities,  $L/S$ , minus retained earnings,  $M(1 - d)$ . Let's look at an example of the relationship between AFN and the internal growth rate.

<sup>2</sup> We illustrated this point when we discussed growth versus income in Section 5.3 of Chapter 5.

Tennessee Clay Inc. is currently doing \$10 million per year in sales. The firm requires \$0.75 in additional assets for each \$1.00 increase in sales, and short-term liabilities go up \$0.10 for each \$1.00 increase in sales. Tennessee Clay's net profit margin on sales is 12%. Finally, the firm has a dividend payout ratio of one-third. What is the maximum amount of growth that Tennessee Clay can have without getting additional external financing?

Using Equation (22.2) reveals that Tennessee Clay's internal growth rate is

$$g = \frac{M(1-d)}{(A/S) - (L/S) - M(1-d)} = \frac{0.12(1-1/3)}{(0.75) - (0.10) - 0.12(1-1/3)}$$

$$= \frac{0.08}{0.75 - 0.10 - 0.08} = \frac{0.08}{0.57} = 14.04\%$$

Therefore, Tennessee Clay can finance internally up to 14.04% in growth. Growth above this level will require additional external financing.

Figure 22-2 shows the amount of external financing needed for various growth rates between zero and 40%. If Tennessee Clay's growth in sales is below 14.04%, the firm will have excess funds beyond what is required to finance its growth. ■

### Sustainable Growth

If a firm finances its growth internally (with retained earnings and short-term, naturally occurring liabilities), then over time its retained earnings will grow, and because it is not raising long-term debt funds, its financial leverage will decline. If a firm wants to maintain its capital structure (proportion of debt financing), then it must issue new debt along with its increases in retained earnings. The **sustainable growth rate** is the maximum rate at which the firm can grow by using internal sources and new external debt, but without increasing its financial leverage. The sustainable growth rate is, of course, higher than the internal growth rate, because it includes new external debt in addition to the internal funds.

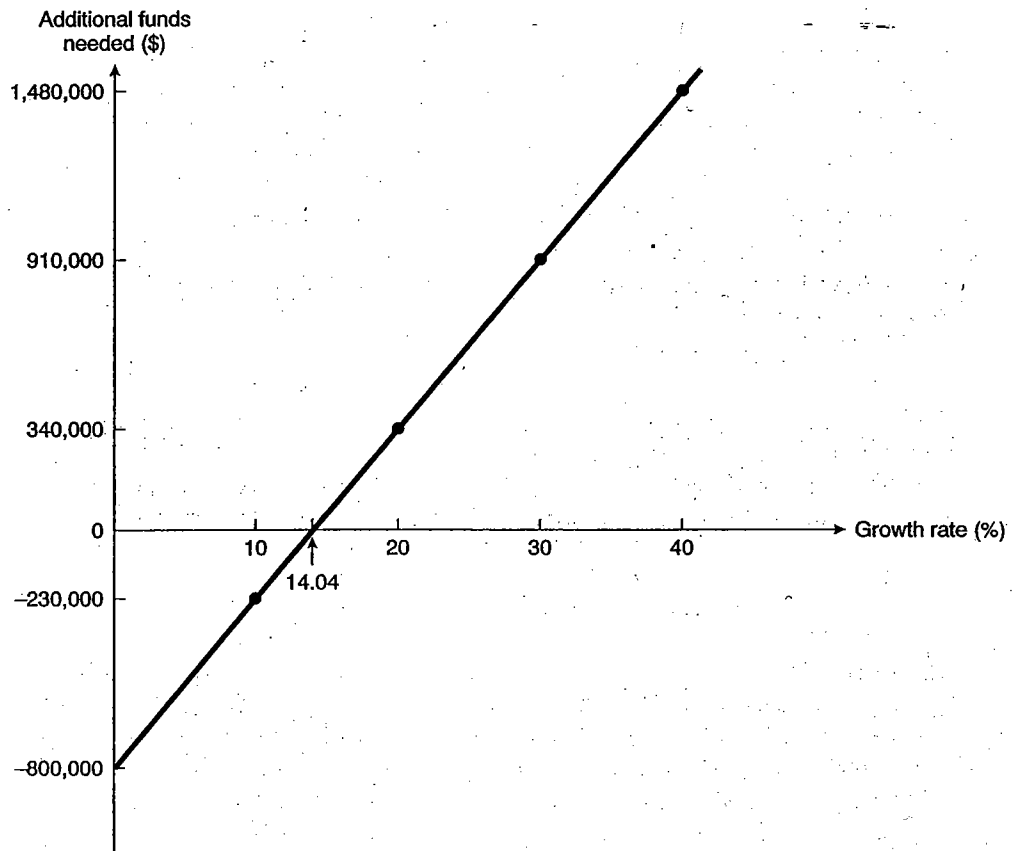
We can modify Equation (22.1) to include the effect of capital structure maintenance. We do this by subtracting the funds that come in from the new external debt. The new debt equals the debt-to-equity ratio,  $B/E$ , times the additional retained earnings, so

$$\begin{aligned} \text{AFN} &= (A/S)gS_0 - (L/S)gS_0 - MS_0(1+g)(1-d) - (B/E)(MS_0)(1+g)(1-d) \\ &= (A/S)gS_0 - (L/S)gS_0 - MS_0(1+g)(1-d)(1+B/E) \end{aligned}$$

