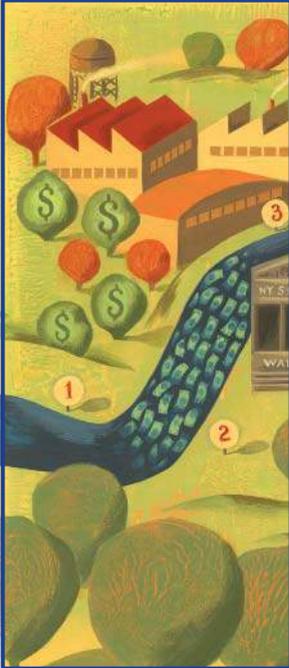


CHAPTER OUTLINE

**Business Planning**

Component Parts of a Business Plan
 The Purpose of Planning and Plan Information
 Credibility and Supporting Detail
 Four Kinds of Business Plan
 The Financial Plan as a Component of a Business Plan

Making Financial Projections

Planning for New and Existing Businesses
 The General Approach, Assumptions, and the Debt/Interest Problem
 Plans with Simple Assumptions
 Forecasting Cash Needs

The Percentage of Sales Method—A Formula Approach

The Sustainable Growth Rate Plans with More Complicated Assumptions

A Comprehensive Example—A Complex Plan for an Existing Business

Planning at the Department Level
 The Cash Budget

Management Issues in Financial Planning

The Financial Plan as a Set of Goals
 Risk in Financial Planning in General
 Financial Planning and Computers

Planning is a big part of modern corporate life, especially in large companies. Firms plan their futures constantly, addressing everything from cash flow and short-term profitability to long-run strategy.

Generally, the higher in management people are, the more time they devote to planning. It isn't unusual for top executives to spend 80% of their time thinking about the future. At the same time, some planning functions involve virtually everyone in management. For example, one thing you can be sure you'll do in your first management job is prepare a budget.

This chapter deals primarily with *financial planning*. Simply put, that means projecting a company's financial statements into the future. However, financial planning is a part of a broader activity known as *business planning*. To really appreciate financial planning, we have to understand the nature and purpose of business planning, and see how the financial element fits into the broader concept.

BUSINESS PLANNING

The easiest way to describe business planning is in terms of its result. The process produces a document called a **business plan**, which can be thought of as a picture or model of what a business unit is expected to become in the future. The business plan generally looks like a magazine (with graphs and diagrams rather than pictures), and consists of a combination of words and numbers that describe the business.

The numbers in a plan are largely projected financial statements. That is, they're estimates of what the firm's statements will look like in the future if the assumptions about the business made by the planners come true. Such statements based on hypothetical circumstances are called *pro forma*, meaning they are cast "as if" the planning assumptions are true.

A **business plan** is a model of what management expects a business to become in the future expressed in **words** and **financial projections**.

The words in a business plan describe the operation in a realistic yet concise way. They discuss broad strategic issues, detail the handling of short-term tactical questions, and amplify the financial projections.

The overall image conveyed by a good business plan is very comprehensive. It includes information on products, markets, employees, technology, facilities, capital, revenue, profitability, and anything else that might be relevant in describing the organization and its affairs.

COMPONENT PARTS OF A BUSINESS PLAN

Although the detail within business plans varies a great deal from company to company, most follow a fairly standard overall format. A typical outline follows.

- a. Contents
- b. Executive Summary
- c. Mission and Strategy Statement
- d. Market Analysis
- e. Operations (of the business)
- f. Management and Staffing
- g. **Financial Projections**
- h. Contingencies

The first two sections are introductory. The table of contents is just that, and the executive summary is a one-page overview of everything that follows.

The mission and strategy section lays out the basic charter of the business and establishes its long-term direction. The market analysis attempts to demonstrate why the business will succeed against its competitors. The chapter on operations describes how the firm creates and distributes its product or service. The management and staffing chapter details the firm's projected personnel needs and in some cases lays out the credentials of key managers.

The financial section of the business plan projects the company's financial results into the future, and is the firm's **financial plan**. How that projection is put together will be our main focus in this chapter. The section on contingencies tells what the company will do if things don't go as planned.

THE PURPOSE OF PLANNING AND PLAN INFORMATION

The two major audiences for a firm's business plan and the information it contains are the firm's own management and outside investors.

The Managerial Value of Planning

Business planning has several managerial benefits. One has to do with the process of creating the plan, while the others are related to using the finished product.

The Planning Process

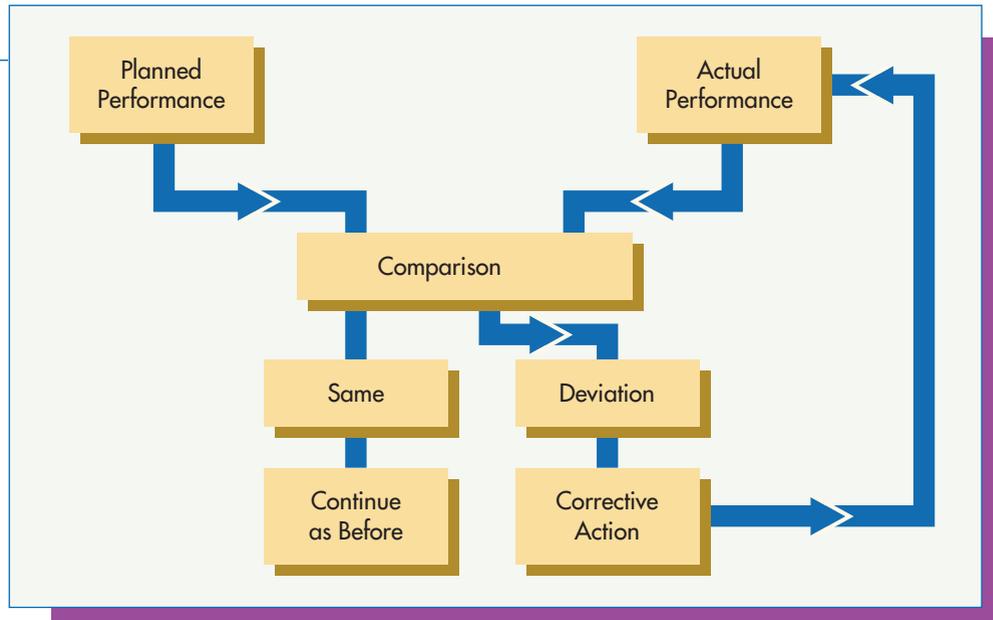
The planning process can pull a management team into a cohesive unit with common goals. It helps everyone understand what the objectives of the organization are, why they're important, and how the organization intends to achieve them. Creating a plan forces the team to think through everything that has to be done in the coming period, making sure everyone understands what they have to do.

A Road Map for Running the Business

A business plan functions as a road map for getting an organization to its goal. Comparing the details of operating performance with the plan and investigating

A firm's **financial plan** is a projection of its financial statements into the **future**.

The **planning process** helps to pull the management team together.

Figure 4.1**Using a Plan to Guide Business Performance**

deviations is an important management process. When a business goes off course, such a comparison is the best way to understand the firm's problems and come up with solutions. The idea is illustrated in Figure 4.1.

A Statement of Goals

A business plan is a projection of the future that generally reflects what management would like to see happen. Accordingly, it can be viewed as a set of goals for the company as a whole and for its individual departments.

A plan contains revenue targets, departmental expense constraints, and various development goals for products and processes. Different people are responsible for different goals, and performance against them can be measured and evaluated.

It's especially common to tie executive bonuses to the achievement of goals within business plans. We'll have more to say about goals within plans later in the chapter.

Predicting Financing Needs

Financial planning is extremely important for companies that rely on outside financing. Only through accurate financial planning can a corporate treasurer predict when he or she will need to turn to financial markets to raise additional money to support operations.

Communicating Information to Investors

A business plan is management's statement about what the company is going to be in the future, and can be used to communicate those ideas to investors. A plan predicts the future character of the enterprise. It makes an estimate of profitability and cash flow. The financial information tells equity investors what returns they can expect and debt investors where the firm will get the money to repay loans.

Small firms use the business plan document itself in dealing with investors. Large companies convey selected plan information to securities analysts who use it and past performance as a basis for recommendations to clients.

A completed plan serves as a **road map** for guiding a business toward the goals stated in the plan.

The financial plan is especially important for anticipating **financing needs**.

The business plan is a vehicle for communicating with potential **investors**.

Business Planning in Divisions of Large Companies

Large companies are usually organized into decentralized operating divisions that function more or less like independent companies. Most large firms engage in a nearly continuous planning process. Divisions produce their own plans, which are consolidated to create overall corporate plans.

The business planning process is an important vehicle through which divisions communicate with corporate managements. A division’s final business plan is a statement of its goals that reflects the parent company’s expectations as well as its own. Divisional plans are generally approved by corporate management after lengthy reviews, and nearly everything a division does is compared with its plan.

Success and failure at the division are defined relative to the business plan.

CREDIBILITY AND SUPPORTING DETAIL

Predictions of the future may not come true. Everyone knows that, so there’s always an issue of believability surrounding business plans. Financial plans are especially subject to skepticism because it’s usually hard to tell how the planners developed the numbers in the projected statements. Let’s consider a simplified example to illustrate the idea.

Suppose Poorly Inc. has revenue of \$100 million and profit of \$1 million this year. The board of directors is pressuring management for better performance and has demanded a plan showing an improvement. In response, management submits the following.

A good business plan shows enough **supporting detail** to indicate that it is the product of **careful thinking**.

	Poorly Inc. Financial Plan	
	<i>This Year</i>	<i>Next Year</i>
Revenue	\$100 million	\$120 million
EAT	1 million	12 million

Technically, this projection satisfies the board’s request for a plan showing improvement, but the obvious question is why should the board members believe it. In the situation described, they probably would not.

The problem is that this “plan” as presented lacks *supporting detail*. A reader doesn’t know whether it’s something made up just to satisfy the board’s demand or represents the summarized product of a great deal of analysis. In other words, it doesn’t tell the reader enough about the thinking behind the financial figures to make them believable.

A competent plan may display summarized financial projections, but the figures are supported by enough detail to show that they’re the product of logical thinking. For example, revenue projections are usually supported by schedules showing the products and quantities to be sold, their prices, and which sales organizations are expected to do the selling. These schedules in turn are backed up by reasoning that tells why certain products are expected to sell more than others and why some salespeople will outsell their rivals. The point is that a planner can’t just write down a revenue figure that’s plucked out of thin air and expect people to believe it.

Supporting detail shows how the numbers in the financial plan were developed. The detail doesn’t all have to be included in the plan document itself, but should be available if a reader has questions.

As we proceed, we’ll see that financial plans are constructed with varying levels of supporting detail depending on their use. It’s important to match the level of detail to the purpose of the plan.

FOUR KINDS OF BUSINESS PLAN

There are as many as four variations on the basic idea of business planning. Each serves a different purpose and results in a separate document. Large, sophisticated companies tend to do all of these different kinds of planning. Small firms usually do only one plan that combines features of the four variations.

The four kinds of planning are (1) strategic planning, (2) operational planning, (3) budgeting, and (4) forecasting.^{1,2} They differ according to three attributes: the length of the planning period (the **planning horizon**), the kinds of issues addressed, and the level of financial detail projected.

Strategic Planning

Strategic planning involves broad, conceptual thinking about the nature of a business, whom it serves, and what it does. It's generally a long-term exercise in which managers try to predict in rough terms what the business will do and become over a period of several years. A five-year horizon is the most common.

Strategic planning begins by questioning the company's very existence. Why is the firm doing what it does? Would it be better off doing something else? What customer need does it serve? How? What opportunities are present in the marketplace? What threats? Strategy demands that a company develop a mission and a charter and that it define what it does and why, while stating its loftiest goals.

Once that base is established, strategic planners look forward over several years and consider broad, sweeping issues. At the end of five years, will the firm be in the same lines of business? In the same geographic areas? How large will it have grown? Who will be its competitors, and how will it fight them? And so on.

Strategic planning deals with concepts and ideas expressed mostly with words rather than numbers. The numbers used tend to be simple and approximate. For example, a firm's strategic plan might establish a goal of being the number one or two rated company in its industry based on some measure such as sales or market share. Or a firm might set a sales goal of about \$500 million a year, stating that revenue figure without a lot of supporting detail.

Strategic plans include projected financial statements, but they're approximate and ideal, and usually not supported by much detail. The plan's last (usually fifth) year generally shows financial results that reflect the best the business could ever be expected to do.

Strategic plans are often called long-range plans or five-year plans.

In a nutshell, systematic strategic thinking says that a business must first analyze itself, its industry, and the competitive situation. Then it must construct an approach to doing business that takes advantage of its strengths and minimizes the vulnerabilities created by its weaknesses. A strategic plan is a vehicle for documenting this kind of thinking.

Operational Planning

Operational planning involves translating business ideas into concrete, shorter-term projections usually encompassing about a year. Projections are a great deal more detailed here than in strategic planning.

The **strategic plan** addresses broad, long-term issues, and contains only summarized, **approximate financial projections**.

1. Planning terminology isn't consistent among companies. In some firms, people talk about an annual operating budget, while others make a long-term forecast. The words "outlook" and "view" are also common. The important distinction is the length of the planning horizon: Multi- (usually five) year—long-term, strategic. One year—intermediate term, operating. Three to six months—short-term, budgetary. Two weeks to three months—very short-term, forecast.

2. Budgets and forecasts are abbreviated business plans and often don't have all the parts described earlier. They are predominantly financial projections.

Among other things, operational plans specify how much the company will sell, to whom, and at what prices. They also spell out where the firm will get its inputs and equipment, what those things will cost, and what the firm expects to earn.

The word “operational” or “operating” means having to do with the day-to-day running of the business. Major short-term goals are generally set up in the operating plan. Revenue targets are established along with profit objectives. Sales quotas and product development milestones are laid out. Compensation and bonus systems are also specified. Most companies do an annual plan that is an operational plan, and is generally their most important planning exercise.

A typical annual **operating plan** is conceptually an almost even mix of words and numbers. The document explains what’s going on verbally, but backs the explanation up with financial projections containing substantial supporting detail.

The **annual operating plan** projects the business in detail over a year, and is the **most important** planning exercise.

Budgeting

In many industries, business conditions change rapidly and an annual operating plan can be badly out of date by the second half of the year it covers. Budgets are essentially short-term updates of annual plans, typically covering three-month quarters. In addition, they usually contain supporting detail beyond that found in the annual plan.

A budget ties down exactly how much money, material, and labor will flow through the organization and fixes responsibility on specific people for making it happen. The budgeting process involves trying to predict exactly how much of which products will be sold and at what cost. Along with that, it attempts a precise estimate of how many dollars will be spent in each department, on exactly what items: salary, material, travel, and so on.

It’s important to realize that the budgetary time frame is too short to make major conceptual changes in the businesses. Policy issues and long-term direction aren’t usually discussed, so budgets have relatively fewer words and more financial detail than annual plans. Clearly, a budget can also be considered an operating plan because it details the day-to-day operation of the business.

Budgets are short-term updates of the annual plan when business **conditions change** rapidly.

