Financial Planning

This chapter is concerned with financial planning. We look first at short-term planning where the focus is on ensuring that the firm does not run out of cash. Short-term planning is, therefore, often termed *cash budgeting*. In the second half of the chapter we look at how firms also use financial planning models to develop a coherent *long-term* strategy.

In the last chapter we introduced you to the principal short-term assets—inventory, accounts receivable, cash, and marketable securities. Decisions on these assets cannot be made in isolation. For example, suppose that the marketing manager wishes to give customers more time to pay for their purchases. This reduces the firm's future cash balances. Or perhaps the production manager adopts a just-in-time system for ordering from suppliers. That allows the firm to get by on smaller inventories and frees up cash.

Managers concerned with short-term financial decisions can avoid many of the difficult conceptual issues encountered elsewhere in this book. In that respect short-term decisions are easier than long-term decisions, but they are not less important. A firm can identify extremely valuable capital investment opportunities, find the precise optimal debt ratio, follow the perfect dividend policy, and yet founder because no one bothers to raise the cash to pay this year's bills. Hence the need for short-term planning.

Short-term planning rarely looks further ahead than the next 12 months. It seeks to ensure that the firm has enough cash to pay its bills and makes sensible short-term borrowing and lending decisions. But the financial manager also needs to think about the investments that will be needed to meet the firm's *long-term* goals and the financing that must be arranged. Long-term financial planning focuses on the implications of alternative financial strategies. It allows managers to avoid some surprises and consider how they should react to surprises that *cannot* be avoided. And it helps to establish goals for the firm and to provide standards for measuring performance.

29-1 Links Between Short-Term and Long-Term Financing Decisions

Short-term financial decisions differ in two ways from long-term decisions such as the purchase of plant and equipment or the choice of capital structure. First, they generally involve short-lived assets and liabilities, and, second, they are usually easily reversed. Compare, for example, a 60-day bank loan with an issue of 20-year bonds. The bank loan is clearly a short-term decision. The firm can repay it two months later and be right back where it started. A firm might conceivably issue a 20-year bond in January and retire it in March, but it would be extremely inconvenient and expensive to do so. In practice, the bond issue is a long-term decision, not only because of the bond's 20-year maturity but also because the decision to issue it cannot be reversed on short notice.

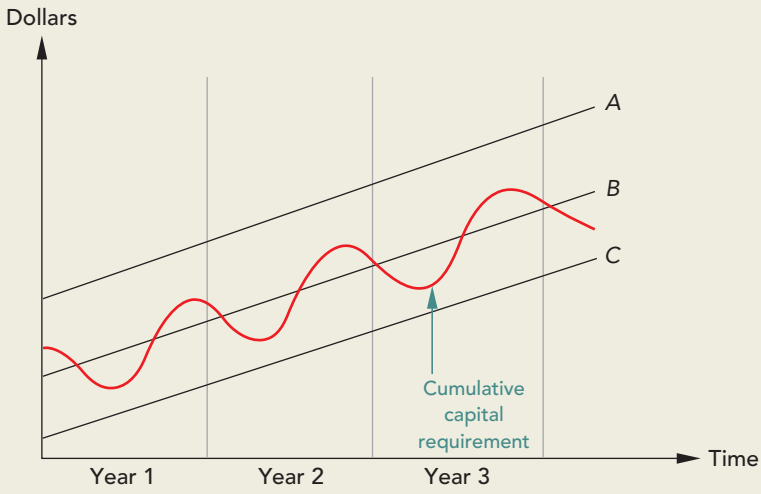

FIGURE 29.1

The firm's cumulative capital requirement (red line) is the cumulative investment in all the assets needed for the business. This figure shows that the requirement grows year by year, but there is some seasonal fluctuation within each year. The requirement for short-term financing is the difference between long-term financing (lines *A*, *B*, and *C*) and the cumulative capital requirement. If long-term financing follows line *C*, the firm always needs short-term financing. At line *B*, the need is seasonal. At line *A*, the firm never needs short-term financing. There is always extra cash to invest.

Short-term financing needs are nevertheless tied to the firm's long-term decisions. All businesses require capital—that is, money invested in plant, machinery, inventories, accounts receivable, and all the other assets it takes to run a business. These assets can be financed by either long-term or short-term sources of capital.

Let us call the total investment the firm's *cumulative capital requirement*. For most firms the cumulative capital requirement grows irregularly, like the wavy line in Figure 29.1. This line shows a clear upward trend as the firm's business grows. But the figure also shows seasonal variation around the trend, with the capital requirement peaking late in each year. In addition, there would be unpredictable week-to-week and month-to-month fluctuations, but we have not attempted to show these in Figure 29.1.

When long-term financing does not cover the cumulative capital requirement, the firm must raise short-term capital to make up the difference. When long-term financing *more* than covers the cumulative capital requirement, the firm has surplus cash available. Thus the amount of long-term financing raised, given the capital requirement, determines whether the firm is a short-term borrower or lender.

Lines *A*, *B*, and *C* in Figure 29.1 illustrate this. Each depicts a different long-term financing strategy. Strategy *A* implies a permanent cash surplus, which can be invested in short-term securities. Strategy *C* implies a permanent need for short-term borrowing. Under *B*, which is probably the most common strategy, the firm is a short-term lender during part of the year and a borrower during the rest.

What is the *best* level of long-term financing relative to the cumulative capital requirement? It is hard to say. There is no convincing theoretical analysis of this question. We can make practical observations, however. First, most financial managers attempt to "match

maturities" of assets and liabilities.[1] That is, they largely finance long-lived assets like plant and machinery with long-term borrowing and equity. Second, most firms make a permanent investment in net working capital (current assets less current liabilities). This investment is financed from long-term sources.

Current assets can be converted into cash more easily than long-term assets. So firms with large holdings of current assets enjoy greater liquidity. Of course, some of these assets are more liquid than others. Inventories are converted into cash only when the goods are produced, sold, and paid for. Receivables are more liquid; they become cash as customers pay their outstanding bills. Short-term securities can generally be sold if the firm needs cash on short notice and are therefore more liquid still.

Some firms choose to hold more liquidity than others. For example, many high-tech companies, such as Intel and Cisco, hold huge amounts of short-term securities. On the other hand, firms in old-line manufacturing industries—such as chemicals, paper, or steel—manage with a far smaller reserve of liquidity. Why is this? One reason is that companies with rapidly growing profits may generate cash faster than they can redeploy it in new positive-NPV investments. This produces a surplus of cash that can be invested in short-term securities. Of course, companies faced with a growing mountain of cash may eventually respond by adjusting their payout policies. In Chapter 16 we saw how Microsoft reduced its cash mountain by paying a special dividend and repurchasing its stock.

There are some advantages to holding a large reservoir of cash, particularly for smaller firms that face relatively high costs to raising funds on short notice. For example, biotech firms require large amounts of cash to develop new drugs. Therefore, these firms generally have substantial cash holdings to fund their R&D programs. If these precautionary reasons for holding liquid assets are important, we should find that small companies in relatively high-risk industries are more likely to hold large cash surpluses. A study by Tim Opler and others confirms that this is in fact the case.[2]

Financial managers of firms with a surplus of long-term financing and with cash in the bank don't have to worry about finding the money to pay next month's bills. The cash can help to protect the firm against a rainy day and give it the breathing space to make changes to operations. However, there are also drawbacks to surplus cash. Holdings of marketable securities are at best a zero-NPV investment for a taxpaying firm.[3] Also managers of firms with large cash surpluses may be tempted to run a less tight ship and may simply allow the cash to seep away in a succession of operating losses. For example, at the end of 2007 General Motors held $27 billion in cash and short-term investments. But shareholders valued GM stock at less than $14 billion. It seemed that shareholders realized that the cash would be used to support ongoing losses and to service GM's huge debts.

Pinkowitz and Williamson looked at the value that investors place on a firm's cash and found that on average shareholders valued a dollar of cash at $1.20.[4] They placed a particularly high value on liquidity in the case of firms with plenty of growth opportunities. At the

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[1] A survey by Graham and Harvey found that managers considered that the desire to match the maturity of the debt with that of the assets was the single most important factor in their choice between short- and long-term debt. See J. R. Graham and C. R. Harvey, "The Theory and Practice of Finance: Evidence from the Field," *Journal of Financial Economics* 61 (May 2001), pp. 187–243. Stohs and Mauer confirm that firms with a preponderance of short-term assets do indeed tend to issue short-term debt. See M. H. Stohs and D. C. Mauer, "The Determinants of Corporate Debt Maturity Structure," *Journal of Business* 69 (July 1996), pp. 279–312.