The sustainable growth rate is then determined by again setting  $\text{AFN} = 0$  and solving for  $g$ :

$$g = \frac{M(1-d)(1+B/E)}{(A/S) - (L/S) - M(1-d)(1+B/E)} \quad (22.3)$$

The sustainable growth rate (the maximum rate at which the firm can grow by using internal and external new debt but without increasing financial leverage) is then directly related to the leverage ratio,  $B/E$ , and the profit margin,  $M$ , and inversely related to the dividend payout ratio,  $d$ . A higher leverage ratio allows more growth. A higher profit margin also allows more growth, but a higher payout ratio restricts growth. The additional financing needed,  $\text{AFN}$ , for an additional dollar of sales is the denominator of Equation (22.3). It is the assets required,  $A/S$ , minus the natural increase in short-term liabilities,  $L/S$ , minus retained earnings,  $M(1-d)$ , and the new debt necessary for capital structure maintenance  $(B/E)M(1-d)$ . The next example illustrates the relationship between  $\text{AFN}$  and the sustainable growth rate.



Growth Rate	Sales Increase	Additional Assets	Additional Spontaneous Funds	Additional Retained Earnings	Additional Financing Needed
0%	\$0	\$0	\$0	\$800,000	-\$800,000
10	1,000,000	750,000	100,000	880,000	-230,000
14.04	1,404,000	1,053,000	140,400	912,320	280 <sup>a</sup>
20	2,000,000	1,500,000	200,000	960,000	340,000
30	3,000,000	2,250,000	300,000	1,040,000	910,000
40	4,000,000	3,000,000	400,000	1,120,000	1,480,000

$\text{Sales increase} = g(S_0) = g(10,000,000)$   
 $\text{Additional assets} = (A/S)(\text{sales increase}) = 0.75(\text{sales increase})$   
 $\text{Additional spontaneous funds} = (L/S)(\text{sales increase}) = 0.10(\text{sales increase})$   
 $\text{Additional retained earnings} = M(1-d)(\text{total sales}) = 0.12(1-1/3)(10,000,000 + \text{sales increase})$   
 $\text{Additional financing needed} = \text{additional assets} - \text{additional spontaneous funds} - \text{additional retained earnings}$

<sup>a</sup>This amount is not zero because the internal growth rate was rounded.

**FIGURE 22-2**  
External financing requirements and the internal growth rate for Tennessee Clay.

**EXAMPLE**

*Tennessee Clay's Sustainable Growth Rate*

Let's continue our Tennessee Clay example and calculate the sustainable growth rate. Tennessee Clay has a debt-to-equity ratio of 50%. To maintain this capital structure, the firm will take on additional debt capital at the rate of \$0.50 for each additional \$1.00 of retained earnings. What is the maximum amount of growth that Tennessee Clay can finance by using internal funds and new external debt but without raising its leverage ratio?

With  $B/E = 0.50$ ,  $S_0 = \$10$  million,  $A/S = 0.75$ ,  $L/S = 0.10$ ,  $M = 0.12$ , and  $d = 1/3$ ,

Tennessee Clay's sustainable growth rate is

$$g = \frac{M(1-d)(1+B/E)}{(A/S) - (L/S) - M(1-d)(1+B/E)} = \frac{0.12(1-1/3)(1+0.50)}{(0.75) - (0.10) - 0.12(1-1/3)(1+0.50)}$$

$$= \frac{0.12}{0.75 - 0.10 - 0.12} = \frac{0.12}{0.53} = 22.64\%$$

Therefore, Tennessee Clay can finance up to 22.64% in growth by using internal funds and new external debt but without raising its leverage ratio. Growth above this level will require external equity financing or an increase in Tennessee Clay's leverage ratio.

Figure 22-3 shows the amount of external equity financing needed for various growth rates between zero and 40%. Note that the two lines are not parallel because the amount of long-term debt that can be issued increases as the growth rate of sales increases. If Tennessee Clay's growth in sales is below 22.64%, then the firm will have excess funds beyond what is required to finance its growth. ■

### Long-term Planning Models

Thus far we have focused on short-term planning models. Firms also use long-term planning models, where the planning horizon depends on the nature of the industry. Most firms use a five- or ten-year planning horizon. Some industries, such as electric utilities, have even longer horizons. Long-term planning models incorporate the firm's strategic commitments of resources. They are built around periodic pro forma financial statements over the planning horizon.

