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SHORT-TERM FINANCE AND PLANNING

In the middle of 2006, with gasoline prices approaching \$3 per gallon, sales of low-mileage automobiles slowed to a crawl. Unfortunately for auto manufacturers, low sales meant higher inventory. For example, inventory for the GMC Sierra pickup reached 120 days, and inventory of the Chrysler 300 C grew to about

90 days—both considerably longer than the 60-day supply

considered optimal in the industry. To reduce inventory and increase sales, manufacturers and dealers were forced to resort to rebates and zero-interest loans. In fact, General Motors offered rebates of up to \$8,400 for the purchase of selected models. 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 industries such as the automobile industry pay close attention to it.

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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 describe in Chapter 2 and elsewhere, 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 or less. 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 just a very 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.

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, 3, and 4. 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 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 short-term 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:

$$\text{Net working capital} + \text{Fixed assets} = \text{Long-term debt} + \text{Equity} \quad [19.1]$$

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

$$\begin{aligned} \text{Net working capital} &= (\text{Cash} + \text{Other current assets}) \\ &\quad - \text{Current liabilities} \end{aligned} \quad [19.2]$$

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

$$\begin{aligned} \text{Cash} &= \text{Long-term debt} + \text{Equity} + \text{Current liabilities} \\ &\quad - \text{Current assets other than cash} - \text{Fixed assets} \end{aligned} \quad [19.3]$$

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)

19.1



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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.

As we discussed in Chapter 3, those 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 19.1**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 lent the money; this is a *use* of cash.

Concept Questions

- 19.1a** What is the difference between net working capital and cash?
- 19.1b** Will net working capital always increase when cash increases?
- 19.1c** List five potential sources of cash.
- 19.1d** List five potential uses of cash.

19.2 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
1. Buying raw materials	1. 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	4. Whether credit should be extended to a particular customer
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	−\$1,000
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:

$$\text{Operating cycle} = \text{Inventory period} + \text{Accounts receivable period} \quad [19.4]$$

$$105 \text{ days} = 60 \text{ days} + 45 \text{ days}$$

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

operating cycle

The period between the acquisition of inventory and the collection of cash from receivables.

inventory period

The time it takes to acquire and sell inventory.

accounts receivable period

The time between sale of inventory and collection of the receivable.

accounts payable period

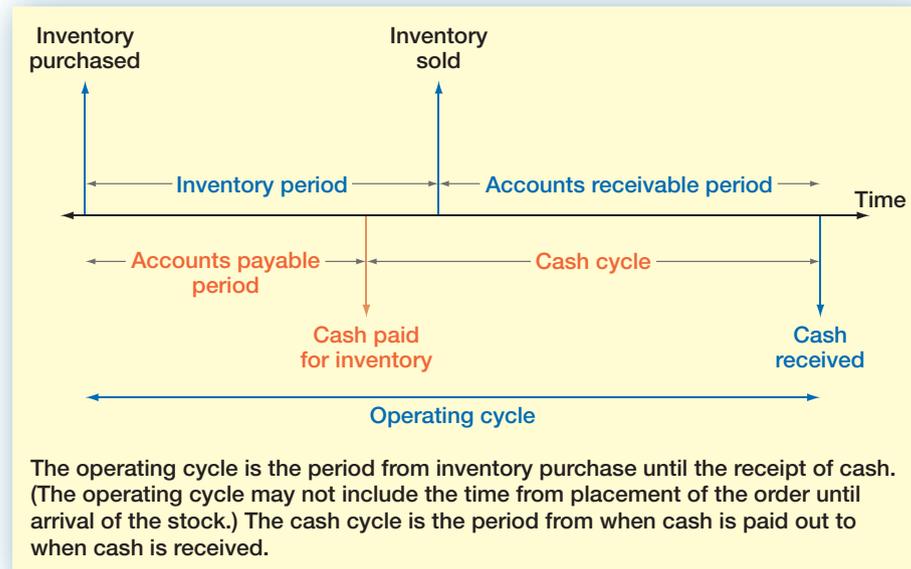
The time between receipt of inventory and payment for it.

cash cycle

The time between cash disbursement and cash collection.

FIGURE 19.1

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



on our definitions, the cash cycle is the difference between the operating cycle and the accounts payable period:

$$\text{Cash cycle} = \text{Operating cycle} - \text{Accounts payable period} \quad [19.5]$$

$$75 \text{ days} = 105 \text{ days} - 30 \text{ days}$$

cash flow time line

A graphical representation of the operating cycle and the cash cycle.



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Figure 19.1 depicts the short-term operating activities and cash flows for 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 19.1, 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 and in subsequent chapters.

Internet-based bookseller and retailer Amazon.com provides an interesting example of the importance of managing the cash cycle. By mid-2006, the market value of Amazon.com was higher than (in fact more than six times as much as) that of Barnes & Noble, king of the brick-and-mortar bookstores, even though Amazon's sales were only 1.7 times greater.

How could Amazon.com be worth so much more? There are multiple reasons, but short-term management is one factor. During 2005, Amazon turned over its inventory about 30 times per year, 5 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 2005, Amazon's cash cycle was a negative 56 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 2005, Boeing had an inventory period of 59 days and a receivables period of 49 days, so its operating cycle was a lengthy 108 days. Boeing's cash cycle must be fairly long, right? Wrong. Boeing had a payables period of 208 days, so its cash cycle was a negative 100 days!

THE OPERATING CYCLE AND THE FIRM'S ORGANIZATIONAL 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 19.1 illustrates, short-term financial management in a large corporation involves a number of different financial and nonfinancial managers. Examining Table 19.1, 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. We start by gathering some balance sheet information such as the following (in thousands):

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

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

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 securities, 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 about purchases, suppliers; may negotiate payment terms	Inventory, accounts payable
Production manager	Setting of production schedules and materials requirements	Inventory, accounts payable
Payables manager	Decisions about payment policies and about whether to take discounts	Accounts payable
Controller	Accounting information about cash flows; reconciliation of accounts payable; application of payments to accounts receivable	Accounts receivable, accounts payable

TABLE 19.1

Managers Who Deal with Short-Term Financial Problems

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:¹

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

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:

$$\begin{aligned}\text{Inventory period} &= \frac{365 \text{ days}}{\text{Inventory turnover}} \\ &= \frac{365}{3.28} = 111.3 \text{ days}\end{aligned}$$

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

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

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

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

$$\begin{aligned}\text{Receivables period} &= \frac{365 \text{ days}}{\text{Receivables turnover}} \\ &= \frac{365}{6.4} = 57 \text{ days}\end{aligned}$$

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.

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

$$\begin{aligned}\text{Operating cycle} &= \text{Inventory period} + \text{Accounts receivable period} \\ &= 111 \text{ days} + 57 \text{ days} = 168 \text{ days}\end{aligned}$$

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

¹Notice 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.

²This measure is conceptually identical to the days' sales in inventory figure we discussed in Chapter 3.

³If fewer 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 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:

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

The payables period is:

$$\begin{aligned}\text{Payables period} &= \frac{365 \text{ days}}{\text{Payables turnover}} \\ &= \frac{365}{9.4} = 39 \text{ days}\end{aligned}$$

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:

$$\begin{aligned}\text{Cash cycle} &= \text{Operating cycle} - \text{Accounts payable period} \\ &= 168 \text{ days} - 39 \text{ days} = 129 \text{ days}\end{aligned}$$

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

EXAMPLE 19.2

You have collected the following information for the Slowpay Company:

Item	Beginning	Ending
Inventory	\$5,000	\$7,000
Accounts receivable	1,600	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:

$$\text{Inventory turnover} = \$30,000 / 6,000 = 5 \text{ times}$$

$$\text{Receivables turnover} = \$50,000 / 2,000 = 25 \text{ times}$$

$$\text{Payables turnover} = \$30,000 / 3,750 = 8 \text{ times}$$

We use these to get the various periods:

$$\text{Inventory period} = 365 / 5 = 73 \text{ days}$$

$$\text{Receivables period} = 365 / 25 = 14.6 \text{ days}$$

$$\text{Payables period} = 365 / 8 = 45.6 \text{ days}$$

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

(continued)

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 can 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 $\text{Sales}/\text{Total assets}$. In Chapter 3, we saw that the higher this ratio is, the greater is 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.

Concept Questions

- 19.2a** Describe the operating cycle and the cash cycle. What are the differences?
19.2b What does it mean to say that a firm has an inventory turnover ratio of 4?
19.2c Explain the connection between a firm's accounting-based profitability and its cash cycle.

