## **CHAPTER 26**

## Short-Term Finance and Planning



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With gasoline approaching \$4 per gallon in the middle of 2011, sales of hybrid automobiles really began to pick up. For example, in July 2011, a Toyota Prius sat on a dealer's lot for 19 days, on average, before selling. If you were looking for something a little more upscale, the Lexus CT 200H sat for only seven days, on average. And the inventory for the plug-in hybrid Chevrolet Volt was even lower. There were only 100 vehicles on dealer lots across the U.S. and less than 11 percent of all dealers even had a Volt on the lot. That's shocking! As this chapter explores, the length of time goods are carried in inventory until they are sold is an important element of short-term financial management, and companies such as those in the automobile industry pay close attention to it.

To this point, we have described many of the decisions of long-term finance, such as those of capital budgeting, dividend policy, and financial structure. In this chapter, we begin to discuss short-term finance. Short-term finance is primarily concerned with the analysis of decisions that affect current assets and current liabilities.

Frequently, the term *net working capital* is associated with short-term financial decision making. As we have described in previous chapters, net working capital is the difference between current assets and current liabilities. Often, short-term financial management is called *working capital management*. These terms mean the same thing.

There is no universally accepted definition of short-term finance. The most important difference between short-term and long-term finance is in the timing of cash flows. Short-term financial decisions typically involve cash inflows and outflows that occur within a year. For example, short-term financial decisions are involved when a firm orders raw materials, pays in cash, and anticipates selling finished goods in one year for cash. In contrast, long-term financial decisions are involved when a firm purchases a special machine that will reduce operating costs over, say, the next five years.

What types of questions fall under the general heading of short-term finance? To name a few:

- 1. What is a reasonable level of cash to keep on hand (in a bank) to pay bills?
- 2. How much should the firm borrow in the short term?
- 3. How much credit should be extended to customers?

This chapter introduces the basic elements of short-term financial decisions. First, we discuss the short-term operating activities of the firm. We then identify some alternative short-term financial policies. Finally, we outline the basic elements in a short-term financial plan and describe short-term financing instruments.

## 26.1 Tracing Cash and Net Working Capital

In this section, we examine the components of cash and net working capital as they change from one year to the next. We have already discussed various aspects of this subject in Chapters 2 and 3. We briefly review some of that discussion as it relates to short-term financing decisions. Our goal is to describe the short-term operating activities of the firm and their impact on cash and net working capital.

To begin, recall that *current assets* are cash and other assets that are expected to convert to cash within the year. Current assets are presented on the balance sheet in order of their accounting liquidity—the ease with which they can be converted to cash and the time it takes to convert them. Four of the most important items found in the current asset section of a balance sheet are cash and cash equivalents, marketable securities, accounts receivable, and inventories.

Analogous to their investment in current assets, firms use several kinds of shortterm debt called *current liabilities*. Current liabilities are obligations that are expected to require cash payment within one year (or within the operating period if it is longer than one year). Three major items found as current liabilities are accounts payable, expenses payable (including accrued wages and taxes), and notes payable.

Because we want to focus on changes in cash, we start off by defining cash in terms of the other elements of the balance sheet. This lets us isolate the cash account and explore the impact on cash from the firm's operating and financing decisions. The basic balance sheet identity can be written as:

Net working capital + Fixed assets = Long-term debt + Equity (26.1)

Net working capital is cash plus other current assets, less current liabilities; that is:

Net working capital = (Cash + Other current assets) - Current liabilities (26.2)

If we substitute this for net working capital in the basic balance sheet identity and rearrange things a bit, we see that cash is:

Cash = Long-term debt + Equity + Current liabilities (26.3) - Current assets other than cash - Fixed assets

This tells us in general terms that some activities naturally increase cash and some activities decrease it. We can list these various activities, along with an example of each, as follows:

#### **Activities That Increase Cash**

Increasing long-term debt (borrowing over the long term)

Increasing equity (selling some stock)

Increasing current liabilities (getting a 90-day loan)

Decreasing current assets other than cash (selling some inventory for cash)

Decreasing fixed assets (selling some property)

#### **Activities That Decrease Cash**

Decreasing long-term debt (paying off a long-term debt) Decreasing equity (repurchasing some stock) Decreasing current liabilities (paying off a 90-day loan)

Increasing current assets other than cash (buying some inventory for cash)

Increasing fixed assets (buying some property)

Notice that our two lists are exact opposites. For example, floating a long-term bond issue increases cash (at least until the money is spent). Paying off a long-term bond issue decreases cash.

Activities that increase cash are called *sources of cash*. Those activities that decrease cash are called *uses of cash*. Looking back at our list, we see that sources of cash always involve increasing a liability (or equity) account or decreasing an asset account. This makes sense because increasing a liability means that we have raised money by borrowing it or by selling an ownership interest in the firm. A decrease in an asset means that we have sold or otherwise liquidated an asset. In either case there is a cash inflow.

Uses of cash are just the reverse. A use of cash involves decreasing a liability by paying it off, perhaps, or increasing assets by purchasing something. Both of these activities require that the firm spend some cash.