Whittaker Industries has a 7-year planning model that includes detailed financial statements for the next 7 years. Some of the data from Whittaker's pro forma income statements, statements of cash flows, and balance sheets are summarized and presented in Table 22-4. This table provides a good overview of several of the firm's strategic decisions.

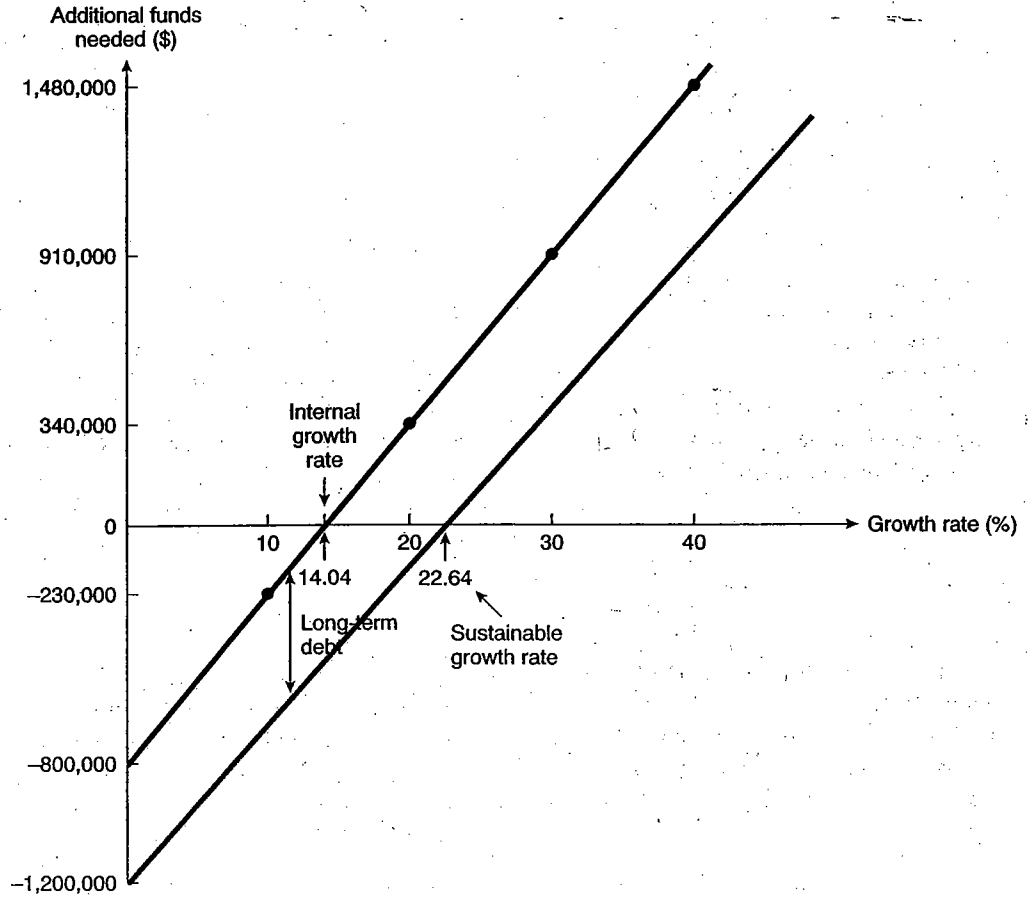
The firm intends to expand from 1999 to 2001. You can see this in the large investing cash flow (the negative cash flow is an investment) for the first 3 years. Net fixed assets also increase substantially on the balance sheet in the early years of the plan. In the fourth year, 2002, some of the short-term debt expected to be accumulated to finance construction will be refinanced with long-term mortgages. Sales growth is expected to be slow for the first 3 years but much faster in years 4 through 6 of the plan. In year 7, sales growth is expected to taper off. The sales growth in years 4 through 6 is accompanied by planned increases in working capital. The firm plans to hold dividends constant for 4 years, until after the construction is completed and net income has begun increasing in response to the sales expansion. In years 5 and 6, if all goes well, the firm will be able to increase substantially the dividend on its common shares.