19.3 Some Aspects of Short-Term Financial Policy

The short-term financial policy that a firm adopts will be reflected in at least two ways:

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 relatively high ratio of current assets to sales. A *restrictive* short-term financial policy would entail a low ratio of current assets to sales.⁴
2. *The financing of current assets:* This is measured as the proportion of short-term debt (that is, current liabilities) and long-term debt used to finance current assets. 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.

⁴Some people use the term *conservative* in place of *flexible* and the term *aggressive* in place of *restrictive*.

If we take these two areas together, we see that a firm with a flexible policy would have a relatively large investment in current assets, and it would finance this investment with relatively less short-term debt. The net effect of a flexible policy is thus a relatively high level of net working capital. Put another way, with a flexible policy, the firm maintains a higher overall level of liquidity.

THE SIZE OF THE FIRM'S INVESTMENT IN CURRENT ASSETS

Short-term financial policies that are flexible with regard to current assets include such actions as:

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 would be just the opposite:

1. Keeping low cash balances and making little investment in marketable securities.
2. Making small investments in inventory.
3. Allowing few or no credit sales, thereby minimizing accounts receivable.

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

Current asset holdings are highest with a flexible short-term financial policy and lowest with a restrictive policy. So, flexible short-term financial policies are costly in that they require a greater investment in cash and marketable securities, inventory, and accounts receivable. However, we expect that future cash inflows will be higher with a flexible policy. For example, sales are stimulated by the use of a credit policy that provides liberal financing to customers. A large amount of finished inventory on hand (“on the shelf”) enables quick delivery service to customers and may increase sales. Similarly, a large inventory of raw materials may result in fewer production stoppages because of inventory shortages.

A more restrictive short-term financial policy probably reduces future sales to levels below those that would be achieved under flexible policies. It is also possible that higher prices can be charged to customers under flexible working capital policies. Customers may be willing to pay higher prices for the quick delivery service and more liberal credit terms implicit in flexible policies.

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

In a general sense, carrying costs are the opportunity costs associated with current assets. The rate of return on current assets is very low when compared to that on other assets. For example, the rate of return on U.S. Treasury bills is usually a good deal less than 10 percent. This is very low compared to the rate of return firms would like to achieve overall. (U.S. Treasury bills are an important component of cash and marketable securities.)

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. Of course, if a firm runs out of cash and cannot readily sell marketable securities, it may have to borrow or default on an

carrying costs

Costs that rise with increases in the level of investment in current assets.

shortage costs

Costs that fall with increases in the level of investment in current assets.

obligation. This situation is called a *cash-out*. A firm may lose customers if it runs out of inventory (a *stockout*) or if it cannot extend credit to customers.

More generally, 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, for example) or more inventory (production setup costs, for example).
2. *Costs related to lack of safety reserves*: These are costs of lost sales, lost customer goodwill, and disruption of production schedules.

The top part of Figure 19.2 illustrates the basic trade-off between carrying costs and shortage costs. On the vertical axis, we have costs measured in dollars; on the horizontal axis, we have the amount of current assets. Carrying costs start out at zero when current assets are zero and then climb steadily as current assets grow. Shortage costs start out very high and then decline as we add current assets. The total cost of holding current assets is the sum of the two. Notice how the combined costs reach a minimum at CA*. This is the optimal level of current assets.

Optimal current asset holdings are highest under a flexible policy. This policy is one in which the carrying costs are perceived to be low relative to shortage costs. This is Case A in Figure 19.2. In comparison, under restrictive current asset policies, carrying costs are perceived to be high relative to shortage costs, resulting in lower current asset holdings. This is Case B in Figure 19.2.

ALTERNATIVE FINANCING POLICIES FOR CURRENT ASSETS

In previous sections, we looked at the basic determinants of the level of investment in current assets, and we thus focused on the asset side of the balance sheet. Now we turn to the financing side of the question. Here we are concerned with the relative amounts of short-term and long-term debt, assuming that the investment in current assets is constant.

An Ideal Case We start off with the simplest possible case: an “ideal” economy. In such an 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.

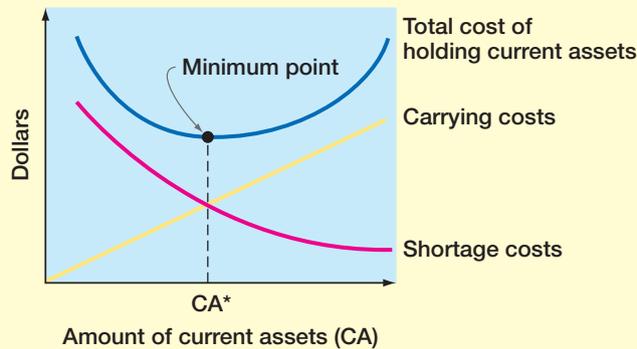
Consider a simplified case for a grain elevator operator. Grain elevator operators buy crops after harvest, store them, and sell them during the year. They have high inventories of grain after the harvest and end up with low inventories just before the next harvest.

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

The situation is shown in Figure 19.3. 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 up at zero just before the next harvest. Current (short-term) 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. Figure 19.3 displays a “sawtooth” pattern that we will see again when we get to our discussion of cash management in the next chapter. For now, we need to discuss some alternative policies for financing current assets under less idealized conditions.

Different Policies for Financing Current Assets In the real world, it is not likely that current assets will ever drop to zero. For example, a long-term rising level of sales will result in some permanent investment in current assets. Moreover, the firm’s investments in long-term assets may show a great deal of variation.

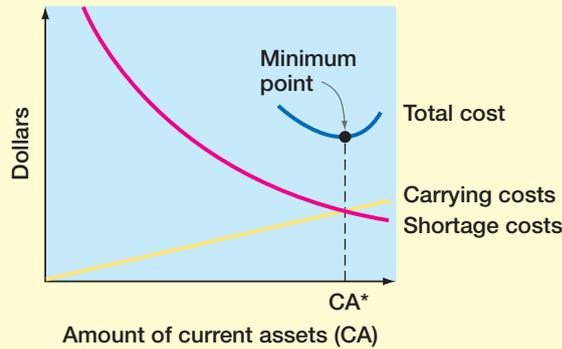
Short-term financial policy: the optimal investment in current assets



CA* represents the optimal amount of current assets. Holding this amount minimizes total costs.

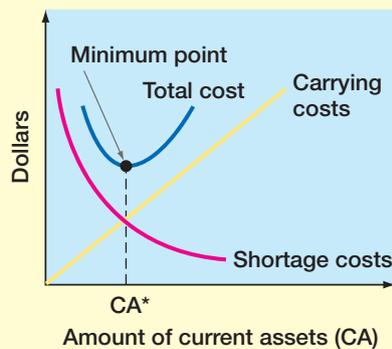
Carrying costs increase with the level of investment in current assets. They include the costs of maintaining economic value and opportunity costs. Shortage costs decrease with increases in the level of investment in current assets. They include trading costs and the costs related to being short of the current asset (for example, being short of cash). The firm's policy can be characterized as flexible or restrictive.

A. Flexible policy



A flexible policy is most appropriate when carrying costs are low relative to shortage costs.

B. Restrictive policy



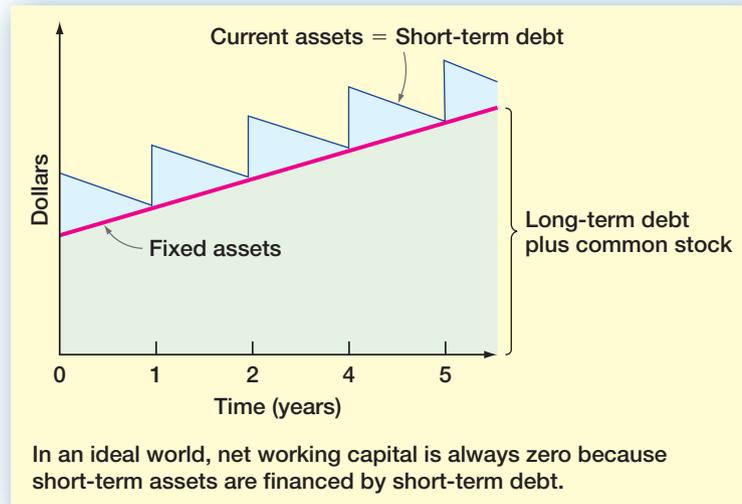
A restrictive policy is most appropriate when carrying costs are high relative to shortage costs.