[2] T. Opler, L. Pinkowitz, R. Stulz, and R. Williamson, "The Determinants and Implications of Corporate Cash Holdings," *Journal of Financial Economics* 52 (April 1999), pp. 3–46.

[3] If, as most people believe, there is a tax advantage to borrowing there must be a corresponding tax disadvantage to lending, since the firm must pay tax at the corporate rate on the interest that it receives from Treasury bills. In this case investment in Treasury bills has a negative NPV. See Section 18-1.

[4] L. Pinkowitz and R. Williamson. "The Market Value of Cash," *Journal of Applied Corporate Finance* 19 (2007), pp. 74–81.

other extreme, they found that, when a firm was likely to face financial distress, a dollar of cash within the firm was often worth less than a dollar to the shareholders.[5]

29-2 Tracing Changes in Cash

Table 29.1 shows the 2009 income statement for Dynamic Mattress Company, and Table 29.2 compares the firm's 2008 and 2009 year-end balance sheets. You can see that in 2009 Dynamic's cash balance increased from $20 million to $25 million.

What caused this increase? Did the extra cash come from Dynamic's issue of long-term debt, from reinvested earnings, from cash released by reducing inventory, or from extra credit extended by Dynamic's suppliers? (Note the increase in accounts payable.) The answer is provided in the company's cash flow statement shown in Table 29.3.

Cash flow statements classify cash flows into those from operating activities, investing activities, and financing activities. Sources of cash are shown as positive numbers; uses of

TABLE 29.1

Income statement for Dynamic Mattress Company, 2009 (figures in $ millions).

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1	Sales	2,200
2	Cost of goods sold	1,644
3	Other expenses	411
4	Depreciation	20
5	EBIT (1−2−3−4)	125
6	Interest	5
7	Pretax income (5−6)	120
8	Tax at 50%	60
9	Net income (7−8)	60
	Dividend	30
	Earnings retained in the business	30

TABLE 29.2

Year-end balance sheets for 2009 and 2008 for Dynamic Mattress Company (figures in $ millions).

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	2009	2008
Current assets:		
Cash	25	20
Marketable securities	25	0
Accounts receivable	150	125
Inventory	125	130
Total current assets	325	275
Fixed assets:		
Gross investment	350	320
Less depreciation	100	80
Net fixed assets	250	240
Total assets	575	515
Current liabilities:		
Bank loans	0	25
Accounts payable	135	110
Total current liabilities	135	135
Long-term debt	90	60
Net worth (equity and retained earnings)	350	320
Total liabilities and net worth	575	515

[5] The apparent implication is that the firm should distribute the cash to shareholders. However, debtholders may place restrictions on dividend payments to the shareholders.

Cash flows from operating activities:	
Net income	60
Depreciation	20
Decrease (increase) in accounts receivable	−25
Decrease (increase) in inventories	5
Increase (decrease) in accounts payable	25
Net cash flow from operating activities	85
Cash flows from investing activities:	
Investment in fixed assets	−30
Cash flows from financing activities:	
Dividends	−30
Sale (purchase) of marketable securities	−25
Increase (decrease) in long-term debt	30
Increase (decrease) in short-term debt	−25
Net cash flow from financing activities	−50
Increase (decrease) in cash balance	5

TABLE 29.3

Statement of cash flows for Dynamic Mattress Company, 2009 (figures in $ millions).

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cash are shown as negative numbers. Dynamic's cash flow statement shows that Dynamic *generated* cash from the following sources:

1. It earned $60 million of net income (*operating activity*).
2. It set aside $20 million as depreciation. Remember that depreciation is *not* a cash outlay. Thus, it must be added back to obtain Dynamic's cash flow (*operating activity*).
3. It reduced inventory, releasing $5 million (*operating activity*).
4. It increased its accounts payable, in effect borrowing an additional $25 million from its suppliers (*operating activity*).
5. It issued $30 million of long-term debt (*financing activity*).

Dynamic's cash flow statement shows that it *used* cash for the following purposes:

1. It allowed accounts receivable to expand by $25 million (*operating activity*). In effect, it lent this additional amount to its customers.
2. It invested $30 million (*investing activity*). This shows up as the increase in gross fixed assets in Table 29.2.
3. It paid a $30 million dividend (*financing activity*). (*Note:* The $30 million increase in Dynamic's equity in Table 29.2 is due to retained earnings: $60 million of equity income, less the $30 million dividend.)
4. It purchased $25 million of marketable securities (*financing activity*).
5. It repaid $25 million of short-term bank debt (*financing activity*).[6]

Look again at Table 29.3. Notice that to calculate cash flows from operating activities, we start with net income and then make two adjustments. First, since depreciation is *not* a cash outlay, we must add it back to net income.[7] Second, we need to recognize the fact

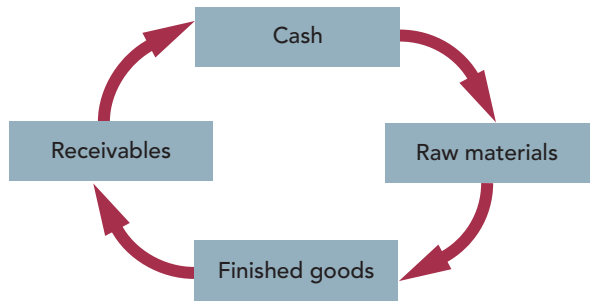
[6] This is principal repayment, not interest. Sometimes interest payments are explicitly recognized as a use of funds. If so, cash flow from operations would be defined *before* interest, that is, as net income plus interest plus depreciation.

[7] There is a potential complication here, for the depreciation figure shown in the company's report to shareholders is rarely the same as the depreciation figure used to calculate tax. The reason is that firms can minimize their current tax payments by using *accelerated* depreciation when computing their taxable income. As a result, the shareholder books (which generally use straight-line depreciation) overstate the firm's current tax liability. Accelerated depreciation does not eliminate taxes; it only delays them. Since the ultimate liability has to be recognized, the additional taxes that will need to be paid are shown on the balance sheet as a deferred tax liability. In the statement of cash flows any increase in deferred taxes is treated as a source of funds. In the Dynamic Mattress example we ignore deferred taxes.

that the income statement shows sales and expenditures when they are made, rather than when cash changes hands. For example, think of what happens when Dynamic sells goods on credit. The company records a profit at the time of sale, but there is no cash inflow until the bills are paid. Since there is no cash inflow, there is no change in the company's cash balance, although there is an increase in working capital in the form of an increase in accounts receivable. No net addition to cash would be shown in a cash flow statement like Table 29.3. The increase in cash from operations would be offset by an increase in accounts receivable. Later, when the bills are paid, there is an increase in the cash balance. However, there is no further profit at this point and no increase in working capital. The increase in the cash balance is exactly matched by a decrease in accounts receivable.

Table 29.3 adjusts the cash flow from operating activities *downward* by $25 million to reflect the additional credit that Dynamic has extended to its customers. On the other hand, in 2009 Dynamic reduced its inventories and increased the amount that is owed to its suppliers. The cash flow from operating activities is adjusted *upward* to reflect these changes.

That brings up an interesting characteristic of working capital. Imagine a company that conducts a very simple business. It buys raw materials for cash, processes them into finished goods, and then sells these goods on credit. The whole cycle of operations looks like this:



If you draw up a balance sheet at the beginning of the process, you see cash. If you delay a little, you find the cash replaced by inventories of raw materials and, still later, by inventories of finished goods. When the goods are sold, the inventories give way to accounts receivable, and, finally, when the customers pay their bills, the firm draws out its profit and replenishes the cash balance.

There is only one constant in this process, namely, working capital. That is one reason why (net) working capital is a useful summary measure of current assets and liabilities. The strength of the working-capital measure is that it is unaffected by seasonal or other temporary movements between different current assets or liabilities. But the strength is also its weakness, for the working-capital figure hides a lot of interesting information. In our example cash was transformed into inventory, then into receivables, and back into cash again. But these assets have different degrees of risk and liquidity. You can't pay bills with inventory or with receivables, you must pay with cash.

