

Long-Term Financial Planning and Growth

In 2003, The Walking Company filed for bankruptcy. The company, which retails specialty shoes under the Danskø, Ecco, Merrill, and other well-known brand names, was a victim of its own success. It had grown rapidly from 20 stores to more than 100 stores in 2003 with about \$65 million in sales. Unfortunately, following real

estate and merchandising missteps, the company stumbled and ran out of cash. It emerged from bankruptcy in early 2004 when it was purchased by the parent company of Big Dog Sportswear for about \$19 million.

The case of The Walking Company is not a unique one. Often firms that grow at a phenomenal pace run into

cash flow problems and, subsequently, financial difficulties. In other words, it is literally possible to "grow broke." This chapter emphasizes the importance of planning for the future and discusses tools firms use to think about, and manage, growth.

A lack of effective long-range planning is a commonly cited reason for financial distress and failure. As we will develop in this chapter, long-range planning is a means of systematically thinking about the future and anticipating possible problems before they arrive. There are no magic mirrors, of course, so the best we can hope for is a logical and organized procedure for exploring the unknown. As one member of GM's board was heard to say, "Planning is a process that at best helps the firm avoid stumbling into the future backwards."

Financial planning establishes guidelines for change and growth in a firm. It normally focuses on the big picture. This means it is concerned with the major elements of a firm's financial and investment policies without examining the individual components of those policies in detail.

Our primary goals in this chapter are to discuss financial planning and to illustrate the interrelatedness of the various investment and financing decisions a firm makes. In the chapters ahead, we will examine in much more detail how these decisions are made.

We first describe what is usually meant by financial planning. For the most part, we talk about long-term planning. Short-term financial planning is discussed in a later chapter. We examine what the firm can accomplish by developing a long-term financial plan. To do this, we develop a simple, but very useful, long-range planning technique: the percentage of sales approach. We describe how to apply this approach in some simple cases, and we discuss some extensions.

To develop an explicit financial plan, management must establish certain elements of the firm's financial policy. These basic policy elements of financial planning are:

1. The firm's needed investment in new assets. This will arise from the investment opportunities the firm chooses to undertake, and it is the result of the firm's capital budgeting decisions.
2. The degree of financial leverage the firm chooses to employ. This will determine the amount of borrowing the firm will use to finance its investments in real assets. This is the firm's capital structure policy.
3. The amount of cash the firm thinks is necessary and appropriate to pay shareholders. This is the firm's dividend policy.
4. The amount of liquidity and working capital the firm needs on an ongoing basis. This is the firm's net working capital decision.

As we will see, the decisions a firm makes in these four areas will directly affect its future profitability, need for external financing, and opportunities for growth.

A key lesson to be learned from this chapter is that the firm's investment and financing policies interact and thus cannot truly be considered in isolation from one another. The types and amounts of assets the firm plans on purchasing must be considered along with the firm's ability to raise the capital necessary to fund those investments. Many business students are aware of the classic three *Ps* (or even four *Ps*) of marketing. Not to be outdone, financial planners have no fewer than six *Ps*: *Proper Prior Planning Prevents Poor Performance*.

Financial planning forces the corporation to think about goals. A goal frequently espoused by corporations is growth, and almost all firms use an explicit, companywide growth rate as a major component of their long-run financial planning. For example, in 2004, home-improvement retailer Lowe's projected that sales for 2005 would increase 17 percent, with same store sales increasing 5 to 6 percent. It also projected a further sales increase of 17 percent for 2006. The company said that EPS would grow at about 14 percent over this period.

There are direct connections between the growth a company can achieve and its financial policy. In the following sections, we show how financial planning models can be used to better understand how growth is achieved. We also show how such models can be used to establish the limits on possible growth.

WHAT IS FINANCIAL PLANNING?

4.1

Financial planning formulates the way in which financial goals are to be achieved. A financial plan is thus a statement of what is to be done in the future. Most decisions have long lead times, which means they take a long time to implement. In an uncertain world, this requires that decisions be made far in advance of their implementation. If a firm wants to build a factory in 2006, for example, it might have to begin lining up contractors and financing in 2004, or even earlier.

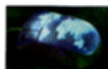
Growth as a Financial Management Goal

Because the subject of growth will be discussed in various places in this chapter, we need to start out with an important warning: Growth, by itself, is not an appropriate goal for the financial manager. Clothing retailer J. Peterman Co., whose quirky catalogs were made

famous on the TV show “Seinfeld,” learned this lesson the hard way. Despite its strong brand name and years of explosive revenue growth, the company filed for bankruptcy in 1999, the victim of an overly ambitious, growth-oriented, expansion plan.

Amazon.com, the big online retailer, is another example. At one time, Amazon’s motto seemed to be “growth at any cost.” Unfortunately, what really grew rapidly for the company were losses. Amazon refocused its business, explicitly sacrificing growth in the hope of achieving profitability. The plan seems to be working as Amazon.com turned a profit for the first time in the third quarter of 2003.

As we discussed in Chapter 1, the appropriate goal is increasing the market value of the owners’ equity. Of course, if a firm is successful in doing this, then growth will usually result. Growth may thus be a desirable consequence of good decision making, but it is not an end unto itself. We discuss growth simply because growth rates are so commonly used in the planning process. As we will see, growth is a convenient means of summarizing various aspects of a firm’s financial and investment policies. Also, if we think of growth as growth in the market value of the equity in the firm, then goals of growth and increasing the market value of the equity in the firm are not all that different.



You can find growth rates under the research links at www.investor.reuters.com and finance.yahoo.com.

planning horizon

The long-range time period on which the financial planning process focuses, usually the next two to five years.

aggregation

The process by which smaller investment proposals of each of a firm’s operational units are added up and treated as one big project.

Dimensions of Financial Planning

It is often useful for planning purposes to think of the future as having a short run and a long run. The short run, in practice, is usually the coming 12 months. We focus our attention on financial planning over the long run, which is usually taken to be the coming two to five years. This time period is called the **planning horizon**, and it is the first dimension of the planning process that must be established.

In drawing up a financial plan, all of the individual projects and investments the firm will undertake are combined to determine the total needed investment. In effect, the smaller investment proposals of each operational unit are added up, and the sum is treated as one big project. This process is called **aggregation**. The level of aggregation is the second dimension of the planning process that needs to be determined.

Once the planning horizon and level of aggregation are established, a financial plan requires inputs in the form of alternative sets of assumptions about important variables. For example, suppose a company has two separate divisions: one for consumer products and one for gas turbine engines. The financial planning process might require each division to prepare three alternative business plans for the next three years:

1. **A worst case.** This plan would require making relatively pessimistic assumptions about the company’s products and the state of the economy. This kind of disaster planning would emphasize a division’s ability to withstand significant economic adversity, and it would require details concerning cost cutting, and even divestiture and liquidation. For example, sales were sluggish in the PC market in 2004. That left big manufacturers like Hewlett-Packard, Dell, and Gateway locked in a price war, fighting for market share at a time when revenues were stagnant.
2. **A normal case.** This plan would require making the most likely assumptions about the company and the economy.
3. **A best case.** Each division would be required to work out a case based on optimistic assumptions. It could involve new products and expansion and would then detail the financing needed to fund the expansion.

In this example, business activities are aggregated along divisional lines and the planning horizon is three years. This type of planning, which considers all possible events, is

particularly important for cyclical businesses (businesses with sales that are strongly affected by the overall state of the economy or business cycles).

What Can Planning Accomplish?

Because the company is likely to spend a lot of time examining the different scenarios that will become the basis for the company's financial plan, it seems reasonable to ask what the planning process will accomplish.

Examining Interactions As we discuss in greater detail in the following pages, the financial plan must make explicit the linkages between investment proposals for the different operating activities of the firm and the financing choices available to the firm. In other words, if the firm is planning on expanding and undertaking new investments and projects, where will the financing be obtained to pay for this activity?

Exploring Options The financial plan provides the opportunity for the firm to develop, analyze, and compare many different scenarios in a consistent way. Various investment and financing options can be explored, and their impact on the firm's shareholders can be evaluated. Questions concerning the firm's future lines of business and questions of what financing arrangements are optimal are addressed. Options such as marketing new products or closing plants might be evaluated.

Avoiding Surprises Financial planning should identify what may happen to the firm if different events take place. In particular, it should address what actions the firm will take if things go seriously wrong, or, more generally, if assumptions made today about the future are seriously in error. As physicist Niels Bohr once observed, "Prediction is very difficult, particularly when it concerns the future." Thus, one of the purposes of financial planning is to avoid surprises and develop contingency plans.

For example, in December 2003, Motorola announced that its mobile phone sales fell 3 percent, compared with its prior target growth of 5 percent. The fall in sales did not occur because of a lack of demand; rather, Motorola experienced a shortage of parts. Apparently, Motorola found itself unable to meet orders when demand accelerated. Thus, a lack of planning for sales growth can be a problem for even the biggest companies.

Ensuring Feasibility and Internal Consistency Beyond a general goal of creating value, a firm will normally have many specific goals. Such goals might be couched in terms of market share, return on equity, financial leverage, and so on. At times, the linkages between different goals and different aspects of a firm's business are difficult to see. Not only does a financial plan make explicit these linkages, but it also imposes a unified structure for reconciling differing goals and objectives. In other words, financial planning is a way of verifying that the goals and plans made with regard to specific areas of a firm's operations are feasible and internally consistent. Conflicting goals will often exist. To generate a coherent plan, goals and objectives will therefore have to be modified, and priorities will have to be established.

For example, one goal a firm might have is 12 percent growth in unit sales per year. Another goal might be to reduce the firm's total debt ratio from 40 to 20 percent. Are these two goals compatible? Can they be accomplished simultaneously? Maybe yes, maybe no. As we will discuss, financial planning is a way of finding out just what is possible, and, by implication, what is not possible.

Conclusion Probably the most important result of the planning process is that it forces management to think about goals and to establish priorities. In fact, conventional business wisdom holds that financial plans don't work, but financial planning does. The future is inherently unknown. What we can do is establish the direction in which we want to travel and take some educated guesses at what we will find along the way. If we do a good job, then we won't be caught off guard when the future rolls around.

Concept Questions

- 4.1a What are the two dimensions of the financial planning process?
4.1b Why should firms draw up financial plans?