Forecasting

Forecasts are quick estimates of short-term financial results. They’re essentially projections of where the *financial momentum* of a business will carry it over a short period. They usually consist almost entirely of numbers with very little supporting verbiage.

Forecasts are generally made either to estimate cash flows or when management gets worried about how the company will close out a period in terms of profits.

Short-term forecasting is especially important with respect to cash requirements. If a company is to pay its bills and make its payroll, it has to have an accurate picture of the cash ins and outs that can be expected over the next few weeks and months. If a temporary shortage is predicted, bank borrowing has to be arranged to keep the firm running until collections catch up with disbursements.

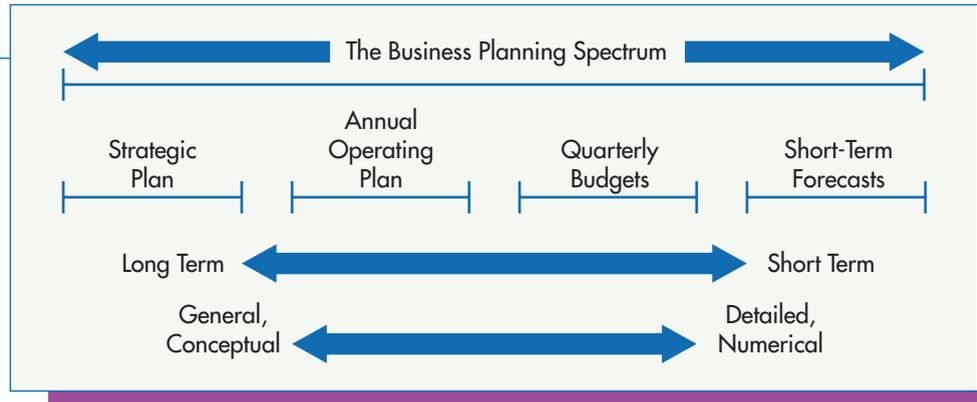
A *cash forecast* is a financial projection made with the explicit purpose of predicting short-term cash needs. Most large firms do *monthly* cash forecasts.³

Forecasts are very **short-term** projections of **profit** and **cash** flow.

3. The words “plan” and “forecast” have slightly different implications when used as nouns and verbs. A forecast (noun) tends to mean a short-term projection. A plan (noun) has a longer-term implication. The verbs are used more generally and don’t tend to be tied to the length of the planning horizon. Hence, we routinely talk about *forecasting* the numbers within a plan or *planning* the numbers within a forecast.

Figure 4.2

The Business Planning Spectrum



The Business Planning Spectrum

It helps one's understanding of planning to imagine the different kinds of plan arrayed along a spectrum. The broad, conceptual thinking of long-term strategic planning is on one end, while the numerical detail of short-term forecasting is on the other. The idea is illustrated in Figure 4.2. As we move from left to right, the planning horizon (time covered) gets shorter, and the documents progress from qualitative to quantitative—that is, from being mostly words to mostly numbers.

Ideally, companies practice the whole spectrum of planning. That's the way most large companies operate, producing all the different documents. In such an environment, the strategic plan and the annual operating plan are each produced once a year about six months apart.⁴ In addition, there are usually four quarterly budgets and any number of forecasts.⁵

Relating Planning Processes of Small and Large Businesses

In the small business world, the planning spectrum is usually compressed into one document known simply as the company's "business plan." It tends to be produced when the firm is getting started and updated later when money is needed from a bank or another outside source.

The business plan produced by small companies can be related to the full planning spectrum found in larger firms. The idea is illustrated in Figure 4.3. The (small) business plan overlaps three of the exercises along the spectrum. It includes everything we normally think of as operational (annual) planning, as well as elements of both strategic planning and budgeting.

The entrepreneur's plan must do everything the big corporation's annual operating plan does. It has to provide a thorough rationale for the concrete actions planned in the next year and make some fairly detailed projections of quantities, staffing, and dollars over that period.

4. It's important to notice that even though the strategic plan covers five or more years, it is revised annually.

5. Companies in very stable businesses may omit the budget segment of the spectrum. Producers of basic foods and certain regulated utilities are examples. Their revenues don't change much from year to year, so it may not be necessary to rebudget quarterly to keep up with changing business conditions. High-tech industries represent the opposite extreme. Technology and the markets for it change rapidly, and the companies constantly engage in replanning.



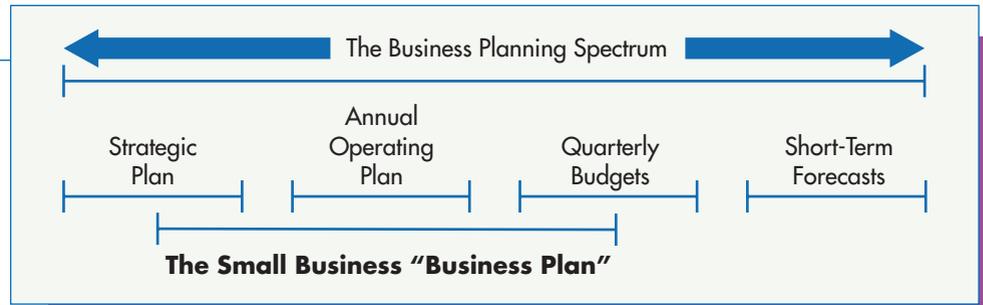
When in need of funding, **small businesses** tend to do a single **business plan** that contains both strategic and operating elements.

http://

The Small Business Administration offers some helpful tips and information on running a small business including financial guidance at <http://www.sba.gov>

Figure 4.3

Relating Business Planning in Large and Small Companies



With respect to strategy, however, the small business plan doesn't need to cover the broadest issues. For example, it doesn't have to discuss why the entrepreneur chose this business over others because that decision has already been made. The plan does have to establish that a market clearly exists and that it can be served by the business. The small business plan must also make longer-term strategic projections of what the business will be three to five years in the future.

Finally, a small business plan has to get under an operating plan and project at least the first year in budget-like detail. Investors generally demand at least this much precision from entrepreneurs.⁶

THE FINANCIAL PLAN AS A COMPONENT OF A BUSINESS PLAN

A financial plan is simply the financial portion of any of the business plans we've been talking about. It is a set of pro forma financial statements projected over the time period covered by the plan.⁷

It's important to appreciate the role of the financial plan in each of the four planning documents we discussed earlier. No business plan is complete without a financial projection, but it's of secondary importance in the strategic plan. That document is an exposition of thoughts and ideas that discusses the how and why of a business. The *financials* are pieces of the projection, but generally aren't central to the presentation.

In an annual plan, on the other hand, the financial projection is the centerpiece of the document. In operational terms, a company's financial plan is its business plan. There are usually a great many words in an annual plan, but they tend to be explanations of how the operating figures are to be achieved rather than discussions that stand by themselves.

Budgets and forecasts, especially the latter, are almost entirely financial planning exercises.

MAKING FINANCIAL PROJECTIONS

Projecting financial statements involves translating planned physical and economic activity into dollars. That generally means making a sales forecast first, and then developing what the rest of the company needs to do to support the activity implied. Those physical projections lead to the dollar figures in the financial statements.

6. For a comprehensive treatment of business planning in the context of small business, see *The Perfect Business Plan Made Simple* by William Lasher (New York: Random House, 2005).

7. The terms "financial plan" and "financial planner" have a common meaning that shouldn't be confused with their use in this chapter. Personal financial advisors who set up investment programs (financial plans) for clients are known as "financial planners." The field has nothing to do with business planning or projecting financial statements.

The **financial plan** is an integral part of the overall **business plan**.

http://

The Business Owner's Toolkit at <http://www.toolkit.cch.com/tools/tools.asp> offers some great financial planning ideas for small businesses.

PLANNING FOR NEW AND EXISTING BUSINESSES

Financial plans are constructed for both new and ongoing businesses. The processes are conceptually similar, but as a practical matter it's a good deal harder to plan for an operation that's either very new or has yet to be started.

It's difficult to forecast how much a new business will sell or how much support it will need, because there's no history on which to base projections. That means everything has to be developed from the ground up. Forecasting for an established business is much easier, because recent results and the existing base of assets and liabilities can be used as points of departure for the projection.

The Typical Planning Task

Most financial planning is done for existing businesses. Basically, it involves forecasting changes to what's been going on in the past. The changes are generally referred to as **planning assumptions**. Anything about which an explicit assumption isn't made is implicitly assumed to remain unchanged from the previous year. (For a new business, everything has to be explicitly assumed.)

For example, an existing business might plan next year's operations assuming the following changes.

- A 10% growth in unit sales
- A 3% reduction in product price
- A \$2 per unit increase in the cost of materials
- Overall labor cost increases of 4%
- An improvement in inventory turnover from 5.3 to 6.3
- An improvement in the ACP from 45 to 40 days
- An increase in interest rates from 7% to 9%
- And so on.

The financial planner's task is to put together a plan, benchmarking from last year's performance, that reflects these changes in the projected financial statements.

THE GENERAL APPROACH, ASSUMPTIONS, AND THE DEBT/INTEREST PROBLEM

In this section we'll outline how any financial planning problem is tackled, and consider the peculiar problem of forecasting debt and interest. We'll begin by establishing exactly what we're trying to forecast and exactly what we have to start with.

What We Have and What We Need to Project

Every financial planning problem involves forecasting future financial statements beginning with the next period given the results of the last period.^{8,9} Only the income statement and balance sheet have to be forecast. The statement of cash flows is developed from those two without any additional projections.

8. For discussion purposes, we'll assume yearly time periods.

9. Most of the time, planning for a particular year is done toward the end of the preceding (current) year. That means planners don't have actual financial results for the current year with which to work. However, because year end is close, they generally have relatively good estimates of the year's actual results.

Most financial planning involves forecasting changes in ongoing businesses based on **planning assumptions**.

Figure 4.4

The Planning Task

	INCOME STATEMENTS		BALANCE SHEETS		
	This Year	Next Year		Next Year	
				Begin	End
Revenue	\$XX	\$?	ASSETS		
COGS	<u>XX</u>	<u>?</u>	Current	\$ XX	\$?
Gross margin	\$XX	?	Fixed	<u>XX</u>	<u>?</u>
Expense	<u>XX</u>	<u>?</u>	Total assets	\$XXX	<u>?</u>
EBIT	\$XX	?	LIABILITIES		
Interest	<u>XX</u>	<u>?</u>	Current Liabilities	\$ XX	?
EBT	\$XX	?	Debt	XX	?
Tax	<u>XX</u>	<u>?</u>	Equity	<u>XX</u>	<u>?</u>
EAT	\$XX	?	Total L & E	\$XXX	<u>?</u>

Figure 4.4 shows the planner's task conceptually. The current (this) year's income statement is available, as is the ending balance sheet (which is next year's beginning balance sheet). These items are indicated by \$XX in the figure. Using those as references, next year's income statement and ending balance sheet must be forecast incorporating the physical and economic assumptions made in the plan.

If the plan is for a new business, the \$XXs are simply all zeros.

Planning Assumptions

We introduced the idea of an assumption briefly in the last section. At this point we'll define the concept more precisely and illustrate how it works.

A *planning assumption* is some physical or economic condition that is expected to exist during the planning period. Assumptions can reflect any of the forces that influence a firm's financial results. Some things originate outside the company, like interest rates and taxes. Others come from planned management actions, like pricing or cost control. Still others come from customer behavior, like the volume response to a price change.

In general, each line on a projected set of financial statements is forecast on the basis of one or more assumptions about the business. Here's a simplified example to illustrate the idea.

A **planning assumption** is an **expected condition** that dictates the size of one or more **financial statement items**.

Example 4.1

This year Crumb Baking Corp. sold 1 million coffee cakes per month to grocery distributors at \$1 each for a total of \$12 million. The firm had year-end receivables equal to two months of sales or \$2 million. Crumb's operating assumptions with respect to sales and receivables for next year are:

1. Price will be decreased by 10% in order to sell more product.
2. As a result of the price decrease, unit sales volume will increase to 15 million coffee cakes.
3. Collection efforts will be increased so that only one month of sales will be in receivables at year end.

Forecast next year's revenue and ending receivables balance on the basis of these assumptions. Assume sales are evenly distributed over the year.

SOLUTION: There are three interrelated planning assumptions in this example. The first reflects a management action with respect to pricing, and the second defines the expected customer response to that action. Together, they establish the revenue forecast: Next year, 15 million coffee cakes will be sold at \$.90 each, so total revenue will be

$$\text{revenue} = 15,000,000 \times \$.90 = \$13,500,000$$

The third assumption is that the company's credit and collection activities will be more effective next year. This will be reflected by a decrease from two to one in the number of months of revenue that remain uncollected in accounts receivable at year end.

$$\text{A/R} = \$13,500,000/12 = \$1,125,000$$

Notice that the receivables calculation depends on all three assumptions, because it uses the revenue projection developed from the first two as well as the third assumption about the effectiveness of credit and collections.

The Procedural Approach

Financial plans are built by attacking line items one at a time starting with revenue, doing the kind of thing illustrated in Example 4.1.

The substance of financial planning is the logical translation of assumptions into the forecast figures they imply. It's important to realize that the calculations required for that translation differ, depending on the line item and the nature of the assumption. Some are very simple while others can become involved. We'll go through some more examples shortly.

The procedure moves down the income statement through cost and expense, stopping just *before* the interest expense line. Then the balance sheet projections are addressed. All the asset and liability accounts other than long-term debt and equity are forecast. At that point the planning procedure encounters a problem.

The Debt/Interest Planning Problem

The next items needed to complete the financial statements are interest expense on the income statement and debt on the balance sheet. The problem is that each depends on the other, so a straightforward forecast is impossible.

It's important to understand the reason for this difficulty, but the explanation can be a little hard to follow. The problem is described in the following paragraphs and illustrated in Figure 4.5. Read the explanation carefully, referring to the illustration at the same time.

Start by examining Figure 4.5. \$XXs imply dollar forecasts have already been made and question marks (?) indicate they haven't. Notice that on the income statement we lack a forecast of interest expense and everything below it, including earnings after tax (EAT). On the balance sheet we have forecasts for all the asset and liability accounts other than debt and equity. Notice that we do have the total liabilities and equity figure, because it's equal to total assets.

To complete the income statement, we need a forecast of interest expense. But interest is calculated by applying the interest rate to the average projected debt balance during the coming year. We know the beginning debt balance, but we have to forecast the ending figure to get an average.

Forecasting ending debt requires that we complete the ending balance sheet, which requires that we forecast ending equity. Ending equity is computed by adding the

The **debt/interest** dilemma: Planned **debt is required to forecast interest**, but **interest is required to forecast debt**.

Figure 4.5

The Debt/Interest Planning Problem

INCOME STATEMENTS		BALANCE SHEETS		
	Next Year		Next Year	
			Beginning	Ending
Revenue	\$XX	ASSETS		
COGS	<u>XX</u>	Current	\$ XX	\$ XX
Gross margin	\$XX	Fixed	<u>XX</u>	<u>XX</u>
Expense	<u>XX</u>	Total assets	\$XXX	\$XXX
EBIT	\$XX	LIABILITIES		
Interest	<u>?</u>	Current	\$ XX	\$ XX
EBT	<u>?</u>	Debt	XX	<u>?</u>
Tax	<u>?</u>	Equity	<u>XX</u>	<u>?</u>
EAT	<u>?</u>	Total L&E	\$XXX	\$XXX

EAT (less dividends) is added to beginning equity to arrive at ending equity, which is required to compute ending debt.