#### EXAMPLE 26.1

**Sources and Uses** Here is a quick check of your understanding of sources and uses: If accounts payable go up by \$100, does this indicate a source or a use? What if accounts receivable go up by \$100?

Accounts payable are what we owe our suppliers. This is a short-term debt. If it rises by \$100, we have effectively borrowed the money, which is a *source* of cash. Receivables are what our customers owe to us, so an increase of \$100 in accounts receivable means that we have loaned the money; this is a *use* of cash.

## 26.2 The Operating Cycle and the Cash Cycle

The primary concern in short-term finance is the firm's short-run operating and financing activities. For a typical manufacturing firm, these short-run activities might consist of the following sequence of events and decisions:

Event	Decision
I. Buying raw materials	I. How much inventory to order
2. Paying cash	2. Whether to borrow or draw down cash balances
3. Manufacturing the product	3. What choice of production technology to use
4. Selling the product	<ol> <li>Whether credit should be extended to a particular customer</li> </ol>
5. Collecting cash	5. How to collect

These activities create patterns of cash inflows and cash outflows. These cash flows are both unsynchronized and uncertain. They are unsynchronized because, for example, the payment of cash for raw materials does not happen at the same time as the

receipt of cash from selling the product. They are uncertain because future sales and costs cannot be precisely predicted.

#### **DEFINING THE OPERATING AND CASH CYCLES**

We can start with a simple case. One day, call it Day 0, we purchase \$1,000 worth of inventory on credit. We pay the bill 30 days later, and, after 30 more days, someone buys the \$1,000 in inventory for \$1,400. Our buyer does not actually pay for another 45 days. We can summarize these events chronologically as follows:

Day	Activity	Cash Effect
0	Acquire inventory	None
30	Pay for inventory	-\$I,000
60	Sell inventory on credit	None
105	Collect on sale	+\$1,400

**The Operating Cycle** There are several things to notice in our example. First, the entire cycle, from the time we acquire some inventory to the time we collect the cash, takes 105 days. This is called the operating cycle.

As we illustrate, the operating cycle is the length of time it takes to acquire inventory, sell it, and collect for it. This cycle has two distinct components. The first part is the time it takes to acquire and sell the inventory. This period, a 60-day span in our example, is called the inventory period. The second part is the time it takes to collect on the sale, 45 days in our example. This is called the accounts receivable period.

Based on our definitions, the operating cycle is obviously just the sum of the inventory and accounts receivable periods:

Operating cycle = Inventory period + Accounts receivable period  

$$105 \text{ days} = 60 \text{ days} + 45 \text{ days}$$
(26.4)

What the operating cycle describes is how a product moves through the current asset accounts. The product begins life as inventory, it is converted to a receivable when it is sold, and it is finally converted to cash when we collect from the sale. Notice that, at each step, the asset is moving closer to cash.

The Cash Cycle The second thing to notice is that the cash flows and other events that occur are not synchronized. For example, we don't actually pay for the inventory until 30 days after we acquire it. The intervening 30-day period is called the accounts payable period. Next, we spend cash on Day 30, but we don't collect until Day 105. Somehow, we have to arrange to finance the 1,000 for 105 - 30 = 75 days. This period is called the **cash cycle**.

The cash cycle, therefore, is the number of days that pass before we collect the cash from a sale, measured from when we actually pay for the inventory. Notice that, based on our definitions, the cash cycle is the difference between the operating cycle and the accounts payable period:

> Cash cycle = Operating cycle - Accounts payable period (26.5)75 days = 105 days - 30 days

#### Figure 26.I

Cash Flow Time Line and the Short-Term Operating Activities of a Typical Manufacturing Firm



The operating cycle is the time period from inventory purchase until the receipt of cash. (The operating cycle may not include the time from placement of the order until arrival of the stock.) The cash cycle is the time period from when cash is paid out to when cash is received.

Figure 26.1 depicts the short-term operating activities and cash flows of a typical manufacturing firm by way of a cash flow time line. As shown, the **cash flow time line** presents the operating cycle and the cash cycle in graphical form. In Figure 26.1, the need for short-term financial management is suggested by the gap between the cash inflows and the cash outflows. This is related to the lengths of the operating cycle and the accounts payable period.

The gap between short-term inflows and outflows can be filled either by borrowing or by holding a liquidity reserve in the form of cash or marketable securities. Alternatively, the gap can be shortened by changing the inventory, receivable, and payable periods. These are all managerial options that we discuss in the following sections.

Internet-based bookseller and retailer Amazon.com provides an interesting example of the importance of managing the cash cycle. In August 2011, the market value of Amazon.com was higher than (in fact, more than 100 times as much as) that of Barnes & Noble, king of the brick-and-mortar bookstores.

How could Amazon.com be worth so much more? There are multiple reasons, but short-term management is one factor. During 2010, Amazon turned over its inventory about 10 times per year, 3 times faster than Barnes & Noble; so, its inventory period was dramatically shorter. Even more striking, Amazon charges a customer's credit card when it ships a book, and it usually gets paid by the credit card firm within a day. This means Amazon has a *negative* cash cycle! In fact, during 2010, Amazon's cash cycle was a negative 69 days. Every sale therefore generates a cash inflow that can be put to work immediately.