4.2

FINANCIAL PLANNING MODELS: A FIRST LOOK

Just as companies differ in size and products, the financial planning process will differ from firm to firm. In this section, we discuss some common elements in financial plans and develop a basic model to illustrate these elements. What follows is just a quick overview; later sections will take up the various topics in more detail.

A Financial Planning Model: The Ingredients

Most financial planning models require the user to specify some assumptions about the future. Based on those assumptions, the model generates predicted values for a large number of other variables. Models can vary quite a bit in terms of their complexity, but almost all will have the elements that we discuss next.

Sales Forecast Almost all financial plans require an externally supplied sales forecast. In our models that follow, for example, the sales forecast will be the “driver,” meaning that the user of the planning model will supply this value, and most other values will be calculated based on it. This arrangement is common for many types of business; planning will focus on projected future sales and the assets and financing needed to support those sales.

Frequently, the sales forecast will be given as the growth rate in sales rather than as an explicit sales figure. These two approaches are essentially the same because we can calculate projected sales once we know the growth rate. Perfect sales forecasts are not possible, of course, because sales depend on the uncertain future state of the economy. To help a firm come up with its projections, some businesses specialize in macroeconomic and industry projections.

As we discussed previously, we frequently will be interested in evaluating alternative scenarios, so it isn't necessarily crucial that the sales forecast be accurate. In such cases, our goal is to examine the interplay between investment and financing needs at different possible sales levels, not to pinpoint what we expect to happen.

Pro Forma Statements A financial plan will have a forecasted balance sheet, income statement, and statement of cash flows. These are called *pro forma statements*, or *pro formas* for short. The phrase *pro forma* literally means “as a matter of form.” In our case,



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this means the financial statements are the form we use to summarize the different events projected for the future. At a minimum, a financial planning model will generate these statements based on projections of key items such as sales.

In the planning models we will describe, the pro formas are the output from the financial planning model. The user will supply a sales figure, and the model will generate the resulting income statement and balance sheet.

Asset Requirements The plan will describe projected capital spending. At a minimum, the projected balance sheet will contain changes in total fixed assets and net working capital. These changes are effectively the firm’s total capital budget. Proposed capital spending in different areas must thus be reconciled with the overall increases contained in the long-range plan.

Financial Requirements The plan will include a section on the necessary financing arrangements. This part of the plan should discuss dividend policy and debt policy. Sometimes firms will expect to raise cash by selling new shares of stock or by borrowing. In this case, the plan will have to consider what kinds of securities have to be sold and what methods of issuance are most appropriate. These are subjects we consider in Part 6 of our book, where we discuss long-term financing, capital structure, and dividend policy.

The Plug After the firm has a sales forecast and an estimate of the required spending on assets, some amount of new financing will often be necessary because projected total assets will exceed projected total liabilities and equity. In other words, the balance sheet will no longer balance.

Because new financing may be necessary to cover all of the projected capital spending, a financial “plug” variable must be selected. The plug is the designated source or sources of external financing needed to deal with any shortfall (or surplus) in financing and thereby bring the balance sheet into balance.

For example, a firm with a great number of investment opportunities and limited cash flow may have to raise new equity. Other firms with few growth opportunities and ample cash flow will have a surplus and thus might pay an extra dividend. In the first case, external equity is the plug variable. In the second, the dividend is used.

Economic Assumptions The plan will have to state explicitly the economic environment in which the firm expects to reside over the life of the plan. Among the more important economic assumptions that will have to be made are the level of interest rates and the firm’s tax rate.

A Simple Financial Planning Model

We can begin our discussion of long-term planning models with a relatively simple example. The Computerfield Corporation’s financial statements from the most recent year are as follows:

COMPUTERFIELD CORPORATION Financial Statements					
Income Statement			Balance Sheet		
Sales	\$1,000	Assets	\$500	Debt	\$250
Costs	<u>800</u>			Equity	<u>250</u>
Net income	<u>\$ 200</u>	Total	<u>\$500</u>	Total	<u>\$500</u>

Unless otherwise stated, the financial planners at Computerfield assume that all variables are tied directly to sales and current relationships are optimal. This means that all items will grow at exactly the same rate as sales. This is obviously oversimplified; we use this assumption only to make a point.

Suppose sales increase by 20 percent, rising from \$1,000 to \$1,200. Planners would then also forecast a 20 percent increase in costs, from \$800 to $\$800 \times 1.2 = \960 . The pro forma income statement would thus be:

Pro Forma Income Statement	
Sales	\$1,200
Costs	<u>960</u>
Net income	<u>\$ 240</u>

The assumption that all variables will grow by 20 percent will enable us to easily construct the pro forma balance sheet as well:

Pro Forma Balance Sheet			
Assets	\$600 (+100)	Debt	\$300 (+ 50)
		Equity	<u>300 (+ 50)</u>
Total	<u>\$600 (+100)</u>	Total	<u>\$600 (+100)</u>

Notice we have simply increased every item by 20 percent. The numbers in parentheses are the dollar changes for the different items.

Now we have to reconcile these two pro formas. How, for example, can net income be equal to \$240 and equity increase by only \$50? The answer is that Computerfield must have paid out the difference of $\$240 - 50 = \190 , possibly as a cash dividend. In this case, dividends are the plug variable.

Suppose Computerfield does not pay out the \$190. In this case, the addition to retained earnings is the full \$240. Computerfield's equity will thus grow to \$250 (the starting amount) plus \$240 (net income), or \$490, and debt must be retired to keep total assets equal to \$600.

With \$600 in total assets and \$490 in equity, debt will have to be $\$600 - 490 = \110 . Since we started with \$250 in debt, Computerfield will have to retire $\$250 - 110 = \140 in debt. The resulting pro forma balance sheet would look like this:

Pro Forma Balance Sheet			
Assets	\$600 (+100)	Debt	\$110 (-140)
		Equity	<u>490 (+240)</u>
Total	<u>\$600 (+100)</u>	Total	<u>\$600 (+100)</u>

In this case, debt is the plug variable used to balance out projected total assets and liabilities.

This example shows the interaction between sales growth and financial policy. As sales increase, so do total assets. This occurs because the firm must invest in net working capital and fixed assets to support higher sales levels. Because assets are growing, total liabilities and equity, the right-hand side of the balance sheet, will grow as well.



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planware.org](http://www.planware.org)).

The thing to notice from our simple example is that the way the liabilities and owners' equity change depends on the firm's financing policy and its dividend policy. The growth in assets requires that the firm decide on how to finance that growth. This is strictly a managerial decision. Note that, in our example, the firm needed no outside funds. This won't usually be the case, so we explore a more detailed situation in the next section.

Concept Questions

4.2a What are the basic components of a financial plan?

4.2b Why is it necessary to designate a plug in a financial planning model?

THE PERCENTAGE OF SALES APPROACH

4.3

In the previous section, we described a simple planning model in which every item increased at the same rate as sales. This may be a reasonable assumption for some elements. For others, such as long-term borrowing, it probably is not, because the amount of long-term borrowing is something set by management, and it does not necessarily relate directly to the level of sales.

In this section, we describe an extended version of our simple model. The basic idea is to separate the income statement and balance sheet accounts into two groups, those that do vary directly with sales and those that do not. Given a sales forecast, we will then be able to calculate how much financing the firm will need to support the predicted sales level.

The financial planning model we describe next is based on the **percentage of sales approach**. Our goal here is to develop a quick and practical way of generating pro forma statements. We defer discussion of some "bells and whistles" to a later section.

The Income Statement

We start out with the most recent income statement for the Rosengarten Corporation, as shown in Table 4.1. Notice we have still simplified things by including costs, depreciation, and interest in a single cost figure.

Rosengarten has projected a 25 percent increase in sales for the coming year, so we are anticipating sales of $\$1,000 \times 1.25 = \$1,250$. To generate a pro forma income statement, we assume that total costs will continue to run at $\$800/1,000 = 80\%$ of sales. With this assumption, Rosengarten's pro forma income statement is as shown in Table 4.2. The effect here of assuming that costs are a constant percentage of sales is to assume that the profit margin is constant. To check this, notice that the profit margin was $\$132/1,000 = 13.2\%$. In our pro forma, the profit margin is $\$165/1,250 = 13.2\%$; so it is unchanged.

percentage of sales approach

A financial planning method in which accounts are varied depending on a firm's predicted sales level.

ROSENGARTEN CORPORATION
Income Statement

Sales		\$1,000
Costs		800
Taxable income		\$ 200
Taxes (34%)		68
Net income		\$ 132
Dividends	\$44	
Addition to retained earnings	88	

<< TABLE 4.1

TABLE 4.2 >>

ROSENGARTEN CORPORATION Pro Forma Income Statement	
Sales (projected)	\$1,250
Costs (80% of sales)	<u>1,000</u>
Taxable income	\$ 250
Taxes (34%)	<u>85</u>
Net income	<u>\$ 165</u>

Next, we need to project the dividend payment. This amount is up to Rosengarten's management. We will assume Rosengarten has a policy of paying out a constant fraction of net income in the form of a cash dividend. For the most recent year, the **dividend payout ratio** was:

dividend payout ratio
The amount of cash paid out to shareholders divided by net income.

$$\begin{aligned} \text{Dividend payout ratio} &= \text{Cash dividends/Net income} \\ &= \$44/132 = 33 \frac{1}{3}\% \end{aligned} \quad [4.1]$$

We can also calculate the ratio of the addition to retained earnings to net income as:

$$\text{Addition to retained earnings/Net income} = \$88/132 = 66 \frac{2}{3}\%$$

retention ratio
The addition to retained earnings divided by net income. Also called the plowback ratio.

This ratio is called the **retention ratio** or **plowback ratio**, and it is equal to 1 minus the dividend payout ratio because everything not paid out is retained. Assuming that the payout ratio is constant, the projected dividends and addition to retained earnings will be:

$$\begin{aligned} \text{Projected dividends paid to shareholders} &= \$165 \times 1/3 = \$ 55 \\ \text{Projected addition to retained earnings} &= \$165 \times 2/3 = \frac{110}{\$165} \end{aligned}$$

The Balance Sheet

To generate a pro forma balance sheet, we start with the most recent statement, as shown in Table 4.3.