The Cash Cycle

In Chapter 28 we showed how to calculate the average time that materials remain in inventory and the average time that it takes for customers to pay their bills. In the case of Dynamic:

$$\text{Average days in inventory} = \frac{\text{inventory at start of year}}{\text{daily cost of goods sold}} = \frac{130}{1{,}644/365} = 29 \text{ days}$$

$$\text{Average collection period} = \frac{\text{receivables at start of year}}{\text{average daily sales}} = \frac{125}{2{,}200/365} = 21 \text{ days}$$

We can also calculate the average time that it takes *Dynamic* to pay its bills:[8]

$$\text{Average payment period} = \frac{\text{payables at start of year}}{\text{daily cost of goods sold}} = \frac{110}{1{,}644/365} = 24 \text{ days}$$

Think what this implies for the financing that is needed to maintain regular operations. Suppose that Dynamic purchases materials on day 0. It pays for these materials on day 24 (average payment period = 24 days). By day 29 Dynamic has converted the raw materials into finished mattresses that are then sold (days in inventory = 29). Twenty-one days later on day 50 Dynamic's customers pay for their purchases (collection period = 21). Thus, cash went out the door on day 24; it did not come back in again until day 50. This 26-day interval is called the *cash cycle* or *cash conversion period*:[9]

Cash cycle (days)	=	average days in inventory	+	average collection period	−	average payment period
26	=	29	+	21	−	24

The cash cycle affects the amount of working capital that the firm needs. For example, major machinery manufacturers typically hold large inventories and offer long payment periods. Their cash cycle is nearly six months and they need to make a substantial investment in net working capital. By contrast, utilities with their low investment in inventory have a cash cycle of only about one and a half months. Utilities often have negative working capital.

29-3 Cash Budgeting

The past is interesting for what one can learn from it. The financial manager's problem is to forecast *future* sources and uses of cash. These forecasts serve two purposes. First, they provide a standard, or budget, against which subsequent performance can be judged. Second, they alert the manager to future cash-flow needs. Cash, as we all know, has a habit of disappearing fast.

Preparing the Cash Budget: Inflows

We illustrate the preparation of the capital budget by continuing the example of Dynamic Mattress.

Most of Dynamic's cash inflow comes from the sale of mattresses. We therefore start with a sales forecast by quarter for 2010:[10]

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Sales ($ millions)	560	502	742	836

But sales become accounts receivable before they become cash. Cash flow comes from *collections* on accounts receivable.

Most firms keep track of the average time it takes customers to pay their bills. From this they can forecast what proportion of a quarter's sales is likely to be converted into cash in that quarter and what proportion is likely to be carried over to the next quarter as accounts receivable. Suppose that 70% of sales are "cashed in" in the immediate quarter and 30% are cashed

[8] Since the balance sheet shows the cost of materials rather than the amount that the finished goods will eventually sell for, it makes sense to compare the level of inventories and payables with the cost of goods sold rather than with sales.

[9] The total length of time from the purchase of raw materials until the final payment by the customer is termed the *operating cycle.*

[10] Most firms would forecast by month instead of by quarter. Sometimes weekly or even daily forecasts are made. But presenting a monthly forecast would triple the number of entries in Table 29.4 and subsequent tables. We wanted to keep the examples as simple as possible.

in the following quarter. Table 29.4 shows forecasted collections under this assumption. For example, you can see that in the first quarter collections from current sales are 70% of $560, or $392 million. But the firm also collects 30% of the previous quarter's sales, or .3($397) = $119 million. Therefore total collections are $392 + $119 = $511 million.

Dynamic started the first quarter with $150 million of accounts receivable. The quarter's sales of $560 million were *added* to accounts receivable, but collections of $511 million were *subtracted.* Therefore, Table 29.4 shows that Dynamic ended the quarter with accounts receivable of $150 + 560 − 511 = $199 million. The general formula is

Ending accounts receivable = beginning accounts receivable + sales − collections

The top section of Table 29.5 shows forecasted sources of cash for Dynamic Mattress. Collection of receivables is the main source, but it is not the only one. Perhaps the firm plans to dispose of some land or expects a tax refund or payment of an insurance claim. All such items are included as "other" sources. It is also possible that you may raise additional capital by borrowing or selling stock, but we don't want to prejudge that question. Therefore, for the moment we just assume that Dynamic will not raise further long-term finance.

Preparing the Cash Budget: Outflows

So much for the incoming cash. Now for the outgoing. There always seem to be many more uses for cash than there are sources. For simplicity, we have condensed the uses into five categories in Table 29.5.

1. *Payments on accounts payable.* The firm has to pay its bills for raw materials, parts, electricity, etc. The cash-flow forecast assumes all these bills are paid on time, although Dynamic could probably delay payment to some extent. Delaying payment is sometimes called *stretching payables.* Stretching is one source of short-term financing, but for most firms it is an expensive source, because by stretching they lose discounts given to firms that pay promptly.
2. *Increase in inventories.* The expected increase in sales in 2010 requires additional investment in inventories.
3. *Labor, administrative, and other expenses.* This category includes all other regular business expenses.
4. *Capital expenditures.* Note that Dynamic Mattress plans a major capital outlay in the first quarter.

		First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1	Receivables at start of period	150	199	181.6	253.6
2	Sales	560	502	742	836
	Collections:				
	Sales in current period (70%)	392	351.4	519.4	585.2
	Sales in last period (30%)	119*	168	150.6	222.6
3	Total collections	511	519.4	670	807.8
4	Receivables at end of period 1+2−3	199	181.6	253.6	281.8

TABLE 29.4

To forecast Dynamic Mattress's collections on accounts receivable, you have to forecast sales and collection rates in 2010 (figures in $ millions).

*We assume that sales in the last quarter of the previous year were $397 million.

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Sources of cash:				
Collections on accounts receivable	511	519.4	670	807.8
Other	0	0	77	0
Total sources	511	519.4	747	807.8
Uses of cash:				
Payments on accounts payable	250	250	267	261
Increase in inventory	150	150	170	180
Labor and other expenses	136	136	136	136
Capital expenditures	70	10	8	14.5
Taxes, interest, and dividends	46	46	46	46
Total uses	652	592	627	637.5
Sources minus uses	−141	−72.6	120	170.3
Calculation of short-term borrowing requirement:				
Cash at start of period	25	−116	−188.6	−68.6
Change in cash balance	−141	−72.6	120	170.3
Cash at end of period	−116	−188.6	−68.6	101.7
Minimum operating balance	25	25	25	25
Cumulative financing required	141	213.6	93.6	−76.7

TABLE 29.5

Dynamic Mattress's cash budget for 2010 (figures in $ millions)

5. *Taxes, interest, and dividend payments.* This includes interest on presently outstanding long-term debt but does not include interest on any additional borrowing to meet cash requirements in 2010. At this stage in the analysis, Dynamic does not know how much it will have to borrow, or whether it will have to borrow at all.

The forecasted net inflow of cash (sources *minus* uses) is shown by the shaded line in Table 29.5. Note the large negative figure for the first quarter: a $141 million forecasted *outflow.* There is a smaller forecasted outflow in the second quarter, and then substantial cash inflows in the third and fourth quarters.

The bottom part of Table 29.5 calculates how much financing Dynamic will have to raise if its cash-flow forecasts are right. It starts the year with $25 million in cash. There is a $141 million cash outflow in the first quarter, and so Dynamic will have to obtain at least $141 − 25 = $116 million of additional financing. This would leave the firm with a forecasted cash balance of exactly zero at the start of the second quarter.

Most financial managers regard a planned cash balance of zero as driving too close to the edge of the cliff. They establish a *minimum operating cash balance* to absorb unexpected cash inflows and outflows. We assume that Dynamic's minimum operating cash balance is $25 million. This means it will have to raise the full $141 million in the first quarter and $72.6 million more in the second quarter. Thus its *cumulative* financing requirement is $213.6 million by the second quarter. Fortunately, this is the peak: the cumulative requirement declines in the third quarter by $120 million to $93.6 million. In the final quarter Dynamic is out of the woods: its cash balance is $101.7 million, well clear of its minimum operating balance.

The next step is to develop a *short-term financing plan* that covers the forecasted requirements in the most economical way. We move on to that topic after two general observations:

1. The large cash outflows in the first two quarters do not necessarily spell trouble for Dynamic Mattress. In part, they reflect the capital investment made in the first quarter: Dynamic is spending $70 million, but it should be acquiring an asset worth that much or more. In part, the cash outflows reflect low sales in the first half of the year; sales recover in the second half.[11] If this is a predictable seasonal pattern, the firm should have no trouble borrowing to tide it over the slow months.
2. Table 29.5 is only a best guess about future cash flows. It is a good idea to think about the *uncertainty* in your estimates. For example, you could undertake a sensitivity analysis, in which you inspect how Dynamic's cash requirements would be affected by a shortfall in sales or by a delay in collections. The trouble with such sensitivity analyses is that you are changing only one item at a time, whereas in practice a downturn in the economy might affect, say, sales levels *and* collection rates. An alternative but more complicated solution is to build a model of the cash budget and then to simulate possible alternative cash requirements. If cash requirements are difficult to predict, you may wish to hold additional cash or marketable securities to cover a possible unexpected cash outflow.