Ending debt is averaged with beginning debt and multiplied by the interest rate to calculate interest expense.

year's EAT from the income statement (less any dividends to be paid plus any new stock that will be sold) to beginning equity.

But we don't have a forecast for EAT because we weren't able to complete the income statement without interest expense, which we don't have because we don't have a forecast for ending debt. In other words, the problem is circular. We need debt to calculate interest, but we have to have interest to calculate debt (through EAT and equity).

All this means we can't make a direct forecast of either debt or interest expense. Therefore, we can't complete the financial plan with the direct line-by-line approach we've been using so far. Every financial plan runs into this technical impasse.

An Iterative Numerical Approach

The problem is solved using a numerical technique that begins with a guess at the solution. The guess is usually wrong, but it gives us a starting point from which we can work toward the correct answer.

The procedure works as follows.

1. *Interest*: Guess a value of interest expense.
2. *EAT*: Complete the income statement.
3. *Ending equity*: Calculate ending equity as beginning equity plus EAT (less dividends plus new stock to be sold if either of these exist).

An **iterative, numerical approach** solves the debt/interest problem.

4. *Ending debt*: Calculate ending debt as total L&E (= total assets) less current liabilities less ending equity.
5. *Interest*: Average beginning and ending debt. Calculate interest by multiplying average debt by the interest rate.
6. *Test results*: Compare the calculated interest from step 5 to the original guess in step 1.
 - a. If the two are significantly different, return to step 1, replacing the guess at interest with the value just calculated and repeat steps 2 through 6.
 - b. If the calculated value of interest is close to the guess, stop.

Procedures like this one that find solutions to problems through a repetitive series of calculations are known as *numerical methods* or *iterative techniques*. Each pass through the procedure is an iteration. It rarely takes more than two or three iterations to arrive at an acceptable solution regardless of the initial guess. An example will make the method clear.

Example 4.2

The following partial financial forecast has been done for Hanover Inc. Complete the financial plan, assuming that Hanover pays interest at 10% and has a flat income tax rate of 40% including federal and state taxes. (We'll generally assume a simple, flat tax rate in our examples.) Also assume no dividends are to be paid and no new stock is to be sold.

Financial Plan for Hanover Inc. (\$000)				
INCOME STATEMENT		BALANCE SHEETS		
	Next Year		Next Year	
			<i>Beginning</i>	<i>Ending</i>
Revenue	\$10,000	ASSETS		
Cost/Expense	<u>9,000</u>	Total assets	\$1,000	\$3,000
EBIT	\$ 1,000	LIABILITIES		
Interest	<u>?</u>	Current liabilities	\$ 300	\$ 700
EBT	<u>?</u>	Debt	100	?
Tax	<u>?</u>	Equity	<u>600</u>	<u>?</u>
EAT	<u>?</u>	Total L&E	\$1,000	\$3,000

SOLUTION: First notice that we're assuming a rather large growth rate in this illustration. Hanover's assets are forecast to triple in one year. That's possible, but unusual. In this case, it will cause the company's debt to increase rather dramatically in the coming year.

We'll complete the forecast using the procedure outlined above, considering each step in turn.

1. *Guess at interest*: In most practical situations, the interest paid last year makes a good starting guess for next year's interest. Since we don't have that here, we'll make an arbitrary guess of \$200,000.

The forecast is completed in the next three steps. We'll display the result now, and then show the detail of steps 2 through 4. The bottom of the income statement and the liabilities and equity portion of the balance sheet based on our interest guess are as follows.

		First Iteration (\$000)		
EBIT	\$1,000	LIABILITIES & EQUITY		
Interest	<u>200</u>	Current liabilities	\$ 300	\$ 700
EBT	\$ 800	Debt	100	1,220
Tax	<u>320</u>	Equity	<u>600</u>	<u>1,080</u>
EAT	\$ 480	Total L&E	\$1,000	\$3,000

The following steps get us to this result.

2. *Compute EAT:* Assuming interest expense of \$200,000, EAT is \$480,000 calculated as follows.

EBIT	\$ 1,000,000
Interest	<u>200,000</u>
EBT	\$ 800,000
Tax (@ 40%)	<u>320,000</u>
EAT	\$ 480,000

3. *Ending equity:* Ending equity is beginning equity plus EAT.

Beginning equity	\$ 600,000
EAT	<u>480,000</u>
Ending equity	\$ 1,080,000

4. *Ending debt:* Ending debt is total L&E less ending equity less ending current liabilities.

Total L&E	\$ 3,000,000
Ending equity	(1,080,000)
Current liabilities	<u>(700,000)</u>
Ending debt	\$ 1,220,000

At this point we have a set of financial statements based on our guess at interest expense. Next we test to see whether the calculated debt and the implied interest are consistent with that guess.

5. *Interest:* The interest implied by our calculated debt is the product of average debt and the interest rate.

$$\text{average debt} \times \text{interest rate} = \frac{\$100,000 + \$1,220,000}{2} \times .10 = \$66,000$$

6. *Test results:* Our next step is to test the calculated interest from step 5 against the original guess. As is usually the case, the two aren't very close. The original guess of \$200,000 is much higher than the calculated interest of \$66,000.

We begin the next iteration of the procedure by using the calculated interest figure (\$66,000) in place of the guess. Verify that steps 2 through 4 result in the following figures (rounded to the nearest thousand dollars).

		Second Iteration (\$000)		
EBIT	\$1,000	LIABILITIES & EQUITY		
Interest	<u>66</u>	Current liabilities	\$ 300	\$ 700
EBT	\$ 934	Debt	100	1,140
Tax	<u>374</u>	Equity	<u>600</u>	<u>1,160</u>
EAT	\$ 560	Total L&E	\$1,000	\$3,000

Given these results, average debt is

$$\frac{\$100,000 + \$1,140,000}{2} = \$620,000$$

and interest is

$$\$620,000 \times .10 = \$62,000$$

Thus, the second guess and the calculated result are off by only \$4,000 out of \$62,000.

As an exercise, demonstrate that one more iteration gives a result that's accurate to within a thousand dollars with interest of \$62,000 and ending debt of \$1,143,000.

PLANS WITH SIMPLE ASSUMPTIONS

Financial plans can be constructed roughly or with great precision. The difference lies in the amount of thought and detail put into the assumptions on which the plans are based. A rough plan is based on just a few assumptions about the future, while a detailed plan can involve a great many. In this section we'll look into creating a financial plan for an existing business in simple, rough terms.

The Quick Estimate Based on Sales Growth

The *percentage of sales method* is a simple, approximate approach to forecasting financial statements for an existing business. The method involves estimating the company's sales growth rate, and assuming that all income statement and balance sheet line items grow at the same rate. The technique implicitly assumes that the firm's efficiency and all of its operating *ratios* (Chapter 3) stay the same through the growth period.

The assumption that everything varies proportionately with (grows at the same rate as) sales is an oversimplification that's of theoretical interest, but isn't usually applicable in practice. Most of the time, the method is modified to assume that most, but not all, things vary directly with sales. We'll call such an approach the modified percentage of sales method. Here's an example.

Percentage of sales methods assume most financial statement line items **vary directly** with revenue.

from the **CFO**

Example 4.3

The Underhill Manufacturing Company expects next year's revenues to increase by 15% over this year's. The firm has some excess factory capacity, so no new fixed assets beyond normal replacements will be needed to support the growth. This year's income statement and ending balance sheet are estimated as follows.

Underhill Manufacturing Company This Year (\$000)

INCOME STATEMENT		BALANCE SHEET	
Revenue	\$ 13,580	ASSETS	
COGS	7,470	Cash	\$ 348
Gross margin	\$ 6,110	Accounts receivable	1,698
Expense*	3,395	Inventory	1,494
EBIT	\$ 2,715	Current assets	\$3,540
Interest	150	Net fixed assets	2,460
EBT	\$ 2,565	Total assets	\$6,000
Tax	1,077	LIABILITIES & EQUITY	
EAT	\$ 1,488	Accounts payable	\$ 125
*Includes marketing, engineering, and administration.		Accruals	45
		Current liabilities	\$ 170
		Debt	1,330
		Equity	4,500
		Total L&E	\$6,000

Assume the firm pays state and federal income taxes at a combined flat rate of 42%, borrows at 12% interest, and expects to pay no dividends.

Project next year’s income statement and balance sheet using the modified percentage of sales method.

SOLUTION: In this problem we’ll grow everything except net fixed assets by 15%. That means we’ll multiply the following items by 1.15: revenue, COGS, expense, all current assets, and all current liabilities. Then we’ll hold net fixed assets constant because of the assumption that the firm has excess capacity, and will just replace equipment that wears out. The result is reflected in the following incomplete statements.

Incomplete Statements for Next Year (\$000)

INCOME STATEMENT		BALANCE SHEET	
Revenue	\$15,617	ASSETS	
COGS	8,591	Cash	\$ 400
Gross margin	\$ 7,026	Accounts receivable	1,953
Expense*	3,904	Inventory	1,718
EBIT	\$ 3,122	Current assets	\$4,071
Interest	—	Net fixed assets	2,460
EBT	\$ —	Total assets	\$6,531
Tax	—	LIABILITIES & EQUITY	
EAT	\$ —	Accounts payable	\$ 144
*Includes marketing, engineering, and administration		Accruals	52
196		Current liabilities	\$ —
		Debt	—
		Equity	—
		Total L&E	\$6,531

At this point we’re at the debt/interest impasse. To complete the projection, we have to guess at interest and work through the procedure illustrated in the last section. This time, however, we have last year’s interest of \$150,000 to use as a starting guess. That and Underhill’s other projected figures result in the following first iteration.

Debt/Interest Calculation – First Iteration (\$000)

INCOME STATEMENT		BALANCE SHEET		
	Next Year		This Year	Next Year
EBIT	\$3,122	ASSETS		
Interest	150	Total assets	\$6,000	\$6,531
EBT	\$2,972	LIABILITIES & EQUITY		
Tax	1,248	Current liabilities	\$ 170	\$ 196
EAT	\$1,724	Debt	1,330	111
		Equity	4,500	6,224
		Total L&E	\$6,000	\$6,531

Taking the average debt at 12% yields a calculated interest of approximately \$86,000, which is considerably less than the \$150,000 assumed. Two more iterations yield the following complete financial projection.

Underhill Manufacturing Company Next Year (\$000)			
INCOME STATEMENT		BALANCE SHEET	
Revenue	\$15,617	ASSETS	
COGS	<u>8,591</u>	Cash	\$ 400
Gross margin	\$ 7,026	Accounts receivable	1,953
Expense*	<u>3,904</u>	Inventory	<u>1,718</u>
EBIT	\$ 3,122	Current assets	\$4,071
Interest	<u>84</u>	Net fixed assets	<u>2,460</u>
EBT	\$ 3,038	Total assets	\$6,531
Tax	<u>1,276</u>	LIABILITIES & EQUITY	
EAT	\$ 1,762	Accounts payable	\$ 144
*Includes marketing, engineering, and administration.		Accruals	<u>52</u>
		Current liabilities	\$ 196
		Debt	73
		Equity	<u>6,262</u>
		Total L&E	\$6,531

FORECASTING CASH NEEDS

Recall that a key reason for doing financial projections is to forecast the firm's external financing needs. We can observe that need quickly in the preceding example by comparing Underhill's beginning and ending debt balances for the forecast year. If the balance increases, the plan implies the firm will need more cash than it is generating through operations, and will have to borrow more. A decrease in debt implies that cash will be generated beyond the firm's immediate needs, so debt can be paid down.¹⁰ In this example, Underhill is planning to generate \$1,257,000 in cash, enough to pay down its debt from \$1,330,000 to \$73,000.

When a plan shows increasing debt, the implication is that additional external financing will be needed during the forecast year. Of course, the funds could be acquired by selling additional stock (equity) rather than borrowing. That would be reflected as an increase in the ending equity account beyond the addition of EAT to retained earnings, which in turn would reduce the amount of ending debt required to balance the balance sheet.

THE PERCENTAGE OF SALES METHOD—A FORMULA APPROACH

In Example 4.3 we used a modified percentage of sales method to create a financial projection based on an assumed growth in revenue and a separate assumption about fixed assets. If we're willing to assume that net fixed assets also grows proportionately with revenue, the percentage of sales method can be condensed into a single formula for the purpose of estimating external funding requirements. We'll call the formula the *EFR* relationship for *external funding requirement*.

The idea behind the EFR relationship is very simple: A growing firm must have enough money on hand to purchase the new assets it needs to support its growth.

¹⁰ A negative figure for ending debt is possible and implies that cash will be generated beyond the firm's beginning debt level. The negative debt would generally be shown as increasing the cash account.

However, that funding requirement is reduced by two automatic sources, (1) the amount by which current liabilities grow¹¹ and (2) the amount the firm earns during the year but doesn't pay out in dividends.¹² In other words, for the year being planned (next year):

$$(4.1) \quad \begin{array}{r} \text{growth in assets} \\ - \text{growth in current liabilities} \\ - \text{earnings retained} \\ \hline = \text{external funding requirement} \end{array}$$

Expression 4.1 is true for any financial projection, but can be written in simple terms when sales, earnings, assets, and current liabilities are all assumed to grow at the same rate, which we'll call g .

We generally define g in terms of sales growth. That is,

$$g = \frac{\text{increase in sales}}{\text{sales}_{\text{this year}}}$$

For example, if this year's sales are \$100,000 and next year's are projected to be \$115,000, $g = .15$ or 15%.

In terms of expression 4.1, the assumption that assets and current liabilities grow at rate g means

$$(4.2) \quad \text{growth in assets} = g \times \text{assets}_{\text{this year}}$$

and

$$(4.3) \quad \text{growth in current liabilities} = g \times \text{current liabilities}_{\text{this year}}$$

(The following derivation of the EFR can be skipped without loss of continuity. Just resume reading at equation 4.6 or page 134.)

To develop an expression for current earnings retained in terms of profits and dividends, begin by recalling the expression for return on sales (ROS) (Chapter 3, page 89).

$$\text{ROS} = \frac{\text{EAT}}{\text{sales}}$$

Solve for EAT in terms of ROS and sales.

$$\text{EAT} = \text{ROS} \times \text{sales}$$

Notice that since we're assuming both EAT and sales grow at the same rate, ROS will remain constant from year to year. Then next year's EAT can be written as the constant ROS times next year's sales, which are just $(1 + g)$ times this year's sales. So

$$(4.4) \quad \text{EAT}_{\text{next year}} = \text{ROS} \times (1 + g)\text{sales}_{\text{this year}}$$

Next write the *dividend payout ratio*, which is defined as the ratio of dividends paid to EAT.

$$d = \frac{\text{dividends}}{\text{EAT}}$$

11. Current liabilities are said to provide spontaneous financing, because they reflect the acquisition of assets that don't have to be paid for immediately. We will examine this idea in more detail in Chapter 16.