FIGURE 19.2

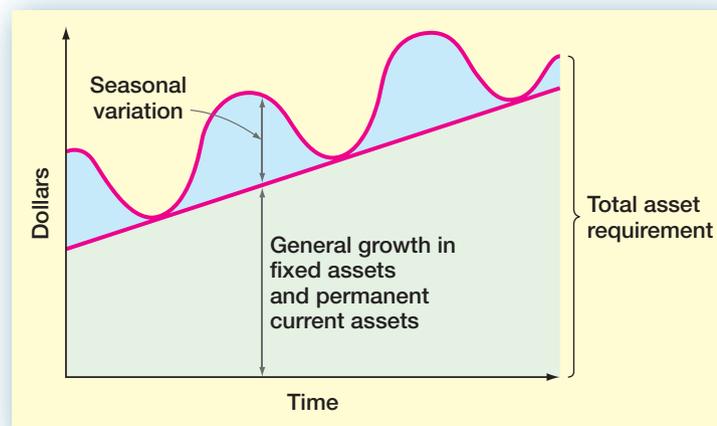
Carrying Costs and Shortage Costs

FIGURE 19.3

Financing Policy for an Ideal Economy

**FIGURE 19.4**

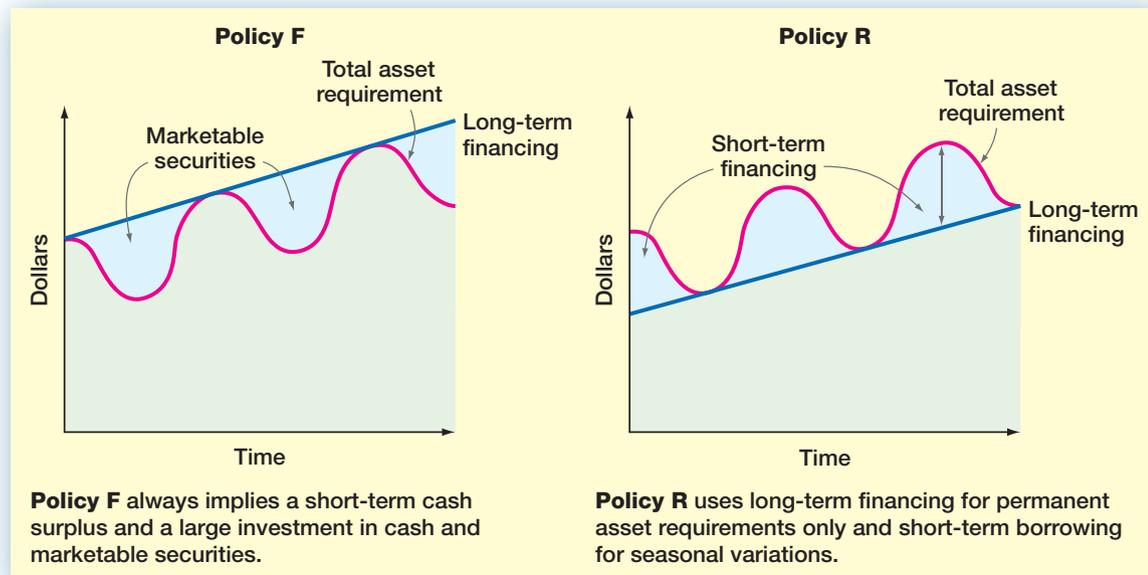
The Total Asset Requirement over Time



A growing firm can be thought of as having a total asset requirement consisting of the current assets and long-term assets needed to run the business efficiently. The total asset requirement may exhibit change over time for many reasons, including (1) a general growth trend, (2) seasonal variation around the trend, and (3) unpredictable day-to-day and month-to-month fluctuations. This fluctuation is depicted in Figure 19.4. (We have not tried to show the unpredictable day-to-day and month-to-month variations in the total asset requirement.)

The peaks and valleys in Figure 19.4 represent the firm's total asset needs through time. For example, for a lawn and garden supply firm, the peaks might represent inventory build-ups prior to the spring selling season. The valleys would come about because of lower off-season inventories. Such a firm might consider two strategies to meet its cyclical needs. First, the firm could keep a relatively large pool of marketable securities. As the need for inventory and other current assets began to rise, the firm would sell off marketable securities and use the cash to purchase whatever was needed. Once the inventory was sold and inventory holdings began to decline, the firm would reinvest in marketable securities. This approach is the flexible policy illustrated in Figure 19.5 as Policy F. Notice that the firm essentially uses a pool of marketable securities as a buffer against changing current asset needs.

FIGURE 19.5 Alternative Asset Financing Policies



At the other extreme, the firm could keep relatively little in marketable securities. As the need for inventory and other assets began to rise, the firm would simply borrow the needed cash on a short-term basis. The firm would repay the loans as the need for assets cycled back down. This approach is the restrictive policy illustrated in Figure 19.5 as Policy R.

In comparing the two strategies illustrated in Figure 19.5, notice that the chief difference is the way in which the seasonal variation in asset needs is financed. In the flexible case, the firm finances internally, using its own cash and marketable securities. In the restrictive case, the firm finances the variation externally, borrowing the needed funds on a short-term basis. As we discussed previously, all else being the same, a firm with a flexible policy will have a greater investment in net working capital.

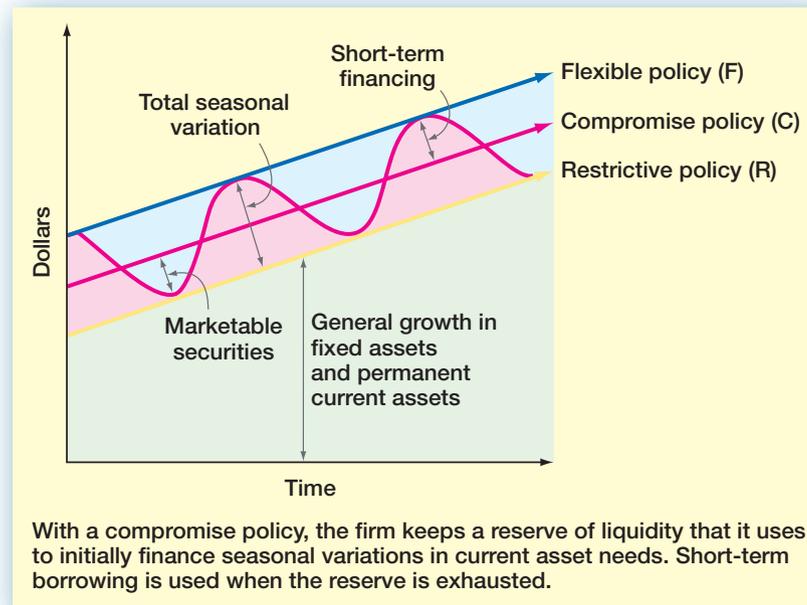
WHICH FINANCING POLICY IS BEST?

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

1. *Cash reserves:* The flexible financing policy implies surplus cash and little short-term borrowing. This policy reduces the probability that a firm will experience financial distress. Firms may not have to worry as much about meeting recurring, short-run obligations. However, investments in cash and marketable securities are zero net present value investments at best.
2. *Maturity hedging:* Most firms attempt to match the maturities of assets and liabilities. They 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 refinancing and is inherently risky because short-term interest rates are more volatile than longer-term rates.
3. *Relative interest rates:* Short-term interest rates are usually lower than long-term rates. This implies that it is, on the average, more costly to rely on long-term borrowing as compared to short-term borrowing.

FIGURE 19.6

A Compromise Financing Policy



The two policies, F and R, we depict in Figure 19.5 are, of course, extreme cases. With F, the firm never does any short-term borrowing; with R, the firm never has a cash reserve (an investment in marketable securities). Figure 19.6 illustrates these two policies along with a compromise, Policy C.

With this compromise approach, the firm borrows in the short term to cover peak financing needs, but it maintains a cash reserve in the form of marketable securities during slow periods. As current assets build up, the firm draws down this reserve before doing any short-term borrowing. This allows for some run-up in current assets before the firm has to resort to short-term borrowing.

CURRENT ASSETS AND LIABILITIES IN PRACTICE

Short-term assets represent a significant portion of a typical firm's overall assets. For U.S. manufacturing, mining, and trade corporations, current assets were about 50 percent of total assets in the 1960s. Today, this figure is closer to 40 percent. Most of the decline is due to more efficient cash and inventory management. Over this same period, current liabilities rose from about 20 percent of total liabilities and equity to almost 30 percent. The result is that liquidity (as measured by the ratio of net working capital to total assets) has declined, signaling a move to more restrictive short-term policies.