On our balance sheet, we assume that some of the items vary directly with sales and others do not. For those items that do vary with sales, we express each as a percentage of sales for the year just completed. When an item does not vary directly with sales, we write "n/a" for "not applicable."

For example, on the asset side, inventory is equal to 60 percent of sales (\$600/1,000) for the year just ended. We assume this percentage applies to the coming year, so for each \$1 increase in sales, inventory will rise by \$.60. More generally, the ratio of total assets to sales for the year just ended is $\$3,000/1,000 = 3$, or 300%.

capital intensity ratio
A firm's total assets divided by its sales, or the amount of assets needed to generate \$1 in sales.

This ratio of total assets to sales is sometimes called the **capital intensity ratio**. It tells us the amount of assets needed to generate \$1 in sales; so the higher the ratio is, the more capital intensive is the firm. Notice also that this ratio is just the reciprocal of the total asset turnover ratio we defined in the last chapter.

For Rosengarten, assuming that this ratio is constant, it takes \$3 in total assets to generate \$1 in sales (apparently Rosengarten is in a relatively capital intensive business). Therefore, if sales are to increase by \$100, then Rosengarten will have to increase total assets by three times this amount, or \$300.

On the liability side of the balance sheet, we show accounts payable varying with sales. The reason is that we expect to place more orders with our suppliers as sales volume

TABLE 4.3 >>

ROSENGARTEN CORPORATION Balance Sheet					
Assets			Liabilities and Owners' Equity		
	\$	Percentage of Sales		\$	Percentage of Sales
Current assets			Current liabilities		
Cash	\$ 160	16%	Accounts payable	\$ 300	30%
Accounts receivable	440	44	Notes payable	100	n/a
Inventory	600	60	Total	\$ 400	n/a
Total	\$1,200	120	Long-term debt	\$ 800	n/a
Fixed assets			Owners' equity		
Net plant and equipment	\$1,800	180	Common stock and paid-in surplus	\$ 800	n/a
			Retained earnings	1,000	n/a
			Total	\$1,800	n/a
Total assets	\$3,000	300%	Total liabilities and owners' equity	\$3,000	n/a

increases, so payables will change “spontaneously” with sales. Notes payable, on the other hand, represents short-term debt such as bank borrowing. This will not vary unless we take specific actions to change the amount, so we mark this item as “n/a.”

Similarly, we use “n/a” for long-term debt because it won’t automatically change with sales. The same is true for common stock and paid-in surplus. The last item on the right-hand side, retained earnings, will vary with sales, but it won’t be a simple percentage of sales. Instead, we will explicitly calculate the change in retained earnings based on our projected net income and dividends.

We can now construct a partial pro forma balance sheet for Rosengarten. We do this by using the percentages we have just calculated wherever possible to calculate the projected amounts. For example, net fixed assets are 180 percent of sales; so, with a new sales level of \$1,250, the net fixed asset amount will be $1.80 \times \$1,250 = \$2,250$, representing an increase of $\$2,250 - 1,800 = \450 in plant and equipment. It is important to note that for those items that don’t vary directly with sales, we initially assume no change and simply write in the original amounts. The result is shown in Table 4.4. Notice that the change in retained earnings is equal to the \$110 addition to retained earnings we calculated earlier.

Inspecting our pro forma balance sheet, we notice that assets are projected to increase by \$750. However, without additional financing, liabilities and equity will only increase by \$185, leaving a shortfall of $\$750 - 185 = \565 . We label this amount *external financing needed* (EFN).

A Particular Scenario

Our financial planning model now reminds us of one of those good news–bad news jokes. The good news is we’re projecting a 25 percent increase in sales. The bad news is this isn’t going to happen unless Rosengarten can somehow raise \$565 in new financing.

This is a good example of how the planning process can point out problems and potential conflicts. If, for example, Rosengarten has a goal of not borrowing any additional funds and not selling any new equity, then a 25 percent increase in sales is probably not feasible.

TABLE 4.4 >>

ROSENGARTEN CORPORATION Partial Pro Forma Balance Sheet					
Assets			Liabilities and Owners' Equity		
	Present Year	Change from Previous Year		Present Year	Change from Previous Year
Current assets			Current liabilities		
Cash	\$ 200	\$ 40	Accounts payable	\$ 375	\$ 75
Accounts receivable	550	110	Notes payable	100	0
Inventory	750	150	Total	\$ 475	\$ 75
Total	<u>\$1,500</u>	<u>\$300</u>	Long-term debt	<u>\$ 800</u>	<u>\$ 0</u>
Fixed assets			Owners' equity		
Net plant and equipment	<u>\$2,250</u>	<u>\$450</u>	Common stock and paid-in surplus	\$ 800	\$ 0
			Retained earnings	1,110	110
			Total	<u>\$1,910</u>	<u>\$110</u>
Total assets	<u>\$3,750</u>	<u>\$750</u>	Total liabilities and owners' equity	<u>\$3,185</u>	<u>\$185</u>
			External financing needed	<u>\$ 565</u>	<u>\$565</u>

If we take the need for \$565 in new financing as given, we know that Rosengarten has three possible sources: short-term borrowing, long-term borrowing, and new equity. The choice of some combination among these three is up to management; we will illustrate only one of the many possibilities.

Suppose Rosengarten decides to borrow the needed funds. In this case, the firm might choose to borrow some over the short term and some over the long term. For example, current assets increased by \$300 whereas current liabilities rose by only \$75. Rosengarten could borrow $\$300 - 75 = \225 in short-term notes payable and leave total net working capital unchanged. With \$565 needed, the remaining $\$565 - 225 = \340 would have to come from long-term debt. Table 4.5 shows the completed pro forma balance sheet for Rosengarten.

We have used a combination of short- and long-term debt as the plug here, but we emphasize that this is just one possible strategy; it is not necessarily the best one by any means. There are many other scenarios we could (and should) investigate. The various ratios we discussed in Chapter 3 come in very handy here. For example, with the scenario we have just examined, we would surely want to examine the current ratio and the total debt ratio to see if we were comfortable with the new projected debt levels.

Now that we have finished our balance sheet, we have all of the projected sources and uses of cash. We could finish off our pro formas by drawing up the projected statement of cash flows along the lines discussed in Chapter 3. We will leave this as an exercise and instead investigate an important alternative scenario.

An Alternative Scenario

The assumption that assets are a fixed percentage of sales is convenient, but it may not be suitable in many cases. In particular, note that we effectively assumed that Rosengarten was using its fixed assets at 100 percent of capacity, because any increase in sales led to an

TABLE 4.5 >>

ROSENGARTEN CORPORATION Pro Forma Balance Sheet					
Assets			Liabilities and Owners' Equity		
	Present Year	Change from Previous Year		Present Year	Change from Previous Year
Current assets			Current liabilities		
Cash	\$ 200	\$ 40	Accounts payable	\$ 375	\$ 75
Accounts receivable	550	110	Notes payable	325	225
Inventory	750	150	Total	\$ 700	\$300
Total	<u>\$1,500</u>	<u>\$300</u>	Long-term debt	<u>\$1,140</u>	<u>\$340</u>
Fixed assets			Owners' equity		
Net plant and equipment	<u>\$2,250</u>	<u>\$450</u>	Common stock and paid-in surplus	\$ 800	\$ 0
			Retained earnings	1,110	110
			Total	<u>\$1,910</u>	<u>\$110</u>
Total assets	<u>\$3,750</u>	<u>\$750</u>	Total liabilities and owners' equity	<u>\$3,750</u>	<u>\$750</u>

increase in fixed assets. For most businesses, there would be some slack or excess capacity, and production could be increased by, perhaps, running an extra shift.

For example, in early 2004, both Ford and GM announced plans to increase production in Venezuela. The increased production was to accommodate increased sales in that country. In Ford's case, the company planned no additional capital expenditures; in other words, the company did not plan to increase production facilities. GM's announcement of increased production came with an announcement that the company would invest in production facilities. Apparently, Ford had the capacity to expand production without significantly adding to fixed costs, while GM did not.

In another example also in early 2004, Simmons announced it was closing its mattress factory in Ohio. The company stated it would increase mattress production at other plants to compensate for the closing. Evidently, Simmons had significant excess capacity in its production facilities.

If we assume that Rosengarten is only operating at 70 percent of capacity, then the need for external funds will be quite different. When we say "70 percent of capacity," we mean that the current sales level is 70 percent of the full-capacity sales level:

$$\text{Current sales} = \$1,000 = .70 \times \text{Full-capacity sales}$$

$$\text{Full-capacity sales} = \$1,000 / .70 = \$1,429$$

This tells us that sales could increase by almost 43 percent—from \$1,000 to \$1,429—before any new fixed assets would be needed.

In our previous scenario, we assumed it would be necessary to add \$450 in net fixed assets. In the current scenario, no spending on net fixed assets is needed, because sales are projected to rise only to \$1,250, which is substantially less than the \$1,429 full-capacity level.

As a result, our original estimate of \$565 in external funds needed is too high. We estimated that \$450 in net new fixed assets would be needed. Instead, no spending on new net

fixed assets is necessary. Thus, if we are currently operating at 70 percent capacity, then we need only $\$565 - 450 = \115 in external funds. The excess capacity thus makes a considerable difference in our projections.

EXAMPLE 4.1 >> EFN and Capacity Usage

Suppose Rosengarten were operating at 90 percent capacity. What would sales be at full capacity? What is the capital intensity ratio at full capacity? What is EFN in this case?

Full-capacity sales would be $\$1,000/.90 = \$1,111$. From Table 4.3, we know that fixed assets are \$1,800. At full capacity, the ratio of fixed assets to sales is thus:

$$\text{Fixed assets/Full-capacity sales} = \$1,800/1,111 = 1.62$$

This tells us that Rosengarten needs \$1.62 in fixed assets for every \$1 in sales once it reaches full capacity. At the projected sales level of \$1,250, then, it needs $\$1,250 \times 1.62 = \$2,025$ in fixed assets. Compared to the \$2,250 we originally projected, this is \$225 less, so EFN is $\$565 - 225 = \340 .

Current assets would still be \$1,500, so total assets would be $\$1,500 + 2,025 = \$3,525$. The capital intensity ratio would thus be $\$3,525/1,250 = 2.82$, less than our original value of 3 because of the excess capacity.