12. In the *unmodified* percentage of sales method, we shortcut the iterative debt/interest procedure by assuming EAT grows at the same rate as sales. This is equivalent to assuming that the return on sales ratio (ROS) stays constant.

The **EFR** relationship provides an **estimate of funding** needs assuming all financial items **vary directly** with sales.

From that definition, earnings (EAT) are split between those paid out as dividends, $d(\text{EAT})$, and those retained, $(1 - d)\text{EAT}$.¹³

Then for next year,

$$\text{earnings retained} = (1 - d)\text{EAT}_{\text{next year}}$$

Substituting for $\text{EAT}_{\text{this year}}$ from expression 4.4 yields

$$(4.5) \quad \text{earnings retained} = (1 - d)\text{ROS} \times (1 + g)\text{sales}_{\text{this year}}$$

Now, to get the EFR relation, rewrite expression 4.1 as an equation, substituting from 4.2, 4.3, and 4.5.

$$(4.6) \quad \begin{aligned} \text{EFR} &= g(\text{assets}_{\text{this year}}) \\ &- g(\text{current liabilities}_{\text{this year}}) \\ &- [(1 - d)\text{ROS}][(1 + g)\text{sales}_{\text{this year}}] \end{aligned}$$

Although equation 4.6 looks messy, it's easy to use because everything on the right side comes from this year's financial statements and the growth rate assumption.

Example 4.4

Reforecast the external financing requirements of the Underhill Manufacturing Company of Example 4.3, assuming net fixed assets and EAT grow at the same 15% rate as sales. However, also assume the firm plans to pay a dividend equal to 25% of earnings next year.

SOLUTION: First note Underhill's sales, assets, and current liabilities for this year (page 130) as well as its payout ratio. Then calculate its return on sales. (Omit \$000 as before.)

$$\text{sales}_{\text{this year}} = \$13,580$$

$$\text{assets}_{\text{this year}} = \$6,000$$

$$\text{current liabilities}_{\text{this year}} = \$170$$

$$d = 25.0\%$$

$$\text{ROS} = \frac{\text{EAT}}{\text{sales}} = \frac{\$1,488}{\$13,580} = 11.0\%$$

Next write equation 4.6 and substitute.

$$\begin{aligned} \text{EFR} &= g(\text{assets}_{\text{this year}}) \\ &- g(\text{current liabilities}_{\text{this year}}) \\ &- [(1 - d)\text{ROS}][(1 + g)\text{sales}_{\text{this year}}] \\ \text{EFR} &= .15(\$6,000) - .15(\$170) \\ &- [(1 - .25)(.11)][(1.15)(\$13,580)] \\ \text{EFR} &= -\$413.9 \end{aligned}$$

This result says that Underhill will generate enough funds during the projected year to reduce its debt by about \$414,000.

13. The expression $(1 - d)$ is called the *retention ratio*.

It's important to keep in mind that the EFR approach and the related unmodified percentage of sales method are of limited value because of the general impracticality of the assumption that everything varies directly with sales. To see that, notice that the \$414,000 net cash flow in Example 4.4 is substantially lower than the forecast in Example 4.3 of \$1,257 (see Forecasting Cash Needs on page 132 immediately following the example). About half of the \$843,000 difference comes from the fact that we assumed a dividend in Example 4.4 that wasn't in Example 4.3. The other half, however, comes from the fact that the percentage of sales method forces an assumption of a 15% growth in Net Fixed Assets, which in this case is probably unrealistic.

A firm can grow at its **sustainable growth rate** without selling new stock if its financial ratios remain constant.

THE SUSTAINABLE GROWTH RATE

A firm's **sustainable growth rate** is a theoretical measure of its strength. It is the rate at which the firm can grow if none of its financial ratios change and if it doesn't raise any new equity by selling stock. These conditions are equivalent to the assumptions of the unmodified percentage of sales method.

Sustainable growth is simply the growth in equity created by profits. We can develop an expression for the rate by noticing that business operations create new equity equal to the amount of current earnings retained. That can be written as

$$(1 - d)\text{EAT}$$

where d is the dividend payout ratio, the fraction of earnings paid to stockholders as dividends.

This implies a sustainable growth rate in equity, g_s , equal to the amount of new equity created divided by equity itself.

$$(4.7a) \quad g_s = \frac{\text{EAT}(1 - d)}{\text{equity}}$$

from which

$$(4.7b) \quad g_s = \text{ROE}(1 - d)$$

because $\text{ROE} = \text{EAT}/\text{equity}$.

Notice that although the idea of sustainable growth implies that no new equity is raised through the sale of stock, it does require new borrowing to keep the debt/equity ratio constant as equity grows through retaining earnings.

The value of the sustainable growth concept is largely theoretical. It gives an indication of the determinants of a firm's inherent growth capability. Recall from our study of Du Pont equations (Chapter 3, pages 9296) that ROE can be written as

$$\text{ROE} = \text{ROS} \times \text{total asset turnover} \times \text{equity multiplier}$$

Substituting this expression for ROE into 4.7b, we have

$$g_s = (1 - d)[\text{ROS} \times \text{total asset turnover} \times \text{equity multiplier}]$$

which can be written more explicitly as

$$(4.8) \quad g_s = (1 - d) \times \frac{\text{EAT}}{\text{sales}} \times \frac{\text{sales}}{\text{assets}} \times \frac{\text{assets}}{\text{equity}}$$

Equation 4.8 says a firm's ability to grow depends on four fundamentals:

1. Its ability to earn profits on sales as measured by its ROS (EAT/sales)
2. Its talent at using assets to generate sales as measured by its total asset turnover (sales/assets)
3. Its use of leverage (borrowed money) as measured by the equity multiplier (assets/equity)
4. The percentage of earnings it retains as measured by $(1 - d)$, the *earnings retention ratio*

These ideas can be used to analyze why a particular firm's growth has been good or bad in relation to that of other firms.

For example, after having lower than average growth, Slowly Inc. might compare its sustainable growth rate with an industry average as follows.

	g_s	=	$(1 - d)$	×	ROS	×	total asset turnover	×	equity multiplier
Industry	13.5%		.75		6%		1.2		2.5
Slowly Inc.	4.8		.40		8		1.0		1.5

Notice that Slowly's sustainable growth rate is much lower than the average. The question is why. The comparison immediately shows that profitability is not the problem, as Slowly's ROS is better than average. It's also apparent that total asset turnover is a bit low, but not enough to make much difference.

Slowly's growth problem seems to be associated with its modest use of leverage. The firm's equity multiplier is substantially lower than average, meaning it is financed with proportionately less debt and more equity than other firms. Its *earnings retention ratio*, $(1 - d)$, is also lower than average.

These things may explain why the firm isn't growing rapidly. It's paying most of its earnings out in dividends rather than reinvesting them in growth opportunities. At the same time, it's constrained not to raise much money by borrowing. This is a low-risk strategy but it doesn't lead to rapid growth.

PLANS WITH MORE COMPLICATED ASSUMPTIONS

The percentage of sales methods (modified and unmodified) are appropriate for quick estimates, but aren't generally used in formal plans because they gloss over too much detail.

It's usually possible to make intelligent estimates of a large number of individual items within a financial plan. Putting those separate pieces of intelligence into the projections clearly makes sense. That's done by incorporating a series of detailed assumptions into the process. Each assumption is worked into the plan in a manner that depends on the way the related item is managed and on its accounting treatment. As an illustration, let's take a closer look at the treatment of fixed assets for the Underhill Manufacturing Company of Example 4.3.

In that example we made the assumption that the firm had excess factory capacity, which implied that a certain amount of growth could be accommodated in the plant without adding new assets. Hence, net fixed assets could be expected to remain roughly constant. That assumption is reasonable but somewhat simplistic. It would rarely be used in a serious operating plan.

Real plans generally incorporate **complex assumptions** about important financial items.

Acquiring fixed assets calls for the commitment of large amounts of money, and tends to be analyzed very carefully. That means a great deal of information about fixed assets is usually available.

In fact, the business planning process generally includes a *capital plan*, a list of the assets and projects on which the firm intends to spend money during the coming period.

In the next example, we'll assume a capital plan has been done for Underhill, and show how some of the information it contains can be worked into the financial plan.

Example 4.5

Assume the following for the Underhill Manufacturing Company of Example 4.3.

1. The ending balance sheet for the current year contains the following fixed asset accounts.

Gross	\$5,600,000
Accumulated depreciation	<u>(3,140,000)</u>
Net	\$2,460,000

2. Next year's depreciation on the assets owned at the end of this year is \$450,000, and there are no plans to dispose of old assets.
3. The capital plan indicates that assets will be acquired next year at an estimated total cost of \$1.2 million.
4. The average depreciation life of the new equipment will be five years. Straight line depreciation will be used. Assume one-half year of depreciation will be taken on new assets in the first year to reflect less than a full year's use.

Notice that items 1 and 2 are not planning assumptions. They're financial facts available from the company's accounting records. Items 3 and 4 are planning assumptions summarizing the information contained in Underhill's capital plan.

Forecast Underhill's fixed asset accounts for next year.

SOLUTION: Gross fixed assets will grow by the amount of new capital expenditures.

Beginning gross fixed assets	\$5,600,000
Planned additions	<u>1,200,000</u>
Ending gross fixed assets	\$6,800,000

Depreciation during the year will come from two sources, the old assets already on board at the beginning of the year and the new additions. We've already established that the old depreciation will be \$450,000. New depreciation based on the five-year/straight line assumption factored down by one half for a partial year of service is

$$\text{depreciation on new assets} = \frac{\$1,200,000}{5} \times \frac{1}{2} = \$120,000$$

Then total depreciation next year is as follows.

Old assets	\$450,000
New assets	120,000
Total	\$570,000

Fixed assets are forecast by projecting the **gross** account using the **capital plan** and handling **depreciation** separately.

With this information, the balance sheet fixed asset accounts at year end are forecast as follows. (Review the accounting for fixed assets, Chapter 2, pages 33–36 if necessary.)

	Actual Beginning	Planned Additions	Planned Ending
Gross	\$5,600,000	\$1,200,000	\$6,800,000
Accumulated depreciation	(3,140,000)	(570,000)	(3,710,000)
Net	<u>\$2,460,000</u>	<u>\$ 630,000</u>	<u>\$3,090,000</u>

It's important to notice that this approach produces the following fixed-asset-related items for the projected financial statements.

1. The year-end balance sheet account detail
2. An estimate of the use of cash for capital spending for the cash flow statement
3. An estimate of total depreciation for the income statement and the cash flow statement

The approach in Example 4.3, on the other hand, gave us no information beyond the net fixed asset figure, which was not very accurate.

Two Kinds of Planning Assumption—Direct and Indirect—Management by Ratios

Indirect planning assumptions are made about financial **ratios**, which in turn lead to line-item values.

A financial planning assumption can be made directly about the financial item to which it's related or indirectly about a derivative of the item, usually a ratio. In Example 4.5 we made direct assumptions about capital expenditures to forecast items related to fixed assets.

An indirect planning assumption is usually based on the use of financial ratios. Instead of forecasting a particular item, we forecast a related ratio. Accounts receivable is a good example. Managers generally think of receivables in terms of the average time it takes to collect cash from customers rather than in terms of the magnitude of the receivables account on the balance sheet. In other words, receivables are managed through the average collection period (ACP) ratio. (See Chapter 3, page 35.) This means that financial planning assumptions about receivables tend to be made in terms of the ACP. Projected statements are then put together using receivables balances calculated from those assumptions.

Example 4.6

The Mylar Corporation currently has receivables of \$1.2 million on revenues of \$7.2 million for an ACP of 60 days calculated as follows.

$$\begin{aligned} \text{ACP} &= \frac{\text{A/R}}{\text{average daily sales}} \\ &= \frac{\text{A/R}}{\text{sales}} \times 360 = \frac{\$1.2 \text{ million}}{\$7.2 \text{ million}} \times 360 = 60 \text{ days} \end{aligned}$$

A review of individual accounts has revealed that there are no very old or plainly uncollectible accounts in the receivables balance.

Accounts receivable are generally forecast by making an assumption about the **ACP** and calculating the implied balance.

Management feels that a 60-day ACP represents unacceptably slow payment by customers, and plans to tighten credit and collection policy enough to reduce it to 40 days in the coming year. Next year's revenue projection reflects a growth of approximately 10% to \$7.9 million after consideration of the credit and collections policy change.

What balance sheet figure for receivables should be included in the financial plan to reflect this assumption about ACP?

SOLUTION: The indirect planning assumption is that the ACP will be 40 days next year. To put together a financial plan consistent with that assumption, we calculate the year-end receivables balance that results in a 40-day ACP. Begin by rewriting the ACP formula.

$$\text{ACP} = \frac{\text{A/R}}{\text{sales}} \times 360$$

Then substitute next year's figures, treating A/R as an unknown.

$$40 \text{ days} = \frac{\text{A/R}}{\$7,900,000} \times 360$$

Solve this expression for the A/R balance implied by the ACP assumption.

$$\text{A/R} = \$877,777^{14}$$

A COMPREHENSIVE EXAMPLE—A COMPLEX PLAN FOR AN EXISTING BUSINESS

In this section we'll take an ongoing business and make a projection for next year based on a fairly broad set of assumptions. Notice that most of the assumptions are based on changes from last year.

Example 4.7

The Macadam Company is developing its annual plan for next year. The company expects to finish this year with the following financial results.

14. In practice, the calculation would usually be somewhat more complicated. Most people calculate ACPs on the basis of an average A/R balance over the year using the following formula.

$$\text{ACP} = \frac{(\text{beginning A/R} + \text{ending A/R})/2}{\text{sales}} \times 360$$

Next year's beginning A/R balance is this year's ending balance, \$1.2 million in this case. Substituting yields

$$40 \text{ days} = \frac{(\$1,200,000 + \text{ending A/R})/2}{\$7,900,000} \times 360$$

from which

$$\text{ending A/R} = \$555,556$$

Notice that this figure is unrealistically low because of the inclusion of the high ending balance from last year. If the ACP calculation is based on average A/R balances, the target ACP should be raised in a transitional year to reflect that fact. In this case, a 50-day target over the entire year would be appropriate to get the firm operating at a 40-day level by year end.