Concept Questions

- 19.3a** What keeps the real world from being an ideal one in which net working capital could always be zero?
- 19.3b** What considerations determine the optimal size of the firm's investment in current assets?
- 19.3c** What considerations determine the optimal compromise between flexible and restrictive net working capital policies?

The Cash Budget

The **cash budget** is a primary tool in short-run financial planning. It allows the financial manager to identify short-term financial needs and opportunities. An important function of the cash budget is to help the manager explore the need for short-term borrowing. The idea of the cash budget is simple: It records estimates of cash receipts (cash in) and disbursements (cash out). The result is an estimate of the cash surplus or deficit.

19.4

cash budget

A forecast of cash receipts and disbursements for the next planning period.

SALES AND CASH COLLECTIONS

We start with an example involving the Fun Toys Corporation. We will prepare a quarterly cash budget. We could just as well use a monthly, weekly, or even daily basis. We choose quarters for convenience and also because a quarter is a common short-term business planning period. (Note that, throughout this example, all figures are in millions of dollars.)

All of Fun Toys' cash inflows come from the sale of toys. Cash budgeting for Fun Toys must therefore start with a sales forecast for the coming year, by quarter:

	Q1	Q2	Q3	Q4
Sales (in millions)	\$200	\$300	\$250	\$400

Note that these are predicted sales, so there is forecasting risk here, and actual sales could be more or less. Fun Toys started the year with accounts receivable equal to \$120.

Fun Toys has a 45-day receivables, or average collection, period. This means that half of the sales in a given quarter will be collected the following quarter. This happens because sales made during the first 45 days of a quarter will be collected in that quarter, whereas sales made in the second 45 days will be collected in the next quarter. Note that we are assuming that each quarter has 90 days, so the 45-day collection period is the same as a half-quarter collection period.

Based on the sales forecasts, we now need to estimate Fun Toys' projected cash collections. First, any receivables that we have at the beginning of a quarter will be collected within 45 days, so all of them will be collected sometime during the quarter. Second, as we discussed, any sales made in the first half of the quarter will be collected, so total cash collections are:

$$\text{Cash collections} = \text{Beginning accounts receivable} + 1/2 \times \text{Sales} \quad [19.6]$$

For example, in the first quarter, cash collections would be the beginning receivables of \$120 plus half of sales, $1/2 \times \$200 = \100 , for a total of \$220.

Because beginning receivables are all collected along with half of sales, ending receivables for a particular quarter will be the other half of sales. First-quarter sales are projected at \$200, so ending receivables will be \$100. This will be the beginning receivables in the second quarter. Cash collections in the second quarter will thus be \$100 plus half of the projected \$300 in sales, or \$250 total.

Continuing this process, we can summarize Fun Toys' projected cash collections as shown in Table 19.2.

	Q1	Q2	Q3	Q4
Beginning receivables	\$120	\$100	\$150	\$125
Sales	200	300	250	400
Cash collections	220	250	275	325
Ending receivables	100	150	125	200

$$\begin{aligned} \text{Collections} &= \text{Beginning receivables} + 1/2 \times \text{Sales} \\ \text{Ending receivables} &= \text{Beginning receivables} + \text{Sales} - \text{Collections} \\ &= 1/2 \times \text{Sales} \end{aligned}$$



See the Finance Tools section of www.toolkit.cch.com/tools/tools.asp for several useful templates, including a cash flow budget.

TABLE 19.2

Cash Collection for Fun Toys (in Millions)

In Table 19.2, collections are shown as the only source of cash. Of course, this need not be the case. Other sources of cash could include asset sales, investment income, and receipts from planned long-term financing.

CASH OUTFLOWS

Next, we consider the cash disbursements, or payments. These come in four basic categories:

1. *Payments of accounts payable*: These are payments for goods or services rendered by suppliers, such as raw materials. Generally, these payments will be made sometime after purchases.
2. *Wages, taxes, and other expenses*: This category includes all other regular costs of doing business that require actual expenditures. Depreciation, for example, is often thought of as a regular cost of business; but it requires no cash outflow and is not included.
3. *Capital expenditures*: These are payments of cash for long-lived assets.
4. *Long-term financing expenses*: This category includes, for example, interest payments on long-term debt outstanding and dividend payments to shareholders.

Fun Toys' purchases from suppliers (in dollars) in a quarter are equal to 60 percent of the next quarter's predicted sales. Fun Toys' payments to suppliers are equal to the previous quarter's purchases, so the accounts payable period is 90 days. For example, in the quarter just ended, Fun Toys ordered $.60 \times \$200 = \120 in supplies. This will actually be paid in the first quarter (Q1) of the coming year.

Wages, taxes, and other expenses are routinely 20 percent of sales; interest and dividends are currently \$20 per quarter. In addition, Fun Toys plans a major plant expansion (a capital expenditure) costing \$100 in the second quarter. If we put all this information together, the cash outflows are as shown in Table 19.3.

THE CASH BALANCE

The predicted *net cash inflow* is the difference between cash collections and cash disbursements. The net cash inflow for Fun Toys is shown in Table 19.4. What we see immediately is that there is a cash surplus in the first and third quarters and a cash deficit in the second and fourth.

TABLE 19.3

Cash Disbursements for Fun Toys (in Millions)

	Q1	Q2	Q3	Q4
Payment of accounts (60% of sales)	\$120	\$180	\$150	\$240
Wages, taxes, other expenses	40	60	50	80
Capital expenditures	0	100	0	0
Long-term financing expenses (interest and dividends)	20	20	20	20
Total cash disbursements	\$180	\$360	\$220	\$340

TABLE 19.4

Net Cash Inflow for Fun Toys (in Millions)

	Q1	Q2	Q3	Q4
Total cash collections	\$220	\$250	\$275	\$325
Total cash disbursements	180	360	220	340
Net cash inflow	\$ 40	-\$110	\$ 55	-\$ 15

	Q1	Q2	Q3	Q4
Beginning cash balance	\$20	\$ 60	-\$50	\$ 5
Net cash inflow	40	- 110	55	- 15
Ending cash balance	\$60	-\$ 50	\$ 5	-\$10
Minimum cash balance	- 10	- 10	- 10	- 10
Cumulative surplus (deficit)	\$50	-\$ 60	-\$ 5	-\$20

TABLE 19.5Cash Balance for Fun Toys
(in Millions)

We will assume that Fun Toys starts the year with a \$20 cash balance. Furthermore, Fun Toys maintains a \$10 minimum cash balance to guard against unforeseen contingencies and forecasting errors. So, the company starts the first quarter with \$20 in cash. This amount rises by \$40 during the quarter, and the ending balance is \$60. Of this, \$10 is reserved as a minimum, so we subtract it out and find that the first quarter surplus is $\$60 - \$10 = \$50$.

Fun Toys starts the second quarter with \$60 in cash (the ending balance from the previous quarter). There is a net cash inflow of $-\$110$, so the ending balance is $\$60 - \$110 = -\$50$. We need another \$10 as a buffer, so the total deficit is $-\$60$. These calculations and those for the last two quarters are summarized in Table 19.5.

At the end of the second quarter, Fun Toys has a cash shortfall of \$60. This occurs because of the seasonal pattern of sales (higher toward the end of the second quarter), the delay in collections, and the planned capital expenditure.

The cash situation at Fun Toys is projected to improve to a \$5 deficit in the third quarter; but, by year's end, Fun Toys still has a \$20 deficit. Without some sort of financing, this deficit will carry over into the next year. We explore this subject in the next section.

For now, we can make the following general comments about Fun Toys' cash needs:

1. Fun Toys' large outflow in the second quarter is not necessarily a sign of trouble. It results from delayed collections on sales and a planned capital expenditure (presumably a worthwhile one).
2. The figures in our example are based on a forecast. Sales could be much worse (or better) than the forecast figures.

Concept Questions

19.4a How would you do a sensitivity analysis (discussed in Chapter 11) for Fun Toys' net cash balance?

19.4b What could you learn from such an analysis?

Short-Term Borrowing

19.5

Fun Toys has a short-term financing problem. It cannot meet the forecast cash outflows in the second quarter using internal sources. How it will finance that shortfall depends on its financial policy. With a very flexible policy, Fun Toys might seek up to \$60 million in long-term debt financing.