These alternative scenarios illustrate that it is inappropriate to blindly manipulate financial statement information in the planning process. The results depend critically on the assumptions made about the relationships between sales and asset needs. We return to this point a little later.

One thing should be clear by now. Projected growth rates play an important role in the planning process. They are also important to outside analysts and potential investors. Our nearby *Work the Web* box shows you how to obtain growth rate estimates for real companies.

Concept Questions

- 4.3a** What is the basic idea behind the percentage of sales approach?
- 4.3b** Unless it is modified, what does the percentage of sales approach assume about fixed asset capacity usage?

4.4

EXTERNAL FINANCING AND GROWTH


External financing needed and growth are obviously related. All other things staying the same, the higher the rate of growth in sales or assets, the greater will be the need for external financing. In the previous section, we took a growth rate as given, and then we determined the amount of external financing needed to support that growth. In this section, we turn things around a bit. We will take the firm's financial policy as given and then examine the relationship between that financial policy and the firm's ability to finance new investments and thereby grow.

Once again, we emphasize that we are focusing on growth not because growth is an appropriate goal; instead, for our purposes, growth is simply a convenient means of

WORK THE WEB

Calculating company growth rates can involve detailed research, and a major part of a stock analyst's job is to provide estimates of them. One place to find earnings and sales growth rates on the Web is Yahoo! Finance at finance.yahoo.com. Here, we pulled up a quote for Minnesota Mining & Manufacturing (MMM, or 3M as it is known) and followed the "Analyst Estimates" link. Below you will see an abbreviated look at the results.



Earnings Est	Current Qtr	Next Qtr	Current Year	Next Year
Avg. Estimate	0.87	0.91	3.61	4.04
No. of Analysts	13	10	16	13
Low Estimate	0.86	0.89	3.50	3.90
High Estimate	0.88	0.94	3.70	4.20
Year Ago EPS	0.71	0.78	3.09	3.61
Next Earnings Date: 19-Apr-04 -  Set a Reminder				
Revenue Est	Current Qtr	Next Qtr	Current Year	Next Year
Avg. Estimate	4.82B	5.05B	20.12B	21.48B
No. of Analysts	3	3	7	7
Low Estimate	4.76B	4.99B	19.65B	20.74B
High Estimate	4.88B	5.12B	20.31B	22.39B
Year Ago Sales	4.32B	4.58B	N/A	20.12B
Sales Growth (year/est)	11.7%	10.2%	N/A	6.8%

As shown, analysts expect, on average, revenue (sales) of \$20.12 billion in 2004, growing to \$21.48 billion in 2005, an increase of 6.8 percent. We also have the following table comparing MMM to some benchmarks:

Growth Est	MMM	Industry	Sector	S&P 500
Current Qtr.	22.5%	8.0%	19.0%	15.5%
Next Qtr.	16.7%	7.1%	18.3%	13.0%
This Year	16.8%	8.0%	18.2%	14.2%
Next Year	11.9%	14.6%	18.2%	12.1%
Past 5 Years (per annum)	8.7%	N/A	N/A	N/A
Next 5 Years (per annum)	11.5%	10.81%	11.67%	10.67%
Price/Earnings (avg. for comparison categories)	22.8	19.96	20.19	17.98
PEG Ratio (avg. for comparison categories)	1.98	1.85	1.73	1.69

As you can see, the estimated earnings growth rate for MMM is slightly higher than the industry and S&P 500 over the next five years. What does this mean for MMM stock? We'll get to that in a later chapter. Here is an assignment for you: What's a PEG ratio? Locate a financial glossary on the Web (there are lots of them) to find out.

examining the interactions between investment and financing decisions. In effect, we assume that the use of growth as a basis for planning is just a reflection of the very high level of aggregation used in the planning process.

EFN and Growth

The first thing we need to do is establish the relationship between EFN and growth. To do this, we introduce the simplified income statement and balance sheet for the Hoffman Company in Table 4.6. Notice we have simplified the balance sheet by combining short-term and long-term debt into a single total debt figure. Effectively, we are assuming that none of the current liabilities vary spontaneously with sales. This assumption isn't as restrictive as it sounds. If any current liabilities (such as accounts payable) vary with sales, we can assume that any such accounts have been netted out in current assets. Also, we continue to combine depreciation, interest, and costs on the income statement.

Suppose the Hoffman Company is forecasting next year's sales level at \$600, a \$100 increase. Notice that the percentage increase in sales is $\$100/\$500 = 20\%$. Using the percentage of sales approach and the figures in Table 4.6, we can prepare a pro forma income statement and balance sheet as in Table 4.7. As Table 4.7 illustrates, at a 20 percent growth rate, Hoffman needs \$100 in new assets (assuming full capacity). The projected addition to retained earnings is \$52.8, so the external financing needed, EFN, is $\$100 - \$52.8 = \$47.2$.

Notice that the debt-equity ratio for Hoffman was originally (from Table 4.6) equal to $\$250/\$250 = 1.0$. We will assume that the Hoffman Company does not wish to sell new equity. In this case, the \$47.2 in EFN will have to be borrowed. What will the new debt-equity ratio be? From Table 4.7, we know that total owners' equity is projected at \$302.8. The new total debt will be the original \$250 plus \$47.2 in new borrowing, or \$297.2 total. The debt-equity ratio thus falls slightly from 1.0 to $\$297.2/\$302.8 = .98$.

Table 4.8 shows EFN for several different growth rates. The projected addition to retained earnings and the projected debt-equity ratio for each scenario are also given (you should probably calculate a few of these for practice). In determining the debt-equity

TABLE 4.6 >>

HOFFMAN COMPANY					
Income Statement and Balance Sheet					
Income Statement					
	Sales			\$500	
	Costs			400	
	Taxable income			100	
	Taxes (34%)			34	
	Net income			66	
	Dividends	\$22			
	Addition to retained earnings	44			
Balance Sheet					
Assets			Liabilities and Owners' Equity		
	\$	Percentage of Sales		\$	Percentage of Sales
Current assets	\$200	40%	Total debt	\$250	n/a
Net fixed assets	300	60	Owners' equity	250	n/a
Total assets	\$500	100%	Total liabilities and owners' equity	\$500	n/a

TABLE 4.7 >>

HOFFMAN COMPANY					
Pro Forma Income Statement and Balance Sheet					
Income Statement					
Sales (projected)				\$600.0	
Costs (80% of sales)				480.0	
Taxable income				120.0	
Taxes (34%)				40.8	
Net income				\$ 79.2	
Dividends			\$26.4		
Addition to retained earnings			52.8		
Balance Sheet					
Assets			Liabilities and Owners' Equity		
	\$	Percentage of Sales		\$	Percentage of Sales
Current assets	\$240.0	40%	Total debt	\$250.0	n/a
Net fixed assets	360.0	60	Owners' equity	302.8	n/a
Total assets	\$600.0	100%	Total liabilities and owners' equity	\$552.8	n/a
			External financing needed	\$ 47.2	n/a

ratios, we assumed that any needed funds were borrowed, and we also assumed any surplus funds were used to pay off debt. Thus, for the zero growth case, the debt falls by \$44, from \$250 to \$206. In Table 4.8, notice that the increase in assets required is simply equal to the original assets of \$500 multiplied by the growth rate. Similarly, the addition to retained earnings is equal to the original \$44 plus \$44 times the growth rate.

Table 4.8 shows that for relatively low growth rates, Hoffman will run a surplus, and its debt-equity ratio will decline. Once the growth rate increases to about 10 percent, however, the surplus becomes a deficit. Furthermore, as the growth rate exceeds approximately 20 percent, the debt-equity ratio passes its original value of 1.0.

Figure 4.1 illustrates the connection between growth in sales and external financing needed in more detail by plotting asset needs and additions to retained earnings from Table 4.8 against the growth rates. As shown, the need for new assets grows at a much faster rate than the addition to retained earnings, so the internal financing provided by the addition to retained earnings rapidly disappears.

As this discussion shows, whether a firm runs a cash surplus or deficit depends on growth. Microsoft is a good example. Its revenue growth in the 1990s was amazing,

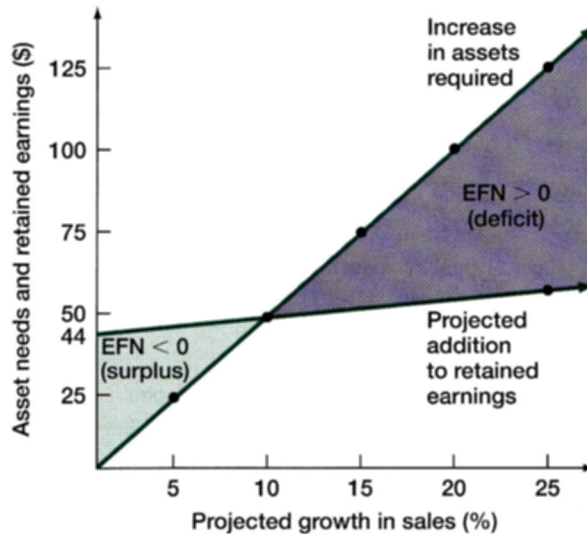
Projected Sales Growth	Increase in Assets Required	Addition to Retained Earnings	External Financing Needed, EFN	Projected Debt-Equity Ratio
0%	\$ 0	\$44.0	-\$44.0	.70
5	25	46.2	- 21.2	.77
10	50	48.4	1.6	.84
15	75	50.6	24.4	.91
20	100	52.8	47.2	.98
25	125	55.0	70.0	1.05

<< TABLE 4.8

Growth and Projected EFN for the Hoffman Company

FIGURE 4.1 >>

Growth and Related Financing Needed for the Hoffman Company



averaging well over 30 percent per year for the decade. Growth slowed down noticeably over the 2000–2004 period, but nonetheless, Microsoft’s combination of growth and substantial profit margins led to enormous cash surpluses. In part because Microsoft paid few or no dividends, the cash really piled up; in 2004, Microsoft’s cash horde exceeded \$50 billion.

Financial Policy and Growth

Based on our discussion just preceding, we see that there is a direct link between growth and external financing. In this section, we discuss two growth rates that are particularly useful in long-range planning.