Amazon is not the only company with a negative cash cycle. Consider aircraft manufacturer Boeing Company. During 2010, Boeing had an inventory period of 145 days and a receivables period of 36 days, so its operating cycle was a lengthy 182 days (the extra day is due to rounding errors). Boeing's cash cycle must be fairly long, right? Wrong. Boeing had a payables period of 235 days, so its cash cycle was a negative 53 days!

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808

# Table 26.1Managers WhoDeal with Short-

Term Financial Problems

Title of Manager	Duties Related to Short-Term Financial Management	Assets/Liabilities Influenced
Cash manager	Collection, concentration, disbursement; short-term investments; short-term borrowing; banking relations	Cash, marketable securi- ties, short-term loans
Credit manager	Monitoring and control of accounts receivable; credit policy decisions	Accounts receivable
Marketing manager	Credit policy decisions	Accounts receivable
Purchasing manager	Decisions on purchases, suppliers; may negotiate payment terms	Inventory, accounts payable
Production manager	Setting of production schedules and materials requirements	Inventory, accounts payable
Payables manager	Decisions on payment policies and on whether to take discounts	Accounts payable
Controller	Accounting information on cash flows; reconciliation of accounts payable; application of payments to accounts receivable	Accounts receivable, accounts payable

#### THE OPERATING CYCLE AND THE FIRM'S ORGANIZATION CHART

Before we examine the operating and cash cycles in greater detail, it is useful for us to take a look at the people involved in managing a firm's current assets and liabilities. As Table 26.1 illustrates, short-term financial management in a large corporation involves a number of different financial and nonfinancial managers. Examining Table 26.1, we see that selling on credit involves at least three different entities: The credit manager, the marketing manager, and the controller. Of these three, only two are responsible to the vice president of finance (the marketing function is usually associated with the vice president of marketing). Thus, there is the potential for conflict, particularly if different managers concentrate on only part of the picture. For example, if marketing is trying to land a new account, it may seek more liberal credit terms as an inducement. However, this may increase the firm's investment in receivables or its exposure to bad-debt risk, and conflict can result.

#### **CALCULATING THE OPERATING AND CASH CYCLES**

In our example, the lengths of time that made up the different periods were obvious. If all we have is financial statement information, we will have to do a little more work. We illustrate these calculations next.

To begin, we need to determine various things such as how long it takes, on average, to sell inventory and how long it takes, on average, to collect receivables. We start by gathering some balance sheet information such as the following (in thousands):

ltem	Beginning	Ending	Average
Inventory Accounts receivable	\$2,000 1,600	\$3,000 2,000	\$2,500 1,800
Accounts payable	750	1,000	875

809

Also, from the most recent income statement, we might have the following figures (in thousands):

Net sales	\$11,500
Cost of goods sold	8,200

We now need to calculate some financial ratios. We discussed these in some detail in Chapter 3; here, we just define them and use them as needed.

**The Operating Cycle** First of all, we need the inventory period. We spent \$8.2 million on inventory (our cost of goods sold). Our average inventory was \$2.5 million. We thus turned our inventory over \$8.2/2.5 times during the year:<sup>1</sup>

Inventory turnover = 
$$\frac{\text{Cost of goods sold}}{\text{Average inventory}}$$
  
=  $\frac{\$8.2 \text{ million}}{2.5 \text{ million}} = 3.28 \text{ times}$ 

Loosely speaking, this tells us that we bought and sold off our inventory 3.28 times during the year. This means that, on average, we held our inventory for:

Inventory period = 
$$\frac{365 \text{ days}}{\text{Inventory turnover}}$$
  
=  $\frac{365}{3.28}$  = 111.3 days

So, the inventory period is about 111 days. On average, in other words, inventory sat for about 111 days before it was sold.<sup>2</sup>

Similarly, receivables averaged \$1.8 million, and sales were \$11.5 million. Assuming that all sales were credit sales, the receivables turnover is:<sup>3</sup>

Receivables turnover =  $\frac{\text{Credit sales}}{\text{Average accounts receivable}}$ =  $\frac{\$11.5 \text{ million}}{1.8 \text{ million}} = 6.4 \text{ times}$ 

If we turn over our receivables 6.4 times a year, then the receivables period is:

Receivables period = 
$$\frac{365 \text{ days}}{\text{Receivables turnover}}$$
  
=  $\frac{365}{6.4}$  = 57 days

The receivables period is also called the *days' sales in receivables*, or the *average collection period*. Whatever it is called, it tells us that our customers took an average of 57 days to pay.

 $<sup>^{1}</sup>$ Notice that in calculating inventory turnover here, we use the *average* inventory instead of using the ending inventory as we did in Chapter 3. Both approaches are used in the real world. To gain some practice using average figures, we will stick with this approach in calculating various ratios throughout this chapter.

<sup>&</sup>lt;sup>2</sup>This measure is conceptually identical to the days' sales in inventory figure we discussed in Chapter 3.

<sup>&</sup>lt;sup>3</sup>If less than 100 percent of our sales were credit sales, then we would just need a little more information, namely, credit sales for the year. See Chapter 3 for more discussion of this measure.