In addition, note that much of the cash deficit comes from the large capital expenditure. Arguably, this is a candidate for long-term financing. Nonetheless, because we have discussed long-term financing elsewhere, we will concentrate here on two short-term borrowing options: (1) unsecured borrowing and (2) secured borrowing.

line of credit

A formal (committed) or informal (noncommitted) prearranged, short-term bank loan.

UNSECURED LOANS

The most common way to finance a temporary cash deficit is to arrange a short-term unsecured bank loan. Firms that use short-term bank loans often arrange for a line of credit. A **line of credit** is an agreement under which a firm is authorized to borrow up to a specified amount. To ensure that the line is used for short-term purposes, the lender will sometimes require the borrower to pay the line down to zero and keep it there for some period during the year, typically 60 days (called a *cleanup period*).

Short-term lines of credit are classified as either *committed* or *noncommitted*. The latter type is an informal arrangement that allows firms to borrow up to a previously specified limit without going through the normal paperwork (much as they would with a credit card). A *revolving credit arrangement* (or just *revolver*) is similar to a line of credit, but it is usually open for two or more years, whereas a line of credit would usually be evaluated on an annual basis.

Committed lines of credit are more formal legal arrangements that usually involve a commitment fee paid by the firm to the bank (usually the fee is on the order of .25 percent of the total committed funds per year). The interest rate on the line of credit is usually set equal to the bank's prime lending rate plus an additional percentage, and the rate will usually float. A firm that pays a commitment fee for a committed line of credit is essentially buying insurance to guarantee that the bank can't back out of the agreement (absent some material change in the borrower's status).

Compensating Balances As a part of a credit line or other lending arrangement, banks will sometimes require that the firm keep some amount of money on deposit. This is called a compensating balance. A **compensating balance** is some of the firm's money kept by the bank in low-interest or non-interest-bearing accounts. By leaving these funds with the bank and receiving little or no interest, the firm further increases the effective interest rate earned by the bank on the line of credit, thereby "compensating" the bank. A compensating balance might be on the order of 2 to 5 percent of the amount borrowed.

Firms also use compensating balances to pay for noncredit bank services such as cash management services. A traditionally contentious issue is whether the firm should pay for bank credit and noncredit services with fees or with compensating balances. Most major firms have now negotiated for banks to use the corporation's collected funds for compensation and use fees to cover any shortfall. Arrangements such as this one and some similar approaches discussed in the next chapter make the subject of minimum balances less of an issue than it once was.

Cost of a Compensating Balance A compensating balance requirement has an obvious opportunity cost because the money often must be deposited in an account with a zero or low interest rate. For example, suppose that we have a \$100,000 line of credit with a 10 percent compensating balance requirement. This means that 10 percent of the amount actually used must be left on deposit in a non-interest-bearing account.

The quoted interest rate on the credit line is 16 percent. Suppose we need \$54,000 to purchase some inventory. How much do we have to borrow? What interest rate are we effectively paying?

If we need \$54,000, we have to borrow enough so that \$54,000 is left over after we take out the 10 percent compensating balance:

$$\begin{aligned} \$54,000 &= (1 - .10) \times \text{Amount borrowed} \\ \$60,000 &= \$54,000/.90 = \text{Amount borrowed} \end{aligned}$$

compensating balance

Money kept by the firm with a bank in low-interest or non-interest-bearing accounts as part of a loan agreement.

The interest on the \$60,000 for one year at 16 percent is $\$60,000 \times .16 = \$9,600$. We're actually getting only \$54,000 to use, so the effective interest rate is:

$$\begin{aligned}\text{Effective interest rate} &= \text{Interest paid/Amount available} \\ &= \$9,600/54,000 \\ &= 17.78\%\end{aligned}$$

Notice that what effectively happens here is that we pay 16 cents in interest on every 90 cents we borrow because we don't get to use the 10 cents tied up in the compensating balance. The interest rate is thus $.16/90 = 17.78\%$, as we calculated.

Several points bear mentioning. First, compensating balances are usually computed as a monthly *average* of the daily balances. This means that the effective interest rate may be lower than our example illustrates. Second, it has become common for compensating balances to be based on the *unused* amount of the credit line. The requirement of such a balance amounts to an implicit commitment fee. Third, and most important, the details of any short-term business lending arrangements are highly negotiable. Banks will generally work with firms to design a package of fees and interest.

Letters of Credit A *letter of credit* is a common arrangement in international finance. With a letter of credit, the bank issuing the letter promises to make a loan if certain conditions are met. Typically, the letter guarantees payment on a shipment of goods provided that the goods arrive as promised. A letter of credit can be revocable (subject to cancellation) or irrevocable (not subject to cancellation if the specified conditions are met).

SECURED LOANS

Banks and other finance companies often require security for a short-term loan just as they do for a long-term loan. Security for short-term loans usually consists of accounts receivable, inventories, or both.

Accounts Receivable Financing **Accounts receivable financing** involves either *assigning* receivables or *factoring* receivables. Under assignment, the lender has the receivables as security, but the borrower is still responsible if a receivable can't be collected. With *conventional factoring*, the receivable is discounted and sold to the lender (the factor). Once it is sold, collection is the factor's problem, and the factor assumes the full risk of default on bad accounts. With *maturity factoring*, the factor forwards the money on an agreed-upon future date.

Factors play a particularly important role in the retail industry. Retailers in the clothing business, for example, must buy large amounts of new clothes at the beginning of the season. Because this is typically a long time before they have sold anything, they wait to pay their suppliers, sometimes 30 to 60 days. If an apparel maker can't wait that long, it turns to factors, who buy the receivables and take over collection. In fact, the garment industry accounts for about 80 percent of all factoring in the United States.

One of the newest types of factoring is called *credit card receivable funding* or *business cash advances*. The way business cash advances work is that a company goes to a factor and receives cash up front. From that point on, a portion of each credit card sale (perhaps 6 to 8 percent) is routed directly to the factor by the credit card processor until the loan is paid off. This arrangement may be attractive to small businesses in particular, but it can be expensive. The typical premium on the advance is about 35 percent—meaning that with a \$100,000 loan, \$135,000 must be repaid within a relatively short period.

accounts receivable financing

A secured short-term loan that involves either the assignment or the factoring of receivables.



For more about factoring, see www.factors.com.

EXAMPLE 19.3**Cost of Factoring**

For the year just ended, LuLu's Pies had an average of \$50,000 in accounts receivable. Credit sales were \$500,000. LuLu's factors its receivables by discounting them 3 percent—in other words, by selling them for 97 cents on the dollar. What is the effective interest rate on this source of short-term financing?

To determine the interest rate, we first have to know the accounts receivable, or average collection, period. During the year, LuLu's turned over its receivables $\$500,000/\$50,000 = 10$ times. The average collection period is therefore $365/10 = 36.5$ days.

The interest paid here is a form of discount interest (discussed in Chapter 6). In this case, LuLu's is paying 3 cents in interest on every 97 cents of financing. The interest rate per 36.5 days is thus $.03/.97 = 3.09\%$. The APR is $10 \times 3.09\% = 30.9\%$, but the effective annual rate is:

$$\text{EAR} = 1.0309^{10} - 1 = 35.6\%$$

Factoring is a relatively expensive source of money in this case.

We should note that, if the factor takes on the risk of default by a buyer, then the factor is providing insurance as well as immediate cash. More generally, the factor essentially takes over the firm's credit operations. This can result in a significant saving. The interest rate we calculated is therefore overstated, particularly if default is a significant possibility.

inventory loan

A secured short-term loan to purchase inventory.

Inventory Loans *Inventory loans*, short-term loans to purchase inventory, come in three basic forms: blanket inventory liens, trust receipts, and field warehouse financing:

1. *Blanket inventory lien*: A blanket lien gives the lender a lien against all the borrower's inventories (the blanket "covers" everything).
2. *Trust receipt*: A trust receipt is a device by which the borrower holds specific inventory in "trust" for the lender. Automobile dealer financing, for example, is done by use of trust receipts. This type of secured financing is also called *floor planning*, in reference to inventory on the showroom floor. However, it is somewhat cumbersome to use trust receipts for, say, wheat grain.
3. *Field warehouse financing*: In field warehouse financing, a public warehouse company (an independent company that specializes in inventory management) acts as a control agent to supervise the inventory for the lender.

OTHER SOURCES

A variety of other sources of short-term funds are employed by corporations. Two of the most important are *commercial paper* and *trade credit*.