Macadam Company Income Statement This Year (\$000)

	\$	%
Revenue	\$14,200	100.0
COGS	<u>7,810</u>	<u>55.0</u>
Gross margin	\$ 6,390	45.0
Expenses		
Marketing	\$ 2,556	18.0
Engineering	1,065	7.5
Finance & administrative	<u>1,349</u>	<u>9.5</u>
Total expenses	\$ 4,970	35.0
EBIT	\$ 1,420	10.0
Interest	<u>568</u>	<u>4.0</u>
EBT	\$ 852	6.0
Income tax	<u>341</u>	<u>2.4</u>
EAT	\$ 511	3.6

Macadam Company Balance Sheet This Year (\$000)

ASSETS		LIABILITIES & EQUITY	
Cash	\$ 1,560	Accounts payable	\$ 716
Accounts receivable	3,550	Accruals	<u>230</u>
Inventory	<u>2,603</u>	Current liabilities	\$ 946
Current assets	\$ 7,713	Long-term debt	\$ 4,000
Fixed assets		Equity	
Gross	\$12,560	Stock accounts	\$ 6,000
Accumulated depreciation	<u>(3,620)</u>	Retained earnings	<u>5,707</u>
Net	\$ 8,940	Total equity	\$11,707
Total assets	\$16,653	Total L&E	\$16,653

(The income statement is presented with a common size statement, because certain planning assumptions are commonly based on projected percentages of revenue. See Chapter 3, page 82.)

The current values of Macadam's ACP and inventory turnover ratio can be calculated from the statements.

The ACP is

$$\text{ACP} = \frac{\text{A/R}}{\text{sales}} \times 360 = \frac{\$3,550}{\$14,200} \times 360 = 90 \text{ days}$$

and the inventory turnover based on COGS is

$$\text{inventory turnover} = \frac{\text{COGS}}{\text{inventory}} = \frac{\$7,810}{\$2,603} = 3.0$$

The following facts (not assumptions) are also available about the firm's operations.

FACTS

- Virtually all payables are due to inventory purchases, and the COGS is approximately 60% purchased material.

- Assets currently on the firm's books will generate depreciation of \$510,000 next year.
- The only balance sheet accrual represents unpaid wages. Preliminary estimates indicate that next year's payroll will be about \$6.1 million. Next year's closing balance sheet date will be nine working days after a payday.
- The combined state and federal income tax rate is 40%. (Assume a flat rate.)
- Interest on current and future borrowing will be at a rate of 10%.

The management team has met and agreed upon the following assumptions under which the plan will be developed.

PLANNING ASSUMPTIONS

Income, Cost, and Expense

1. During the coming year, the firm will mount a major program to expand sales. The expected result is a 20% growth in revenue. Pricing and product mix will remain unchanged.
2. The revenue growth will be accomplished by increasing efforts in the marketing/sales department. The increased expenses generated will be accommodated by planning marketing department expenses at 19% of the expanded revenue rather than the current 18%.
3. A major cost-reduction effort is under way in the manufacturing department, which is expected to reduce the *cost ratio* (COGS/revenue) to 53% from its current level of 55%.
4. The engineering department will be unaffected by the expansion in sales. Its dollar expenses will increase by normal inflation at a 4% rate over last year's level.
5. Finance and administrative expenses will need to expand to support the higher volume, but because of scale economies the expansion will be at a lower rate than the growth in sales. A target growth of 10% is planned for those expenses.

Assets and Liabilities

6. A new cash management system¹⁵ will reduce the cash balance by 20%.
7. The current 90-day collection period (ACP) is considered unacceptable. Increased attention to credit and collections in both finance and sales is expected to bring the ACP down to 65 days.
8. Top management feels that the firm is operating with more inventory than it needs. Manufacturing management has been challenged to increase the inventory turnover ratio based on COGS to 5.0 from its present level of 3.0.
9. The capital plan has been put together in preliminary form, and indicates capital spending of \$5 million. The average depreciation life of the assets to be acquired is 10 years. Straight line depreciation will be used, and a convention of taking one-half year's depreciation in the first year will be followed.
10. Vendors are complaining because the firm pays its bills in 55 days even though most terms call for payment within 30 days. Fearing that inventory and supplies will be cut off, management has decided to shorten the payment cycle to 45 days.
11. No dividends will be paid next year, and no new stock will be sold.

15. We'll discuss cash management systems in Chapter 16.

Construct a financial plan for next year for Macadam based on last year's statements and these assumptions. To keep the computation simple, we'll assume all balance sheet ratios are calculated using ending balances (not averages).

SOLUTION: We'll begin Macadam's plan by projecting each operating line of the income statement and balance sheet. Then we'll complete those statements by iterating for debt and interest. Finally, we'll construct a projected statement of cash flows from the completed income statement and balance sheet.

Notice as we go along that each line item is handled differently. Some are very simple, while others take some calculation. We'll omit the \$000 and round all results to the nearest thousand dollars for convenience.

Revenue: Our revenue forecast is based on the direct assumption of a 20% growth rate on last year's figure.

$$\text{revenue} = \$14,200 \times 1.20 = \mathbf{\$17,040}$$

Cost of goods sold (COGS): The forecast of COGS is based on an assumed improvement in manufacturing efficiency, which is reflected in an improvement (lowering) in the *cost ratio* from last year's 55% to 53% next year. The cost ratio is the ratio of COGS to revenue and appears on the COGS line of the common size income statement. Because we know next year's cost ratio as well as its revenue, we can multiply to project COGS.

$$\text{COGS} = \$17,040 \times .53 = \mathbf{\$9,031}$$

Marketing expense: Departmental expenses are frequently managed to a first level of approximation in common size terms. This implies comparing those expenses as percentages of revenue to industry averages to keep them in reasonable ranges. In this case, Macadam's top management is permitting spending in marketing to increase from 18% to 19% of sales to allow for an expanded effort in sales. The figure is easily forecast as 19% of next year's sales.

$$\text{marketing expense} = \$17,040 \times .19 = \mathbf{\$3,238}$$

Notice that this represents a very substantial growth (27%) over last year's spending in dollar terms.

Engineering expense: Engineering is a long-term development function that isn't directly related to the current year's sales. Hence, there's no reason to assume it has to grow a great deal to support the marketing expansion. The assumption of a 4% growth in spending over last year just keeps up with normal inflation.

$$\text{engineering expense} = \$1,065 \times 1.04 = \mathbf{\$1,108}$$

Finance and administrative expense: Finance and administrative expenses pay for things like accounting, treasury, personnel, and executive management. These functions grow with revenue, but economies of scale tend to make them more efficient as size increases, implying that they should grow less rapidly than sales. In this case management has assumed a growth of 10%, half the rate assumed for sales.

$$\text{finance and administrative expense} = \$1,349 \times 1.10 = \mathbf{\$1,484}$$

The next line on the income statement is interest, which we can't address until we've completed the balance sheet down to debt. Therefore, we'll move on to current assets at this point.

Cash: A new system is forecast to improve Macadam's cash management, resulting in a 20% decrease in the balance from its current level. This assumption is quite aggressive in the face of an increase in business.

$$\text{cash} = \$1,560 \times (1 - .20) = \mathbf{\$1,248}$$

Most managements forecast **accounts receivable** indirectly through the **average collection period** (ACP).

Accounts receivable: Macadam manages its receivables indirectly by addressing the ACP, which it has forecast at 65 days for next year.

$$ACP = \frac{A/R}{\text{sales}} \times 360$$

from which

$$65 = \frac{A/R}{\$17,040} \times 360$$

and

$$A/R = \mathbf{\$3,077}$$

Notice that this forecast represents a decrease in A/R in spite of the planned increase in revenue, which would normally be expected to raise receivables. That's because the improvement in collections is forecast to have a bigger effect than the growth in revenue. This too is a very aggressive assumption.

Inventory: Management has assumed an improvement in inventory utilization, which is reflected by an increase in the inventory turnover ratio to 5.0 from its current level of 3.0. This (indirectly) implies an inventory level through the equation defining the turnover ratio.

Inventory is generally forecast **indirectly** through the **inventory turnover** ratio.

$$\text{inventory turnover} = \frac{\text{COGS}}{\text{inventory}}$$

from which

$$5.0 = \frac{\$9,031}{\text{inventory}}$$

and

$$\text{inventory} = \mathbf{\$1,806}$$

Here again it's important to notice the aggressiveness of management's planning assumption. A 20% volume increase would normally lead to larger inventories, but this forecast is for a substantial decline due to the projected efficiency improvement.

Fixed assets: The fixed asset forecast is handled exactly as illustrated in Example 4.5. Additions and depreciation are as follows.

Gross fixed asset additions	\$5,000
Depreciation	
New equipment = $[\$5,000/10] \times 1/2 =$	250
Old equipment	<u>510</u>
	\$ 760

From these and the beginning balances in the fixed asset accounts, the ending balances are forecast as follows.

	Beginning	Additions	Ending
Gross	\$12,560	\$5,000	\$ 17,560
Accumulated depreciation	<u>(3,620)</u>	<u>(760)</u>	<u>(4,380)</u>
Net	\$ 8,940	\$4,240	\$13,180

Accounts payable: Macadam is currently slow-paying vendors in 55 days, probably to conserve cash. The practice is an abuse of most credit terms, which demand payment in 30 days, and the firm is getting a bad reputation among its suppliers. That can lead to production problems if suppliers hold up delivery. Management has decided to adjust its policy by paying in 45 days. This is still a violation of most 30-day terms, but it's less flagrant and more likely to be tolerated by vendors over the long run. Our problem is to calculate the payables balance implied by the policy.

Payables are generated almost entirely by inventory purchases, which are 60% of product cost. Hence, the total amount passing through the payables account in a year is 60% of COGS. If bills are paid in 45 days, the unpaid amount at any time is $45/360$ of that annual total. This thinking leads to the following calculation.

$$\begin{aligned}\text{accounts payable} &= \text{purchases} \times \frac{45}{360} = .60 \times \text{COGS} \times \frac{45}{360} \\ &= .60 \times \$9,031 \times \frac{45}{360} = \mathbf{\$677}\end{aligned}$$

(As an exercise, demonstrate that this year's payables balance represents a 55-day payment policy.)

Accruals: Macadam's only accrual reflects unpaid wages. Recall that the amount of such an accrual represents wages earned between the year's last payday and its closing date. (See Chapter 2, pages 36–37.) The amount can be estimated by examining a calendar to determine the ending date of the year being planned and the date of the immediately preceding payday. The period between the two dates represents the time for which wages have to be accrued. In this case there are nine working days between the two dates, which represent $1.8 (= 9/5)$ normal five-day workweeks. Hence, the accrual must be for $1.8/52$ of the total amount paid to employees in a year. Next year's annual payroll is estimated at \$6,100, so the amount that will be accrued is

$$\text{accruals} = \$6,100 \times \frac{1.8}{52} = \mathbf{\$2,11}^{16}$$

This completes the forecast of the operating items in Macadam's income statement and balance sheet. To complete those statements we have to go through the iterative procedure illustrated previously to determine debt and interest. That's readily accomplished by starting with this year's interest as a guess for next year. Three iterations result in the statements below. The figures that come from the iterative procedure are shown in italics.

Notice the side-by-side (comparative) format in which the statements are presented. This year and next year are shown together for both statements, and a common size presentation is included for the income statement. This format is highly recommended for planning work because it makes it easy to work with the year-to-year changes that are the essence of most planning exercises.

16. In practice, accrual calculations tend to be more complex than this. Firms often have different payrolls for different types of employees, and everyone isn't always fully paid off as of payday. In addition, a number of things besides wages are generally accrued.

Macadam Company Projected Income Statement (\$'000)

	This Year		Next Year	
	\$	%	\$	%
Revenue	\$ 14,200	100.0	\$ 17,040	100.0
COGS	<u>7,810</u>	<u>55.0</u>	<u>9,031</u>	<u>53.0</u>
Gross margin	\$ 6,390	45.0	\$ 8,009	47.0
Expenses				
Marketing	\$ 2,556	18.0	\$ 3,238	19.0
Engineering	1,065	7.5	1,108	6.5
Finance & administrative	<u>1,349</u>	<u>9.5</u>	<u>1,484</u>	<u>8.7</u>
Total expenses	\$ 4,970	35.0	\$ 5,830	34.2
EBIT	\$ 1,420	10.0	\$ 2,179	12.8
Interest	<u>568</u>	<u>4.0</u>	<u>485</u>	<u>2.8</u>
EBT	\$ 852	6.0	\$ 1,694	10.0
Income tax	<u>341</u>	<u>2.4</u>	<u>678</u>	<u>4.0</u>
EAT	\$ 511	3.6	\$ 1,016	6.0

Macadam Company Projected Balance Sheet (\$'000)

	This Year		Next Year	
	This Year	Next Year	This Year	Next Year
ASSETS			LIABILITIES & EQUITY	
Cash	\$ 1,560	\$ 1,248	Accounts payable	\$ 716 \$ 677
Accounts receivable	3,550	3,077	Accruals	<u>230</u> <u>211</u>
Inventory	<u>2,603</u>	<u>1,806</u>	Current liabilities	\$ 946 \$ 888
Current assets	\$ 7,713	\$ 6,131	Debt	\$ 4,000 \$ 5,700
Fixed assets			Equity	
Gross	\$12,560	\$ 17,560	Stock	\$ 6,000 \$ 6,000
Accumulated depreciation	<u>(3,620)</u>	<u>(4,380)</u>	Retained earnings	<u>5,707</u> <u>6,723</u>
Net	\$ 8,940	\$ 13,180	Total equity	\$ 11,707 \$ 12,723
Total assets	\$16,653	\$ 19,311	Total L&E	\$ 16,653 \$ 19,311

Macadam's financial plan is completed by constructing a projected statement of cash flows. That is readily done by using the procedures we studied in Chapter 3. No new projecting is required because the cash flow statement comes entirely from the income statement and balance sheet, which have already been forecast. The comparative format we're using makes constructing a cash statement particularly convenient. We begin with a summary of the planned changes in working capital items.

Macadam Company Projected Changes in Working Capital (\$'000)

	Beginning	Ending	Change
Accounts receivable	\$3,550	\$3,077	\$ 473
Inventory	2,603	1,806	797
Accounts payable	716	677	(39)
Accruals	<u>230</u>	<u>211</u>	<u>(19)</u>
Decrease/(increase) in working capital	\$5,207	\$3,995	\$1,212

The projected statement of cash flows follows immediately.

Macadam Company Projected Statement of Cash Flows (\$000)	
OPERATING ACTIVITIES	
EAT	\$ 1,016
Depreciation	760
Decrease in working capital	<u>1,212</u>
Cash from operating activities	\$ 2,988
INVESTING ACTIVITIES	
Increase in gross fixed assets	<u>\$(5,000)</u>
Cash from investing activities	\$(5,000)
FINANCING ACTIVITIES	
Increase in debt	<u>\$ 1,700</u>
Cash from investing activities	\$ 1,700
NET CASH FLOW	\$ (312)
RECONCILIATION	
Beginning cash	\$ 1,560
Net cash flow	<u>(312)</u>
Ending cash	\$ 1,248

PLANNING AT THE DEPARTMENT LEVEL

The financial plan we developed for the Macadam Company in Example 4.7 includes an income statement that shows the total expenses of three major departments: marketing, engineering, and finance/administration.

It's important to understand that in operational plans (annual plans and quarterly budgets) projections of departmental expenses are much more detailed and complex than the single numbers appearing on the income statement. The statement numbers are simply departmental totals. They're *supported* by documentation that details the nature of the expenses and when during the planning period they'll occur.¹⁷

The format for departmental detail is usually a spreadsheet with time periods across the top and expense categories down the side. In an annual plan, the time periods are usually quarterly. The idea is illustrated in Figure 4.6.