The operating cycle is the sum of the inventory and receivables periods:

Operating cycle = Inventory period + Accounts receivable period = 111 days + 57 days = 168 days

This tells us that, on average, 168 days elapse between the time we acquire inventory and, having sold it, collect for the sale.

**The Cash Cycle** We now need the payables period. From the information given earlier, we know that average payables were \$875,000 and cost of goods sold was \$8.2 million. Our payables turnover is:

Payables turnover =  $\frac{\text{Cost of goods sold}}{\text{Average payables}}$ =  $\frac{\$8.2 \text{ million}}{.875 \text{ million}} = 9.4 \text{ times}$ 

The payables period is:

Payables period = 
$$\frac{365 \text{ days}}{\text{Payables turnover}}$$
  
=  $\frac{365}{9.4}$  = 39 days

Thus, we took an average of 39 days to pay our bills.

Finally, the cash cycle is the difference between the operating cycle and the payables period:

Cash cycle = Operating cycle - Accounts payable period = 168 days - 39 days = 129 days

So, on average, there is a 129-day delay between the time we pay for merchandise and the time we collect on the sale.



**The Operating and Cash Cycles** You have collected the following information for the Slowpay Company:

ltem	Beginning	Ending
Inventory	\$5,000	\$7,000
Accounts receivable	I,600	2,400
Accounts payable	2,700	4,800

Credit sales for the year just ended were \$50,000, and cost of goods sold was \$30,000. How long does it take Slowpay to collect on its receivables? How long does merchandise stay around before it is sold? How long does Slowpay take to pay its bills?

We can first calculate the three turnover ratios:

Inventory turnover = 330,000/6,000 = 5 times Receivables turnover = 50,000/2,000 = 25 times Payables turnover = 330,000/3,750 = 8 times

(continued)

We use these to get the various periods:

Inventory period = 365/5 = 73 days Receivables period = 365/25 = 14.6 days Payables period = 365/8 = 45.6 days

All told, Slowpay collects on a sale in 14.6 days, inventory sits around for 73 days, and bills get paid after about 46 days. The operating cycle here is the sum of the inventory and receivables periods: 73 + 14.6 = 87.6 days. The cash cycle is the difference between the operating cycle and the payables period: 87.6 - 45.6 = 42 days.

#### **INTERPRETING THE CASH CYCLE**

Our examples show that the cash cycle depends on the inventory, receivables, and payables periods. The cash cycle increases as the inventory and receivables periods get longer. It decreases if the company is able to defer payment of payables and thereby lengthen the payables period.

Unlike Amazon.com, most firms have a positive cash cycle, and they thus require financing for inventories and receivables. The longer the cash cycle, the more financing is required. Also, changes in the firm's cash cycle are often monitored as an early warning measure. A lengthening cycle can indicate that the firm is having trouble moving inventory or collecting on its receivables. Such problems can be masked, at least partially, by an increased payables cycle, so both cycles should be monitored.

The link between the firm's cash cycle and its profitability can be easily seen by recalling that one of the basic determinants of profitability and growth for a firm is its total asset turnover, which is defined as Sales/Total assets. In Chapter 3, we saw that the higher this ratio is, the greater are the firm's accounting return on assets, ROA, and return on equity, ROE. Thus, all other things being the same, the shorter the cash cycle is, the lower is the firm's investment in inventories and receivables. As a result, the firm's total assets are lower, and total turnover is higher.

#### A LOOK AT OPERATING AND CASH CYCLES

In 2011, *CFO* magazine published its survey of working capital for various industries. The results of this survey highlight the marked differences in cash and operating cycles across industries. The table below shows four different industries and the median operating and cash cycles for each. Of these, the airline industry has the lowest operating and cash cycles. Airlines also have a short inventory period. The multiline retailers, which include Dollar General and Bon-Ton Stores, actually have a zero receivables period.

	Receivables Period (days)	Inventory Period (days)	Operating Cycle (days)	Payables Period (days)	Cash Cycle (days)
Airlines	10	7	17	18	-1
Biotechnology	64	49	113	14	99
Food products	25	39	64	26	38
Multiline retail	0	62	62	26	36

813

Compared to the food products companies, the multiline retailers have about the same operating cycle. However, we can see that there is a major difference since the retail industry has no receivables period and a much longer inventory period. The inventory period is necessary in this industry so that the shelves are kept stocked, but since customers tend to pay in cash, firms in this industry have little or no receivables.

We've seen that operating and cash cycles can vary quite a bit across industries, but these cycles also can be different for companies within the same industry. Below you will find the operating and cash cycles for selected computer and consumer electronics companies. As you can see, there are differences. Apple and Dell have the best operating and cash cycles in the industry. In fact, Dell has long been known as a leader in current asset management. Both Imation and Diebold have much longer inventory periods.

	Receivables Period (days)	Inventory Period (days)	Operating Cycle (days)	Payables Period (days)	Cash Cycle (days)
Apple	31	6	37	67	-30
Dell	39	8	47	67	-20
Imation	65	51	116	55	61
Diebold	52	58	110	28	82

By examining all parts of the cash and conversion cycles, you can see when a company is performing well, or poorly, as the case may be. Looking at the operating cycles for Imation and Diebold, they appear fairly similar. However, Diebold has a longer inventory period, and Imation has a longer payables period.