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 interest rate the firm obtains is often significantly below the rate a bank would charge for a direct loan.

Another option available to a firm is to increase the accounts payable period; in other words, the firm may take longer to pay its bills. This amounts to borrowing from suppliers in the form of trade credit. This is an extremely important form of financing for smaller businesses in particular. As we discuss in Chapter 21, a firm using trade credit may end up paying a much higher price for what it purchases, so this can be a very expensive source of financing.

Concept Questions

19.5a What are the two basic forms of short-term financing?

19.5b Describe two types of secured loans.

A Short-Term Financial Plan

19.6

To illustrate a completed short-term financial plan, we will assume that Fun Toys arranges to borrow any needed funds on a short-term basis. The interest rate is a 20 percent APR, and it is calculated on a quarterly basis. From Chapter 6, we know that the rate is $20\%/4 = 5\%$ per quarter. We will assume that Fun Toys starts the year with no short-term debt.

From Table 19.5, we know that Fun Toys has a second-quarter deficit of \$60 million. The firm will have to borrow this amount. Net cash inflow in the following quarter is \$55 million. The firm will now have to pay $\$60 \text{ million} \times .05 = \3 million in interest out of that, leaving \$52 million to reduce the borrowing.

Fun Toys still owes $\$60 \text{ million} - 52 \text{ million} = \8 million at the end of the third quarter. Interest in the last quarter will thus be $\$8 \text{ million} \times .05 = \$.4 \text{ million}$. In addition, net inflows in the last quarter are $-\$15 \text{ million}$; so the company will have to borrow a total of \$15.4 million, bringing total borrowing up to $\$15.4 \text{ million} + 8 \text{ million} = \23.4 million . Table 19.6 extends Table 19.5 to include these calculations.

Notice that the ending short-term debt is just equal to the cumulative deficit for the entire year, \$20 million, plus the interest paid during the year, $\$3 \text{ million} + \$.4 \text{ million} = \$3.4 \text{ million}$, for a total of \$23.4 million.

Our plan is very simple. For example, we ignored the fact that the interest paid on the short-term debt is tax deductible. We also ignored the fact that the cash surplus in the first quarter would earn some interest (which would be taxable). We could add on a number of refinements. Even so, our plan highlights the fact that in about 90 days, Fun Toys will need to borrow \$60 million or so on a short-term basis. It's time to start lining up the source of the funds.

Our plan also illustrates that financing the firm's short-term needs will cost about \$3.4 million in interest (before taxes) for the year. This is a starting point for Fun Toys to begin evaluating alternatives to reduce this expense. For example, can the \$100 million planned expenditure be postponed or spread out? At 5 percent per quarter, short-term credit is expensive.

	Q1	Q2	Q3	Q4
Beginning cash balance	\$20	\$ 60	\$10	\$10.0
Net cash inflow	40	- 110	55	- 15.0
New short-term borrowing	—	60	—	15.4
Interest on short-term borrowing	—	—	- 3	- .4
Short-term borrowing repaid	—	—	- 52	—
Ending cash balance	\$60	\$ 10	\$10	\$10.0
Minimum cash balance	- 10	- 10	- 10	- 10.0
Cumulative surplus (deficit)	\$50	\$ 0	\$ 0	\$ 0.0
Beginning short-term borrowing	0	0	60	8.0
Change in short-term debt	0	60	- 52	15.4
Ending short-term debt	\$ 0	\$ 60	\$ 8	\$23.4

TABLE 19.6

Short-Term Financial Plan
for Fun Toys (in Millions)

Also, if Fun Toys' sales are expected to keep growing, then the deficit of \$20 million plus will probably also keep growing, and the need for additional financing will be permanent. Fun Toys may wish to think about raising money on a long-term basis to cover this need.

Concept Questions

19.6a In Table 19.6, does Fun Toys have a projected deficit or surplus?

19.6b In Table 19.6, what would happen to Fun Toys' deficit or surplus if the minimum cash balance was reduced to \$5?

19.7 Summary and Conclusions

1. This chapter has 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.
2. Managing short-term cash flows involves the minimizing of costs. The two major costs are carrying costs, the return forgone by keeping too much invested 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 doing short-term financial planning is to find the optimal trade-off between these two costs.
3. In an ideal economy, the 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 we live in, cash and net working capital provide 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 run. The firm has available to it a number of possible ways of acquiring funds to meet short-term shortfalls, including unsecured and secured loans.

CHAPTER REVIEW AND SELF-TEST PROBLEMS

19.1 The Operating and Cash Cycles Consider the following financial statement information for the Route 66 Company:

Item	Beginning	Ending
Inventory	\$1,273	\$1,401
Accounts receivable	3,782	3,368
Accounts payable	1,795	2,025
Net sales		\$14,750
Cost of goods sold		11,375

Calculate the operating and cash cycles.

19.2 Cash Balance for Greenwell Corporation The Greenwell Corporation has a 60-day average collection period and wishes to maintain a \$160 million minimum cash balance. Based on this and the information given in the following cash budget, complete the cash budget. What conclusions do you draw?

GREENWELL CORPORATION Cash Budget (in millions)				
	Q1	Q2	Q3	Q4
Beginning receivables	\$240			
Sales	150	\$165	\$180	\$135
Cash collections				
Ending receivables				
Total cash collections				
Total cash disbursements	170	160	185	190
Net cash inflow				
Beginning cash balance	\$ 45			
Net cash inflow				
Ending cash balance				
Minimum cash balance				
Cumulative surplus (deficit)				

ANSWERS TO CHAPTER REVIEW AND SELF-TEST PROBLEMS

19.1 We first need the turnover ratios. Note that we use the average values for all balance sheet items and that we base the inventory and payables turnover measures on cost of goods sold:

$$\text{Inventory turnover} = \$11,375 / [(1,273 + 1,401) / 2] = 8.51 \text{ times}$$

$$\text{Receivables turnover} = \$14,750 / [(3,782 + 3,368) / 2] = 4.13 \text{ times}$$

$$\text{Payables turnover} = \$11,375 / [(1,795 + 2,025) / 2] = 5.96 \text{ times}$$

We can now calculate the various periods:

$$\text{Inventory period} = 365 \text{ days} / 8.51 \text{ times} = 42.89 \text{ days}$$

$$\text{Receivables period} = 365 \text{ days} / 4.13 \text{ times} = 88.38 \text{ days}$$

$$\text{Payables period} = 365 \text{ days} / 5.96 \text{ times} = 61.24 \text{ days}$$

So the time it takes to acquire inventory and sell it is about 43 days. Collection takes another 88 days, and the operating cycle is thus $43 + 88 = 131$ days. The cash cycle is thus 131 days less the payables period: $131 - 61 = 70$ days.

19.2 Because Greenwell has a 60-day collection period, only sales made in the first 30 days of the quarter will be collected in the same quarter. Total cash collections in the first quarter will thus equal $30/90 = 1/3$ of sales plus beginning receivables, or $1/3 \times \$150 + 240 = \290 . Ending receivables for the first quarter (and the second-quarter beginning receivables) are the other $2/3$ of sales, or $2/3 \times \$150 = \100 . The remaining calculations are straightforward, and the completed budget follows:

GREENWELL CORPORATION Cash Budget (in millions)				
	Q1	Q2	Q3	Q4
Beginning receivables	\$240	\$100	\$110	\$120
Sales	150	165	180	135
Cash collections	290	155	170	165
Ending receivables	\$100	\$110	\$120	\$ 90
Total cash collections	\$290	\$155	\$170	\$165
Total cash disbursements	170	160	185	190
Net cash inflow	\$120	-\$ 5	-\$ 15	-\$ 25
Beginning cash balance	\$ 45	\$165	\$160	\$145
Net cash inflow	120	- 5	- 15	- 25
Ending cash balance	\$165	\$160	\$145	\$120
Minimum cash balance	- 160	- 160	- 160	- 160
Cumulative surplus (deficit)	\$ 5	\$ 0	-\$ 15	-\$ 40

The primary conclusion from this schedule is that, beginning in the third quarter, Greenwell's cash surplus becomes a cash deficit. By the end of the year, Greenwell will need to arrange for \$40 million in cash beyond what will be available.