The Internal Growth Rate The first growth rate of interest is the maximum growth rate that can be achieved with no external financing of any kind. We will call this the **internal growth rate** because this is the rate the firm can maintain with internal financing only. In Figure 4.1, this internal growth rate is represented by the point where the two lines cross. At this point, the required increase in assets is exactly equal to the addition to retained earnings, and EFN is therefore zero. We have seen that this happens when the growth rate is slightly less than 10 percent. With a little algebra (see Problem 32 at the end of the chapter), we can define this growth rate more precisely as:

$$\text{Internal growth rate} = \frac{\text{ROA} \times b}{1 - \text{ROA} \times b} \quad [4.2]$$

where ROA is the return on assets we discussed in Chapter 3, and b is the plowback, or retention, ratio defined earlier in this chapter.

For the Hoffman Company, net income was \$66 and total assets were \$500. ROA is thus $\$66/\$500 = 13.2\%$. Of the \$66 net income, \$44 was retained, so the plowback ratio, b , is $\$44/\$66 = 2/3$. With these numbers, we can calculate the internal growth rate as:

$$\begin{aligned} \text{Internal growth rate} &= \frac{\text{ROA} \times b}{1 - \text{ROA} \times b} \\ &= \frac{.132 \times (2/3)}{1 - .132 \times (2/3)} \\ &= 9.65\% \end{aligned}$$

internal growth rate

The maximum growth rate a firm can achieve without external financing of any kind.

Thus, the Hoffman Company can expand at a maximum rate of 9.65 percent per year without external financing.

The Sustainable Growth Rate We have seen that if the Hoffman Company wishes to grow more rapidly than at a rate of 9.65 percent per year, then external financing must be arranged. The second growth rate of interest is the maximum growth rate a firm can achieve with no external *equity* financing while it maintains a constant debt-equity ratio. This rate is commonly called the **sustainable growth rate** because it is the maximum rate of growth a firm can maintain without increasing its financial leverage.

There are various reasons why a firm might wish to avoid equity sales. For example, as we discuss in Chapter 15, new equity sales can be very expensive. Alternatively, the current owners may not wish to bring in new owners or contribute additional equity. Why a firm might view a particular debt-equity ratio as optimal is discussed in Chapters 14 and 16; for now, we will take it as given.

Based on Table 4.8, the sustainable growth rate for Hoffman is approximately 20 percent because the debt-equity ratio is near 1.0 at that growth rate. The precise value can be calculated as (see Problem 32 at the end of the chapter):

sustainable growth rate
The maximum growth rate a firm can achieve without external equity financing while maintaining a constant debt-equity ratio.

$$\text{Sustainable growth rate} = \frac{\text{ROE} \times b}{1 - \text{ROE} \times b} \quad [4.3]$$

This is identical to the internal growth rate except that ROE, return on equity, is used instead of ROA.

For the Hoffman Company, net income was \$66 and total equity was \$250; ROE is thus \$66/\$250 = 26.4 percent. The plowback ratio, *b*, is still 2/3, so we can calculate the sustainable growth rate as:

$$\begin{aligned} \text{Sustainable growth rate} &= \frac{\text{ROE} \times b}{1 - \text{ROE} \times b} \\ &= \frac{.264 \times (2/3)}{1 - .264 \times (2/3)} \\ &= 21.36\% \end{aligned}$$

Thus, the Hoffman Company can expand at a maximum rate of 21.36 percent per year without external equity financing.

◀◀ **EXAMPLE 4.2**

Sustainable Growth

Suppose Hoffman grows at exactly the sustainable growth rate of 21.36 percent. What will the pro forma statements look like?

At a 21.36 percent growth rate, sales will rise from \$500 to \$606.8. The pro forma income statement will look like this:

HOFFMAN COMPANY	
Pro Forma Income Statement	
Sales (projected)	\$606.8
Costs (80% of sales)	485.4
Taxable income	\$121.4
Taxes (34%)	41.3
Net income	<u>\$ 80.1</u>
Dividends	\$26.7
Addition to retained earnings	53.4

continued

We construct the balance sheet just as we did before. Notice, in this case, that owners' equity will rise from \$250 to \$303.4 because the addition to retained earnings is \$53.4.

HOFFMAN COMPANY					
Pro Forma Balance Sheet					
Assets			Liabilities and Owners' Equity		
	\$	Percentage of Sales		\$	Percentage of Sales
Current assets	\$242.7	40%	Total debt	\$250.0	n/a
Net fixed assets	364.1	60	Owners' equity	303.4	n/a
Total assets	<u>\$606.8</u>	<u>100%</u>	Total liabilities and owners' equity	<u>\$553.4</u>	<u>n/a</u>
			External financing needed	\$ 53.4	n/a

As illustrated, EFN is \$53.4. If Hoffman borrows this amount, then total debt will rise to \$303.4, and the debt-equity ratio will be exactly 1.0, which verifies our earlier calculation. At any other growth rate, something would have to change.

Determinants of Growth In the last chapter, we saw that the return on equity, ROE, could be decomposed into its various components using the Du Pont identity. Because ROE appears so prominently in the determination of the sustainable growth rate, it is obvious that the factors important in determining ROE are also important determinants of growth.

From Chapter 3, we know that ROE can be written as the product of three factors:

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

If we examine our expression for the sustainable growth rate, we see that anything that increases ROE will increase the sustainable growth rate by making the top bigger and the bottom smaller. Increasing the plowback ratio will have the same effect.

Putting it all together, what we have is that a firm's ability to sustain growth depends explicitly on the following four factors:

- 1. Profit margin.** An increase in profit margin will increase the firm's ability to generate funds internally and thereby increase its sustainable growth.
- 2. Dividend policy.** A decrease in the percentage of net income paid out as dividends will increase the retention ratio. This increases internally generated equity and thus increases sustainable growth.
- 3. Financial policy.** An increase in the debt-equity ratio increases the firm's financial leverage. Because this makes additional debt financing available, it increases the sustainable growth rate.
- 4. Total asset turnover.** An increase in the firm's total asset turnover increases the sales generated for each dollar in assets. This decreases the firm's need for new assets as sales grow and thereby increases the sustainable growth rate. Notice that increasing total asset turnover is the same thing as decreasing capital intensity.

The sustainable growth rate is a very useful planning number. What it illustrates is the explicit relationship between the firm's four major areas of concern: its operating efficiency as measured by profit margin, its asset use efficiency as measured by total asset turnover, its dividend policy as measured by the retention ratio, and its financial policy as measured by the debt-equity ratio.

Given values for all four of these, there is only one growth rate that can be achieved. This is an important point, so it bears restating:

If a firm does not wish to sell new equity and its profit margin, dividend policy, financial policy, and total asset turnover (or capital intensity) are all fixed, then there is only one possible growth rate.

As we described early in this chapter, one of the primary benefits of financial planning is that it ensures internal consistency among the firm's various goals. The concept of the sustainable growth rate captures this element nicely. Also, we now see how a financial planning model can be used to test the feasibility of a planned growth rate. If sales are to grow at a rate higher than the sustainable growth rate, the firm must increase profit margins, increase total asset turnover, increase financial leverage, increase earnings retention, or sell new shares.

The two growth rates, internal and sustainable, are summarized in Table 4.9.

A Note on Sustainable Growth Rate Calculations

Very commonly, the sustainable growth rate is calculated using just the numerator in our expression, $ROE \times b$. This causes some confusion, which we can clear up here. The issue has to do with how ROE is computed. Recall that ROE is calculated as net income divided by total equity. If total equity is taken from an ending balance sheet (as we have done consistently, and is commonly done in practice), then our formula is the right one. However, if total equity is from the beginning of the period, then the simpler formula is the correct one.

In principle, you'll get exactly the same sustainable growth rate regardless of which way you calculate it (as long you match up the ROE calculation with the right formula). In reality, you may see some differences because of accounting-related complications. By the way, if you use the average of beginning and ending equity (as some advocate), yet another formula is needed. Also, all of our comments here apply to the internal growth rate as well.

<< TABLE 4.9

Summary of Internal and Sustainable Growth Rates

I. Internal Growth Rate

$$\text{Internal growth rate} = \frac{ROA \times b}{1 - ROA \times b}$$

where

ROA = Return on assets = Net income/Total assets

b = Plowback (retention) ratio

= Addition to retained earnings/Net income

The internal growth rate is the maximum growth rate than can be achieved with no external financing of any kind.

II. Sustainable Growth Rate

$$\text{Sustainable growth rate} = \frac{ROE \times b}{1 - ROE \times b}$$

where

ROE = Return on equity = Net income/Total equity

b = Plowback (retention) ratio

= Addition to retained earnings/Net income

The sustainable growth rate is the maximum growth rate than can be achieved with no external equity financing while maintaining a constant debt-equity ratio.



Robert C. Higgins on Sustainable Growth

>> **Most financial officers** know intuitively that it takes money to make money. Rapid sales growth requires increased assets in the form of accounts receivable, inventory, and fixed plant, which, in turn, require money to pay for assets. They also know that if their company does not have the money when needed, it can literally “grow broke.” The sustainable growth equation states these intuitive truths explicitly.

Sustainable growth is often used by bankers and other external analysts to assess a company’s creditworthiness. They are aided in this exercise by several sophisticated computer software packages that provide detailed analyses of the company’s past financial performance, including its annual sustainable growth rate.

Bankers use this information in several ways. Quick comparison of

a company’s actual growth rate to its sustainable rate tells the banker what issues will be at the top of management’s financial agenda. If actual growth consistently exceeds sustainable growth, management’s problem will be where to get the cash to finance growth. The banker thus can anticipate interest in loan products. Conversely, if sustainable growth consistently exceeds actual, the banker had best be prepared to talk about investment products, because management’s problem will be what to do with all the cash that keeps piling up in the till.

Bankers also find the sustainable growth equation useful for explaining to financially inexperienced small business owners and overly optimistic entrepreneurs that, for the long-run viability of their business, it is necessary to keep growth and profitability in proper balance.

Finally, comparison of actual to sustainable growth rates helps a banker understand why a loan applicant needs money and for how long the need might continue. In one instance, a loan applicant requested \$100,000 to pay off several insistent suppliers and promised to repay in a few months when he collected some accounts receivable that were coming due. A sustainable growth analysis revealed that the firm had been growing at four to six times its sustainable growth rate and that this pattern was likely to continue in the foreseeable future. This alerted the banker to the fact that impatient suppliers were only a symptom of the much more fundamental disease of overly rapid growth, and that a \$100,000 loan would likely prove to be only the down payment on a much larger, multiyear commitment.