The illustration shows expense detail for a single subdepartment within the larger marketing department. Every subdepartment has such a sheet, all of which consolidate into a single detail sheet for marketing as a whole. The total expense figure in the lower right corner of the consolidated sheet must match the marketing expense figure on the plan's income statement.

Manufacturing Departments

Spending detail in expense areas like marketing, engineering, and administration is relatively straightforward and easy to understand. In manufacturing departments, the way in which departmental plans are reflected in the income statement is quite a bit more complex.

Departmental detail supports the expense entries on the planned income statement.

17. In a long-range strategic plan such supporting detail generally doesn't exist.

Figure 4.6

**Supporting Detail
for Annual planning
at the Department
Level**

Department: Sales Training — Annual Plan 20X1					
Item	1Qtr	2Qtr	3Qtr	4Qtr	Total
Headcount	35	36	38	38	
Wages	\$350K	\$360K	\$382K	\$383K	\$1,475K
Overtime	\$ 78K	\$ 86K	\$ 38K	\$ 40K	\$ 242K
Travel	...	...	...	...	...
Depreciation	...	...	...	...	...
Telephone	...	...	...	...	...
Supplies	...	...	...	...	...
Advertising		...	...	...	...
⋮	⋮				⋮
Misc. Expenses	...	...	...	...	...
Total	\$XXX	\$XXX	...	...	\$X,XXX

Spending in manufacturing becomes incorporated in the cost of product through cost accounting procedures. Money spent is absorbed into inventory and then moves onto the income statement as COGS to the extent that product is sold. Therefore, a fully developed manufacturing plan must assume spending levels in factory departments, production quantities, and inventory levels at the beginning and end of the year.

Comparing actual manufacturing performance with plan involves breaking variations in product cost into those caused by spending differences and those caused by differences in production quantities, and comparing each with plan. The approach we've taken in the Macadam example is something of a shortcut in that we're working with the overall cost ratio, which is a top-level summary of a great deal of cost detail. The approach is an effective way for senior management to overview factory cost, but has to be backed up by analysis at the department level.

Our purpose here is to give readers an overview of planning processes. For that we can stay at the summary level implied by cost ratios as long as we understand that real business plans are supplemented with considerably more detail.

THE CASH BUDGET

Forecasting cash is an especially important part of financial planning. Companies need to be able to predict cash balances accurately, because running out can be a complete disaster. For example, even if everything else is going well, a firm without the cash to meet its payroll is likely to fail quickly. Hence, well-managed companies pay a lot of attention to cash.

There are two ways to forecast cash. We've already looked at the first, which involves forecasting the income statement and balance sheet and deriving a projected statement of cash flows from those documents.

The second approach, known as **cash budgeting**, is more detailed. It involves forecasting cash receipts and disbursements on the dates they're likely to occur. Then the

The **cost ratio** assumption summarizes **enormous detail** in manufacturing departments.

The **cash budget** is a detailed projection of **receipts and disbursements** of cash.

ins and outs are summed in each planning period, usually months, to get net cash flows.

Receipts generally come from making cash sales, collecting receivables, borrowing, and selling stock. Disbursements include paying for purchases, wages, taxes, and other expenses such as rent, utilities, supplies, and outside services.

Receivables and Payables—Forecasting with Time Lags

Forecasting the collection of receivables is difficult, because it's hard to know exactly when customers will pay their bills. Some pay within the terms of sale, usually 30 days, but others lean on the trade and don't pay for 50 or 60 days. A few never pay at all.

However, firms generally have historical information on the percent of revenues that tend to be collected in each month following sales. For example, on the average a firm's collections may behave according to the following *time lagged* pattern.

Months after sale	1	2	3
% collected	60%	30%	8%

Notice that the total collected is 98%, which recognizes that on the average 2% of sales turn out to be bad debts.

Applying the pattern to each month's forecast of sales revenue lets us build up a projection of collections. Here's an illustration showing how first quarter sales might be collected.

	Jan	Feb	Mar	Apr	May	Jun
Sales	\$500	\$600	\$700			
Collections from sales made in						
Jan		\$300	\$150	\$ 40		
Feb			360	180	\$ 48	
Mar				420	210	\$56
Total collections		\$300	\$510	\$640	\$258	\$56

There's an added complication if a prompt payment discount is offered. In that case, first month collections are reduced to reflect some customers taking the discount.

Payables are handled similarly but with more precision, because the firm knows its own payment policy. For example, if a company pays its bills 30 days after receipt of product, it simply lags forecast inventory receipts by one month to predict disbursements. If the policy is to pay in 45 days, split the payment evenly between the first and second month after receipt.

Debt and Interest

Forecasting short-term debt and interest can be a little tricky if a company is funding current cash needs directly by borrowing, which isn't unusual. Under that arrangement the current month's interest payment is based on the loan balance at the end of the last month. But that balance changes depending on whether the month's cash flow is positive or negative. That means we have to work our way through a forecast, month by month, to calculate the interest payments.

Consider the following illustration in which interest is charged at 1% per month. Assume the forecast of everything but interest has been completed and is summarized

in the first line, and that there's no debt at the beginning of the year (end of December). Interest is charged/earned on cumulative cash flow, which is debt when negative and money in the bank when positive.

	Dec	Jan	Feb	Mar	Apr
Cash flow before interest		\$ (500)	\$ (800)	\$ (700)	\$ 900
Interest		0	5	13	20
Net cash flow		\$ (500)	\$ (805)	\$ (713)	\$ 880
Cumulative cash flow at month end	0	\$ (500)	\$ (1,305)	\$ (2,018)	\$ (1,138)

Working from left to right, there's no interest payment in January, but cash flow is negative, so there's a \$500 debt at the end of the month. Interest of \$5 is charged on that balance in February. That adds to the month's negative cash flow making the cumulative debt \$1,305. That generates \$13 interest in March, which adds to that month's cumulative outflow bringing it to \$2,018, and so on.

Other Items

Forecasting most other items is fairly straightforward. Payroll dates are known so wages are easy to forecast. The payment dates for interest and repayment on long-term debt are also generally easy to predict as are big disbursements for things like taxes and projects.

Example 4.8

The Pulmeri Company's revenues tend to go through a quarterly cycle. It's now mid-March and management expects the first quarter's pattern to be repeated in the second quarter. The six-month period is as follows (\$000).

	Jan	Feb	Mar	Apr	May	Jun
Revenue	\$5,000	\$8,000	\$9,000	\$5,000	\$8,000	\$9,000

Historically, Pulmeri collects its receivables according to the following pattern.

Months after sale	1	2	3
% collected	65%	25%	10%

No prompt payment discount is offered, and there are virtually no bad debts. The firm purchases and receives inventory one month in advance of sales. Materials cost about half of sales revenue. Invoices for inventory purchases are paid 45 days after receipt of material.

Payroll runs a constant \$2.5 million per month, and other expenses such as rent, utilities, and supplies are a fairly steady \$1.5 million per month. A \$0.5 million tax payment is scheduled for mid-April. Pulmeri has a short-term loan outstanding that is expected to stand at \$5 million at the end of March. Monthly interest is 1% of the previous month-end balance.

Prepare Pulmeri's cash budget for the second quarter.

SOLUTION: First lay out revenue and lag in collections according to the historical pattern.

	Jan	Feb	Mar	Apr	May	Jun
Revenue	\$5,000	\$8,000	\$9,000	\$5,000	\$8,000	\$9,000
Collections from sales made in						
Jan		\$3,250	\$1,250	\$ 500		
Feb			5,200	2,000	\$ 800	
Mar				5,850	2,250	\$ 900
Apr					3,250	1,250
May						5,200
Second quarter collections				\$8,350	\$6,300	\$7,350

Next, lag inventory purchases (half of sales dollars) *back* one month from the date of sale and then lag the payment two months *forward* in two equal parts.

	Jan	Feb	Mar	Apr	May	Jun
Purchases		\$4,500	\$2,500	\$4,000	\$4,500	
Payment						
Feb			\$2,250	\$2,250		
Mar				1,250	\$1,250	
Apr					2,000	\$2,000
May						2,250
Payment for materials				\$3,500	\$3,250	\$4,250

Next, summarize these results along with payroll and other disbursements and work through the interest charges.

Pulmeri Company
Cash Budget
Second Quarter 20x1
(\$000)

	Jan	Feb	Mar	Apr	May	Jun
Revenue	\$5,000	\$8,000	\$9,000	\$ 5,000	\$ 8,000	\$ 9,000
Collections				8,350	6,300	7,350
Disbursements						
Materials purchases				\$ 3,500	\$ 3,250	\$ 4,250
Payroll				2,500	2,500	2,500
General expenses				1,500	1,500	1,500
Tax payment				500		
Disbursements before interest				\$ 8,000	\$ 7,250	\$ 8,250
Cash flow before interest				\$ 350	\$ (950)	\$ (900)
Interest				(50)	(47)	(57)
Net cash flow				\$ 300	\$ (997)	\$ (957)
Cumulative cash flow (loan)			\$ (5,000)	\$ (4,700)	\$ (5,697)	\$ (6,654)

MANAGEMENT ISSUES IN FINANCIAL PLANNING

Financial plans and their use in business create a number of potential managerial problems. It's a good idea to be aware of these problems before you run into them at work.

THE FINANCIAL PLAN AS A SET OF GOALS

The Macadam Company of Example 4.7 can be used to illustrate an important practical use of a financial plan. Look back at the way the ACP and the inventory turnover ratio have been used to construct next year's financial statements, and notice the large size of the forecast improvements. In essence, the ratios and the associated balance sheet accounts are set up as targets to be achieved by the responsible managers.

In most companies, executive pay is part salary and part bonus. In well-managed companies, executive bonuses are tied to the achievement of measurable goals like the ACP and inventory turnover in this example. In the Macadam Company, it's quite likely that the CFO's bonus will depend in some part on lowering the ACP to the planned level and that the bonus for the VP of manufacturing will depend on increasing the inventory turnover ratio.

Seen in this context, the financial plan becomes a tool with which to manage the company and motivate desirable performance. It's easy to identify several bonusable features and the responsible departments in the Macadam plan:

- 20% growth in revenue—marketing/sales
- Inventory turnover—manufacturing
- 53% cost ratio—manufacturing
- ACP—finance and marketing/sales¹⁸
- Reduction in vendor complaints—finance
- Control cash balance—finance
- Overall profitability and cash flow—general manager and staff VPs
- Operating departments within planned expense levels—individual departments

Inherent Conflicts

Financial plans are used as management goals all the time. A problem sometimes arises, however, when top management puts in what may be described as stretch goals. A stretch goal serves as a target toward which the organization strives, but isn't likely to be achieved.

In the Macadam example, inventory turnover is probably a stretch goal. Notice that the plan calls for a 67% improvement, from 3× to 5×. In most factories, that would be a Herculean achievement in one year. Top management probably wants the organization to work hard on turnover, but doesn't really expect it to achieve the goal in a year.

A stretch goal can sometimes backfire in terms of motivation. Instead of stretching toward the goal, people may give up on it if they consider it impossible.

from the **CFO**

18. We will discuss the reasons that marketing/sales share the responsibility for collections and the ACP in Chapter 16.

Another problem arises if someone else uses the plan and assumes it's an accurate estimate of what's going to happen in the future. To understand this issue, let's evaluate the cash flow implication of the assumption that inventory turnover will increase to 5.0.

Notice that in the statement of changes in working capital, the source of cash resulting from the decrease in inventory is \$797,000. However, that's after a 20% volume increase. If there were no improvement in turnover, instead of shrinking, inventory would actually grow by \$407,000 $[(\$9,031/3) - \$2,603]$. That means the cash flow effect of the turnover assumption is a source of roughly \$1.2 million.

Now suppose Macadam uses the plan's cash flow projection as a basis for arranging next year's bank borrowing. If the turnover assumption doesn't come true, the firm will have understated its borrowing requirements by up to \$1.2 million. That means the arrangement it makes with the bank is unlikely to provide enough cash to get it through the year.

Obviously, the CFO should take a modified plan to the bank.

RISK IN FINANCIAL PLANNING IN GENERAL

Let's pursue this idea a little further. We'll begin by reexamining Macadam's overall plan with an eye toward judging whether it's likely to come true. In doing that, it's important to keep in mind that what a plan says about a business's future flows directly from the *assumptions* made by the planners. Therefore, the impression conveyed may or may not be realistic.

Look back at Macadam's list of assumptions. Everything is marvelously positive. Revenue is going to grow by a whopping 20%, the cost of production will decrease by 2% (that's a lot in an established factory), and asset management will be terrifically successful. We have to ask ourselves if *all* of these positive things are likely to come true without any offsetting negatives. The answer is generally no.

The situation depicted for Macadam is typical of corporate business plans. Everything is routinely forecast to improve in the future, regardless of whether recent performance has been good or bad. The positive assumptions made by managements tend to be a combination of stretch planning and what might be called aggressive optimism. This is a condition in which people allow what they want to happen to overshadow their forecast of what's likely to happen.

For example, suppose a business operation is planning for next year after having had sales of \$100 million and profits of \$6 million last year. The chances are that the performance of the organization's top management is measured primarily by growth in revenue and profit. An "A" report card might be revenue of \$120 million and profit of \$8 million next year. In such a situation, it is very common for top management to define its expectations about next year's performance in terms of the "A" report card. It is then likely to force the organization into a plan that shows those goals being met even if market conditions are such that they're unrealistic.

The practice is called **top-down planning** because top executives force a plan on the rest of the organization. Middle and lower-level managers often feel that such plans are unrealistic. The risk in financial planning is that a great many plans overstate achievable performance because of the top-down phenomenon.

Excessive optimism in business planning can be a major problem because important operating and investment decisions are based on the information in plans. If an optimistic future is projected, resources tend to be committed in ways that will take advantage of that success. If it doesn't materialize, there is generally considerable loss.

The issue can be stated another way. It's never quite clear whether a company's plan (for periods of a year or longer) is a candid statement of what's likely to happen

Stretch goals can lead to confusion. Is the plan a reliable prediction or an unreachable goal?

Stretch planning and **aggressive optimism** can lead to **unrealistic plans** that have little chance of coming true.

from the **CFO**

Top-down plans are forced on the organization by management and are often **unrealistically** optimistic.

in the future or a set of desirable goals. All plans are ultimately a little of each, but which idea predominates and the extent of the diversion between the two is generally a bit of a mystery.

Underforecasting—The Other Extreme

The opposite phenomenon can also occur when people know their performance is going to be graded relative to a plan. Underforecasting sets up a goal that's easy to meet and ensures success in the future. The practice is especially common when department managers submit their expense requirements as inputs to the planning process. The philosophy is “ask for more than you need, because you won't get everything you ask for.” This is especially true in operational planning where targets are set that are tied to compensation.

Bottom-up planning puts together the requests and forecasts of lower and middle management without judgment by top-level executives. Bottom-up plans have a tendency to understate achievable performance.

Underforecasting is a less serious problem in that it results in plans that are beaten by actual performance. That's a pleasant problem in comparison to significantly underperforming a widely published estimate.