29-4 The Short-Term Financing Plan

Dynamic's cash budget defines its problem: its financial manager must find short-term financing to cover the firm's forecasted cash requirements. There are dozens of sources of short-term financing, but for simplicity we assume that Dynamic has just two options.

Options for Short-Term Financing

1. *Bank loan:* Dynamic has an existing arrangement with its bank allowing it to borrow up to $100 million at an interest cost of 10% a year or 2.5% per quarter. The firm can borrow and repay whenever it wants to do so, as long as it does not exceed its credit limit.
2. *Stretching payables:* Dynamic can also raise capital by putting off paying its bills. The financial manager believes that Dynamic can defer up to $100 million of payables each quarter. Thus, $100 million can be saved in the first quarter by *not* paying bills in that quarter. (Note that the cash-flow forecasts in Table 29.5 assumed that these bills *will* be paid in the first quarter.) If deferred, these payments *must* be made in the second quarter, but a further $100 million of the second quarter bills can be deferred to the third quarter, and so on.

Stretching payables is often costly, even if no ill will is incurred. The reason is that suppliers may offer discounts for prompt payment. Dynamic loses this discount if it pays late. In this example we assume the lost discount is 5% of the amount deferred. In other words, if a $100 payment is delayed, the firm must pay $105 in the next quarter.

Dynamic's Financing Plan

With these two options, the short-term financing strategy is obvious. Use the bank loan first, if necessary up to the $100 million limit. If there is still a shortage of cash, stretch payables.

Table 29.6 shows the resulting plan. In the first quarter the plan calls for borrowing the full amount from the bank ($100 million) and stretching $16 million of payables (see lines 1 and 2 in the table). In addition the company sells the $25 million of marketable securities

[11] Maybe people buy more mattresses late in the year when the nights are longer.

		First Quarter	Second Quarter	Third Quarter	Fourth Quarter
	New borrowing:				
1	Bank loan	100.0	0.0	0.0	0.0
2	Stretching payables	16.0	92.4	0.0	0.0
3	Total	116.0	92.4	0.0	0.0
	Repayments:				
4	Bank loan	0.0	0.0	20.0	80.0
5	Stretching payables	0.0	16.0	92.4	0.0
6	Total	0.0	16.0	112.4	80.0
7	Net new borrowing	116.0	76.4	−112.4	−80.0
8	Plus securities sold	25.0	0.0	0.0	0.0
9	Less securities bought	0.0	0.0	0.0	87.8
10	Total cash raised	141.0	76.4	−112.4	−167.8
	Note: Cumulative borrowing and security sales				
	Bank loan	*100.0*	*100.0*	*80.0*	*0.0*
	Stretching payables	*16.0*	*92.4*	*0.0*	*0.0*
	Net securities sold	*25.0*	*25.0*	*25.0*	*−62.8*
	Interest payments:				
11	Bank loan	0.0	2.5	2.5	2.0
12	Stretching payables	0.0	0.8	4.6	0.0
13	Interest on securities sold	0.0	0.5	0.5	0.5
14	Net interest paid	0.0	3.8	7.6	2.5
15	Cash required for operations	141.0	72.6	−120.0	−170.3
16	Total cash required	141.0	76.4	−112.4	−167.8

TABLE 29.6

Dynamic Mattress's financing plan (figures in $ millions).

it held at the end of 2009 (line 8). Thus it raises 100 + 16 + 25 = $141 million of cash in the first quarter (line 10).

In the second quarter, the plan calls for Dynamic to continue to borrow $100 million from the bank and to stretch $92.4 million of payables. This raises $76.4 million after paying off the $16 million of bills deferred from the first quarter.

Why raise $76.4 million when Dynamic needs only an additional $72.6 million to finance its operations? The answer is that the company must pay interest on the borrowings that it undertook in the first quarter and it forgoes interest on the marketable securities that were sold.[12]

In the third and fourth quarters the plan calls for Dynamic to pay off its debt and to make a purchase of marketable securities.

Evaluating the Plan

Does the plan shown in Table 29.6 solve Dynamic's short-term financing problem? No: the plan is feasible, but Dynamic can probably do better. The most glaring weakness is its reliance on stretching payables, an extremely expensive financing device. Remember that it costs Dynamic 5% *per quarter* to delay paying bills—an effective interest rate of over 20% per year. The first plan would merely stimulate the financial manager to search for cheaper sources of short-term borrowing.

[12] The bank loan calls for quarterly interest of .025 × 100 = $2.5 million; the lost discount on the payables amounts to .05 × 16 = $.8 million, and the interest lost on the marketable securities is .02 × 25 = $.5 million.

The financial manager would ask several other questions as well. For example:

1. Does the plan yield satisfactory current and quick ratios?[13] Its bankers may be worried if these ratios deteriorate.[14]
2. Are there intangible costs of stretching payables? Will suppliers begin to doubt Dynamic's creditworthiness?
3. Does the plan for 2010 leave Dynamic in good financial shape for 2011? (Here the answer is yes, since Dynamic will have paid off its short-term borrowing by the end of the year.)
4. Should Dynamic try to arrange long-term financing for the major capital expenditure in the first quarter? This seems sensible, following the rule of thumb that long-term assets deserve long-term financing. It would also reduce the need for short-term borrowing dramatically. A counterargument is that Dynamic is financing the capital investment only temporarily by short-term borrowing. By year-end, the investment is paid for by cash from operations. Thus Dynamic's initial decision not to seek immediate long-term financing may reflect a preference for ultimately financing the investment with retained earnings.
5. Is it possible to adjust the firm's operating and investment plans to make the short-term financing problem easier. Perhaps there is a way to defer the first quarter's large cash outflow? For example, suppose that the large capital investment in the first quarter is for new mattress-stuffing machines to be delivered and installed in the first half of the year. The new machines are not scheduled to be ready for full-scale use until August. Perhaps the machine manufacturer could be persuaded to accept 60% of the purchase price on delivery and 40% when the machines are installed and operating satisfactorily.
6. Should Dynamic release cash by reducing the level of other current assets? For example, it could reduce receivables by getting tough with customers who are late paying their bills. (The cost is that in the future these customers may take their business elsewhere.) Or it may be able to get by with lower inventories of mattresses. (The cost is that it may lose business if there is a rush of orders that it cannot supply.)

Short-term financing plans are developed by trial and error. You lay out one plan, think about it, and then try again with different assumptions on financing and investment alternatives. You continue until you can think of no further improvements.

Trial and error is important because it helps you understand the real nature of the problem the firm faces. Here we can draw a useful analogy between the *process* of planning and Chapter 10, "Project Analysis." In Chapter 10 we described sensitivity analysis and other tools used by firms to find out what makes capital investment projects tick and what can go wrong with them. Dynamic's financial manager faces the same kind of task here: not just to choose a plan but to understand what can go wrong and what will be done if conditions change unexpectedly.[15]

A Note on Short-Term Financial Planning Models

Working out a consistent short-term plan requires burdensome calculations.[16] Fortunately much of the arithmetic can be delegated to a computer. Many large firms have

[13] These ratios were discussed in Chapter 28.

[14] We have not worked out these ratios explicitly, but you can infer from Table 29.6 that they would be fine at the end of the year but relatively low midyear, when Dynamic's borrowing is high.

[15] This point is even more important in *long-term* financial planning.

[16] If you doubt that, look again at Table 29.6. Notice that the cash requirements in each quarter depend on borrowing in the previous quarter, because borrowing creates an obligation to pay interest. Moreover, the problem's complexity would have been tripled had we not simplified by forecasting per quarter rather than by month.

built *short-term financial planning models* to do this. Smaller companies do not face so much detail and complexity and find it easier to work with a spreadsheet program on a personal computer. In either case the financial manager specifies forecasted cash requirements or surpluses, interest rates, credit limits, etc., and the model grinds out a plan like the one shown in Table 29.6.

The computer also produces balance sheets, income statements, and whatever special reports the financial manager may require. Smaller firms that do not want custom-built models can rent general-purpose models offered by banks, accounting firms, management consultants, or specialized computer software firms.