Robert C. Higgins is Professor of Finance at the University of Washington. He pioneered the use of sustainable growth as a tool for financial analysis.

EXAMPLE 4.3 >> Profit Margins and Sustainable Growth

Babar Trunks, an operating firm located in India, has a debt-equity ratio of .5, a profit margin of 3 percent, a dividend payout ratio of 40 percent, and a capital intensity ratio of 1. What is its sustainable growth rate? If Babar desired a 10 percent sustainable growth rate and planned to achieve this goal by improving profit margins, what would you think?

ROE is $.03 \times 1 \times 1.5 = 4.5$ percent. The retention ratio is $1 - .40 = .60$. Sustainable growth is thus $.045(.60)/[1 - .045(.60)] = 2.77$ percent.

For Babar to achieve a 10 percent growth rate, the profit margin will have to rise. To see this, assume that sustainable growth is equal to 10 percent and then solve for profit margin, PM:

$$.10 = \text{PM}(1.5)(.6)/[1 - \text{PM}(1.5)(.6)]$$

$$\text{PM} = .1/.99 = 10.1\%$$

For the plan to succeed, the necessary increase in profit margin is substantial, from 3 percent to about 10 percent. This may not be feasible.

Concept Questions

4.4a What are the determinants of growth?

4.4b How is a firm's sustainable growth related to its accounting return on equity (ROE)?

SOME CAVEATS REGARDING FINANCIAL PLANNING MODELS

4.5

Financial planning models do not always ask the right questions. A primary reason is that they tend to rely on accounting relationships and not financial relationships. In particular, the three basic elements of firm value tend to get left out, namely, cash flow size, risk, and timing.

Because of this, financial planning models sometimes do not produce output that gives the user many meaningful clues about what strategies will lead to increases in value. Instead, they divert the user's attention to questions concerning the association of, say, the debt-equity ratio and firm growth.

The financial model we used for the Hoffman Company was simple—in fact, too simple. Our model, like many in use today, is really an accounting statement generator at heart. Such models are useful for pointing out inconsistencies and reminding us of financial needs, but they offer very little guidance concerning what to do about these problems.

In closing our discussion, we should add that financial planning is an iterative process. Plans are created, examined, and modified over and over. The final plan will be a result negotiated between all the different parties to the process. In fact, long-term financial planning in most corporations relies on what might be called the Procrustes approach.¹ Upper-level management has a goal in mind, and it is up to the planning staff to rework and to ultimately deliver a feasible plan that meets that goal.

The final plan will therefore implicitly contain different goals in different areas and also satisfy many constraints. For this reason, such a plan need not be a dispassionate assessment of what we think the future will bring; it may instead be a means of reconciling the planned activities of different groups and a way of setting common goals for the future.

Concept Questions

4.5a What are some important elements that are often missing in financial planning models?

4.5b Why do we say planning is an iterative process?

SUMMARY AND CONCLUSIONS

4.6

Financial planning forces the firm to think about the future. We have examined a number of features of the planning process. We described what financial planning can accomplish and the components of a financial model. We went on to develop the relationship between

¹In Greek mythology, Procrustes is a giant who seizes travelers and ties them to an iron bed. He stretches them or cuts off their legs as needed to make them fit the bed.

growth and financing needs, and we discussed how a financial planning model is useful in exploring that relationship.

Corporate financial planning should not become a purely mechanical activity. If it does, it will probably focus on the wrong things. In particular, plans all too often are formulated in terms of a growth target with no explicit linkage to value creation, and they frequently are overly concerned with accounting statements. Nevertheless, the alternative to financial planning is stumbling into the future. Perhaps the immortal Yogi Berra (the baseball catcher, not the cartoon character) put it best when he said, “Ya gotta watch out if you don’t know where you’re goin’. You just might not get there.”²

Chapter Review and Self-Test Problems

- 4.1 Calculating EFN** Based on the following information for the Skandia Mining Company, what is EFN if sales are predicted to grow by 10 percent? Use the percentage of sales approach and assume the company is operating at full capacity. The payout ratio is constant.

SKANDIA MINING COMPANY Financial Statements					
Income Statement			Balance Sheet		
		Assets		Liabilities and Owners' Equity	
Sales	\$4,250.0	Current assets	\$ 900.0	Current liabilities	\$ 500.0
Costs	<u>3,875.0</u>	Net fixed assets	<u>2,200.0</u>	Long-term debt	1,800.0
Taxable income	\$ 375.0	Total	<u><u>\$3,100.0</u></u>	Owners' equity	<u>800.0</u>
Taxes (34%)	<u>127.5</u>			Total liabilities and owners' equity	<u><u>\$3,100.0</u></u>
Net income	<u>\$ 247.5</u>				
Dividends	\$ 82.6				
Addition to retained earnings	164.9				

- 4.2 EFN and Capacity Use** Based on the information in Problem 4.1, what is EFN, assuming 60 percent capacity usage for net fixed assets? Assuming 95 percent capacity?
- 4.3 Sustainable Growth** Based on the information in Problem 4.1, what growth rate can Skandia maintain if no external financing is used? What is the sustainable growth rate?

Answers to Chapter Review and Self-Test Problems

- 4.1** We can calculate EFN by preparing the pro forma statements using the percentage of sales approach. Note that sales are forecasted to be $\$4,250 \times 1.10 = \$4,675$.

²We're not *exactly* sure what this means either, but we like the sound of it.

SKANDIA MINING COMPANY Pro Forma Financial Statements					
Income Statement					
Sales		\$4,675.0		Forecast	
Costs		<u>4,262.7</u>		91.18% of sales	
Taxable income		\$ 412.3			
Taxes (34%)		<u>140.2</u>			
Net income		<u>\$ 272.1</u>			
Dividends		\$ 90.8		33.37% of net income	
Addition to retained earnings		181.3			
Balance Sheet					
Assets			Liabilities and Owners' Equity		
Current assets	\$ 990.0	21.18%	Current liabilities	\$ 550	11.76%
Net fixed assets	<u>2,420.0</u>	<u>51.76%</u>	Long-term debt	1,800.0	n/a
Total assets	<u>\$3,410.0</u>	<u>72.94%</u>	Owners' equity	<u>981.3</u>	n/a
			Total liabilities and owners' equity	<u>\$3,331.3</u>	<u>n/a</u>
			EFN	\$ 78.7	n/a

- 4.2 Full-capacity sales are equal to current sales divided by the capacity utilization. At 60 percent of capacity:

$$\$4,250 = .60 \times \text{Full-capacity sales}$$

$$\$7,083 = \text{Full-capacity sales}$$

With a sales level of \$4,675, no net new fixed assets will be needed, so our earlier estimate is too high. We estimated an increase in fixed assets of $\$2,420 - 2,200 = \220 . The new EFN will thus be $\$78.7 - 220 = -\141.3 , a surplus. No external financing is needed in this case.

At 95 percent capacity, full-capacity sales are \$4,474. The ratio of fixed assets to full-capacity sales is thus $\$2,200/4,474 = 49.17\%$. At a sales level of \$4,675, we will thus need $\$4,675 \times .4917 = \$2,298.7$ in net fixed assets, an increase of \$98.7. This is $\$220 - 98.7 = \121.3 less than we originally predicted, so the EFN is now $\$78.7 - 121.3 = -\42.6 , a surplus. No additional financing is needed.

- 4.3 Skandia retains $b = 1 - .3337 = 66.63\%$ of net income. Return on assets is $\$247.5/3,100 = 7.98\%$. The internal growth rate is:

$$\begin{aligned} \frac{\text{ROA} \times b}{1 - \text{ROA} \times b} &= \frac{.0798 \times .6663}{1 - .0798 \times .6663} \\ &= 5.62\% \end{aligned}$$

Return on equity for Skandia is $\$247.5/800 = 30.94\%$, so we can calculate the sustainable growth rate as:

$$\begin{aligned} \frac{\text{ROE} \times b}{1 - \text{ROE} \times b} &= \frac{.3094 \times .6663}{1 - .3094 \times .6663} \\ &= 25.97\% \end{aligned}$$

Concepts Review and Critical Thinking Questions

- Sales Forecast** Why do you think most long-term financial planning begins with sales forecasts? Put differently, why are future sales the key input?
- Sustainable Growth** In the chapter, we used Rosengarten Corporation to demonstrate how to calculate EFN. The ROE for Rosengarten is about 7.3 percent, and the plowback ratio is about 67 percent. If you calculate the sustainable growth rate for Rosengarten, you will find it is only 5.14 percent. In our calculation for EFN, we used a growth rate of 25 percent. Is this possible? (Hint: Yes. How?)
- External Financing Needed** Testaburger, Inc., uses no external financing and maintains a positive retention ratio. When sales grow by 15 percent, the firm has a negative projected EFN. What does this tell you about the firm's internal growth rate? How about the sustainable growth rate? At this same level of sales growth, what will happen to the projected EFN if the retention ratio is increased? What if the retention ratio is decreased? What happens to the projected EFN if the firm pays out all of its earnings in the form of dividends?
- EFN and Growth Rates** Broslofski Co. maintains a positive retention ratio and keeps its debt-equity ratio constant every year. When sales grow by 20 percent, the firm has a negative projected EFN. What does this tell you about the firm's sustainable growth rate? Do you know, with certainty, if the internal growth rate is greater than or less than 20 percent? Why? What happens to the projected EFN if the retention ratio is increased? What if the retention ratio is decreased? What if the retention ratio is zero?

Use the following information to answer the next six questions: A small business called The Grandmother Calendar Company began selling personalized photo calendar kits. The kits were a hit, and sales soon sharply exceeded forecasts. The rush of orders created a huge backlog, so the company leased more space and expanded capacity, but it still could not keep up with demand. Equipment failed from overuse and quality suffered. Working capital was drained to expand production, and, at the same time, payments from customers were often delayed until the product was shipped. Unable to deliver on orders, the company became so strapped for cash that employee paychecks began to bounce. Finally, out of cash, the company ceased operations entirely three years later.