The Ideal Process

Ideally the financial planning process is a combination of top-down and bottom-up elements. Healthy planning begins with a completely bottom-up pass at a plan to which top management applies its judgment in a give-and-take process. The end result is a realistic compromise that stretches the organization's abilities, but can be achieved.

In well-run companies, it's common for financial management to assume an important role in addressing the problem of unrealistic forecasting in either direction. Led by the CFO, the finance staff acts as a voice of reason in reviewing planning assumptions. Unrealistic assumptions should be challenged and sent back to the responsible departments for justification or revision.

Scenario Analysis—“What If”ing

Many companies address the risk issue by producing a number of plans reflecting different *scenarios*, each of which is a variation on the assumptions underlying the plan. The term “what if”ing means the same thing, analyzing what would happen if an assumption takes on one value rather than another.

In scenario analysis, assumptions can be varied singly or several can be changed at a time. In Example 4.7, Macadam's management might be concerned that the assumption of a 20% growth in revenue is too aggressive. It would then be appropriate to construct another plan based on the assumption of only a 10% growth.¹⁹

On the other hand, there might be concern about several issues. Then a scenario could be constructed varying all of the questionable assumptions at once. For example, the implication of lower revenue growth coupled with a less significant improvement in asset management could be investigated. This might be achieved by constructing a plan based on a 15% revenue growth, an ACP of 75 days, and an inventory turnover ratio of 4.0.

Bottom-up plans are consolidated from lower management's inputs, and tend to understate what the firm can do.

Planning ideally **combines** top-down and bottom-up processes.

from the **CFO**

Some companies plan for several **scenarios** representing **variations** in their **assumptions** about the future.

19. It's important to realize that many assumptions are interrelated, so changing one implies some change in others. This is especially true of revenue, which tends to drive the whole plan. For example, the assumption of an improved cost ratio in the Macadam example is probably partially dependent on spreading overhead over the larger production volume implied by the revenue growth assumption. Therefore, changing the revenue assumption is likely to require modifying the cost ratio improvement assumption to a less aggressive figure



ETHICS

Judgment Calls and Ethics in Business Planning

It's common for the planning system to put financial executives in uncomfortable ethical positions. Plans are vehicles for communications to outsiders and they are usually put together by the finance department. But outside communications are ultimately the responsibility of the chief executive officer (CEO). That means that a CEO who doesn't like what a plan says can apply his or her "judgment" and tell outsiders something else.

Problems arise when CEOs use judgment to further their personal ends or just refuse to accept unpleasant realities. Chief financial officers (CFOs) get caught in the middle, because although they work for CEOs, they're supposed to have an overriding responsibility for truth and fairness in financial representations. They also have to stand up next to the CEO when the message is delivered and at least act as if they support every word.

Here's an illustration. Suppose the planning process at a division of a large corporation reveals that it's likely to lose market share and a great deal of money in the future. If the information is revealed to parent company executives in an upcoming meeting, they're likely to replace the division's president whose strategy is probably responsible for the poor performance. On the other hand, if a falsely optimistic plan is presented, the current president and his policies will continue in place, but the eventual loss is likely to be much larger.

The president plans to present the optimistic version of the plan. The division CFO feels this constitutes misleading corporate management. What is her ethical responsibility?

To appreciate this dilemma, it's crucial to understand that all plans are to some extent matters of opinion. No one can say with certainty that the executive is proposing to lie. He's just supporting a planning position that most people would find very unrealistic if they knew all the details. The fact that it serves his own personal ends makes him suspect, but it doesn't prove he doesn't believe in the better plan. Optimistic people believe what they want to in spite of overwhelming evidence to the contrary all the time!

If the CFO refuses to go along and insists on presenting the more likely plan herself, she'll be setting up a confrontation with her boss in front of senior management. That will probably destroy her relationship with the president forever. And she may not win. Remember that the corporate managers put the president in charge because they valued his judgment above that of others. They may still do that in spite of strong evidence that he's wrong. The fact that the CFO may eventually be proven right doesn't help, because the damage will be done, and she'll be long gone by then.

On the other hand, if the CFO doesn't stand up and give her opinion, there's no doubt the unduly optimistic plan will be accepted. That will probably mean deeper losses for the company, which might lead to closing the division and laying off its employees. At that time the corporate people will probably want to know why the division's management team didn't see the problem coming.

What are the CFO's options? What would you do?

Scenario analysis gives planners a feel for the impact of their assumptions not coming true. It produces a range of values within which the important results of a plan can be expected to fall.

Communication

Perhaps the biggest problem related to risk in planning is communication. A business unit is expected to have a financial plan that management is confident it will achieve. Holding more than a brief discussion with outsiders about how likely the plan is to come true casts doubt on management's confidence in its own ability to

steer the company. As a result, a single plan tends to be published with the attendant risks we've been discussing.

FINANCIAL PLANNING AND COMPUTERS

Today, virtually all financial planning is done with the aid of computers. It's important to understand what computers do for planning and what they don't do.

Computers make repetitive calculations easy, but don't do our thinking for us. In other words, computers help us create plans once we've made judgments about the underlying business assumptions, but they don't help us with those judgments. It's very important to realize that the heart and substance of financial planning lies in making assumptions, not in cranking out numbers. Hence, computers have made us quicker planners, but not necessarily better planners.

Computers make planning **quicker** and more thorough, but **don't improve the judgments** at the heart of the process.

Repetitive Calculations

Repetitive planning calculations come from two sources. One is multiyear forecasts. Calculations beyond one year tend to be repetitive of the first year's.

The second and more important source is change. The normal planning process involves making a set of assumptions, developing a plan from those assumptions, and evaluating its implications. If the plan isn't satisfactory, the assumptions are changed and everything is recomputed and reevaluated. This can go on literally dozens of times until a satisfactory plan is reached.

Before the advent of computers, recomputing a plan was a time-consuming, labor-intensive process that seriously limited the number of things that could be evaluated. Today that's changed. With the help of a personal computer and spreadsheet software, any number of assumption sets can be tried quickly and easily. That's been an enormously positive development in planning.

QUESTIONS

1. A financial plan has to be either a prediction about the future or a statement of goals; it can't be both. Explain this statement and comment on its validity.
2. The following issues are related to the accuracy and reliability of financial plans. Explain the process/issues related to each.
 - Top-down versus bottom-up planning
 - Plans as statements of goals versus plans as predictions of what's going to happen
 - Planning assumptions
 - Aggressive optimism versus underforecasting
 - Scenario analysis
3. Why is it important that physical assumptions precede financial results in the planning process? For example, what's wrong with assuming you want a business that sells \$50 million a year earning a profit of \$5 million, and then building a revenue and cost plan to fit those goals?

4. Why is planning for a new business harder than planning for an established operation? In which do you have to make more assumptions? Why? What implicit assumption provides a shortcut in one situation?
5. Briefly describe the debt/interest planning problem and the approach that leads to its solution. (Use a few brief sentences. Don't list the procedural steps or give a numerical example.)
6. How are planning assumptions reflected in projected financial statements? Is there a standard computational procedure for incorporating assumptions into planned numbers? What's the difference between simple, estimated plans and more complex, precise plans? Can a plan be precise, complex, and inaccurate at the same time? If so, how?
7. Comment on the value of the formula (EFR) approach to estimating funding requirements. Could it create more problems than it solves?
8. Contrast planning cash requirements, especially borrowing, using the statement of cash flows derived from forecast financial statement with a cash budget. Which is likely to be more useful in running a finance department?
9. Financial planning is no longer a problem in business because of the advent of personal computers. Armed with a PC and the appropriate software, anyone can do a plan for even the largest and most complicated company. Evaluate this statement.
10. You're a new member of the planning staff within the finance department at Bertram Enterprises, a large manufacturer of household goods. The firm does an annual operating plan and a long-range plan every year. You've just received a note from the CFO asking you to help him prepare for a meeting with the firm's investment bankers to discuss issuing new securities in the future. The note asks you to prepare an estimate of the company's funding needs and suggests that you "start with" the most recent annual and long-range plans. You're confused by the term "start with," since the plans clearly indicate future funding needs. What might the CFO be getting at, and how would you approach the assignment?
11. You are developing next year's financial plan for Ajax Inc., a medium sized manufacturing company that's currently operating at 80% of factory's capacity. The firm is launching a sales promotion that's expected to generate a sudden 20% increase in revenues starting at the beginning of the new year. Unlike current sales which are virtually all on credit, approximately fifty percent of the new business will be paid in cash. No changes are planned in the company's operations other than acquiring the resources necessary to support the sales growth. Develop some reasonable planning assumptions for the following balance sheet line items and explain your reasoning for each. (*Hint: Which balance sheet items will be effected by an increase in sales proportionately or less than proportionately. Assume any additional cash needed is borrowed.*)

Cash	Accounts Payable
Accounts Receivable	Accruals (wage)
Inventory	
Gross Fixed Assets	Debt
Accumulated Depreciation	Equity

BUSINESS ANALYSIS

1. Ed Perez has always wanted to run his own restaurant. He worked part time in the food service business during high school and college and has worked for a large restaurant chain since graduating from college four years ago. He's now ready to open a franchised family-style restaurant. However, a large investment is required to get started. Ed has saved some money, but will also have to secure a substantial loan.

Fortunately, Ed's old college roommate, Joe Dixon, is now a loan officer with the local bank. Besides being a good friend, Joe knows that Ed is a stable, hard-working businessman and an excellent credit risk.

Ed is now meeting with Joe to apply for the loan. After exchanging pleasantries, Joe asks to see Ed's business plan. In response, Ed tells him all about the idea and shows him the written information from the franchisor, which Joe glances at briefly.

Joe listens politely, leans back in his chair, and says, "Ed, I've known you for years. I'm sure this is a great idea, and that you'll make a terrific restaurateur, but we can't even begin to consider a loan until we see a fully developed business plan that looks at least five years into the future."

- a. Why is Joe (the bank) insisting that Ed prepare a business plan?
 1. What will it show the bank?
 - i. List some specific concerns the bank might have that a plan would answer outside of the financial section.
 - ii. List several concerns that the financial plan might answer for the bank.
 - iii. Why is the bank insisting on such a long planning horizon? Does that imply the bank is looking for a strategic plan?
 2. What will preparing a business plan do for Ed?
 - i. Before he gets started.
 - ii. After he gets started.
 - iii. What will he learn by doing the financial plan?
 - b. What kind of thinking is the bank looking for in Ed's plan? That is, should the plan be strategic or operational or short term?
2. You're the CFO of the Ramkin Company, which makes and sells electronic equipment. The firm was originally an independent business, but was acquired by the larger BigTech Inc. 10 years ago and is now operated as a division. BigTech has an elaborate planning system requiring all divisions to produce a strategic plan and an annual operating plan once a year, a budget each quarter, monthly cash forecasts, and several quick forecasts near the end of each quarter.

The forecasts are done primarily by the finance department and don't require much of anyone else's time. However, the strategic plan takes a good deal of executive effort, while budgets and the annual operating plan demand a great deal of management effort at all levels.

It's eight o'clock on a morning in mid-October, and the executive team is about to start a meeting to kick off the preparation of the annual operating plan for the next calendar year. As the meeting convenes, Charlie Gogetter, the VP of marketing, is clearly upset. He takes the floor and makes the following statements.

"I'm tired of spending all this time on these silly plans! We just finished a strategic plan in June that must've taken a month of my time while the western

sales region got itself into big trouble. We also did a third quarter budget in June, and a fourth quarter budget in September. Now we're starting another plan that will probably tie up half of my sales managers' time until Christmas.

"On top of that it seems whenever we're not planning, we're putting together reviews comparing actual performance to plan. Before we were acquired by BigTech, we hardly ever planned and we did just fine! It's true we're a lot larger and more complex now, but I don't think we can spend this much time planning rather than doing!

"I suggest that the CFO (he gestures toward you) be assigned to throw together something we can submit to BigTech, and that the rest of us get on with our work."

Other members of the group to some extent share Charlie's feelings, and his comments have created some unrest among the executive team about the company's management style. Prepare a response to his statement and proposal. Don't rule out the possibility that BigTech is overdoing planning.

3. You've just been hired as CFO of the Gatsby Corp., a new company in the high-tech computer business. Shortly after your arrival you were amazed to find that the firm does virtually no planning. An extensive business plan was put together when it was started with venture capital eight years ago, and revised when another round of funding was needed four years later. Other than on those occasions, no planning seems to have been done at all.

The firm was founded by its entrepreneur president, Harvey Gatsby, based on a new technical product he'd invented. Initial demand for the gadget was overwhelming and the firm grew rapidly if chaotically until about a year ago, when competitive devices started to affect its business. The following conditions exist today.

- Sales of the original product are beginning to decline.
- The organization seems to have a number of people and departments whose function and value aren't clear.
- The engineering department is pursuing several new developments that have commercial possibilities, but progress has been haphazard and no one seems to have thought through how any money will be made from the ideas.
- Additional funding is required to get any new products that might be developed to market. Harvey has suggested that you dust off the old business plan for another run at investors.

You feel that the company is in real danger, and that the source of the problem is that management hasn't done any real forward planning in years. In your opinion the first step toward recovery is to install a competent planning system. Write a memo to Harvey outlining your concerns and suggestions. Include:

- a. The problem—why the happy chaos of the past may be about to come to an end, and what that may mean.
- b. How management's approach has to change if the firm is to survive. In other words, it will have to do a good deal of forward thinking and structured planning.
- c. A statement of how planning systems differ between small and larger companies.
- d. The benefits Gatsby can expect to realize by planning in a careful, structured way.
- e. The need for a well-defined financial plan.

PROBLEMS

- The Cambridge Cartage Company has partially completed its forecast of next year's financial statements as follows.

Cambridge Cartage Company Financial Plan (\$000)				
INCOME STATEMENT		BALANCE SHEET		
Next Year		Next Year		
		Beginning	Ending	
Revenue	\$17,220	ASSETS		
Cost/expenses	<u>14,120</u>	Total assets	\$12,540	\$18,330
EBIT	\$ 3,100	LIABILITIES & EQUITY		
Interest	<u>?</u>	Current liabilities	\$ 410	\$ 680
EBT	<u>?</u>	Debt	5,630	?
Tax	<u>?</u>	Equity	<u>6,500</u>	<u>?</u>
EAT	<u>?</u>	Total L&E	\$12,540	\$18,330

The firm pays interest at 10% on all borrowings and pays a combined state and federal tax rate of 40%. Complete the forecast income statement and balance sheet. Begin by guessing at interest expense as 10% of beginning debt.

- Lap Dogs Inc. is planning for next year and has the following summarized results so far (\$000):

Income Statement		
EBIT	236	
Interest	<u>?</u>	
EBT	<u>?</u>	
Income tax	<u>?</u>	
EAT	<u>?</u>	

Balance Sheet		
	This year	Next Year
Assets	582	745
Current liabilities	63	80
Debt	275	?
Equity	244	?
Total liab & equity	582	745

The Firm pays interest of 12% on all borrowing and is subject to an overall tax rate of 38%. It paid interest of \$20,000 this year and plans a \$75,000 dividend next year. Complete Lap Dog's forecast of next year's financial statements. Round all calculations to the nearest \$1,000.