Most of these models simply work out the consequences of the assumptions and policies specified by the financial manager. *Optimization* models for short-term financial planning are also available. These models are usually linear programming models. They search for the *best* plan from a range of alternative policies identified by the financial manager. Optimization helps when the firm faces complex problems where trial and error might never identify the *best* combination of alternatives.

Of course the best plan for one set of assumptions may prove disastrous if the assumptions are wrong. Thus the financial manager has to explore the implications of alternative assumptions about future cash flows, interest rates, and so on.

29-5 Long-Term Financial Planning

It's been said that a camel looks like a horse designed by a committee. If a firm made every decision piecemeal, it would end up with a financial camel. That is why smart financial managers also need to plan for the long term and to consider the financial actions that will be needed to support the company's long-term growth. Here is where finance and strategy come together. A coherent long-term plan demands an understanding of how the firm can generate superior returns by its choice of industry and by the way that it positions itself within that industry.

Long-term planning involves capital budgeting on a grand scale. It focuses on the investment by each line of business and avoids getting bogged down in details. Of course, some individual projects may be large enough to have significant individual impact. For example, the telecom giant Verizon recently began implementing a project to spend billions of dollars to deploy fiber-optic-based broadband technology to its residential customers. You can bet that this project was explicitly analyzed as part of its long-range financial plan. Normally, however, planners do not work on a project-by-project basis. Instead, they are content with rules of thumb that relate average levels of fixed and short-term assets to annual sales, and do not worry so much about seasonal variations in these relationships. In such cases, the likelihood that accounts receivable may rise as sales peak in the holiday season would be a needless detail that would distract from more important strategic decisions.

Why Build Financial Plans?

Firms spend considerable time and resources in long-term planning. What do they get for this investment?

Contingency Planning Planning is not just forecasting. Forecasting concentrates on the most likely outcomes, but planners worry about unlikely events as well as likely ones. If you think ahead about what could go wrong, then you are less likely to ignore the danger signals and you can respond faster to trouble.

Companies have developed a number of ways of asking "what-if" questions about both individual projects and the overall firm. For example, managers often work through the

consequences of their decisions under different scenarios. One scenario might envisage high interest rates contributing to a slowdown in world economic growth and lower commodity prices. A second scenario might involve a buoyant domestic economy, high inflation, and a weak currency. The idea is to formulate responses to inevitable surprises. What will you do, for example, if sales in the first year turn out to be 10% below forecast? A good financial plan should help you adapt as events unfold.

Considering Options Planners need to think whether there are opportunities for the company to exploit its existing strengths by moving into a wholly new area. Often they may recommend entering a market for "strategic" reasons—that is, not because the immediate investment has a positive net present value but because it establishes the firm in a new market and creates options for possibly valuable follow-on investments.

For example, Verizon's costly fiber-optic initiative gives the company the *real option* to offer additional services that may be highly valuable in the future, such as the rapid delivery of an array of home entertainment services. The justification for the huge investment lies in these potential growth options.

Forcing Consistency Financial plans draw out the connections between the firm's plans for growth and the financing requirements. For example, a forecast of 25% growth might require the firm to issue securities to pay for necessary capital expenditures, while a 5% growth rate might enable the firm to finance these expenditures by using only reinvested profits.

Financial plans should help to ensure that the firm's goals are mutually consistent. For example, the chief executive might say that she is shooting for a profit margin of 10% and sales growth of 20%, but financial planners need to think about whether the higher sales growth may require price cuts that will reduce profit margin.

Moreover, a goal that is stated in terms of accounting ratios is not operational unless it is translated back into what that means for business decisions. For example, a higher profit margin can result from higher prices, lower costs, or a move into new, high-margin products. Why then do managers define objectives in this way? In part, such goals may be a code to communicate real concerns. For example, a target profit margin may be a way of saying that in pursuing sales growth, the firm has allowed costs to get out of control. The danger is that everyone may forget the code and the accounting targets may be seen as goals in themselves. No one should be surprised when lower-level managers focus on the goals for which they are rewarded. For example, when Volkswagen set a goal of a 6.5% profit margin, some VW groups responded by developing and promoting expensive, high-margin cars. Less attention was paid to marketing cheaper models, which had lower profit margins but higher sales volume. As soon as this became apparent, Volkswagen announced that it would de-emphasize its profit margin goal and would instead focus on return on investment. It hoped that this would encourage managers to get the most profit out of every dollar of invested capital.

A Long-Term Financial Planning Model for Dynamic Mattress

Financial planners often use a financial planning model to help them explore the consequences of alternative strategies. We will drop in again on the financial manager of Dynamic Mattress to see how he uses a simple spreadsheet program to draw up the firm's long-term plan.

Long-term planning is concerned with the big picture. Therefore, when constructing long-term planning models it is generally acceptable to collapse all current assets and liabilities into a single figure for net working capital. Table 29.7 replaces Dynamic's latest balance sheets with condensed versions that report only net working capital rather than individual current assets or liabilities.

	2009	2008
Net working capital	190	140
Fixed assets:		
Gross investment	350	320
Less depreciation	100	80
Net fixed assests	250	240
Total net assets	440	380
Long-term debt	90	60
Net worth (equity and retained earnings)	350	320
Long-term liabilities and net worth*	440	380

TABLE 29.7

Condensed year-end balance sheets for 2009 and 2008 for Dynamic Mattress Company (figures in $ millions).

*When only net working capital appears on a firm's balance sheet, this figure (the sum of long-term liabilities and net worth) is often referred to as *total capitalization.*

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Suppose that Dynamic's analysis of the industry leads it to forecast a 20% annual growth in the company's sales and profits over the next five years. Can the company realistically expect to finance this out of retained earnings and borrowing, or should it plan for an issue of equity? Spreadsheet programs are tailor-made for such questions. Let's investigate.

The basic sources and uses relationship tells us that

$$\text{External capital required} = \text{investment in net working capital} + \text{investment in fixed assets} + \text{dividends} - \text{cash flow from operations}$$

Thus there are three steps to finding how much extra capital Dynamic will need and the implications for its debt ratio.

Step 1 Project next year's net income plus depreciation, assuming the planned 20% increase in revenues. The first column of Table 29.8 shows this figure for Dynamic in the latest year (2009) and is taken from Table 29.1. The remaining columns show the forecasted values for the following five years.

Step 2 Project what additional investment in net working capital and fixed assets will be needed to support this increased activity and how much of the net income will be paid out as dividends. The sum of these expenditures gives you the total *uses* of capital. If the total uses of capital exceed the cash flow generated by operations, Dynamic will need to raise additional long-term capital. The first column of Table 29.9 shows that in 2009 Dynamic needed to raise $30 million of new capital. The remaining columns forecast its capital needs for the following five years. For example, you can see that Dynamic will need to issue $144.5 million of debt in 2010 if it is to expand at the planned rate and not sell more shares.

Step 3 Finally, construct a forecast, or pro forma, balance sheet that incorporates the additional assets and the new levels of debt and equity. For example, the first column in Table 29.10 shows the latest condensed balance sheet for Dynamic Mattress. The remaining columns show that the company's equity grows by the additional retained earnings (net income less dividends), while long-term debt increases steadily to $691 million.

Over the five-year period Dynamic Mattress is forecasted to borrow an additional $601 million, and by year 2014 its debt ratio will have risen from 20% to 54%. The interest payments would still be comfortably covered by earnings and most financial managers could just about live with this amount of debt. However, the company could not continue to borrow at that rate beyond five years, and the debt ratio might be close to the limit set by the company's banks and bondholders.

An obvious alternative is for Dynamic to issue a mix of debt and equity, but there are other possibilities that the financial manager may want to explore. One option may be to hold back dividends during this period of rapid growth. An alternative might be to

		2009	2010	2011	2012	2013	2014
1	Revenues	2200.0	2640.0	3168.0	3801.6	4561.9	5474.3
2	Costs (92% of revenues)	2055.0	2428.8	2914.6	3497.5	4197.0	5036.4
3	Depreciation (9% of net fixed assets at start of year)	20.0	22.5	29.7	35.6	42.8	51.3
4	EBIT (1−2−3)	125.0	188.7	223.7	268.5	322.2	386.6
5	Interest (10% of long-term debt at start of year)	5.0	9.0	23.4	31.8	42.0	54.3
6	Tax at 50%	60.0	89.8	100.1	118.3	140.1	166.2
7	Net income (4−5−6)	60.0	89.8	100.1	118.3	140.1	166.2
8	Operating cash flow (3+7)	80.0	112.4	129.8	154.0	182.9	217.5

TABLE 29.8

Actual (2009) and forecasted operating cash flows for Dynamic Mattress Company (figures in $ millions).