- Product Sales** Do you think the company would have suffered the same fate if its product had been less popular? Why or why not?
- Cash Flow** The Grandmother Calendar Company clearly had a cash flow problem. In the context of the cash flow analysis we developed in Chapter 2, what was the impact of customers' not paying until orders were shipped?
- Product Pricing** The firm actually priced its product to be about 20 percent less than that of competitors, even though the Grandmother calendar was more detailed. In retrospect, was this a wise choice?
- Corporate Borrowing** If the firm was so successful at selling, why wouldn't a bank or some other lender step in and provide it with the cash it needed to continue?
- Cash Flow** Which is the biggest culprit here: too many orders, too little cash, or too little production capacity?
- Cash Flow** What are some of the actions that a small company like The Grandmother Calendar Company can take if it finds itself in a situation in which growth in sales outstrips production capacity and available financial resources? What other

options (besides expansion of capacity) are available to a company when orders exceed capacity?

Questions and Problems

1. **Pro Forma Statements** Consider the following simplified financial statements for the Auckland Shearers Company (ASC) (assuming no income taxes):

BASIC
(Questions 1–15)

Income Statement		Balance Sheet			
Sales	NZD 16,000	Assets	NZD 8,900	Debt	NZD 5,100
Costs	12,500			Equity	3,800
Net income	<u>NZD 3,500</u>	Total	<u>NZD 8,900</u>	Total	<u>NZD 8,900</u>

ASC has predicted a sales increase of 10 percent. It has predicted that every item on the balance sheet will increase by 10 percent as well. Create the pro forma statements and reconcile them. What is the plug variable here?

2. **Pro Forma Statements and EFN** In the previous question, assume ASC pays out half of net income in the form of a cash dividend. Costs and assets vary with sales, but debt and equity do not. Prepare the pro forma statements and determine the external financing needed.
3. **EFN** The most recent financial statements for Lima Produce, are shown here:

Income Statement		Balance Sheet			
Sales	PEN 19,200	Assets	PEN 93,000	Debt	PEN 20,400
Costs	15,550			Equity	72,600
Taxable income	PEN 3,650	Total	<u>PEN 93,000</u>	Total	<u>PEN 93,000</u>
Taxes (34%)	1,241				
Net income	<u>PEN 2,409</u>				

Assets and costs are proportional to sales. Debt and equity are not. A dividend of PEN 963.60 was paid, and McGillicuddy wishes to maintain a constant payout ratio. Next year's sales are projected to be PEN 23,040. What is the external financing needed?

4. **Calculating EFN** The most recent financial statements for Warsaw Bagels, a Polish firm, are shown here in millions of zlotych (assuming no income taxes):

Income Statement		Balance Sheet			
Sales	PLN 12,400	Assets	PLN 36,850	Debt	PLN 27,300
Costs	8,055			Equity	9,550
Net income	<u>PLN 4,345</u>	Total	<u>PLN 36,850</u>	Total	<u>PLN 36,850</u>

Assets and costs are proportional to sales. Debt and equity are not. No dividends are paid. Next year's sales are projected to be 10,200 zlotych. What is the external financing needed?



5. **EFN** The most recent financial statements for 2 Doors Down, Inc., are shown here:

Income Statement		Balance Sheet			
Sales	\$3,600	Current assets	\$4,500	Current liabilities	\$ 920
Costs	<u>2,900</u>	Fixed assets	3,900	Long-term debt	1,840
Taxable income	\$ 700			Equity	<u>5,640</u>
Taxes (34%)	<u>238</u>	Total	<u>\$8,400</u>	Total	<u>\$8,400</u>
Net income	<u>\$ 462</u>				

Assets, costs, and current liabilities are proportional to sales. Long-term debt and equity are not. 2 Doors Down maintains a constant 50 percent dividend payout ratio. Like every other firm in its industry, next year's sales are projected to increase by exactly 15%. What is the external financing needed?



6. **Calculating Internal Growth** The most recent financial statements for Panama Boats, in millions of balboas, are shown here:

Income Statement		Balance Sheet			
Sales	PAB 10,400	Current assets	PAB 11,000	Debt	PAB 22,000
Costs	<u>6,820</u>	Fixed assets	<u>27,000</u>	Equity	<u>16,000</u>
Taxable income	PAB 3,580	Total	<u>PAB 38,000</u>	Total	<u>PAB 38,000</u>
Taxes (35%)	<u>1,253</u>				
Net income	<u>PAB 2,327</u>				

Assets and costs are proportional to sales. Debt and equity are not. Panama maintains a constant 20 percent dividend payout ratio. No external equity financing is possible. What is the internal growth rate?

7. **Calculating Sustainable Growth** For the company in the previous problem, what is the sustainable growth rate?
8. **Sales and Growth** The most recent financial statements for Rio Fashion, a Brazilian-based designer, are shown here, in millions of reais:

Income Statement		Balance Sheet			
Sales	BRL 154,000	Current assets	BRL 75,400	Long-term debt	BRL 168,200
Costs	<u>131,320</u>	Fixed assets	<u>304,500</u>	Equity	<u>211,700</u>
Taxable income	BRL 22,680	Total	<u>BRL 379,900</u>	Total	<u>BRL 379,900</u>
Taxes (34%)	<u>7,711</u>				
Net income	<u>BRL 14,969</u>				

Assets and costs are proportional to sales. The company maintains a constant 30 percent dividend payout ratio and a constant debt-equity ratio. What is the maximum increase in sales that can be sustained assuming no new equity is issued?

9. **Calculating Retained Earnings from Pro Forma Income** Consider the following income statement for the Heir Jordan Corporation:

HEIR JORDAN CORPORATION Income Statement	
Sales	\$29,000
Costs	<u>11,200</u>
Taxable income	\$17,800
Taxes (34%)	<u>6,052</u>
Net income	<u>\$11,748</u>
Dividends	\$4,935
Addition to retained earnings	6,813

A 20 percent growth rate in sales is projected. Prepare a pro forma income statement assuming costs vary with sales and the dividend payout ratio is constant. What is the projected addition to retained earnings?

10. **Applying Percentage of Sales** The balance sheet for the Heir Jordan Corporation follows. Based on this information and the income statement in the previous problem, supply the missing information using the percentage of sales approach. Assume that accounts payable vary with sales, whereas notes payable do not. Put "n/a" where needed.

HEIR JORDAN CORPORATION Balance Sheet					
Assets			Liabilities and Owners' Equity		
	\$	Percentage of Sales		\$	Percentage of Sales
Current assets			Current liabilities		
Cash	\$ 3,525	_____	Accounts payable	\$ 3,000	_____
Accounts receivable	7,500	_____	Notes payable	<u>7,500</u>	_____
Inventory	<u>6,000</u>	_____	Total	<u>\$10,500</u>	_____
Total	<u>\$17,025</u>	_____	Long-term debt	<u>\$19,500</u>	_____
Fixed assets			Owners' equity		
Net plant and equipment	<u>\$30,000</u>	_____	Common stock and paid-in surplus	\$15,000	_____
Total assets	<u>\$47,025</u>	_____	Retained earnings	<u>2,025</u>	_____
			Total	<u>\$17,025</u>	_____
			Total liabilities and owners' equity	<u>\$47,025</u>	_____

11. **EFN and Sales** From the previous two questions, prepare a pro forma balance sheet showing EFN, assuming a 15 percent increase in sales, no new external debt or equity financing, and a constant payout ratio.
12. **Internal Growth** If Guangzhou Hobby Shop has a 12 percent ROA and a 22 percent payout ratio, what is its internal growth rate?
13. **Sustainable Growth** If Ho Chi Minh Hiking has a 21 percent ROE and a 40 percent payout ratio, what is its sustainable growth rate?

- 14. Sustainable Growth** Assuming the following ratios are constant, what is the sustainable growth rate?
- Total asset turnover = 1.40
 Profit margin = 7.6%
 Equity multiplier = 1.50
 Payout ratio = 40%
- 15. Sustainable Growth** Based on the following information, calculate the sustainable growth rate for Kaleb's Kickboxing:
- Profit margin = 8.9%
 Capital intensity ratio = .55
 Debt-equity ratio = .60
 Net income = \$29,000
 Dividends = \$15,000

What is the ROE here?

INTERMEDIATE

(Questions 16–27)

- 16. Full-Capacity Sales** Thorpe Torpedo, is currently operating at only 85 percent of fixed asset capacity. Current sales are Au\$510,000. How fast can sales grow before any new fixed assets are needed?
- 17. Fixed Assets and Capacity Usage** For the company in the previous problem, suppose fixed assets are Au\$415,000 and sales are projected to grow to Au\$680,000. How much in new fixed assets are required to support this growth in sales?
- 18. Growth and Profit Margin** Kanpur Exports, an Indian firm, wishes to maintain a growth rate of 10 percent a year, a debt-equity ratio of .40, and a dividend payout ratio of 50 percent. The ratio of total assets to sales is constant at 1.30. What profit margin must the firm achieve?
- 19. Growth and Assets** A firm wishes to maintain an internal growth rate of 9 percent and a dividend payout ratio of 30 percent. The current profit margin is 8 percent and the firm uses no external financing sources. What must total asset turnover be?
- 20. Growth and Debt-Equity Ratio** A firm wishes to maintain a growth rate of 11 percent and a dividend payout ratio of 60 percent. The ratio of total assets to sales is constant at .9, and profit margin is 9.5 percent. If the firm also wishes to maintain a constant debt-equity ratio, what must it be?
- 21. Sustainable Growth** Based on the following information, calculate the sustainable growth rate for Hendrix Guitars, Inc.:
- Profit margin = 6.4%
 Total asset turnover = 1.80
 Total debt ratio = .60
 Payout ratio = 60%
- What is the ROA here?
- 22. Sustainable Growth and Outside Financing** You've collected the following information, in pesos, about the Cuban Tobacco Company (CTC):
- Sales = 140,000
 Net income = 21,000
 Dividends = 12,000
 Total debt = 85,000
 Total equity = 49,000



What is the sustainable growth rate for CTC? If it does grow at this rate, how much new borrowing will take place in the coming year, assuming a constant debt-equity ratio? What growth rate could be supported with no outside financing at all?