In the first 3 years of the plan, Whittaker's total asset turnover and current ratio fall slightly. Thereafter, these ratios improve. Late in the 7-year plan, the firm's overall financial health is expected to have improved to the point where other strategic decisions might be considered, such as additional growth, paying off debt, or repurchasing some common shares. ■

*Whittaker  
Industries  
Long-Term  
Planning  
Model*

**EXAMPLE**





Growth Rate	Sales Increase	Additional Assets	Additional Spontaneous Funds	Additional Retained Earnings	Additional LT Debt Financing	Additional Financing Needed
0%	\$0	\$0	\$0	\$800,000	\$400,000	-\$1,200,000
10	1,000,000	750,000	100,000	880,000	440,000	-670,000
14.04	1,404,000	1,053,000	140,400	912,820	456,160	-455,880
20	2,000,000	1,500,000	200,000	960,000	480,000	-140,000
22.64	2,264,000	1,698,000	226,400	980,800	490,400	-400 <sup>a</sup>
30	3,000,000	2,250,000	300,000	1,040,000	520,000	390,000
40	4,000,000	3,000,000	400,000	1,120,000	560,000	920,000

Sales increase =  $g(S_0) = g(10,000,000)$   
 Additional assets =  $(A/S)(\text{sales increase}) = 0.75(\text{sales increase})$   
 Additional spontaneous funds =  $(L/S)(\text{sales increase}) = 0.10(\text{sales increase})$   
 Additional retained earnings =  $M(1-d)(\text{total sales}) = 0.12(1-1/3)(10,000,000 + \text{sales increase})$   
 Additional long-term debt financing =  $(B/E)(\text{additional retained earnings}) = 0.50(\text{additional retained earnings})$   
 Additional financing needed = additional assets - additional spontaneous funds - additional retained earnings - additional long-term debt financing

<sup>a</sup>This amount is not zero because the sustainable growth rate was rounded.

**FIGURE 22-3**  
**External equity financing requirements and the sustainable growth rate for Tennessee Clay.**

**TABLE 22-4**  
**Whittaker Industries's seven-year plan, 1999–2005.**

	1999	2000	2001	2002	2003	2004	2005
<b>Selected Income Statement Items</b>							
Sales	60.00	62.00	65.00	68.00	75.00	80.00	85.00
Net income	3.00	3.10	3.25	3.60	4.75	5.00	5.50
Dividends	0.60	0.60	0.60	0.60	0.60	0.60	0.60
<b>Statement of Cash Flow Summary</b>							
Operating cash flow	6.50	6.25	6.50	7.50	6.50	7.50	8.50
Investing cash flow	-8.00	-9.00	-8.00	-9.00	-9.00	-9.00	-9.00
Financing cash flow	1.00	2.50	1.50	4.00	7.00	5.50	6.50
Total cash flow	-0.50	-0.25	0.00	2.50	4.50	4.00	6.00
<b>Balance Sheet Summary</b>							
Cash	4.00	3.75	3.75	5.25	7.75	9.25	10.75
Receivables	9.00	9.30	9.75	12.00	14.25	16.50	18.75
Inventory	7.20	7.45	7.70	9.60	11.40	13.20	15.00
Total current assets	20.20	20.50	21.20	26.85	35.40	41.95	44.50
Net fixed assets	35.00	42.00	48.00	50.00	57.00	64.00	71.00
Total assets	55.20	62.50	69.20	76.85	92.40	105.95	115.50
Payables and accruals	3.60	3.72	3.90	4.30	5.70	6.50	7.30
Other short-term debt	10.00	12.00	13.00	16.00	18.35	21.50	24.70
Total current liabilities	13.60	15.72	16.90	20.30	24.05	28.00	32.00
Mortgages	12.00	12.00	12.00	19.00	19.00	19.00	19.00
Other long-term debt	14.40	17.08	19.95	23.30	26.25	29.75	33.70
Stockholders' equity	15.20	17.70	20.35	23.75	27.60	31.65	35.60
Total liabilities and equity	55.20	62.50	69.20	76.85	92.40	105.95	115.50
<b>Selected Financial Ratios</b>							
Sales/total assets	1.09	0.99	0.94	1.04	1.11	1.15	1.21
Current assets/current liabilities	1.49	1.30	1.25	1.49	1.66	1.72	1.73
Dividends/net income	20.0%	19.4%	18.5%	15.0%	13.0%	12.0%	11.0%
Net income/stockholders' equity	19.7	17.5	16.0	16.8	17.2	16.6	15.5
Total debt/total assets	72.5	71.7	70.6	69.1	67.7	67.0	66.0

### Self-Check Questions

1. How do firms use pro forma financial statements?
2. What role do business unit budgets play in the operation of the firm?
3. What is the relationship among the additional financing needed, the required increase in assets, the increase in liabilities, and the increase in retained earnings?
4. If a profitable but rapidly growing firm finds itself short of cash, what steps can it take to deal with the problem?
5. What are the internal growth rate and the sustainable growth rate? How are they different? Is one always higher than the other?