When you look at the operating and cash cycles, consider that each is really a financial ratio. As with any financial ratio, firm and industry characteristics will have an effect, so take care in your interpretation. For example, in looking at Imation and Diebold, we note both companies' seemingly long inventory period. Is that a bad thing? Maybe not. These companies have a different business model compared to Apple and Dell, and, as a result, aren't really comparable when it comes to inventory levels.

## 26.3 Some Aspects of Short-Term Financial Policy

The policy that a firm adopts for short-term finance will be composed of at least two elements:

- 1. *The size of the firm's investment in current assets*: This is usually measured relative to the firm's level of total operating revenues. A flexible or accommodative short-term financial policy would maintain a high ratio of current assets to sales. A restrictive short-term financial policy would entail a low ratio of current assets to sales.
- 2. *The financing of current assets*: This is measured as the proportion of short-term debt to long-term debt. A restrictive short-term financial policy means a high proportion of short-term debt relative to long-term financing, and a flexible policy means less short-term debt and more long-term debt.

#### THE SIZE OF THE FIRM'S INVESTMENT IN CURRENT ASSETS

Flexible short-term financial policies include:

- 1. Keeping large balances of cash and marketable securities.
- 2. Making large investments in inventory.
- 3. Granting liberal credit terms, which results in a high level of accounts receivable.

Restrictive short-term financial policies are:

- 1. Keeping low cash balances and no investment in marketable securities.
- 2. Making small investments in inventory.
- 3. Allowing no credit sales and no accounts receivable.

Determining the optimal investment level in short-term assets requires an identification of the different costs of alternative short-term financing policies. The objective is to trade off the costs of restrictive policies against those of the flexible ones to arrive at the best compromise.

Current asset holdings are highest with a flexible short-term financial policy and lowest with a restrictive policy. Thus, flexible short-term financial policies are costly in that they require higher cash outflows to finance cash and marketable securities, inventory, and accounts receivable. However, future cash inflows are highest with a flexible policy. Sales are stimulated by the use of a credit policy that provides liberal financing to customers. A large amount of inventory on hand ("on the shelf") provides a quick delivery service to customers and increases in sales.<sup>4</sup> In addition, the firm can probably charge higher prices for the quick delivery service and the liberal credit terms of flexible policies. A flexible policy also may result in fewer production stoppages because of inventory shortages.<sup>5</sup>

Managing current assets can be thought of as involving a trade-off between costs that rise with the level of investment and costs that fall with the level of investment. Costs that rise with the level of investment in current assets are called **carrying costs**. Costs that fall with increases in the level of investment in current assets are called **shortage costs**.

Carrying costs are generally of two types. First, because the rate of return on current assets is low compared to that of other assets, there is an opportunity cost. Second, there is the cost of maintaining the economic value of the item. For example, the cost of warehousing inventory belongs here.

Shortage costs are incurred when the investment in current assets is low. If a firm runs out of cash, it will be forced to sell marketable securities. If a firm runs out of cash and cannot readily sell marketable securities, it may need to borrow or default on an obligation. (This general situation is called *cash-out*.) If a firm has no inventory (a *stockout*) or if it cannot extend credit to its customers, it will lose customers.

There are two kinds of shortage costs:

- 1. *Trading, or order, costs*: Order costs are the costs of placing an order for more cash (*brokerage costs*) or more inventory (*production setup costs*).
- 2. *Costs related to safety reserves*: These are the costs of lost sales, lost customer goodwill, and disruption of production schedules.

Figure 26.2 illustrates the basic nature of carrying costs and shortage costs. The total costs of investing in current assets are determined by adding the carrying costs

<sup>&</sup>lt;sup>4</sup>This is true of some types of finished goods.

<sup>&</sup>lt;sup>5</sup>This is true of inventory of raw materials but not of finished goods.

Firms with High Holdings of Liquid Assets Will Have	Firms with Low Holdings of Liquid Assets Will Have
High-growth opportunities	Low-growth opportunities
High-risk investments	Low-risk investments
Small firms	Large firms
Low-credit firms	High-credit firms
will hold more liquid assets (i.e., c	ash and marketable securities) to ens

SOURCE: Tim Opler, Lee Pinkowitz, René Stulz, and Rohan Williamson, "The Determinants and Implications of Corporate Cash Holdings," *Journal of Financial Economics* 52 (1999).

and the shortage costs. The minimum point on the total cost curve (CA\*) reflects the optimal balance of current assets. The curve is generally quite flat at the optimum, and it is difficult, if not impossible, to find the precise optimal balance of shortage and carrying costs. Usually, we are content with a choice near the optimum.

If carrying costs are low or shortage costs are high, the optimal policy calls for substantial current assets. In other words, the optimal policy is a flexible one. This is illustrated in the middle graph of Figure 26.2.

If carrying costs are high or shortage costs are low, the optimal policy is a restrictive one. That is, the optimal policy calls for modest current assets. This is illustrated in the bottom graph of the figure.