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		2009	2010	2011	2012	2013	2014
	Sources of capital:						
1	Net income plus depreciation	80.0	112.4	129.8	154.0	182.9	217.5
	Uses of capital:						
2	Increase in net working capital (NWC) assuming NWC = 11% of revenues	50.0	100.4	58.1	69.7	83.6	100.4
3	Investment in fixed assets (FA) assuming net FA = 12.5% of revenues	30.0	102.5	95.7	114.8	137.8	165.4
4	Dividend (60% of net income)	30.0	53.9	60.1	71.0	84.1	99.7
5	Total uses of funds (2+3+4)	110.0	256.8	213.9	255.5	305.5	365.4
6	External capital required (1−5)	30.0	144.5	84.0	101.6	122.6	147.9

TABLE 29.9

Actual (2009) and forecasted amounts of external capital required for Dynamic Mattress Company (figures in $ millions).

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	2009	2010	2011	2012	2013	2014
Net working capital	190	290.4	348.5	418.2	501.8	602.2
Net fixed assets	250	330.0	396.0	475.2	570.2	684.3
Total net assets	440	620.4	744.5	893.4	1072.1	1286.5
Long-term debt	90	234.5	318.5	420.0	542.7	690.6
Equity	350	385.9	426.0	473.3	529.4	595.8
Total long-term liabilities and equity	440	620.4	744.5	893.4	1072.1	1286.5

TABLE 29.10

Actual (2009) and pro forma balance sheets for Dynamic Mattress Company (figures in $ millions).

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investigate whether the company could cut back on net working capital. For example, it may be able to economize on inventories or speed up the collection of receivables. The model makes it easy to examine these alternatives.

We stated earlier that financial planning is not just about exploring how to cope with the most likely outcomes. It also needs to ensure that the firm is prepared for unlikely or unexpected ones. For example, management would certainly wish to check that Dynamic

Mattress could cope with a cyclical decline in sales and profit margins. Sensitivity analysis or scenario analysis can help to do this.

Pitfalls in Model Design

The Dynamic Mattress model that we have developed is too simple for practical application. You probably have already thought of several ways to improve it—by keeping track of the outstanding shares, for example, and printing out earnings and dividends per share. Or you might want to distinguish between short-term lending and borrowing opportunities, now buried in working capital.

The model that we developed for Dynamic Mattress is known as a *percentage of sales model.* Almost all the forecasts for the company are proportional to the forecasted level of sales. However, in reality many variables will *not* be proportional to sales. For example, important components of working capital such as inventory and cash balances will generally rise less rapidly than sales. In addition, fixed assets such as plant and equipment are not usually added in small increments as sales increase. The Dynamic Mattress plant may well be operating at less than full capacity, so that the company can initially increase output without *any* additions to capacity. Eventually, however, if sales continue to increase, the firm may need to make a large new investment in plant and equipment.

But beware of adding too much complexity: There is always the temptation to make a model bigger and more detailed. You may end up with an exhaustive model that is too cumbersome for routine use. The fascination of detail, if you give in to it, distracts attention from crucial decisions like stock issues and payout policy.

Choosing a Plan

Financial planning models help the manager to develop consistent forecasts of crucial financial variables. For example, if you wish to value Dynamic Mattress, you need forecasts of future free cash flows. These are easily derived up to the end of the planning period from our financial planning model.[17] However, a planning model does not tell you whether the plan is optimal. It does not even tell you which alternatives are worth examining. For example, we saw that Dynamic Mattress is planning for a rapid growth in sales and earnings per share. But is that good news for the shareholders? Well, not necessarily; it depends on the opportunity cost of the capital that Dynamic Mattress needs to invest. If the new investment earns more than the cost of capital, it will have a positive NPV and add to shareholder wealth. If the investment earns less than the cost of capital, shareholders will be worse off, even though the company expects steady growth in earnings.

The capital that Dynamic Mattress needs to raise depends on its decision to pay out 60% of its earnings as a dividend. But the financial planning model does not tell us whether this dividend payment makes sense or what mixture of equity or debt the company should issue. In the end the management has to decide. We would like to tell you exactly how to make the choice, but we can't. There is no model that encompasses all the complexities encountered in financial planning and decision making.

As a matter of fact, there never will be one. This bold statement is based on Brealey, Myers, and Allen's Third Law:[18]

Axiom: The number of unsolved problems is infinite.

Axiom: The number of unsolved problems that humans can hold in their minds is at any time limited to 10.

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[17] Look back at Table 19.1, where we set out the free cash flows for Rio Corporation. A financial planning model would be a natural tool for deriving these figures.

[18] The Second Law is presented in Section 10-1.

Law: Therefore in any field there will always be 10 problems that can be addressed but that have no formal solution.

BMA's Third Law implies that no model can find the best of all financial strategies.[19]

29-6 Growth and External Financing

We started this chapter by noting that financial plans force managers to be consistent in their goals for growth, investment, and financing. Before leaving the topic of financial planning, we should look at some general relationships between a firm's growth objectives and its financing needs.

Recall that Dynamic Mattress ended 2009 with fixed assets and net working capital of $440 million. In 2010 it plans to plow back retained earnings of $35.9 million, so net assets will increase by 35.9/440, or 8.16%. Thus Dynamic Mattress can grow by 8.16% without needing to raise additional capital. The maximum growth rate that a company can achieve without external funds is known as the **internal growth rate.** For Dynamic Mattress

$$\text{Internal growth rate} = \frac{\text{retained earnings}}{\text{net assets}} = 8.16\%$$

We can gain more insight into what determines this growth rate by multiplying the top and bottom of the expression for internal growth rate by *net income* and *equity* as follows:

$$\text{Internal growth rate} = \frac{\text{retained earnings}}{\text{net income}} \times \frac{\text{net income}}{\text{equity}} \times \frac{\text{equity}}{\text{net assets}}$$

In 2010 Dynamic Mattress expects to plow back 40% of net income and to earn a return of 25.66% on the equity with which it began the year. At the start of the year equity finances 79.55% of Dynamic Mattress's net assets. Therefore

$$\text{Internal growth rate} = .40 \times .2566 \times .7955 = .0816 \text{ or } 8.16\%$$

Notice that if Dynamic Mattress wishes to grow faster than this without raising equity capital, it would need to (1) plow back a higher proportion of its earnings, (2) earn a higher return on equity (ROE), or (3) have a lower debt-to-equity ratio.[20]

Instead of focusing on how rapidly the company can grow without *any* external financing, Dynamic Mattress's financial manager may be interested in the growth rate that can be sustained without additional *equity* issues. Of course, if the firm is able to raise enough debt, virtually any growth rate can be financed. It makes more sense to assume that the firm has settled on an optimal capital structure that it will maintain as equity is increased by the retained earnings. Thus the firm issues only enough debt to keep the debt–equity ratio constant. The **sustainable growth rate** is the highest growth rate the firm can maintain without increasing its financial leverage. It turns out that the sustainable growth rate depends only on the plowback rate and the return on equity:

$$\text{Sustainable growth rate} = \text{plowback ratio} \times \text{return on equity}$$

For Dynamic Mattress,

$$\text{Sustainable growth rate} = .40 \times .2566 = .1026, \text{ or } 10.26\%$$

[19] It is possible to build linear programming models that help search for the best strategy subject to specified assumptions and conditions. These models can be more effective in screening alternative financial strategies.

[20] Notice, however, that if assets grow by only 8.16%, either the sales-to-assets ratio or the profit margin must increase to maintain a 25.66% return on equity.

We first encountered this formula in Chapter 4, where we used it to value common stocks.

These simple formulas remind us that firms may grow rapidly in the short term by relying on debt finance, but such growth can rarely be maintained without incurring excessive debt levels.

SUMMARY

Short-term financial planning is concerned with the management of the firm's short-term, or current, assets and liabilities. The most important current assets are cash, marketable securities, accounts receivable, and inventory. The most important current liabilities are short-term loans and accounts payable. The difference between current assets and current liabilities is called (net) working capital.