- The Libris Publishing Company had revenues of \$200 million this year and expects a 50% growth to \$300 million next year. Costs and expenses other than interest are forecast at \$250 million. The firm currently has assets of \$280 million

and current liabilities of \$40 million. Its debt to equity ratio is 3:1. (That is, capital is 75% debt and 25% equity.) It pays 12% interest on all of its debt, and is subject to federal and state income taxes at a total effective rate of 39%.

Libris expects assets and current liabilities to grow at 40%, 10% less than the revenue growth rate. The company plans to pay dividends of \$10 million next year.

- a. What is the planned debt to equity ratio at the end of next year?
 - b. Do these results indicate a problem?
4. Larime Corp. is forecasting 20X2 near the end of 20X1. The estimated year-end financial statements and a worksheet for the forecast follow.

Larime Corp. Projected Income Statement (\$000)

	20X1		20X2	
	\$	%	\$	%
Revenue	\$245,622	100.0		100.0
COGS	142,461	58.0		
Gross margin	\$103,161	42.0		
Expenses	\$ 49,124	20.0		
EBIT	\$ 54,037	22.0		
Interest (12%)	9,642	3.9		
EBT	\$ 44,395	18.1		
Income tax (43%)	19,090	7.8		
EAT	\$ 25,305	10.3		

Larime Corp. Projected Balance Sheet (\$000)

	20X1	20X2		20X1	20X2
ASSETS			LIABILITIES & EQUITY		
Current assets	\$178,106		Current liabilities	\$ 85,700	
Fixed assets	142,128		Debt	78,178	
Total	\$320,234		Equity	156,356	
			Total	\$320,234	

Management expects the following next year.

- An 8% increase in revenue.
- Price cutting will cause the cost ratio (COGS/sales) to deteriorate (increase) by 1% (of sales) from its current level.
- Expenses will increase at a rate that is three quarters of that of sales.
- The current accounts will increase proportionately with sales.
- Net fixed assets will increase by \$5 million.
- All interest will be paid at 12%.
- Federal and state income taxes will be paid at a combined rate of 43%.

Make a forecast of Larime’s complete income statement and balance sheet. Work to the nearest thousand dollars.

5. The Winthrop Company is constructing a five-year plan. The firm’s ACP is currently 90 days, while its inventory turnover ratio is 3× based on COGS. The company has forecast aggressive revenue growth along with efficiency improvements in manufacturing and credit and collections as follows. (Year 0 is the current year.)

	Year					
	0	1	2	3	4	5
Revenue (\$000)	\$50.0	\$57.5	\$66.0	\$76.0	\$87.5	\$100.0
Cost ratio	60%	59%	58%	57%	56%	55%
ACP (days)	90	70	60	50	45	40
Inventory turnover	3×	4×	5×	6×	6.5×	7×

For each planned year:

- a. Calculate the COGS.
 - b. Calculate the A/R balance at year end.
 - c. Calculate the inventory balance at year end.
6. The Eagle Feather Fabric Company expects to complete the current year with the following financial results (\$000).

INCOME STATEMENT

Revenue	\$36,100
COGS	<u>14,440</u>
GM	\$21,660
Expenses	<u>12,635</u>
EBIT	\$ 9,025
Interest (11%)	<u>625</u>
EBT	\$ 8,400
Tax (42%)	<u>3,528</u>
EAT	\$ 4,872

BALANCE SHEET

Assets	
Cash	\$ 1,000
Accounts receivable	5,000
Inventory	<u>2,888</u>
Current assets	\$ 8,888
Net fixed assets	<u>7,250</u>
Total assets	\$16,138
Liabilities & equity	
Accounts payable	\$ 1,550
Accruals	<u>530</u>
Current liabilities	\$ 2,080
Debt	5,598
Equity	<u>8,460</u>
Total L&E	\$16,138

Forecast next year using a modified percentage of sales method assuming no dividends are paid and no new stock is sold along with the following:

- a. A 20% growth in sales and a 40% growth in net fixed assets.
- b. A 15% growth in sales with a 10% growth in expenses and a 20% growth in net fixed assets. (Negative debt means the business will generate more cash than is currently owed.)

7. Assume we're at the end of "this year" planning "next year's" financial statements. Calculate the following using indirect planning assumptions as indicated.
- Sales are forecast to be \$58,400,000. Management wants to plan for a 45-day ACP next year. What ending receivables balance should be planned for next year?
 - What ending inventory should be planned if revenue is expected to be \$457,000 and the cost ratio is 53% (cost of goods sold as a percentage of revenue) and management wants to forecast an inventory turnover of 5×.
 - Normal credit terms from suppliers request payment within 30 days. In an effort to conserve cash, management has decided to pay in 50 days. Nearly all payables come from purchases of inventory. Materials make up 60% of the Cost of Goods Sold. Next year's revenue is forecast to be \$378 million. The firm's cost ratio is expected to be 56%. What figure should be included in next year's ending balance sheet for Accounts Payable?
8. Fleming, Inc. had a dividend payout ratio of 25% this year, which resulted in a payout of \$80,000 in dividends. Return on sales (ROS) was 8% this year and is expected to increase to 9% next year. If Fleming expects to have \$305,100 available from next year's retained earnings, what percent increase is it forecasting in revenues?
9. The Dalmation Corporation expects the following summarized financial results this year (\$000).

INCOME STATEMENT		BALANCE SHEET	
Revenue	\$10,500	Assets	
Cost/expenses	9,100	Current assets	\$ 5,500
Tax	560	Net fixed assets	<u>6,900</u>
EAT	840	Total assets	<u>\$12,400</u>
Dividends	420	Liabilities & equity	
		Current	\$ 320
		Debt	5,080
		Equity	<u>7,000</u>
		Total L&E	<u>\$12,400</u>

Use the EFR relation to estimate Dalmation's external funding requirements under the following conditions.

- Sales growth of 15%.
 - Sales growth of 20% and a reduction in the payout ratio to 25%.
 - Sales growth of 25%, elimination of dividends, and a 4% improvement in ROS.
10. Lytle Trucking projects a \$3.2 million EBIT next year. The firm's marginal tax rate is 40%, and it currently has \$8 million in long-term debt with an average coupon rate of 8%. Management is projecting a requirement for additional assets costing \$1.5 million and no change in current liabilities. They plan to maintain a 30% dividend payout ratio. Any additional borrowing required to fund next year's asset growth will carry a 7% coupon rate. Lytle does not plan on issuing additional stock next year. Using the EFR concept rather than the EFR equation, develop an algebraic formula of your own to compute the additional debt needed to support

an asset growth of \$1.5 million. (*Hint:* Start with the idea that additional debt = new assets – internally generated funds. Then write an algebraic expression for internally generated funds based on the income statement from EBIT to EAT and the dividend payout ratio.)

11. The Bubar Building Co. has the following current financial results (\$000).

Revenue	\$45,000	Assets	\$37,000
EAT	3,600	Equity	28,580
Dividends	1,800		

On the average, other building companies pay about one-quarter of their earnings in dividends, earn about six cents on the sales dollar, carry assets worth about six months of sales, and finance one-third of their assets with debt.

Use the sustainable growth rate concept to analyze Bubar’s inherent ability to grow without selling new equity versus that of an average building company. Identify weak areas and suggest further analyses.

12. Broxholme Industries has sales of \$40 million, equity totaling \$27.5 million, and an ROS of 12%. The sustainable growth rate has been calculated at 10.9%. What dividend payout ratio was assumed in this calculation?
13. The Owl Corporation is planning for 20X2. The firm expects to have the following financial result in 20X1 (\$000).

INCOME STATEMENT

	\$	%
Revenue	\$ 37,483	100.0
COGS	<u>14,807</u>	<u>39.5</u>
Gross margin	\$22,676	60.5
Expense	<u>17,721</u>	<u>47.3</u>
EBIT	\$ 4,955	13.2
Interest	<u>\$ 1,380</u>	<u>3.7</u>
EBT	\$ 3,575	9.5
Income tax	<u>1,430</u>	<u>3.8</u>
EAT	\$ 2,145	5.7

BALANCE SHEET

Assets		Liabilities & Equity	
Cash	\$ 1,571	Accts. Pay.	\$ 1,388
Accts. Rec.	6,247	Accruals	<u>985</u>
Inventory	<u>2,468</u>		
Curr. Assets	\$10,286	Curr. Liab.	\$ 2,373
Fixed Assets		Capital	
Gross	\$25,608	Debt	\$12,390
Accum. Dep.	<u>(14,936)</u>	Equity	<u>6,195</u>
Net	\$10,672		\$18,585
Total Assets	\$20,958	Total L & E	\$20,958

Management has made the following planning assumptions:

Income Statement

- Revenue will grow by 10%.
- The cost ratio will improve to 37% of revenues.
- Expenses will be held to 44% of revenues.

Balance Sheet

- The year end cash balance will be \$1.5 million.
- The ACP will improve to 40 days from the current 60.
- Inventory turnover will improve to 7× from 6×.
- Trade payables will continue to be paid in 45 days.
- New capital spending will be \$5 million.
- Newly purchased assets will be depreciated over 10 years using the straight line method taking a full year's depreciation in the first year.
- The company's payroll will be \$13.7 million at the end of 20X2.
- No dividends or new stock sales are planned.

The following facts are also available:

- The firm pays 10% interest on all of its debt.
- The combined state and federal income tax rate is a flat 40%.
- The only significant payables come from inventory purchases, and product cost is 75% purchased materials.
- Existing assets will be depreciated by \$1,727,000 next year.
- The only significant accrual is payroll. The last day of 20X2 will be one week after a payday.

Forecast Owl's income statement and balance sheet for 20X2. Round all calculations to the nearest \$1,000 and use a 360-day year.

14. The Haverly Company expects to finish the current year with the following financial results, and is developing its annual plan for next year.

Haverly Company Income Statement This Year (\$000)

	\$	%
Revenue	\$73,820	100.0
COGS	<u>31,743</u>	<u>43.0</u>
Gross margin	\$42,077	57.0
Expenses		
Marketing	\$ 17,422	23.6
Engineering	7,087	9.6
Finance & administrative	<u>7,603</u>	<u>10.3</u>
Total expenses	\$32,112	43.5
EBIT	\$ 9,965	13.5
Interest	<u>2,805</u>	<u>3.8</u>
EBT	\$ 7,160	9.7
Income tax	<u>3,007</u>	<u>4.1</u>
EAT	\$ 4,153	5.6

Haverly Company Balance Sheet This Year (\$000)

ASSETS		LIABILITIES & EQUITY	
Cash	\$ 8,940	Accounts payable	\$ 1,984
Accounts receivable	12,303	Accruals	860
Inventory	7,054	Current liabilities	\$ 2,844
Current assets	<u>\$28,297</u>	Long-term debt	<u>\$22,630</u>
Fixed assets		Equity	
Gross	\$65,223	Stock accounts	\$18,500
Accumulated depreciation	<u>(23,987)</u>	Retained earnings	<u>25,559</u>
Net	\$41,236	Total equity	\$44,059
Total assets	\$69,533	Total L&E	\$69,533

The following facts are available.

FACTS

- Payables are almost entirely due to inventory purchases and can be estimated through COGS, which is approximately 45% purchased material.
- Currently owned assets will depreciate an additional \$1,840,000 next year.
- There are two balance sheet accruals. The first is for unpaid wages. The current payroll of \$32 million is expected to grow by 12% next year. The closing date of the year will be six working days after a payday. The second accrual is an estimate of the cost of purchased items that have arrived in inventory, but for which vendor invoices have not yet been received. This materials accrual is generally about 10% of the payables balance at year end.
- The combined state and federal income tax rate is 42%.
- Interest on current and future borrowing will be at a rate of 12%.

The plan will be based on the following assumptions.

PLANNING ASSUMPTIONS*Income Statement Items*

1. Revenue will grow by 13% with no change in product mix. Competitive pressure, however, is expected to force some reductions in pricing.
2. The pressure on prices will result in a 1.5% deterioration (increase) in the next year's cost ratio.
3. Spending in the marketing department is considered excessive and will be held to 21% of revenue next year.
4. Because of a major development project, expenses in the engineering department will increase by 20%.
5. Finance and administration expenses will increase by 6%.

Assets and Liabilities

6. An enhanced cash management system will reduce cash balances by 10%.

7. The ACP will be reduced by 15 days. (Calculate the current value to arrive at the target.)
8. The inventory turnover ratio (COGS/inventory) will decrease by $.5\times$.
9. Capital spending is expected to be \$7 million. The average depreciation life of the assets to be acquired is five years. The firm uses straight line depreciation, and takes a half year in the first year.
10. Bills are currently paid in 50 days. Plans are to shorten that to 40 days.
11. A dividend totaling \$1.5 million will be paid next year. No new stock will be sold. Develop next year's financial plan for Haverly on the basis of these assumptions and last year's financial statements. Include a projected income statement, balance sheet, and statement of cash flows.
15. Lapps Inc. makes a gift product that sells best during the holiday season. Retailers stock up in the fall so Lapps's sales are largest in October and November and drop dramatically in December. The firm expects the following revenue pattern for the second half of this year (\$000). The third quarter figures are actual results, while the fourth quarter is a projection.

	Jul	Aug	Sep	Oct	Nov	Dec
Revenue	\$5,500	\$6,000	\$7,500	\$8,000	\$9,500	\$4,000

Historically, Lapps collects its receivables according to the following pattern.

Months after sale	1	2	3
% collected	60%	30%	9%

The firm offers a 2% prompt payment discount, which is taken by about half of the customers that pay in the first month.

Lapps receives inventory one month in advance of sales. The cost of material is 40% of revenue. Invoices are paid 45 days after receipt of material.

The firm uses temporary labor to meet its seasonal production needs, so payroll can be estimated at 35% of the current month's sales. Other expenses are a constant \$1.8 million per month. A \$.7 million tax payment is scheduled for November, and an expansion project will require cash of \$.5 million in October and \$.8 million in December. Lapps has a \$6 million short-term loan outstanding at the end of September. Monthly interest is 1% of the previous month-end balance.

Prepare Lapps's cash budget for the fourth quarter.

16. Blue & Noble is a small law firm that does all of its business through billings (no cash sales). Historically, the firm has collected 40% of its revenue in the month of billing, 50% during the first month after billing, and 8% during the second month after billing. Two percent typically remains uncollectible. Revenue projections for the coming year are \$47,500 for January and \$50,000 for February. Cash receipts of \$50,600 are expected in March. What revenues are projected for March?

INTERNET PROBLEM

17. The Business Owner's Toolkit at <http://www.toolkit.cch.com/tools/tools.asp> offers a series of comprehensive training modules that will help you learn how to market, manage, promote, and grow your business. Go to the section on *Business Finance* and click on the *Cash Flow Budget Worksheet*. Read that page and then click on *Cash Flow Budget* under "More information:" at the bottom of the page. Why is it so important for businesses to prepare a cash budget monthly? What is the purpose of comparing the monthly cash budget to the actual figures reported?