Opler, Pinkowitz, Stulz, and Williamson examine the determinants of holdings of cash and marketable securities by publicly traded firms.<sup>6</sup> They find evidence that firms behave according to the static trade-off model described earlier. Their study focuses only on liquid assets (i.e., cash and marketable securities), so that carrying costs are the opportunity costs of holding liquid assets and shortage costs are the risks of not having cash when investment opportunities are good.

#### **ALTERNATIVE FINANCING POLICIES FOR CURRENT ASSETS**

In the previous section, we examined the level of investment in current assets. Now we turn to the level of current liabilities, assuming the investment in current assets is optimal.

**An Ideal Model** In an ideal economy, short-term assets can always be financed with short-term debt, and long-term assets can be financed with long-term debt and equity. In this economy, net working capital is always zero.

<sup>&</sup>lt;sup>o</sup>Tim Opler, Lee Pinkowitz, René Stulz, and Rohan Williamson, "The Determinants and Implications of Corporate Cash Holdings," *Journal of Financial Economics* 52 (1999).

#### Figure 26.2

Carrying Costs and Shortage Costs



*Carrying costs* increase with the level of investment in current assets. They include both opportunity costs and the costs of maintaining the asset's economic value. *Shortage costs* decrease with increases in the level of investment in current assets. They include trading costs and the costs of running out of the current asset (for example, being short on cash).

816

#### Figure 26.3

Financing Policy for an Ideal Economy



Imagine the simple case of a grain elevator operator. Grain elevator operators buy crops after harvest, store them, and sell them during the year. They have high inventories of grain after the harvest and end with low inventories just before the next harvest.

Bank loans with maturities of less than one year are used to finance the purchase of grain. These loans are paid with the proceeds from the sale of grain.

The situation is shown in Figure 26.3. Long-term assets are assumed to grow over time, whereas current assets increase at the end of the harvest and then decline during the year. Short-term assets end at zero just before the next harvest. These assets are financed by short-term debt, and long-term assets are financed with long-term debt and equity. Net working capital—current assets minus current liabilities—is always zero.

**Different Strategies for Financing Current Assets** Current assets cannot be expected to drop to zero in the real world because a long-term rising level of sales will result in some permanent investment in current assets. A growing firm can be thought of as having a permanent requirement for both current assets and long-term assets. This total asset requirement will exhibit balances over time reflecting (1) a secular growth trend, (2) a seasonal variation around the trend, and (3) unpredictable day-to-day and month-to-month fluctuations. This is depicted in Figure 26.4. (We have not tried to show the unpredictable day-to-day and month-to-month variations in the total asset requirement.)

Now let us look at how this asset requirement is financed. First, consider the strategy (strategy F in Figure 26.5) where long-term financing covers more than the total asset requirement, even at seasonal peaks. The firm will have excess cash available for investment in marketable securities when the total asset requirement falls from peaks. Because this approach implies chronic short-term cash surpluses and a large investment in net working capital, it is considered a flexible strategy.

When long-term financing does not cover the total asset requirement, the firm must borrow short term to make up the deficit. This restrictive strategy is labeled strategy R in Figure 26.5.

# Figure 26.4 The Total Asset **Requirement over** Time Seasonal variation Figure 26.5 Dollars securities Dollars

Strategy F always implies a short-term cash surplus and a large investment in cash and marketable securities. Strategy *R* uses long-term financing for continuing asset requirements only, and short-term borrowing for seasonal variations.

#### WHICH IS BEST?

What is the most appropriate amount of short-term borrowing? There is no definitive answer. Several considerations must be included in a proper analysis:

Cash reserves: The flexible financing strategy implies surplus cash and little 1. short-term borrowing. This strategy reduces the probability that a firm will









experience financial distress. Firms may not need to worry as much about meeting recurring short-term obligations. However, investments in cash and marketable securities are zero net present value investments at best.

- 2. *Maturity hedging*: Most firms finance inventories with short-term bank loans and fixed assets with long-term financing. Firms tend to avoid financing long-lived assets with short-term borrowing. This type of maturity mismatching would necessitate frequent financing and is inherently risky because short-term interest rates are more volatile than longer rates.
- 3. *Term structure*: Short-term interest rates are normally lower than long-term interest rates. This implies that, on average, it is more costly to rely on long-term borrowing than on short-term borrowing.

## 26.4 Cash Budgeting

The cash budget is a primary tool of short-term financial planning. It allows the financial manager to identify short-term financial needs (and opportunities). It will tell the manager the required borrowing for the short term. It is the way of identifying the cash flow gap on the cash flow time line. The idea of the cash budget is simple: It records estimates of cash receipts and disbursements. We illustrate cash budgeting with the following example of Fun Toys.