CONCEPTS REVIEW AND CRITICAL THINKING QUESTIONS

- Operating Cycle** What are some of the characteristics of a firm with a long operating cycle?
- Cash Cycle** What are some of the characteristics of a firm with a long cash cycle?
- Sources and Uses** For the year just ended, you have gathered the following information about the Holly Corporation:
 - A \$200 dividend was paid.
 - Accounts payable increased by \$500.
 - Fixed asset purchases were \$900.
 - Inventories increased by \$625.
 - 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.
- Cost of Current Assets** Loftis Manufacturing, Inc., has recently installed a just-in-time (JIT) inventory system. Describe the effect this is likely to have on the company's carrying costs, shortage costs, and operating cycle.
- 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.

Use the following information to answer Questions 6–10: Last month, BlueSky Airline announced that it would stretch out its bill payments to 45 days from 30 days. The reason given was that the company wanted to “control costs and optimize cash flow.” The increased payables period will be in effect for all of the company's 4,000 suppliers.

- Operating and Cash Cycles** What impact did this change in payables policy have on BlueSky's operating cycle? Its cash cycle?

7. **Operating and Cash Cycles** What impact did the announcement have on BlueSky's suppliers?
8. **Corporate Ethics** Is it ethical for large firms to unilaterally lengthen their payables periods, particularly when dealing with smaller suppliers?
9. **Payables Period** Why don't all firms simply increase their payables periods to shorten their cash cycles?
10. **Payables Period** BlueSky lengthened its payables period to "control costs and optimize cash flow." Exactly what is the cash benefit to BlueSky from this change?


QUESTIONS AND PROBLEMS

1. **Changes in the Cash Account** Indicate the impact of the following corporate actions on cash, using the letter *I* for an increase, *D* for a decrease, or *N* when no change occurs:
 - a. A dividend is paid with funds received from a sale of debt.
 - b. Real estate is purchased and paid for with short-term debt.
 - c. Inventory is bought on credit.
 - d. A short-term bank loan is repaid.
 - e. Next year's taxes are prepaid.
 - f. Preferred stock is redeemed.
 - g. Sales are made on credit.
 - h. Interest on long-term debt is paid.
 - i. Payments for previous sales are collected.
 - j. The accounts payable balance is reduced.
 - k. A dividend is paid.
 - l. Production supplies are purchased and paid for with a short-term note.
 - m. Utility bills are paid.
 - n. Cash is paid for raw materials purchased for inventory.
 - o. Marketable securities are sold.
2. **Cash Equation** Details Corp. has a book net worth of \$8,500. Long-term debt is \$1,800. Net working capital, other than cash, is \$2,380. Fixed assets are \$6,400. How much cash does the company have? If current liabilities are \$1,250, what are current assets?
3. **Changes in the Operating Cycle** Indicate the effect that the following will have on the operating cycle. Use the letter *I* to indicate an increase, the letter *D* for a decrease, and the letter *N* for no change:
 - a. Average receivables goes up.
 - b. Credit repayment times for customers are increased.
 - c. Inventory turnover goes from 3 times to 6 times.
 - d. Payables turnover goes from 6 times to 11 times.
 - e. Receivables turnover goes from 7 times to 9 times.
 - f. Payments to suppliers are accelerated.
4. **Changes in Cycles** Indicate the impact of the following on the cash and operating cycles, respectively. Use the letter *I* to indicate an increase, the letter *D* for a

BASIC

(Questions 1–12)

decrease, and the letter *N* for no change:

- The terms of cash discounts offered to customers are made less favorable.
- The cash discounts offered by suppliers are decreased; thus, payments are made earlier.
- An increased number of customers begin to pay in cash instead of with credit.
- Fewer raw materials than usual are purchased.
- A greater percentage of raw material purchases are paid for with credit.
- More finished goods are produced for inventory instead of for order.

-  5. **Calculating Cash Collections** The Morning Jolt Coffee Company has projected the following quarterly sales amounts for the coming year:

	Q1	Q2	Q3	Q4
Sales	\$840	\$780	\$950	\$870

- Accounts receivable at the beginning of the year are \$340. Morning Jolt has a 45-day collection period. Calculate cash collections in each of the four quarters by completing the following:

	Q1	Q2	Q3	Q4
Beginning receivables				
Sales				
Cash collections				
Ending receivables				

- Rework (a) assuming a collection period of 60 days.
 - Rework (a) assuming a collection period of 30 days.
6. **Calculating Cycles** Consider the following financial statement information for the Bulldog Icers Corporation:



Item	Beginning	Ending
Inventory	\$9,215	\$10,876
Accounts receivable	5,387	5,932
Accounts payable	7,438	7,847
Net sales		\$85,682
Cost of goods sold		57,687

Calculate the operating and cash cycles. How do you interpret your answer?

- Factoring Receivables** Your firm has an average collection period of 38 days. Current practice is to factor all receivables immediately at a 2 percent discount. What is the effective cost of borrowing in this case? Assume that default is extremely unlikely.
- Calculating Payments** Iron Man Products has projected the following sales for the coming year:

	Q1	Q2	Q3	Q4
Sales	\$680	\$730	\$780	\$860

Sales in the year following this one are projected to be 15 percent greater in each quarter.

- a. Calculate payments to suppliers assuming that Iron Man places orders during each quarter equal to 30 percent of projected sales for the next quarter. Assume that Iron Man pays immediately. What is the payables period in this case?

	Q1	Q2	Q3	Q4
Payment of accounts	\$	\$	\$	\$

- b. Rework (a) assuming a 90-day payables period:

	Q1	Q2	Q3	Q4
Payment of accounts	\$	\$	\$	\$

- c. Rework (a) assuming a 60-day payables period:

	Q1	Q2	Q3	Q4
Payment of accounts	\$	\$	\$	\$

9. **Calculating Payments** The Thunder Dan Corporation’s purchases from suppliers in a quarter are equal to 75 percent of the next quarter’s forecast sales. The payables period is 60 days. Wages, taxes, and other expenses are 20 percent of sales, and interest and dividends are \$80 per quarter. No capital expenditures are planned. Projected quarterly sales are shown here:

	Q1	Q2	Q3	Q4
Sales	\$870	\$980	\$920	\$1,130

Sales for the first quarter of the following year are projected at \$980. Calculate Thunder’s cash outlays by completing the following:

	Q1	Q2	Q3	Q4
Payment of accounts				
Wages, taxes, other expenses				
Long-term financing expenses (interest and dividends)				
Total				

10. **Calculating Cash Collections** The following is the sales budget for Duck-n-Run, Inc., for the first quarter of 2006:

	January	February	March
Sales budget	\$275,000	\$295,000	\$320,000

Credit sales are collected as follows:

65 percent in the month of the sale

20 percent in the month after the sale

15 percent in the second month after the sale

The accounts receivable balance at the end of the previous quarter was \$107,000 (\$78,000 of which was uncollected December sales).

- a. Compute the sales for November.
- b. Compute the sales for December.
- c. Compute the cash collections from sales for each month from January through March.

11. **Calculating the Cash Budget** Here are some important figures from the budget of Nashville Nougats, Inc., for the second quarter of 2006:

	April	May	June
Credit sales	\$370,000	\$386,000	\$413,000
Credit purchases	143,000	172,400	198,500
Cash disbursements			
Wages, taxes, and expenses	48,750	56,500	67,300
Interest	12,500	12,500	12,500
Equipment purchases	78,000	89,000	0

The company predicts that 5 percent of its credit sales will never be collected, 35 percent of its sales will be collected in the month of the sale, and the remaining 60 percent will be collected in the following month. Credit purchases will be paid in the month following the purchase.