The nature of the firm's short-term financial planning problem is determined by the amount of long-term capital it raises. A firm that issues large amounts of long-term debt or common stock, or that retains a large part of its earnings, may find it has permanent excess cash. In such cases there is never any problem paying bills, and short-term financial planning consists of managing the firm's portfolio of marketable securities. A firm holding a reserve of cash is able to buy itself time to react to a short-term crisis. This may be important for growth firms that find it difficult to raise cash on short notice. However, large cash holdings can lead to complacency. We suggest that firms with permanent cash surpluses ought to consider returning the excess cash to their stockholders.

Other firms raise relatively little long-term capital and end up as permanent short-term debtors. Most firms attempt to find a golden mean by financing all fixed assets and part of current assets with equity and long-term debt. Such firms may invest cash surpluses during part of the year and borrow during the rest of the year.

The starting point for short-term financial planning is an understanding of sources and uses of cash. Firms forecast their net cash requirements by estimating collections on accounts receivable, adding other cash inflows, and subtracting all cash outlays. If the forecasted cash balance is insufficient to cover day-to-day operations and to provide a buffer against contingencies, the company will need to find additional finance. The search for the best short-term financial plan inevitably proceeds by trial and error. The financial manager must explore the consequences of different assumptions about cash requirements, interest rates, sources of finance, and so on. Firms use computerized financial models to help in this process. These models range from simple spreadsheet programs that merely help with the arithmetic to linear programming models that search for the best financial plan.

Short-term financial planning focuses on the firm's cash flow over the coming year. But the financial manager also needs to consider what financial actions will be needed to support the firm's plans for growth over the next 5 or 10 years. Most firms, therefore, prepare a long-term financial plan that describes the firm's strategy and projects its financial consequences. The plan establishes financial goals and is a benchmark for evaluating subsequent performance.

The process that produces this plan is valuable in its own right. First, planning forces the financial manager to consider the combined effects of all the firm's investment and financing decisions. This is important because these decisions interact and should not be made independently. Second, planning requires the manager to consider events that could upset the firm's progress and to devise strategies to be held in reserve for counterattack when unhappy surprises occur.

There is no theory or model that leads straight to *the* optimal financial strategy. As in the case of short-term planning, many different strategies may be projected under a range of assumptions about the future. The dozens of separate projections that may need to be made generate a heavy load of arithmetic. We showed how you can use a simple spreadsheet model to analyze Dynamic Mattress's long-term strategy.

FURTHER READING

The following text is concerned with liquidity management and short-term planning:

J. G. Kallberg and K. Parkinson, *Corporate Liquidity Management and Measurement,* (Burr Ridge, IL: Irwin/McGraw-Hill, 1996).

Long-term financial models are discussed in:

J. R. Morris and J. P Daley, *Introduction to Financial Models for Management and Planning* (Boca Raton, FL: Chapman & Hall/CRC Finance Series, 2009).

Select problems are available in McGraw-Hill Connect. Please see the preface for more information.

PROBLEM SETS

BASIC

1. Listed below are six transactions that Dynamic Mattress might make. Indicate how each transaction would affect (a) cash and (b) working capital.

The transactions are

i. Pay out an extra $10 million cash dividend.

ii. Receive $2,500 from a customer who pays a bill resulting from a previous sale.

iii. Pay $50,000 previously owed to one of its suppliers.

iv. Borrow $10 million long term and invest the proceeds in inventory.

v. Borrow $10 million short term and invest the proceeds in inventory.

vi. Sell $5 million of marketable securities for cash.

2. State how each of the following events would affect the firm's balance sheet. State whether each change is a source or use of cash.

a. An automobile manufacturer increases production in response to a forecasted increase in demand. Unfortunately, the demand does not increase.

b. Competition forces the firm to give customers more time to pay for their purchases.

c. Rising commodity prices increase the value of raw material inventories by 20%.

d. The firm sells a parcel of land for $100,000. The land was purchased five years earlier for $200,000.

e. The firm repurchases its own common stock.

f. The firm doubles its quarterly dividend.

g. The firm issues $1 million of long-term debt and uses the proceeds to repay a short-term bank loan.

3. Here is a forecast of sales by National Bromide for the first four months of 2010 (figures in $ thousands):

	Month 1	Month 2	Month 3	Month 4
Cash sales	15	24	18	14
Sales on credit	100	120	90	70

On the average 50% of credit sales are paid for in the current month, 30% are paid in the next month, and the remainder are paid in the month after that. What is the expected cash inflow from operations in months 3 and 4?

4. Dynamic Futon forecasts the following purchases from suppliers:

	Jan.	Feb.	Mar.	Apr.	May	Jun.
Value of goods ($ millions)	32	28	25	22	20	20

a. Forty percent of goods are supplied cash-on-delivery. The remainder are paid with an average delay of one month. If Dynamic Futon starts the year with payables of $22 million, what is the forecasted level of payables for each month?

b. Suppose that from the start of the year the company stretches payables by paying 40% after one month and 20% after two months. (The remainder continue to be paid cash on delivery.) Recalculate payables for each month assuming that there are no cash penalties for late payment.

5. Each of the following events affects one or more tables in Sections 29-2 to 29-3. Show the effects of each event by adjusting the tables listed in parentheses:

a. Dynamic repays only $10 million of short-term debt in 2009. (Tables 29.2 and 29.3)

b. Dynamic issues an additional $40 million of long-term debt in 2009 and invests $25 million in a new warehouse. (Tables 29.1–29.3)

c. In 2009 Dynamic reduces the quantity of stuffing in each mattress. Customers don't notice, but operating costs fall by 10%. (Tables 29.1–29.3)

d. Starting in the third quarter of 2010, Dynamic employs new staff members who prove very effective in persuading customers to pay more promptly. As a result, 90% of sales are paid for immediately and 10% are paid in the following quarter. (Tables 29.4 and 29.5)

e. Starting in the first quarter of 2010, Dynamic cuts wages by $20 million a quarter. (Table 29.5)

f. In the second quarter of 2010 a disused warehouse catches fire mysteriously. Dynamic receives a $50 million check from the insurance company. (Table 29.5)

g. Dynamic's treasurer decides he can scrape by on a $10 million operating cash balance. (Table 29.5)

6. True or false?

a. Financial planning should attempt to minimize risk.

b. The primary aim of financial planning is to obtain better forecasts of future cash flows and earnings.

c. Financial planning is necessary because financing and investment decisions interact and should not be made independently.

d. Firms' planning horizons rarely exceed three years.

e. Financial planning requires accurate forecasting.

f. Financial planning models should include as much detail as possible.

7. Table 29.11 on the next page summarizes the 2011 income statement and end-year balance sheet of Drake's Bowling Alleys. Drake's financial manager forecasts a 10% increase in sales and costs in 2009. The ratio of sales to *average* assets is expected to remain at .40. Interest is forecasted at 5% of debt at the start of the year.

a. What is the implied level of assets at the end of 2012?

b. If the company pays out 50% of net income as dividends, how much cash will Drake need to raise in the capital markets in 2012?

c. If Drake is unwilling to make an equity issue, what will be the debt ratio at the end of 2012?

8. Abbreviated financial statements for Archimedes Levers are shown in Table 29.12 on the next page. If sales increase by 10% in 2011 and all other items, including debt, increase correspondingly, what must be the balancing item? What will be its value?

TABLE 29.11
Financial statements for Drake's Bowling Alleys, 2011 (figures in thousands). See Problem 7.

*Assets at the end of 2010 were $2,400,000.
**Debt at the end of 2010 was $500,000.

Income Statement		
Sales	$1,000	(40% of average assets)*
Costs	750	(75% of sales)
Interest	25	(5% of debt at start of year)**
Pretax profit	225	
Tax	90	(40% of pretax profit)
Net income	$135	

Balance Sheet			
Assets	$2,600	Debt	$500
		Equity	2,100
Total	$2,600	Total	$2,600

TABLE 29.12
Financial statements for Archimedes Levers, 2010. See Problem 8 and 9.

Income Statement	
Sales	$4,000
Costs, including interest	3,500
Net income	$500

Balance Sheet, Year-end					
	2010	2009		2010	2009
Assets	$3,200	$2,700	Debt	$1,200	$1,033
			Equity	2,000	1,667
Total	$3,200	$2,700	Total	$3,200	$2,700

9. What is the maximum possible growth rate for Archimedes (see Problem 8) if the payout ratio is set at 50% and (a) no external debt or equity is to be issued? (b) the firm maintains a fixed debt ratio but issues no equity?