**Cash Collections** All of Fun Toys' cash inflows come from the sale of toys. Cash budgeting for Fun Toys starts with a sales forecast for the next year by quarter:

	First	Second	Third	Fourth
	Quarter	Quarter	Quarter	Quarter
Sales (\$ in millions)	\$100	\$200	\$150	\$100

Fun Toys' fiscal year starts on July I. Fun Toys' sales are seasonal and are usually very high in the second quarter due to holiday sales. But Fun Toys sells to department stores on credit, and sales do not generate cash immediately. Instead, cash comes later from collections on accounts receivable. Fun Toys has a 90-day collection period, and 100 percent of sales are collected the following quarter. In other words:

Collections = Last quarter's sales

This relationship implies that:

Accounts receivable at end of last quarter = Last quarter's sales

(26.6)

We assume that sales in the fourth quarter of the previous fiscal year were \$100 million. From Equation 26.6 we know that accounts receivable at the end of the fourth quarter of the previous fiscal year were \$100 million, and collections in the first quarter of the current fiscal year are \$100 million.

The first quarter sales of the current fiscal year of \$100 million are added to the accounts receivable, but \$100 million of collections are subtracted. Therefore, Fun Toys ended the first quarter with accounts receivable of \$100 million. The basic relation is:

 $\begin{array}{l} \text{Ending accounts} \\ \text{receivable} \end{array} = \begin{array}{l} \text{Starting accounts} \\ \text{receivable} \end{array} + \text{Sales} - \text{Collections} \end{array}$ 

(continued)



EXAMPLE 26.3

This section introduces linking to Word documents.

Table 26.2 shows cash collections for Fun Toys for the next four quarters. Though collections are the only source of cash here, this need not always be the case. Other sources of cash could include sales of assets, investment income, and long-term financing.

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Sales	\$100	\$200	\$150	\$100
Cash collections	100	100	200	150
Starting receivables	100	100	200	150
Ending receivables	100	200	150	100

#### Table 26.2 Sources of Cash (\$ in millions)

#### **CASH OUTFLOW**

Next, we consider cash disbursements. They can be put into four basic categories, as shown in Table 26.3.

1. *Payments of accounts payable*: These are payments for goods or services, such as raw materials. These payments will generally be made after purchases. Purchases will depend on the sales forecast. In the case of Fun Toys, assume that:

Payments = Last quarter's purchases Purchases = 1/2 next quarter's sales forecast

- 2. *Wages, taxes, and other expenses*: This category includes all other normal costs of doing business that require actual expenditures. Depreciation, for example, is often thought of as a normal cost of business, but it requires no cash outflow.
- 3. *Capital expenditures*: These are payments of cash for long-lived assets. Fun Toys plans a major capital expenditure in the fourth quarter.
- 4. *Long-term financing*: This category includes interest and principal payments on long-term outstanding debt and dividend payments to shareholders.

The total forecast outflow appears in the last line of Table 26.3.

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Sales	\$100	\$200	\$150	\$100
Purchases	100	75	50	50
Uses of cash				
Payments of accounts payable	50	100	75	50
Wages, taxes, and other expenses	20	40	30	20
Capital expenditures	0	0	0	100
Long-term financing expenses: interest and dividends	10	10	10	
Total uses of cash	\$ 80	\$150	\$115	\$180

Table 26.3Disbursement ofCash (\$ in millions)

# Table 26.4The Cash Balance(\$ in millions)

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Total cash receipts	\$100	\$100	\$200	\$150
Total cash disbursements	80	150	115	180
Net cash flow	20	(50)	85	(30)
Cumulative excess cash balance	20	(30)	55	25
Minimum cash balance	5	5	5	5
Cumulative finance surplus (deficit) requirement	15	(35)	50	20

#### THE CASH BALANCE

The net cash balance appears in Table 26.4, and a large net cash outflow is forecast in the second quarter. This large outflow is not caused by an inability to earn a profit. Rather, it results from delayed collections on sales. This results in a cumulative cash shortfall of \$30 million in the second quarter.

Fun Toys had established a minimum operating cash balance equal to \$5 million to facilitate transactions, protect against unexpected contingencies, and maintain compensating balances at its commercial banks. This means that it has a cash shortfall in the second quarter equal to \$35 million.

### 26.5 The Short-Term Financial Plan

Fun Toys has a short-term financing problem. It cannot meet the forecast cash outflows in the second quarter from internal sources. Its financing options include (1) unsecured bank borrowing, (2) secured borrowing, and (3) other sources.

#### **UNSECURED LOANS**

The most common way to finance a temporary cash deficit is to arrange a shortterm unsecured bank loan. Firms that use short-term bank loans usually ask their bank for either a noncommitted or a committed *line of credit*. A *noncommitted* line of credit is an informal arrangement that allows firms to borrow up to a previously specified limit without going through the normal paperwork. The interest rate on the line of credit is usually set equal to the bank's prime lending rate plus an additional percentage.

*Committed* lines of credit are formal legal arrangements and usually involve a commitment fee paid by the firm to the bank (usually, the fee is approximately .25 percent of the total committed funds per year). For larger firms, the interest rate is often tied to the London Interbank Offered Rate (LIBOR) or to the bank's cost of funds, rather than the prime rate. Midsized and smaller firms often are required to keep compensating balances in the bank.