In March 2006, credit sales were \$205,000, and credit purchases were \$149,000. Using this information, complete the following cash budget:

	April	May	June
Beginning cash balance	\$210,000		
Cash receipts			
Cash collections from credit sales			
Total cash available			
Cash disbursements			
Purchases			
Wages, taxes, and expenses			
Interest			
Equipment purchases			
Total cash disbursements			
Ending cash balance			

12. **Sources and Uses** Below are the most recent balance sheets for Country Kettles, Inc. Excluding accumulated depreciation, determine whether each item is a source or a use of cash, and the amount:

COUNTRY KETTLES, INC.		
Balance Sheet		
December 31, 2006		
	2006	2005
Assets		
Cash	\$ 42,000	\$ 35,000
Accounts receivable	94,250	84,500
Inventory	78,750	75,000
Property, plant, equipment	181,475	168,750
Less: Accumulated depreciation	61,475	56,250
Total assets	<u>\$335,000</u>	<u>\$307,000</u>
Liabilities and Equity		
Accounts payable	\$ 60,500	\$ 55,000
Accrued expenses	5,150	8,450
Long-term debt	15,000	30,000
Common stock	28,000	25,000
Accumulated retained earnings	226,350	188,550
Total liabilities and equity	<u>\$335,000</u>	<u>\$307,000</u>

- 13. Costs of Borrowing** You've worked out a line of credit arrangement that allows you to borrow up to \$50 million at any time. The interest rate is .72 percent per month. In addition, 4 percent of the amount that you borrow must be deposited in a non-interest-bearing account. Assume that your bank uses compound interest on its line of credit loans.
- What is the effective annual interest rate on this lending arrangement?
 - Suppose you need \$15 million today and you repay it in six months. How much interest will you pay?
- 14. Costs of Borrowing** A bank offers your firm a revolving credit arrangement for up to \$80 million at an interest rate of 1.90 percent per quarter. The bank also requires you to maintain a compensating balance of 5 percent against the *unused* portion of the credit line, to be deposited in a non-interest-bearing account. Assume you have a short-term investment account at the bank that pays 1.10 percent per quarter, and assume that the bank uses compound interest on its revolving credit loans.
- What is your effective annual interest rate (an opportunity cost) on the revolving credit arrangement if your firm does not use it during the year?
 - What is your effective annual interest rate on the lending arrangement if you borrow \$45 million immediately and repay it in one year?
 - What is your effective annual interest rate if you borrow \$80 million immediately and repay it in one year?
- 15. Calculating the Cash Budget** Wildcat, Inc., has estimated sales (in millions) for the next four quarters as follows:

	Q1	Q2	Q3	Q4
Sales	\$230	\$195	\$270	\$290

Sales for the first quarter of the year after this one are projected at \$250 million. Accounts receivable at the beginning of the year were \$79 million. Wildcat has a 45-day collection period.

INTERMEDIATE
(Questions 13–16)



Wildcat's purchases from suppliers in a quarter are equal to 45 percent of the next quarter's forecast sales, and suppliers are normally paid in 36 days. Wages, taxes, and other expenses run about 30 percent of sales. Interest and dividends are \$15 million per quarter.

Wildcat plans a major capital outlay in the second quarter of \$90 million. Finally, the company started the year with a \$73 million cash balance and wishes to maintain a \$35 million minimum balance.

- a. Complete a cash budget for Wildcat by filling in the following:

WILDCAT, INC.				
Cash Budget				
(in millions)				
	Q1	Q2	Q3	Q4
Beginning cash balance	\$35			
Net cash inflow				
Ending cash balance				
Minimum cash balance	35			
Cumulative surplus (deficit)				

- b. Assume that Wildcat can borrow any needed funds on a short-term basis at a rate of 3 percent per quarter and can invest any excess funds in short-term marketable securities at a rate of 2 percent per quarter. Prepare a short-term financial plan by filling in the following schedule. What is the net cash cost (total interest paid minus total investment income earned) for the year?

WILDCAT, INC.				
Short-Term Financial Plan				
(in millions)				
	Q1	Q2	Q3	Q4
Beginning cash balance	\$73			
Net cash inflow				
New short-term investments				
Income from short-term investments				
Short-term investments sold				
New short-term borrowing				
Interest on short-term borrowing				
Short-term borrowing repaid				
Ending cash balance				
Minimum cash balance	35			
Cumulative surplus (deficit)				
Beginning short-term investments				
Ending short-term investments				
Beginning short-term debt				
Ending short-term debt				

16. **Cash Management Policy** Rework Problem 15 assuming:
- Wildcat maintains a minimum cash balance of \$50 million.
 - Wildcat maintains a minimum cash balance of \$20 million.

Based on your answers in (a) and (b), do you think the firm can boost its profit by changing its cash management policy? Are there other factors that must be considered as well? Explain.

17. **Costs of Borrowing** In exchange for a \$400 million fixed commitment line of credit, your firm has agreed to do the following:

1. Pay 1.6 percent per quarter on any funds actually borrowed.
2. Maintain a 4 percent compensating balance on any funds actually borrowed.
3. Pay an up-front commitment fee of .125 percent of the amount of the line.

Based on this information, answer the following:

- a. Ignoring the commitment fee, what is the effective annual interest rate on this line of credit?
 - b. Suppose your firm immediately uses \$210 million of the line and pays it off in one year. What is the effective annual interest rate on this \$210 million loan?
18. **Costs of Borrowing** Come and Go Bank offers your firm a 9 percent *discount* interest loan for up to \$15 million, and in addition requires you to maintain a 5 percent compensating balance against the amount borrowed. What is the effective annual interest rate on this lending arrangement?

CHALLENGE

(Questions 17–18)

WEB EXERCISES

- 19.1 **Cash Cycle** Go to www.investor.reuters.com. You will need to find the most recent annual income statement and two most recent balance sheets for BJ Services Company (BJS) and Avon Products (AVP). Both companies are on the S&P 500 Index. BJS is a provider of pressure pumping and other oilfield services; AVP is a manufacturer and marketer of beauty-related products. Calculate the cash cycle for each company and comment on any similarities or differences.



- 19.2 **Operating Cycle** Using the information you gathered in the previous problem, calculate the operating cycle for each company. What are the similarities or differences? Is this what you would expect from companies in each of these industries?

MINICASE

Piepkorn Manufacturing Working Capital Management

You have recently been hired by Piepkorn Manufacturing to work in the newly established treasury department. Piepkorn Manufacturing is a small company that produces cardboard boxes in a variety of sizes for different purchasers. Gary Piepkorn, the owner of the company, works primarily in the sales and production areas of the company. Currently, the company puts all receivables in one shoe box and all payables in another. Because of the disorganized system, the finance area needs work, and that’s what you’ve been brought in to do.

The company currently has a cash balance of \$164,000, and it plans to purchase new box-folding machinery in the fourth quarter at a cost of \$240,000. The machinery will be purchased with cash because of a discount offered. The company’s policy is to maintain a minimum cash balance of \$100,000. All sales and purchases are made on credit.

Gary Piepkorn has projected the following gross sales for each of the next four quarters:

	Q1	Q2	Q3	Q4
Gross sales	\$795,000	\$808,000	\$841,000	\$857,000

Also, gross sales for the first quarter of next year are projected at \$884,000. Piepkorn currently has an accounts receivable period of 57 days and an accounts receivable balance of \$530,000. Ten percent of the accounts receivable balance is from a company that has just entered bankruptcy, and it is likely this portion of the accounts receivable will never be collected.

Piepkorn typically orders 50 percent of next quarter’s projected gross sales in the current quarter, and suppliers are typically paid in 53 days. Wages, taxes, and other costs run about

25 percent of gross sales. The company has a quarterly interest payment of \$85,000 on its long-term debt.

The company uses a local bank for its short-term financial needs. It pays 1.5 percent per quarter in all short-term borrowing and maintains a money market account that pays 1 percent per quarter on all short-term deposits.

Gary has asked you to prepare a cash budget and short-term financial plan for the company under the current policies. He has also asked you to prepare additional plans based on changes in several inputs.

- Use the numbers given to complete the cash budget and short-term financial plan.
- Rework the cash budget and short-term financial plan assuming Piepkorn changes to a minimum balance of \$80,000.
- You have looked at the credit policy offered by your competitors and have determined that the industry standard credit policy is 1/10, net 45. The discount will
- begin to be offered on the first day of the first quarter. You want to examine how this credit policy would affect the cash budget and short-term financial plan. If this credit policy is implemented, you believe that 25 percent of all sales will take advantage of it, and the accounts receivable period will decline to 38 days. Rework the cash budget and short-term financial plan under the new credit policy and a minimum cash balance of \$80,000. What interest rate are you effectively offering customers?

PIEPKORN MANUFACTURING Cash Budget				
	Q1	Q2	Q3	Q4
Beginning cash balance				
Net cash inflow				
Ending cash balance				
Minimum cash balance	_____			
Cumulative surplus (deficit)	_____			

PIEPKORN MANUFACTURING Short-Term Financial Plan				
	Q1	Q2	Q3	Q4
Beginning cash balance				
Net cash inflow				
New short-term investments				
Income from short-term investments				
Short-term investments sold				
New short-term borrowing				
Interest on short-term borrowing				
Short-term borrowing repaid	_____			
Ending cash balance	_____			
Minimum cash balance	_____			
Cumulative surplus (deficit)	_____			
Beginning short-term investments				
Ending short-term investments				
Beginning short-term debt				
Ending short-term debt				