23. **Sustainable Growth Rate** Taejeon Financial Partners had equity of 165,000 won at the beginning of the year. (All values in millions.) At the end of the year, the company had total assets of 250,000 won. During the year the company sold no new equity. Net income for the year was 80,000 won and dividends were 49,000 won. What is the sustainable growth rate for the company? What is the sustainable growth rate if you use the formula $ROE \times b$ and beginning of period equity? What is the sustainable growth rate if you use end of period equity in this formula? Is this number too high or too low? Why?
24. **Internal Growth Rates** Calculate the internal growth rate for the company in the previous problem. Now calculate the internal growth rate using $ROA \times b$ for both beginning of period and end of period total assets. What do you observe?
25. **Calculating EFN** The most recent financial statements for Kenya Safari Tours, follow. Sales for 2005 are projected to grow by 15 percent. Interest expense will remain constant; the tax rate and the dividend payout rate will also remain constant. Costs, other expenses, current assets, and accounts payable increase spontaneously with sales. If the firm is operating at full capacity and no new debt or equity is issued, what is the external financing needed to support the 15 percent growth rate in sales? Values are in thousands of shillings.



KENYA SAFARI TOURS			
2004 Income Statement			
Sales			KES 905,000
Costs			710,000
Other expenses			12,000
Earnings before interest and taxes			KES 183,000
Interest paid			19,700
Taxable income			KES 163,300
Taxes (35%)			57,155
Net income			KES 106,145
Dividends		KES 42,458	
Addition to retained earnings		63,687	

KENYA SAFARI TOURS			
Balance Sheet as of December 31, 2004			
Assets		Liabilities and Owners' Equity	
Current assets		Current liabilities	
Cash	KES 25,000	Accounts payable	KES 65,000
Accounts receivable	43,000	Notes payable	9,000
Inventory	76,000	Total	KES 74,000
Total	KES 144,000	Long-term debt	KES 156,000
Fixed assets		Owners' equity	
Net plant and equipment	KES 364,000	Common stock and paid-in surplus	KES 21,000
		Retained earnings	257,000
		Total	KES 278,000
Total assets	KES 508,000	Total liabilities and owners' equity	KES 508,000

**CHALLENGE**

(Questions 28–32)

- 26. Capacity Usage and Growth** In the previous problem, suppose the firm was operating at only 80 percent capacity in 2004. What is EFN now?
- 27. Calculating EFN** In Problem 25, suppose the firm wishes to keep its debt-equity ratio constant. What is EFN now?
- 28. EFN and Internal Growth** Redo Problem 25 using sales growth rates of 10 and 20 percent in addition to 15 percent. Illustrate graphically the relationship between EFN and the growth rate, and use this graph to determine the relationship between them. At what growth rate is the EFN equal to zero? Why is this internal growth rate different from that found by using the equation in the text?
- 29. EFN and Sustainable Growth** Redo Problem 27 using sales growth rates of 30 and 35 percent in addition to 15 percent. Illustrate graphically the relationship between EFN and the growth rate, and use this graph to determine the relationship between them. At what growth rate is the EFN equal to zero? Why is this sustainable growth rate different from that found by using the equation in the text?
- 30. Constraints on Growth** Bulla Recording, Inc., wishes to maintain a growth rate of 14 percent per year and a debt-equity ratio of .30. Profit margin is 6.2 percent, and the ratio of total assets to sales is constant at 1.55. Is this growth rate possible? To answer, determine what the dividend payout ratio must be. How do you interpret the result?
- 31. EFN** Define the following:

S = Previous year's sales

A = Total assets

D = Total debt

E = Total equity

g = Projected growth in sales

PM = Profit margin

b = Retention (plowback) ratio

Show that EFN can be written as:

$$EFN = -PM(S)b + (A - PM(S)b) \times g$$

Hint: Asset needs will equal $A \times g$. The addition to retained earnings will equal $PM(S)b \times (1 + g)$.

- 32. Growth Rates** Based on the result in Problem 31, show that the internal and sustainable growth rates are as given in the chapter. Hint: For the internal growth rate, set EFN equal to zero and solve for g .
- 33. Sustainable Growth Rate** In the chapter, we discussed the two versions of the sustainable growth rate formula. Derive the formula $ROE \times b$ from the formula given in the chapter, where ROE is based on beginning of period equity. Also, derive the formula $ROA \times b$ from the internal growth rate formula.

S&P Problems

www.mhhe.com/edumarketinsight

STANDARD
& POOR'S

- 1. Calculating EFN** Find the income statements and balance sheets for Huffy Corporation (HUF), the bicycle manufacturer. Assuming sales grow by 10 percent, what is the EFN for Huffy next year? Assume non-operating income/expense and special items will be zero next year. Assets, costs, and current liabilities are

proportional to sales. Long-term debt and equity are not. Huffey will have the same tax rate next year as it does in the current year.

- Internal and Sustainable Growth Rates** Look up the financial statements for Emerson Electric (EMR) and Wal-Mart (WMT). For each company, calculate the internal growth rate and sustainable growth rate over the past two years. Are the growth rates the same for each company for the two years? Why or why not?

What's On the Web?

- Growth Rates** Go to finance.yahoo.com and enter the ticker symbol "IP" for International Paper. When you get the quote, follow the "Analyst Estimates" link. What is the projected sales growth for International Paper for next year? What is the projected earnings growth rate for next year? For the next five years? How do these earnings growth projections compare to the industry, sector, and S&P 500 index?
- Applying Percentage of Sales** Locate the most recent annual financial statements for Du Pont at www.dupont.com under the "Investor Center" link. Locate the annual report. Using the growth in sales for the most recent year as the projected sales growth for next year, construct a pro forma income statement and balance sheet.
- Growth Rates** You can find the home page for Caterpillar, Inc., at www.caterpillar.com. Go to the Web page, select "About Cat," and find the most recent annual report. Using the information from the financial statements, what is the internal growth rate for Caterpillar? What is the sustainable growth rate?



>> MINI-CASE

Ratios and Financial Planning at S&S Air, Inc.

Chris Guthrie was recently hired by S&S Air, Inc., to assist the company with its financial planning, and to evaluate the company's performance. Chris graduated from college five years ago with a finance degree. He has been employed in the finance department of a Fortune 500 company since then.

S&S Air was founded 10 years ago by friends Mark Sexton and Todd Story. The company has manufactured and sold light airplanes over this period, and the company's products have received high reviews for safety and reliability. The company has a niche market in that it sells primarily to individuals who own and fly their own airplanes. The company has two models, the Birdie, which sells for \$53,000, and the Eagle, which sells for \$78,000.

While the company manufactures aircraft, its operations are different from commercial aircraft companies. S&S Air builds aircraft to order. By using prefabricated parts, the company is able to complete the manufacture of an airplane in only five weeks. The company also receives a deposit on each order, as well as another partial payment before the order is complete. In contrast, a commercial airplane may take one and one-half to two years to manufacture once the order is placed.

Mark and Todd have provided the following financial statements. Chris has gathered the industry ratios for the light airplane manufacturing industry.

S&S Air, Inc. 2004 Income Statement	
Sales	\$12,870,000
Cost of goods sold	9,070,000
Other expenses	1,538,000
Depreciation	420,000
EBIT	<u>\$ 1,842,000</u>
Interest	231,500
Taxable income	<u>\$ 1,610,500</u>
Taxes (40%)	644,200
Net income	<u><u>\$ 966,300</u></u>
Dividends	\$289,890
Add. to retained earnings	676,410

S&S Air, Inc. 2004 Balance Sheet			
Assets		Liabilities & Equity	
Current assets		Current liabilities	
Cash	\$ 234,000	Accounts payable	\$ 497,000
Accounts receivable	421,000	Notes payable	1,006,000
Inventory	472,000	Total current liabilities	<u>\$1,503,000</u>
Total current assets	<u>\$1,127,000</u>	Long-term debt	<u>\$2,595,000</u>
Fixed assets		Shareholder equity	
Net plant and equipment	<u>\$7,228,000</u>	Common stock	\$ 100,000
		Retained earnings	4,157,000
		Total equity	<u>\$4,257,000</u>
Total assets	<u><u>\$8,355,000</u></u>	Total liabilities & equity	<u><u>\$8,355,000</u></u>

Light Airplane Industry Ratios			
	Lower Quartile	Median	Upper Quartile
Current ratio	0.50	1.43	1.89
Quick ratio	0.21	0.38	0.62
Cash ratio	0.08	0.21	0.39
Total asset turnover	0.68	0.85	1.38
Inventory turnover	4.89	6.15	10.89
Receivables turnover	6.27	9.82	14.11
Total debt ratio	0.44	0.52	0.61
Debt-equity ratio	0.79	1.08	1.56
Equity multiplier	1.79	2.08	2.56
Times interest earned	5.18	8.06	9.83
Cash coverage ratio	5.84	8.43	10.27
Profit margin	4.05%	6.98%	9.87%
Return on assets	6.05%	10.53%	13.21%
Return on equity	9.93%	16.54%	26.15%

Questions

- Calculate the following ratios for S&S Air: current ratio, quick ratio, cash ratio, total asset turnover, inventory turnover, receivables turnover, total debt ratio, debt-equity ratio, equity multiplier, times interest earned, cash coverage, profit margin, return on assets, and return on equity.
- Mark and Todd agree that a ratio analysis can provide a measure of the company's performance. They have chosen Boeing as an aspirant company. Would you choose Boeing as an aspirant company? Why or why not?
- Compare the performance of S&S Air to the industry. For each ratio, comment on why it might be viewed as positive or negative relative to the industry. Suppose you create an inventory ratio calculated by inventory divided by current liabilities. How do you think S&S Air's ratio would compare to the industry average?
- Calculate the internal growth rate and sustainable growth rate for S&S Air. What do these numbers mean?
- S&S Air is planning for a growth rate of 20 percent next year. Calculate EFN assuming the company is operating at full capacity.
- Most assets can be increased as a percentage of sales. For instance, cash can be increased by any amount. Fixed assets often must be increased in specific amounts since it is usually impossible or impractical to buy part of a new plant or machine. So, assume S&S Air cannot increase fixed assets as a percentage of sales. Instead, whenever the company needs to purchase new manufacturing equipment, it must purchase in the amount of \$3,000,000. Calculate the new EFN with this assumption. What does this imply about capacity utilization for the company next year?