INTERMEDIATE

10. Table 29.13 (on the next page) lists data from the budget of Ritewell Publishers. Half the company's sales are for cash on the nail; the other half are paid for with a one-month delay. The company pays all its credit purchases with a one-month delay. Credit purchases in January were $30, and total sales in January were $180. Complete the cash budget in Table 29.14 (on the next page).

11. If a firm pays its bills with a 30-day delay, what fraction of its purchases will be paid in the current quarter? In the following quarter? What if the delay is 60 days?

12. Which items in Table 29.6 would be affected by the following events?

a. There is a rise in interest rates.

b. Suppliers demand interest for late payment.

c. Dynamic receives an unexpected bill in the third quarter from the Internal Revenue Service for underpayment of taxes in previous years.

13. Table 29.15 (on the next page) shows Dynamic Mattress's year-end 2007 balance sheet, and Table 29.16 (on page 754) shows its income statement for 2008. Work out the statement of cash flows for 2008. Group these items into sources of cash and uses of cash.

14. Work out a short-term financing plan for Dynamic Mattress Company, assuming the limit on the line of credit is raised from $100 to $120 million. Otherwise keep to the assumptions used in developing Table 29.6 (on page 741).

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	February	March	April
Total sales	$200	$220	$180
Purchases of materials			
For cash	70	80	60
For credit	40	30	40
Other expenses	30	30	30
Taxes, interest, and dividends	10	10	10
Capital investment	100	0	0

TABLE 29.13
Selected budget data for Ritewell Publishers. See Problems 10.

	February	March	April
Sources of cash:			
Collections on cash sales			
Collections on accounts receivables			
Total sources of cash			
Uses of cash:			
Payments of accounts payable			
Cash purchases of materials			
Other expenses			
Capital expenditures			
Taxes, interest, and dividends			
Total uses of cash			
Net cash inflow			
Cash at start of period	100		
+ Net cash inflow			
= Cash at end of period			
+ Minimum operating cash balance	100	100	100
= Cumulative short-term financing required			

TABLE 29.14
Cash budget for Ritewell Publishers. See Problems 10.

Current Assets:		Current Liabilities:	
Cash	$ 20	Bank loans	$ 20
Marketable securities	10	Accounts payable	75
Accounts receivable	110	Total current liabilities	95
Inventory	100		
Total current assets	240	Long-term debt	25
		Net worth (equity and retained earnings)	300
Fixed assets:			
Gross investment	250		
Less depreciation	70		
Net fixed assets	180		
Total assets	420	Total liabilities and net worth	420

TABLE 29.15
Year-end balance sheet for Dynamic Mattress for 2007 (figures in $ millions). See Problems 13.

TABLE 29.16
Income statement for Dynamic Mattress for 2008 (figures in $ millions).

Note: Dividend = $30. Retained earnings = $10.

Sales	$1,500
Operating costs	1,405
	95
Depreciation	10
	85
Interest	5
Pretax income	80
Tax at 50%	40
Net income	40

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15. Dynamic Mattress decides to lease its new mattress-stuffing machines rather than buy them. As a result, capital expenditure in the first quarter is reduced by $50 million, but the company must make lease payments of $2.5 million for each of the four quarters. Assume that the lease has no effect on tax payments until after the fourth quarter. Construct two tables like Tables 29.5 and 29.6 showing Dynamic's cumulative financing requirement and a new financing plan. Check your answer using the "live" spreadsheet on the book's Web site, **www.mhhe.com/bma**.

16. Our long-term planning model of Dynamic Mattress is an example of a top-down planning model. Some firms use a bottom-up financial planning model, which incorporates forecasts of revenues and costs for particular products, advertising plans, major investment projects, and so on. What sort of firms would you expect to use each type, and what would they use them for?

17. Corporate financial plans are often used as a basis for judging subsequent performance. What do you think can be learned from such comparisons? What problems are likely to arise, and how might you cope with these problems?

18. The balancing item in the Dynamic long-term planning model is borrowing. What is meant by *balancing item?* How would the model change if dividends were made the balancing item instead? In that case how would you suggest that planned borrowing be determined?

19. Construct a new model for Dynamic Mattress based on your answer to Problem 18. Does your model generate a feasible financial plan for 2010? (*Hint:* If it doesn't, you may have to allow the firm to issue stock.)

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20. a. Use the Dynamic Mattress model (Tables 29.8–29.10) and the "live" spreadsheets on the book's Web site at **www.mhhe.com/bma** to produce pro forma income statements, balance sheets, and statements of cash flows for 2010 and 2011. Assume business as usual except that now sales and costs are planned to expand by 30% per year, as are fixed assets and net working capital. The interest rate is forecasted to remain at 10% and stock issues are ruled out. Dynamic also sticks to its 60% dividend payout ratio.

b. What are the firm's debt ratio and interest coverage under this plan?

c. Can the company continue to finance expansion by borrowing?

21. The financial statements of Eagle Sport Supply are shown in Table 29.17 (on the next page). For simplicity, "Costs" include interest. Assume that Eagle's assets are proportional to its sales.

a. Find Eagle's required external funds if it maintains a dividend payout ratio of 60% and plans a growth rate of 15% in 2012.

b. If Eagle chooses not to issue new shares of stock, what variable must be the balancing item? What will its value be?

c. Now suppose that the firm plans instead to increase long-term debt only to $1,100 and does not wish to issue any new shares of stock. Why must the dividend payment now be the balancing item? What will its value be?

22. a. What is the internal growth rate of Eagle Sport (see Problem 21) if the dividend payout ratio is fixed at 60% and the equity-to-asset ratio is fixed at two-thirds?

b. What is the sustainable growth rate?

23. Bio-Plasma Corp. is growing at 30% per year. It is all-equity-financed and has total assets of $1 million. Its return on equity is 20%. Its plowback ratio is 40%.

a. What is the internal growth rate?

b. What is the firm's need for external financing this year?

Income Statement					
Sales	$950				
Costs	250				
Pretax income	700				
Taxes (at 28.6%)	200				
Net income	$500				
Balance Sheet, Year-end					
	2011	**2010**		**2011**	**2010**
Assets	$3,000	$2,700	Debt	$1,000	$900
			Equity	2,000	1,800
Total	$3,000	$2,700	Total	$3,000	$2,700

TABLE 29.17
Financial statements for Eagle Sport Supply, 2011. See Problem 21.

c. By how much would the firm increase its internal growth rate if it reduced its payout rate to zero?

d. By how much would such a move reduce the need for external financing? What do you conclude about the relationship between dividend policy and requirements for external financing?

CHALLENGE

24. Table 29.18 shows the 2010 financial statements for the Executive Cheese Company. Annual depreciation is 10% of fixed assets at the beginning of the year, plus 10% of new investment. The company plans to invest a further $200,000 per year in fixed assets for the next five years and net working capital is expected to remain a constant proportion of fixed

Income Statement		
Revenue		$1,785
Fixed costs		53
Variable costs (80% of revenue)		1,428
Depreciation		80
Interest (at 11.8%)		24
Taxes (at 40%)		80
Net income		$ 120
Balance Sheet, Year-end		
	2010	**2009**
Assets:		
Net working capital	$ 400	$ 340
Fixed assets	800	680
Total assets	$1,200	$1,020
Liabilities:		
Debt	$ 240	$ 204
Book equity	960	816
Total liabilities	$1,200	$1,020

TABLE 29.18
Financial statements for Executive Cheese Company, 2010 (figures in thousands).

(*continued on next page*)

TABLE 29.18
(*continued*)
Financial statements for Executive Cheese Company, 2010 (figures in thousands).

Sources and Uses	
Sources:	
Net income	$120
Depreciation	80
Borrowing	36
Stock issues	104
Total sources	$340
Uses:	
Increase in net working capital	$ 60
Investment	200
Dividends	80
Total uses	$340

assets. The company forecasts that the ratio of revenues to total assets at the start of each year will remain at 1.75. Fixed costs are expected to remain at $53, and variable costs at 80% of revenue. The company's policy is to pay out two-thirds of net income as dividends and to maintain a book debt ratio of 20%.

a. Construct a model for Executive Cheese like the one in Tables 29.8–29.10.

b. Use your model to produce a set of financial statements for 2011.

REAL-TIME DATA ANALYSIS

STANDARD &POOR'S

Look up the financial statements for any company either on **http://finance.yahoo.com** or on the Market Insight Database (**www.mhhe.com/edumarketinsight**). Make some plausible forecasts for future growth and the asset base needed to support that growth. Then use a spreadsheet program to develop a five-year financial plan. What financing is needed to support the planned growth? How vulnerable is the company to an error in your forecasts?