**Compensating balances** are deposits the firm keeps with the bank in low-interest or non-interest-bearing accounts. Compensating balances are commonly on the order of 2 to 5 percent of the amount used. By leaving these funds with the bank without receiving interest, the firm increases the effective interest earned by the bank on

the line of credit. For example, if a firm borrowing \$100,000 must keep \$5,000 as a compensating balance, the firm effectively receives only \$95,000. A stated interest rate of 10 percent implies yearly interest payments of \$10,000 (= $$100,000 \times .10$ ). The effective interest rate is 10.53 percent (=\$10,000/\$95,000).

#### SECURED LOANS

Banks and other finance companies often require *security* for a loan. Security for short-term loans usually consists of accounts receivable or inventories.

Under **accounts receivable financing**, receivables are either *assigned* or *factored*. Under assignment, the lender not only has a lien on the receivables but also has recourse to the borrower. Factoring involves the sale of accounts receivable. The purchaser, who is called a *factor*, must then collect on the receivables. The factor assumes the full risk of default on bad accounts.

As the name implies, an **inventory loan** uses inventory as collateral. Some common types of inventory loans are:

- 1. *Blanket inventory lien*: The blanket inventory lien gives the lender a lien against all the borrower's inventories.
- 2. *Trust receipt*: Under this arrangement, the borrower holds the inventory in trust for the lender. The document acknowledging the loan is called the trust receipt. Proceeds from the sale of inventory are remitted immediately to the lender.
- 3. *Field warehouse financing*: In field warehouse financing, a public warehouse company supervises the inventory for the lender.

Purchase order financing (or just PO financing) is a popular form of factoring used by small and midsized companies. In a typical scenario, a small business receives a firm order from a customer, but doesn't have sufficient funds to pay the supplier who manufactured the product. With PO financing, the factor pays the supplier. When the sale is completed and the seller is paid, the factor is repaid. A typical interest rate on purchase order factoring is 3.5 percent for the first 30 days, then 1.25 percent every 10 days after, an annual interest rate above 40 percent.

#### **OTHER SOURCES**

A variety of other sources of short-term funds are employed by corporations. The most important of these are the issuance of **commercial paper** and financing through **banker's acceptances.** Commercial paper consists of short-term notes issued by large, highly rated firms. Typically, these notes are of short maturity, ranging up to 270 days (beyond that limit the firm must file a registration statement with the SEC). Because the firm issues these directly and because it usually backs the issue with a special bank line of credit, the rate the firm obtains is often significantly below the prime rate the bank would charge it for a direct loan.

A banker's acceptance is an agreement by a bank to pay a sum of money. These agreements typically arise when a seller sends a bill or draft to a customer. The customer's bank *accepts* this bill and notes the acceptance on it, which makes it an obligation of the bank. In this way a firm that is buying something from a supplier can effectively arrange for the bank to pay the outstanding bill. Of course, the bank charges the customer a fee for this service.



◀ To test your mastery of this material, take a quiz at <u>mhhe.</u> <u>com/rwj</u>

## Summary and Conclusions

- 1. This chapter introduced the management of short-term finance. Short-term finance involves short-lived assets and liabilities. We traced and examined the short-term sources and uses of cash as they appear on the firm's financial statements. We saw how current assets and current liabilities arise in the short-term operating activities and the cash cycle of the firm. From an accounting perspective, short-term finance involves net working capital.
- 2. Managing short-term cash flows involves the minimization of costs. The two major costs are carrying costs (the interest and related costs incurred by overinvesting in short-term assets such as cash) and shortage costs (the cost of running out of short-term assets). The objective of managing short-term finance and short-term financial planning is to find the optimal trade-off between these costs.
- **3.** In an ideal economy, a firm could perfectly predict its short-term uses and sources of cash, and net working capital could be kept at zero. In the real world, net working capital provides a buffer that lets the firm meet its ongoing obligations. The financial manager seeks the optimal level of each of the current assets.
- **4.** The financial manager can use the cash budget to identify short-term financial needs. The cash budget tells the manager what borrowing is required or what lending will be possible in the short term. The firm has a number of possible ways of acquiring funds to meet short-term shortfalls, including unsecured and secured loans.

## **Concept Questions**

- **1. Operating Cycle** What are some of the characteristics of a firm with a long operating cycle?
- 2. Cash Cycle What are some of the characteristics of a firm with a long cash cycle?
- **3.** Sources and Uses For the year just ended, you have gathered the following information about the Holly Corporation:
  - a. A \$200 dividend was paid.
  - **b.** Accounts payable increased by \$500.
  - **c.** Fixed asset purchases were \$900.
  - d. Inventories increased by \$625.
  - e. Long-term debt decreased by \$1,200.

Label each as a source or use of cash and describe its effect on the firm's cash balance.

- **4. Cost of Current Assets** Grohl Manufacturing, Inc., has recently installed a justin-time (JIT) inventory system. Describe the effect this is likely to have on the company's carrying costs, shortage costs, and operating cycle.
- 5. **Operating and Cash Cycles** Is it possible for a firm's cash cycle to be longer than its operating cycle? Explain why or why not.
- 6. Shortage Costs What are the costs of shortages? Describe them.
- 7. **Reasons for Net Working Capital** In an ideal economy, net working capital is always zero. Why might net working capital be positive in a real economy?